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Assessing Three Theories of Information Systems Innovation: An Interpretive Case Study of a Funds Management Company

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Abstract

There is a growing body of research looking at the adoption and diffusion of IS innovations. This paper assesses three theories of IS innovation and adoption: the stages model, the decision episode framework, and the technological framework model. The three theories are assessed with reference to an in-depth interpretive case study of a funds management company in New Zealand. The most important finding is that no one theory on its own is able to explain what happened in this particular case. All three theories of IS innovation are useful in highlighting particular areas of interest, and contribute to our understanding of the entire IS adoption process.

Keywords: innovation, adoption, diffusion, interpretive research, case study, New Zealand

1. Introduction

Much recent research has focused on the adoption and diffusion of IS innovations. An innovation is an idea, practice, or object that is perceived as new, while diffusion of innovation is the process by which an innovation is communicated through certain channels, over time, among the members of a social system (Rogers, 1983). Applying this to information systems, the focus is on the successful adoption and use of information technology in organizations. As Baskerville and Pries-Heje (Baskerville and Pries-Heje, 2001) point out, not only must those who originally develop the technology be innovative, but those who adopt IT must also be innovative in applying the IT in their own work lives. The "innovation must diffuse along with the IT."

Many theories of the adoption and diffusion of IS innovations have been suggested in the IS research literature. This paper discusses three of the most commonly used theories: the stages model, the decision episode framework, and the technological framework model. The primary purpose of this paper is to assess these three theories with reference to an in-depth interpretive case study of a funds management company in New Zealand. The case highlights the strengths and weaknesses of each theory and also provides some rich insights into the inhibitors of innovation. Our analysis shows that no one theory on its own is able to explain what happened in this particular case. This paper can be seen as a call for a broader perspective to be taken on the adoption and diffusion of IS innovations.

The paper is organised as follows. In the next section (Section 2), the three theoretical frameworks are described. This is followed by a brief discussion of the research method (in

Section 3). In Section 4 the case study data are presented. Section 5 analyses the case study data. The final section is the discussion and conclusions.

2. Three Theoretical Frameworks

Many different theoretical frameworks and approaches with regard IS adoption and innovation have been suggested in the IS research literature (e.g. Allen, 1999; Attewell, 1992; Baskerville and Pries-Heje, 2001; Grover, 1997; Kautz and Pries-Heje, 1996; Swanson, 1994; Zmud, 1984). In this paper we will compare and contrast three widely used theories of IS innovation: the stages model, the decision episode framework, and the technological framework model. These three models will now be described.

2.1 Stages model

Rogers' (1983) early innovation diffusion framework consisted of five linear phases (knowledge, persuasion, decision, implementation, and institutionalising). The framework acknowledges that before deciding to adopt an innovation, potential adopters are involved in a process of persuasion. Boundary spanners (i.e. people who act across group or organisational boundaries) expose the organisation to information about the innovation that influences the decision. Implementation involves acceptance and integration of the innovation into the organisation's systems, processes, and routines. A member of the core group (administrative or technical) that it affects should oversee the implementation. The institutionalising phase is where the innovation is adapted to fit within an organisation.

The main weakness of Rogers' model is that it shows the diffusion process as linear and as being driven by the needs of potential adopters. This fails to address the complex nature of the relationship between the adopter and the supplier e.g. how suppliers can "push" technological innovations on to adopters. Later studies of diffusion have recognised a more complex supplier/adopter relationship.

Zmud (1982) found organizational support for liaison groups to be a key ingredient in facilitating implementations. The existence of a formal internal technical service group comprised of technology champions and specialists enhances the transfer of technical know-how (Nilakanta and Scamell, 1990), and shows a proactive technological orientation. As well as knowledge flowing from the outside into the implementing organisation (diffusion), knowledge also flows from the internal implementing group to the outside supplier, termed 'innofusion' (Robertson, et al., 1996). This enables the supplier to learn by retaining situation specific knowledge and technology from the implementation process, and further diffuse the innovation. Rogers (1983) argues that diffusion is more realistically understood this way rather than as information transfer in bulk to the adopter/implementer.

2.2 Decision Episode Framework

Robertson et al. (1996) focus on a network of interrelationships. Called the Decision Episode Framework (DEF), their theory looks at the needs and activities of the different groups involved - from the supply side, to the innovation pool, and the users (see Figure 1).

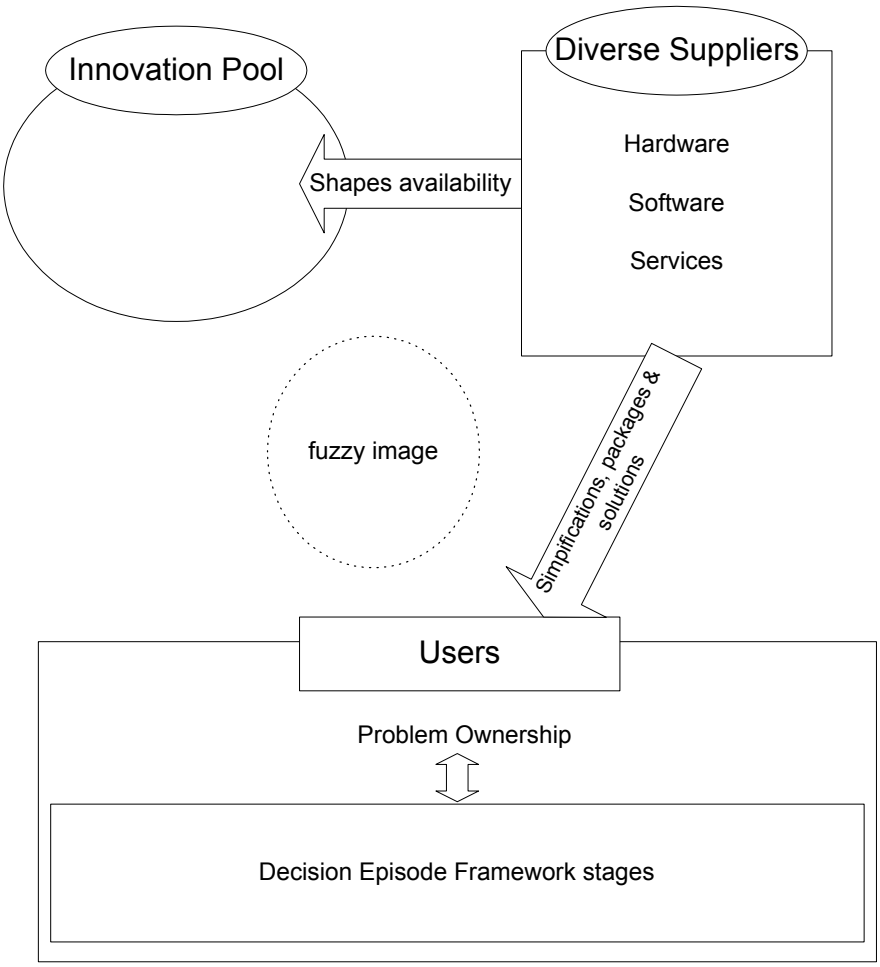

Figure 1. The Decision Episode Framework (adapted from Robertson et al (1996, p. 356)

The supply side shapes the availability of technology to the users. The innovation pool is the sum of technology used to provide an answer to the user's problem. The end result is the commodification of knowledge and its selective transfer between the participants and groups comprising a network.

Robertson et al. (1996) define networks as the basic social form that permits inter-organisational interactions of exchange (including exchange of knowledge). Boundary spanning behaviours (across group and organisational boundaries) will depend on the societal and institutional context within which the organisations are embedded. The composition of the groups involved in the network may bias decisions toward a particular group's self interest. Employees actively involved in these networks are more likely to make informed decisions.

The DEF framework shows the users as active decision makers in a series of 'decision episodes.' Unlike the linear stages model discussed earlier, the DEF episodes are not seen as discrete or "unilinear" stages, but "interactive and subject to loopbacks and modifications" (Clark, et al., 1992, p.73). This is an iterative process of problem definition and solution generation where the user's image of the technology is constantly changing. The DEF recognises the importance of political influence on the innovation process, and accommodates changes in problem ownership as the innovation process unfolds (Robertson, et al., 1996).

Studies have shown that the existence of a formal internal technical service group in the adopting organisation enhances the transfer of technical know-how. Attewell (1992) finds that firms delay adoption of complex technology until they know they have the technical know-how to implement and operate it successfully. The implication is that as knowledge barriers are lowered, diffusion speeds up.

2.3 Technological Frameworks' Model

Leon (1996) looks at knowledge related aspects of diffusion of software technologies. Leon discusses what he calls 'Technological Frameworks', which are maps of individuals' and groups' different reference frameworks. These frameworks include many social and contextual factors, such as the degree to which the group is working cooperatively with the technology provider to adapt the technology to the requirements of their company.

In using these technological frameworks, Leon illustrates how individuals and groups that have different reference frameworks have different perceptions of the technology (see Figure 2). When dealing with communities which have different reference frameworks there needs to be effort put into aligning their views so that a mutually beneficial understanding of the technology can be reached.

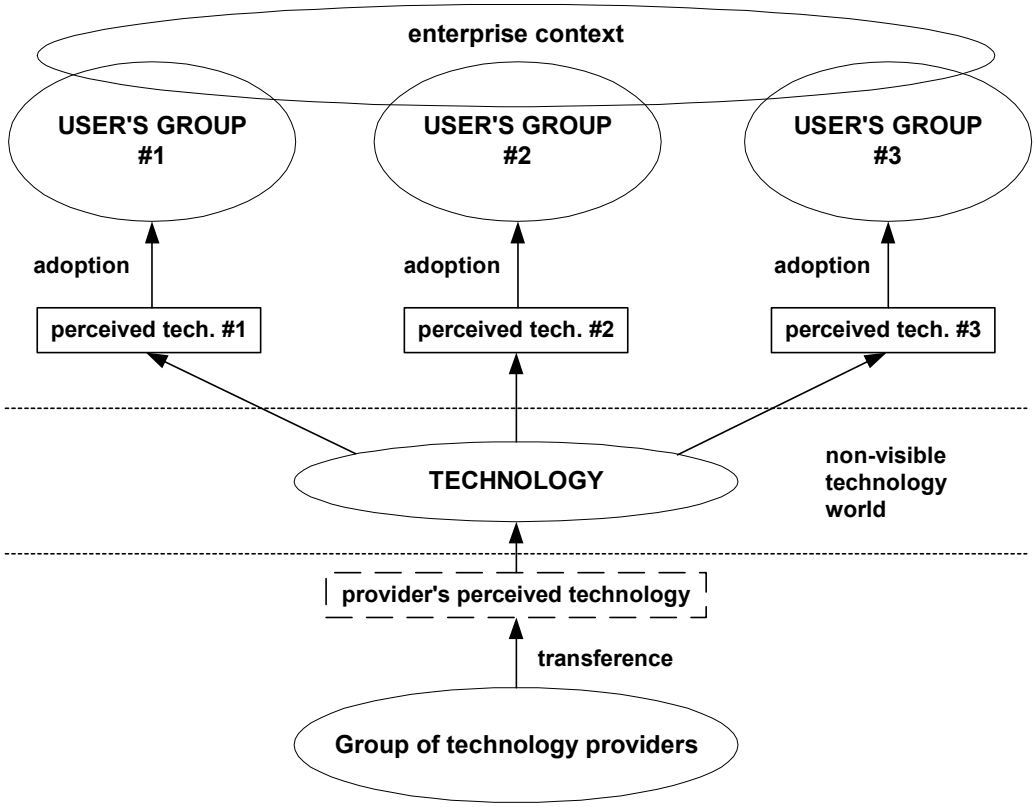

Figure 2 User groups differing technological frameworks (Leon, p.99)

Project team communication with both internal and external sources of innovation implementation is important. Effective communication requires varied information sources and quality channels of communication. The time required to diffuse a technology is strongly

dependent on the mechanisms used by stakeholders to communicate information, and increases when frameworks are not aligned.

Leon decomposes possible groups into circles of diffusion (see Figure 3). At each level there are different technological frames e.g. those used by project managers, developers, or implementers. The involvement of various groups changes over time, depending on the skills and knowledge required.

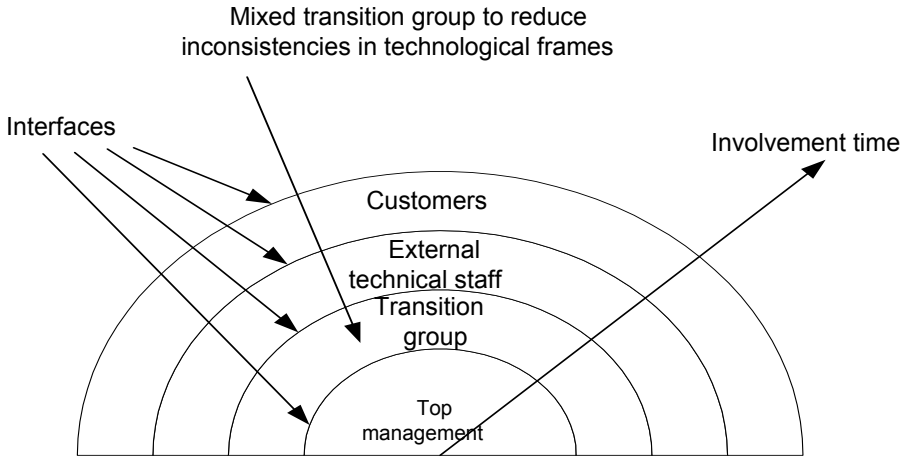

Figure 3 Circles of Diffusion (adapted from Leon, p.107)

Looking at the interface between these groups it is possible to understand the difficulty in "traversing" the interface. These interfaces can be external or internal to a given circle. It is this inconsistency of technological frameworks that is partly to blame for reported problems of introducing a predetermined technology into a certain context. Leon postulates that a failure to understand different technology frameworks is one of the most important causes of failures in adopting technological innovations.

2.4 Summary

We can see that, while the three models overlap in some areas, the perspective they take on the innovation process is quite different. The stages model sees the diffusion process as linear and as being driven by the needs of potential adopters. The DEF model focuses on numerous decision episodes within a network of interrelationships. The Technological Frameworks model focuses on the perceptions of various groups, and the alignment of their technological frameworks.

3. Research Method

As was stated earlier, one of the main purposes of this research was to assess three theories of IS innovation and adoption. We wanted to study one organisation in depth, focusing on the process, context and outcome of IT adoption. It was determined that the most appropriate research method for doing this was the interpretive case study. (Klein and Myers, 1999; Myers, 1997; Walsham, 1993; Walsham, 1995a; Walsham, 1995b).

The focus of our analysis was one specific case of IT adoption, where we wanted to understand the context, process and outcome of one particular project. The data were used to

construct an historical narrative of an IT project in a financial services company in New Zealand, from inception to final implementation.

Data were obtained from formal interviews, numerous documentary sources, and many informal discussions with some of the participants. The company in question (InvestmentLink) provided access to all their current employees for interviews. These employees had worked for InvestmentLink for at least two years, and several had been with the company from its inception. Interviews were held with two of the initial board members who had been strong advocates of the system and whose organisations were early adopters. Interviews were also held with employees of InvestmentLink's technology partner. The interviews typically lasted sixty minutes.

Published documents included newspaper articles, industry newsletters, magazines and reports, journal and newspaper articles, books, electronic media such as web sites, and various company supplied documents such as minutes of meetings, business plans, and copies of emails. The research was conducted by one of the authors over a four month period, from June 1999 to September 1999.

The principles of interpretive research suggested by Klein and Myers were used to guide the conduct of the research (Klein and Myers, 1999). Briefly, the discovery of the multiple perspectives of staff from diverse backgrounds (marketing, finance, management, technical) led to issues and findings being revised and reinterpreted as the project progressed The hermeneutic circle was used as the mode of analysis, attempting to make sense of conflicting interpretations by critically examining them with reference to their context.

4. Case Study: InvestmentLink New Zealand

This case study concerns the diffusion of a technological innovation, the InvestmentLink information system, and its take-up by financial advisors and fund managers. The InvestmentLink system had its origins in Australia and is owned by InvestmentLink Pty Limited in Australia (ILA). InvestmentLink New Zealand (ILNZ) is a private company owned by InvestmentLink Pty Limited and fund managers from the New Zealand market through the InvestmentLink Steering Committee(ILSC). InvestmentLink New Zealand was set up as marketing company, and holds the license for the New Zealand market for the system.

4.1 Investment & Financial Services Sector

In the managed funds industry, there are two main parties, Fund Managers (FM), who provide investment products, and Financial Advisers (FA), who collect market information and advise clients on their best investment options.

Previously, if a client asked a FA for a report on the status of his or her investment portfolio, a complex manual process ensued, requiring many phone calls requesting and chasing-up information. The process was also expensive and time consuming for the FMs, as they had to service the FAs' requests for basic information. The process was prone to errors as there were many stages at which data would need to be re-entered into disparate information systems by the FA or the FM. Reporting a client's position was thus time consuming and unreliable, which undermined the effectiveness of the FAs in giving investment advice. The concept of InvestmentLink was born out of a need to re-engineer this process.

The idea for a new system was also spurred on by a depressed market. Costs savings were becoming increasingly important, particularly with other competing investment products being developed. InvestmentLink was seen as very important to the financial planning and funds management industry because it would

> "provide significant cost savings which may be the salvation of financial advisers battling to keep clients in the face of an upsurge of direct marketed products from life insurance and superannuation companies" (*The National Business Review*, 18 October 1996, p.14).

4.2 The InvestmentLink System

The InvestmentLink system is an industry-wide service that provides the financial services sector with secure access to a centralised, consolidated-by-client source of managed-fund data. The source of data is the FM, who downloads data daily to the central InvestmentLink database. This data details the current value and composition of a client's investment portfolio, which is consolidated with the rest of the client's investment data in InvestmentLink. The data stored in the InvestmentLink database is then available for download by the FAs. The FA uses a desktop client, or Portfolio Management System (PMS), to manage their client's portfolio. The critical functionality of InvestmentLink is that it aggregates a client's investment portfolio under a unique client number, called an InvestmentLink Client Number (ILCN). The InvestmentLink system is shown in Figure 4.

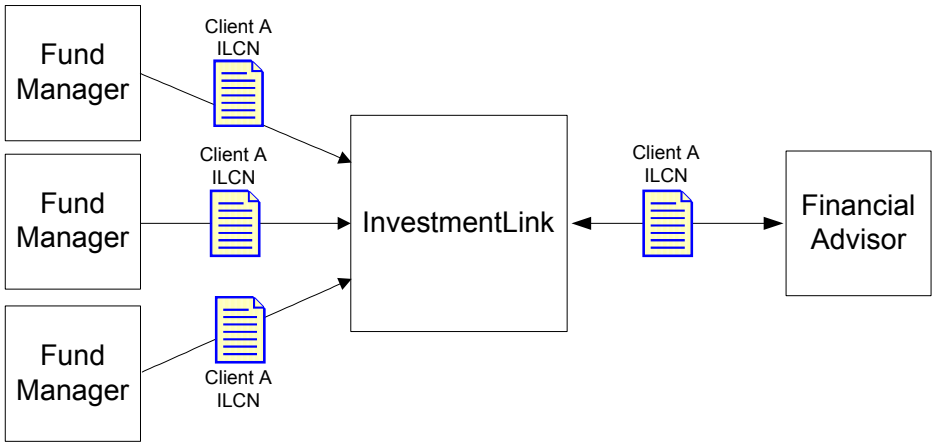

Figure 4. The InvestmentLink system

The take up process, or diffusion of the innovation (the InvestmentLink system), refers to the bringing of FMs and FAs onto InvestmentLink. When a FM or FA joins InvestmentLink, they sign an agreement and pay an initial licensing fee. Once a FM or FA becomes active, there are monthly fees and download charges.

4.3 Organisations and People

The InvestmentLink Steering Committee (ILSC) was established on 22 October 1996. The members of ILSC were executives from funds management companies in New Zealand. Since almost all of these funds management companies were subsidiaries of Australian companies, no market search for a suitable software product for the New Zealand market was

carried out. As the Australian parent companies were already using InvestmentLink, it was assumed that this product would be suitable for New Zealand. ILA (the owner and supplier of the system) was a similar beast to ILNZ; it was owned by a combination of representatives from the funds management industry and a technology provider.

In New Zealand both the ILSC and ILNZ boards were overseeing the project. The chairman of the ILSC board was also chairman of the ILNZ board, and occupied an executive role within ILNZ. His focus was seen to be at the level of servicing the existing customer base, of which his fulltime employer was one.

In Australia, CPS Systems (CPS) was ILA's technology partner. As CPS had a partly owned New Zealand subsidiary called CPSNZ, CPS was chosen to support the development of the system for ILNZ. Like its Australian counterpart, CPSNZ was perceived to have the required development skills and had done prior development work with internet based inter-organisational information systems.

After a proactive start supporting ILNZ, however, CPSNZ withdrew. They realised they would be making a large investment with limited potential for income. They originally thought they would get secondary business through being a reseller of InvestmentLink, but then realised that this would not be the case.

ILNZ's chairman took a marketing focus in his initiatives without realising there were serious implementation problems due to the lack of IT support. This support was meant to be forthcoming from ILA and its partner, and involved customisation (as agreed between the partners), and support of the uptake process. But with the skills of the board members and other employees of the organisation being strongly focused around the funds management industry, and the internally held conviction that ILNZ was a sales and marketing company, there was scant regard given to the role that technology was to play in the implementation process.

4.4 Markets and Structures

There were further complications in transferring the system from Australia to New Zealand. The differing regulatory environments shapes their market structures. In Australia strict reporting requirements meant that FAs formed large advisor groups, whereas in New Zealand the absence of such regulations meant that FAs tended to operate singly.

This had an impact on the ease with which the system was implemented. While the costs of implementing InvestmentLink in Australia (ILA) were minimised by FAs being able to amortise it across the entire group, in New Zealand each single FA had to face this cost burden alone. This was seen as a significant factor for the smaller FAs, who tended not to have a shared or internal IS function, and so needed to bring in consultants to carry out this work. This was made worse by the fact that their internal systems were unique, whereas in Australia, FAs within a group already used a shared IS.

There were several attempts to focus on the problems with the take-up process in New Zealand. CPSNZ rejected suggestions of possible development initiatives, as they were not looking to provide technology development within New Zealand. There was a fundamental misalignment between CPSNZ's intentions and the needs of ILNZ. CPSNZ was looking for

a product that it could resell; ILNZ was looking for a technology partner for development and support in New Zealand.

4.5 Knowledge

One of the main problems that emerged was the lack of IT knowledge within the New Zealand operation. Given ILNZ's focus as a marketing and sales organisation, staff with sales and marketing experience were appointed to positions within the company, but none of these people had any IT skills.

The board seemed unable to realise the problematic nature of the technology. Although ILSC had an articulated goal of stimulating technological innovation, ILNZ did little strategically to affect this goal. It appears they expected the IT strategy to be executed by ILA.

Initially, ILNZ focused on getting many sales for the new system, Operationally, however, ILNZ had difficulty assisting their clients when they encountered implementation problems.

The lack of IT knowledge accentuated another problem. After the first FMs became active, the others trying to come on were mostly small FMs who had no in-house IT and a smaller revenue base with which to absorb the development costs. Without the help of ILNZ, each company had to rely on an outside consultancy to interpret the file specification and attempt to implement it. Due to the diverse interests involved, ILNZ found that many of the FMs had misguided interpretations of the specification. This was only uncovered during testing, or even worse, once the FM had started downloading.

This cascaded down to the FMs who had trouble becoming compliant. They started backing off due to sunk costs, delays, and growing awareness that many others were having similar problems. InvestmentLink was only going to provide value if it had a large degree of take up in the market. But more and more FMs failed to meet their implementation deadlines.

4.6 Technology and Roles

One of the problems that emerged was the perception of the technology by the various stakeholders. This started with the original agreement between ILA and ILNZ. ILNZ understood that the technology was being implemented successfully in the Australian market, and so expected it to run smoothly in New Zealand. In reality the take-up process was complex, often involving multiple legacy systems and staff who did not understand the system.

With no internal IT competence, there was little ILNZ could do to provide effective assistance. Barriers to communication operated at two levels, between ILNZ and their clients, and between ILA and ILNZ. One was related to the mindset and strategic focus of the company as discussed earlier, the other was a contractual and cost issue.

The initial agreement between ILNZ and ILA stipulated that ILA would provide technical assistance to aid the take-up of InvestmentLink by ILNZ, along with training to ILNZ staff. Unfortunately, ILA had stretched their resources in solving their own problems. Added to this, ILNZ pays a fixed annual fee to ILA for provision of the InvestmentLink service. The costs to ILNZ are not based on system usage, so there is little incentive for ILA to ensure ILNZ receive the support they require.

Over time, the initial ownership structure, the differences in markets, and the attributes of the technology all became inhibitors to the success of InvestmentLink in New Zealand. There was still a level of determination within the organisation that InvestmentLink was going to succeed. However, at the time of the empirical research (1999), the financial data showed that there had been no significant growth in the number of clients using the system since mid-1997. Also, many adopting companies had not become 'active' three years or more after their strategic decision to 'join' InvestmentLink, as shown in Figure 5.

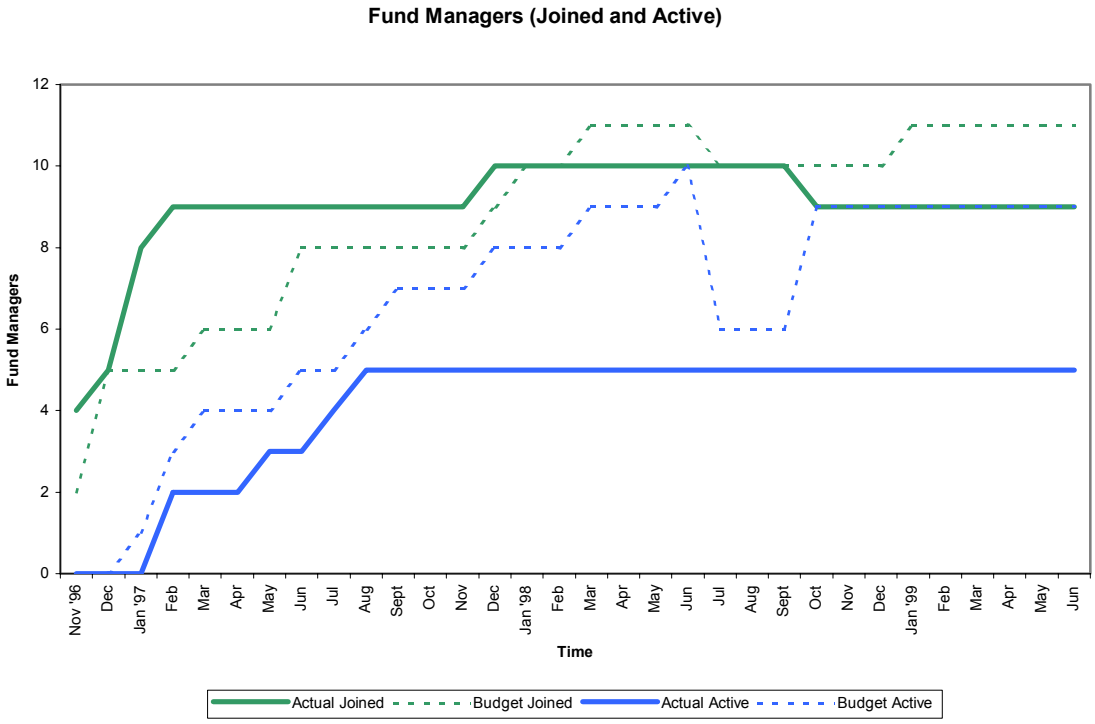

Figure 5. Fund Managers joined and active on InvestmentLink in New Zealand

5. Case Analysis

In Section 2 above, three models of diffusion of innovation were presented: the stages model, the Decision Episode Framework (DEF), and the technological framework model. In this section the aspects of the case that are highlighted by each of the three models are summarised, along with a brief description of how they fit with the case data.

5.1 The Stages Model

The stages model looks at adoption and diffusion of innovation mostly from a perspective internal to the adopting organisation. This study's focus, however, was from the perspective of an industry collaborative that acts as an agent for the technology supplier (but is not the implementing adopter per se). The issues that were in the adopter were also in the supplier; therefore the stages model takes too narrow a focus.

Table 1 summarises the case in relation to the stages model.

Stages model	The InvestmentLink Case Study
Adoption is the decision process and final mandate to adopt an innovation.	After initial acceptance many clients revisited the adoption decision due to resource constraints, turnover of staff, and reassessment of priorities.
An internal need or a market push initiates the innovation. This leads to a proposal being put forward for acceptance at the adoption stage.	Members of the funds management industry identified the need for a back office automation system. It was at an aggregate level that the proposal was put forward.
The implementation of an innovation should be overseen by a member of the core that it affects.	The innovation was seen as a technical innovation, but the implementation was overseen by administrative personnel.
At the implementation stage, organisations need technical resources and an internal technical services group for support.	There was neither an internal technical services group, nor any technical resources internal to the smaller New Zealand clients.
Technology champion and technology specialist, who have slack resources for investigating new technologies.	There were no technology specialists in the smaller clients adopting in New Zealand, with the larger companies relying on their Australian parents for knowledge and support.
A proactive technological orientation.	FMs and FAs made board level decisions to adopt InvestmentLink without any desire to investigate the technology per se.
Knowledge flowing both ways.	As adopters implemented on their own (using external consultants) there was no channel for the retention of site specific knowledge.

Table 1. Stages Model for ILNZ

5.2 The Decision Episode Framework

Robertson et al's (1996) Decision Episode Framework (DEF) depicts innovation as involving three parties (adopting organisation, supplier network, and innovation pool), and focuses primarily on the impact of various interactions with the adopting organisation. Table 2 summarises the case in relation to the DEF framework.

At the organisational level many companies had ‘adopted’ the innovation through purchasing shares in the industry organisation and paying their license and monthly fees. Some of these companies made this move only to regress later, usually following a change in ownership, markets, or personnel. A change in ownership caused companies to reassess their position regarding the innovation, before deciding whether to continue with it. This ties in with the core of the DEF model of iterative decision episodes and changing decision ownership.

In this research project we found that there were many ‘levels’ to a decision to adopt (the industry level, organisational level, and individual level). The industry cooperative body ILNZ facilitated the industry level decision, which was an unusual situation of a competitive decision being made in collaboration, and outside the adopting organisation. There were also other decisions made in the supplier network, which the model would attribute to the adopter. This highlights the problematic nature of a narrow focus on the adopter as the locus of decision-making.

DEF model	The InvestmentLink Case Study
Supplier network acknowledged to have an interest in promoting the diffusion of specific technologies.	ILNZ marketed a technology developed in the Australian market, which was different from its own. It did this as part of the supplier network.
Boundary spanning behaviours that occur will depend on the societal and institutional context within which the organisations are embedded	While there were planned boundary-spanning activities between the Australian and New Zealand partners, resource constraints and misaligned corporate strategies meant these did not eventuate.
The composition of the groups involved in the network may weight their decision toward a particular groups self interest	Those involved in the decision making process held an economic interest in New Zealand
Employees involved in networks are more likely to make informed decisions.	The only networks employees were involved in were related to the funds management industry, its products and markets.
Users as iterative decision makers (interactive, and subject to loopbacks and modifications)	The adopting organisations iterated between adopting and implementing, even after the initial adoption decision. This was often due to changes in management.
Existence of a formal internal technical service group in the adopting organisation enhances the transfer of technical know-how	There was no internal technical service group in the adopting organisations able to participate in knowledge transfer.
Attewell finds that firms delay adoption of complex technology until they know they have the technical know-how to implement and operate it successfully.	There were many delays for adopting organisations, although this wasn't deliberate but a side effect of their lack of technical know-how.

Table 2. DEF model for ILNZ

5.3 Technological Frameworks

The Technological Frameworks model depicts innovation in terms of the historical preconceptions of many different stakeholders in an organisation. Its fundamental tenet is that aligning views through open communication leads to successful innovation. Table 3 summarises the case in relation to the DEF framework.

The analysis using this model shows that the perceptions of technology internal to the adopting organisation were not informed in many vital areas. While a technical services group with the necessary knowledge did exist, they were located in the supplier, and the channels of communication that existed were of very low quality.

The Technological Frameworks model accommodates the differing perceptions of groups, but fails to illustrate the barriers to communication clearly. From earlier analysis using the DEF we saw that political, geographic, and market influences affected communication and knowledge transfer. By not acknowledging the role these boundaries have in impeding communication this model loses the ability to explain some of the unique aspects of this case.

Technological frameworks	The InvestmentLink Case Study
Different reference frameworks leads to different perceived technologies	There were at least three different perceptions of the technology (ILA, ILNZ, and FMs and FAs in New Zealand)
Effort needs to be put in to aligning different reference views so that a mutually beneficial understanding of the technology can be reached	There is no evidence of an effort to align reference views. No focus was given to the technology
Project team communication with both internal and external sources of innovation implementation is important.	There was little concept of a project team, with little ongoing communication with or between adopters.
Various information sources and channels of communication affect effective communication.	There was only one focus for support requests from the sales staff, the Australian helpdesk. Very low levels of service were experienced.
Quality rather than quantity of channels determine the effectiveness of communication. Effective communication aids in aligning frameworks.	There were very few channels available and the ones used were of low quality. The New Zealand sales staff found it frustrating and demoralising to constantly receive no reply from requests to the Australian helpdesk.
Time required to diffuse a technology is strongly dependent on the mechanisms used by stakeholders to perform work and to communicate information with other stakeholders through defined interfaces. Harder when frameworks aren't aligned.	With no effort to align frameworks and poor communication channels, the time required would be expected to increase, which is inline with the observed performance. Clients who expected to become 'active' in several months were taking several years.
Groups and group members participation change during the life of the project, depending on needs for skills and knowledge	Although hired for their experience in the financial sector, front-line sales staff provided technical support, as the team had no technical specialists.

Table 3. Technological Frameworks model for ILNZ

6. Discussion and Conclusions

In the space available we have been able to give only a brief overview of the ILNZ case. Even so we have been able to show something of the richness of the story as it unfolded showing the many dimensions of diffusion of innovation in this context. We have seen something of the complexity of interactions between people, organisations, markets, legal structures, and knowledge. We have also seen that while all three models of IT adoption and innovation are valuable, no one theory on its own is able to explain what happened in this particular case. All three theories of IS innovation are useful in highlighting particular areas of interest, and contribute to our understanding of the entire IS adoption process. But some aspects of the case are also not captured very well by any of the three models.

For example, all three innovation models mention the importance of an internal technical group within the adopting organisation. This group is supposed to influence the understanding of the technological innovation and the decision making process and makes available relevant knowledge to assist in the implementation of the innovation. The literature discusses the location of this technical services group as inside the adopting organisation, whereas in the case it existed deep within the supplier network. Not only did this impede access, but it also meant that this group was removed from the implementation process, removing the ability for members of the group to learn from situation specific problems.

The distance between the technology partners (geographically, and also in terms of strategic alignment) accentuated communication problems, despite contractual agreement to support ILNZ clients. ILNZ support staff were unable to access the information from ILA, who in turn were not prepared to pay for the technical support required from their technology partner.

In this case there was also a lack of understanding of strategic importance of IT. This led to a series of breakdowns in communication and to problems of knowledge retention.

We can conclude that all three models are useful in highlighting particular areas of interest. The three models of innovation provide different insights due to the perspectives they take (c.f. Baskerville and Pries-Heje, 2001). However each model captures just one part of the story. We hope that future researchers will gain further insights by taking a broader perspective on the entire adoption and diffusion of innovation process.

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