Organizational Factors in the Diffusion of an Industry Standard: Implementing an Online Documentation System for Australian Exporters

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INTRODUCTION: THE ROLE OF GOVERNMENT AGENCIES IN INSTITUTIONAL MARKETS

At present, governments in many countries are actively engaged in the development of electronic trading and certification standards to enable the smooth operation of export markets. Standards and their usability underpin confidence in the operations of markets and their effective functioning. In institutional markets, an important role for government agencies lies in developing the initial specifications for standards for interoperable systems. Once these specifications are accepted, governments can then facilitate the eventual diffusion of a standard to the B2B marketplace. Acceptance of an industry standard can determine demand, which defines the viability of that market.

In this paper, we describe an initiative by a government agency, the Australian Quarantine and Inspection Service (AQIS), in developing EXDOC, a standard for export documentation and the role that AQIS played in its implementation and diffusion. Our case study illustrates a successfully facilitated B2G implementation. It demonstrates how a standard can be supported and promulgated for the effective functioning of markets in the transition from manual to online export documentation.

Once the overarching specifications for related industries have been established and diffused by government, opportunities arise for private sector markets to develop across these industries. Government agencies can promote the effective operation of standards for electronic markets. The EXDOC implementation and its iterations provide an exemplar of active engagement in the development of electronic trading and certification standards for an institutional market. Its successful diffusion provides a model of the implementation process for other export sectors and agencies.

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ABSTRACT

At present, governments in many countries are actively engaged in the development of electronic trading and certification standards to enable the smooth operation of export markets. Standards and their usability underpin confidence in the operations of markets and their effective functioning. In institutional markets, an important role for government agencies lies in developing the initial specifications for standards for interoperable systems. Once these specifications are accepted, governments can then facilitate the eventual diffusion of a standard to the B2B marketplace. Acceptance of an industry standard can determine demand, which defines the viability of that market.

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KEYWORDS:
Institutional markets, export documentation, new organizational forums
be problematic. There is growing recognition (Orlikowski 1991; Robey and Boudreau 1999) that the challenges in this area are not uniquely technical problems but require a strategic organizational approach to developing guidelines for industry. Such an approach recognizes that trust in the usability of standards underpins markets and their effective functioning.

Standards that work depend on acceptance of input by organizations across industry groups. Businesses that expand their internal networks to include linkages with other firms typically need to develop strong trust relationships. Security concerns as well as sensitivity of information transmitted over company networks prompt many firms to forge alliances with partners they trust. Such alliances create cooperation based on personal relationships and mutual confidence which can lead to greater efficiency but may result in closed market structures. This may tend to restrict market entry for competitive firms that lack such close relationships (Wyckoff and Colecchia 1999: 146).

The deficiencies of such closed market structures become increasingly evident as firms move to take advantage of the benefits offered by e-commerce. In institutional markets, where business must deal with government, the push for implementation of electronic service delivery to benefit all players in a market tends to favor government agencies as the most acceptable sponsor of an open standard. For example, in our case study, the professional associations representing meat exporters initiated the push for AQIS to implement the EXDOC standard in the industry beginning from the 1980s (AQIS informant).

What do government agencies see as their role in the provision of electronic service delivery? Online and informational government activity can be envisaged as no more than improved efficiency in the provision of both government services and public data and information (CCLIA study 2000). These areas of activity represent proper, if restricted, roles for government. The EXDOC implementation suggests that government agencies can play another role – that of encouraging and facilitating much broader industry input in the formation of standards for electronic markets.

As regulatory bodies with public accountability, government agencies have a mandate to develop specifications for standards. These, in turn, underpin interoperable systems in institutional markets. Once standards are accepted between government and business [G2B], government can then facilitate the eventual diffusion of these standards to the business to business [B2B] marketplace.

Within this context, the major research question in this paper is: What are the organizational factors which lead to the successful development, implementation and diffusion of an industry standard in electronic markets? We also consider the subsidiary question – What is the role of government in supporting electronic markets and the standards that underpin them?

The EXDOC case study provides the context for both these questions. We review it as an illustration of an online documentation system initiated by a government agency in association with meat exporters from the early 1990s. The implementation occurred in a context where governments worldwide are increasingly committed to introducing electronic service delivery [ESD]. For example, a May 2001 report in Federal Computer Week announced that the US government with 164 websites is now the largest player in Internet-based commerce worldwide.

Convenience, speed and time savings are cited as the overwhelming benefits to conducting e-commerce transactions online (Symonds 2000). Business customers dealing with government agencies appreciate the improved competitiveness resulting from ESD. There are rising expectations of service in regards to availability, convenience, delivery time, and customer focus. Increased opportunities for business to government links are also part of these rising expectations.

The EXDOC implementation by AQIS addresses a number of these generic issues for governments engaging in ESD. It provides a current and successful example of the diffusion of a standard. We investigate how EXDOC supports the documentation system for exporters and review emerging outcomes as the system diffuses to other export sectors requiring AQIS documentation.

Context is critical to our understanding of this implementation so that case study methodology was selected as the most appropriate means of investigation. The operational aspects of imposing a standard are discussed in the following section. We then begin by reviewing the data in terms of diffusion theory (Rogers 1995). We also utilize Bijker’s (1995) technological framework, which specifies how discretion is distributed among actors and objects in an innovation context. A description of the EXDOC implementation and the findings derived from the case study follows. We conclude the paper by reviewing the role of government as honest broker in the development and diffusion of standards for institutional electronic markets and the implications of these findings for future research.

**RECOGNITION OF A STANDARD: CONSTRAINTS WITHIN THE ORGANIZATIONAL FRAMEWORK**

Specification of an industry standard is an integral part of providing a usable infrastructure. The outcomes of such an infrastructure enable software developers to build interoperable systems, which in turn open up the possibilities to more and more enterprises of purchasing software and joining in the surge of electronic business.

For both users and suppliers there exist a variety of positive and negative incentives for the development of standards. There is a rising interest in the benefits of interoperability. The benefits of having no need to translate between internal representation of data and interchange standards and the increased opportunities for managing trading partner relationships as well as choice of supply are more and more evident. However these positive incentives
are matched by the constraints offered by the costs attached to adoption and the greater responsibility for matching systems. The deregulation of industries, which allows greater access to all but also enables competitors entry with the removal of barriers, provides another example of the different dynamics at work here.

While the promotion of a universal standard is closely linked to effecting the introduction of ESD by government, problems remain in making standards actually work in practice. Ideally, standards for hardware, software or procedures should be the means of achieving interoperability within and between organizations, across industry sectors and among major world economic trading blocs. However, as we noted earlier, failures have significantly outweighed successes in the history of attempts to impose standards.

Diffusion theory and a social constructivist framework provide a basis for reviewing relationships and issues affecting adoption of a standard. We conclude this section of the paper with an overview of the theoretical underpinnings of this paper before proceeding to consider the EXDOC implementation in detail.

### Standards in Electronic Markets – User Needs and Expectations

In many information systems implementations, difficulties encountered in imposing a standard are more to do with its acceptance by users than purely technology related issues.

Diffusion of a standard for electronic markets requires both acceptance of the technology and accommodation to user needs. Standards that work require input by organizations across industry groups (Swatman 1993). Without such guidelines, standards develop that are selected without reference to any other industry group on the sole basis of incorporating what is seen as most appropriate to the transactions and type of business involved. For example, in extending EXDOC to the dairy sector, it would be extremely easy to develop subsets of optional data elements within this industry group which would have few if any common elements with those developed for meat.

What are appropriate levels of accommodation to the needs of users and what are the requisite levels of adaptation by users to a standard? Where agencies such as AQIS attempt to impose a standard these questions will require careful and ongoing consideration. Studies have shown that organizations seeking to diffuse centrally developed systems find they need to accommodate intraorganizational cultural differences rather than simply demand that end-user groups adapt to the technology (Kaye and Little 1996).

In the case of an officially determined standard for ESD, accommodation of difference is mandated by the fact that since governments cannot choose their customers, the services they provide must be for everyone. Officially determined standards must be the lowest and most inclusive available to ensure they address the capabilities of users. To be truly inclusive, the timing of the introduction of the technology requires careful consideration. If advanced technologies are prematurely deployed they will fail. The standard also has to be accessible to late adopters and provide appropriate entry points. Technology selection can be problematic in fast developing fields such as e-commerce.

AQIS, in its role as a government service provider, had to address the capabilities of EXDOC users across the sectors. Such considerations of inclusiveness eliminate the option of introducing cutting edge technology and narrow the decision-space for users. Building networks involves ‘enrolling’ actors in a network (Sauer and Yetton 1997: 237). While benefits may accrue to all from establishing a formal industry standard, the parties or actors are likely to have differing expectations. Government expectations of ESD will include reduction of redundant manual documentation and increased efficiency and accuracy of data processing and provision of management information. Private sector expectations place priority on reduced fees, quicker turnaround and a simplified documentation system.

Bijker’s technological framework (see Table 1) enables us to recognize the complexity of establishing a universal industry standard. Diffusion of a standard requires both acceptance of the technology and accommodation to user needs. Consequently, a standard represents both a problem as a requirement of an ESD system and a problem-solving strategy eliciting compliance to the system requirements.

### Diffusion and the Network Effect

Metcalfe’s Law states that a network becomes more useful in proportion to the square of the number of users (Shapiro and Varian 1999). Sometimes described as network externalities, the concept has been applied in the literature of standards where a primary concern is the choice of a correct standard. For electronic markets, the network effect – where the value of joining a network increases as more people join – is a critical aspect of the Web. Thus as more people use a network, its influence increases and the connection becomes more and more valuable. As the value for the users increases with the diffusion of the technology it creates lock-ins and self-reinforcing effects. Expanding the installed base of a standard gives rise to an accumulated ‘momentum’ of the standard so it becomes irreversible (Monterio and Hanseth 1996). The history of the adoption of the EXDOC by meat exporters – the first sector in this institutional electronic market to do so – demonstrates how a standard gains momentum to achieve such ‘irreversibility’.

### Diffusion Theory and the Implementation of an Industry Standard

The foundations for our review of the EXDOC implementation derive from diffusion theory (Rogers 1995),
which provided a basis for investigating relationships between and within organizations. Diffusion of innovation research considers the communication, spread and adoption of new ideas through social communities. It offers insights into the reasons surrounding the widespread uptake of new ideas by communities of firms. Where there is a single definable best practice as in the case of EXDOC, success in diffusion of the innovation can be measured by the rate at which potential users adopt the innovation. Diffusion research highlights a number of factors as central to the rate an extent of adoption. These include the characteristics of the innovation, characteristics of potential adopters and the social networks which enable the idea to be communicated to communities of organizations.

In addition to diffusion theory, we also refer to Bijker’s technological framework (1995) which enables the researcher to organize and facilitate interpretation of data from case studies. Bijker presents innovation as an interactive process. The framework integrates detailed case studies with theoretical concepts of issues such as notions of power, involved in sociotechnical change. Bijker explicitly utilizes the definition of power as capacity from Giddens (1979) to consider the effects of inclusion and exclusion on types of innovation. In this paper we apply his conception of power defined as transformative capacity in relation to the role of government in providing a universal standard for electronic markets.

Research Methodology

The case study method was selected as the most suited to the exploratory nature of the research topic. It is especially appropriate as context is critical to understanding the EXDOC implementation. It would be impossible to study the EXDOC system outside the context in which it occurs (Yin 1994). It is also a method that suits studies of electronic markets as it provides opportunities for valuable insights into new topics emerging in a rapidly changing field (Benbasat et al 1987). The diffusion of standards in electronic markets provides a good example of such a phenomenon. The case study is limited in its predictive ability and does not provide much opportunity for hypothesizing on likely variables of interest in advance or how they will be measured. However in studying a phenomenon such as the diffusion of emerging standards in electronic markets, case studies are important to build deep understanding. Currently there are few exemplary case studies of implementations of standards in these markets in the literature. Such case studies may then provide sufficient data for broad and conceptual interpretation to generate theory applicable to a variety of contexts.

ADOPTION OF A STANDARD: THE CASE STUDY

Studies of both proprietary and mandatory standards have established that arriving at a definition of a standard involves much more than simply designing a technological system (Monteiro and Hanseth 1996; Swatman 1993). In the case of EXDOC, it was important to review both the processes involved in its adoption and diffusion and how the standard acquired stability and became increasingly irreversible. This required a clear understanding of what the government agency intended to achieve, the views of the stakeholders concerning the use of the technology and the contexts within which the attempted technological introduction was taking place.

The Impact of EXDOC at AQIS

AQIS, the Australian Quarantine and Inspection Service, uses the EXport DOCumentation (EXDOC) system to demonstrate that export products have been subjected to its inspection and to ensure product meets Australian and importing country standards.

AQIS has operated EXDOC since August 1992 for meat inspections (more than 90% of meat exporters are now EXDOC users) and the system is now being extended to other export sectors, principally dairy, grains, fish and horticulture. It has been piloted in the dairy sector since July 1998. The EXDOC system accepts details of proposed exports from exporters, links these with the results of on-plant inspection of product and, where product is eligible, issues export permits and health certificates to enable
export. The central documents involved are the Request for Permit (RFP), provided by the exporter, and the Export Permit Number (EPN) and health certificate, both provided by AQIS. Export information can be submitted as a single transaction, or incrementally as it becomes known (see Figure 1). The overall impact of electronic transmissions of health certificates (SANCERT) is evident in reducing costs, facilitating data flow and increasing security of both documents and products.

The EXDOC study provides essential insights into the transitional requirements for moving from a traditional paper-based system to one that is electronically enabled. The organizations in the meat export sector were chosen for the study because they were known to be advanced users of EXDOC. The definition of a standard for the fresh food export sector underpinned the implementation.

From its inception in the meat export sector, AQIS was looking to EXDOC to achieve more efficient methods for keeping track of documents. As Table 2 demonstrates, the outcomes appear to have fulfilled these expectations. An AQIS regional manager summed up the benefits: ‘EXDOC certainly is a saving for the Government. They require the same number of people in their regional offices, they get information and they get it quicker before anything happens and most of it is done electronically without interference.’

AQIS is aware of the interest in the implementation from other export sectors. The implementation with the meat sector has generated repeated enquiries from other export sectors. ‘Skins and hides are asking for information about going onto EXDOC . . . lots of people are hooking up their dot matrix printers so the information is already stored in there’ (AQIS informant). In a number of export sectors requiring AQIS documentation, low levels of computer literacy and difficulty in understanding e-commerce demonstrate an inadequate level of preparedness for online documentation (see Commonwealth of Australia, 1999). However, when other export sectors do take on EXDOC it ‘will be an incredible change in the way they do business’ (AQIS informant).

In the longer term, as the EXDOC system is adopted more broadly, these intangible gains could also facilitate the transmission of commercial information to other players in the export chain such as the transport, insurance and banking industries. Improvements in security and delivery mechanisms provide a network for expanding the conduct of AQIS information transfer and business outside the arena of export documentation. These changes ‘will increase the EXDOC revenue base without considerably increasing the fixed cost of providing documentation services. The outcome will be both cheaper user registration charges and lower per documentation charges’ (Commonwealth of Australia, 1999). Improvements in security and delivery mechanisms provide a network for

Figure 1. EXDOC System Overview, 1999, AQIS
Table 2. Impact of Introducing Electronic Documentation at AQIS

<table>
<thead>
<tr>
<th>Current</th>
<th>Potential</th>
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<tr>
<td><strong>Faster turnaround:</strong></td>
<td>Implementation of SANCERT with Australia’s four major meat-trading partners would reduce the amount of paper generated in AQIS regional offices by 60%. Future projections are for a paper-free export certification system</td>
</tr>
<tr>
<td>Export and health certification time reduced from up to 2 days to within 20 minutes</td>
<td></td>
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<tr>
<td><strong>Reduced paperwork:</strong></td>
<td></td>
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<tr>
<td>AQIS and Japan use SANCERT transmissions as the primary edible meat import clearance document comprising 25% of meat health certificates delivered via SANCERT</td>
<td></td>
</tr>
<tr>
<td><strong>Reduced staff time processing export requests:</strong></td>
<td>More focus on developing computer literacy and less on clerical skills</td>
</tr>
<tr>
<td>EXDOC facility for facsimile signatures currently used on 80 per cent of paper health certificates.</td>
<td>Integrating capture of data for AQIS and Australian Customs in a single electronic window</td>
</tr>
<tr>
<td>Full time staff providing certification down from 16.5 to 12 with vet officers down from 6 part time to 1.2 veterinary staff equivalents</td>
<td></td>
</tr>
<tr>
<td><strong>Reduced internal and external costs:</strong></td>
<td></td>
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<tr>
<td>Significantly reduced support requirements for IT improvements to the initial 1998 EXDOC system</td>
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expanding the conduct of AQIS information transfer and business outside the arena of export documentation – an option being actively pursued by firms in the dairy sector.

The more people use a network, the more its influence increases and the connection becomes more and more valuable. The operations of Metcalfe’s Law are apparent in the broader implementation of EXDOC which AQIS is currently extending to non-meat commodities. This will offer AQIS value-adding opportunities to:

- increase productivity with the current 400 meat users growing to around 1,600 to 2,000 users;
- increase output from 12,000 to around 290,000 documents per year; and
- use existing infrastructure to accommodate this increase.

The Benefits of EXDOC

For [exporters] the benefit [of improved supply chain management] can be realized in a number of ways. It can be realized in speed of transaction, or, in the longer term, we also believe that it will give us cost savings in terms of administration within the export business (Mike Newman, Unilever Australia’s export development manager (Supermarket to Asia, 2000))

Moving the documentation of statutory forms to EXDOC was a major benefit of computerization. Exporters no longer had to worry about having to deliver papers, especially the export permit, saving on courier costs. The Meat Industry Association [now known as Meat and Livestock Australia or the MLA] reduced their control costs significantly and AQIS was able to exert more control over exports and grow EXDOC to other sectors.

A manager of a leading meat industry exporter at the time of the changeover recalls: ‘It was the way things were going anyway . . . we could see it would save us a lot of time down the track’. Whereas early adopters were driven by the desire to improve performance, once it has diffused through a sector such as meat, a standard reaches a threshold where adoption provides legitimacy. By defining the change to EXDOC as accepted practice this manager effectively signalled to other stakeholders that the EXDOC standard had achieved ‘lock-in’.

In the case of export documentation for the Australian Quarantine and Inspection Service, pressure for change from the paper-based system came from two sources. The industry was looking for simpler, more cost-effective methods and government wanted to keep track of documents and improve efficiency. EXDOC was intended to lower the existing exporter’ costs by making transactions easier and faster to process. EXDOC was promoted to exporters as a service supporting current systems of business rather than overtaking them.

Within the meat export sector, a strong push for change came from larger firms and representatives of the MLA. They were keenly aware of the benefits EXDOC would confer on them:

- registration fee cut by 50% (in some cases amounting to a saving of some $40,000 pa);
- communication costs cut by up to 50%;
- paperwork reduced significantly (with consequent redeployment of clerical staff); and
- data for quotas, statistical purposes available online (representing significant time savings and improved industry forecasting).

The majority of meat producers at the end of the 1980s were only ad hoc exporters who felt they had no choice in the matter. The small ‘meaties’ were ‘still part of the game’ but many of them were not computer-literate and could ill afford the cost involved in purchasing software and
Organizational Factors in the Diffusion of EXDOC

There was scant evidence of a relationship between organizational readiness and adoption in the EXDOC implementation in the meat export sector. As a government informant recalled, ‘In the early 1990s managers in the smaller companies had no idea of technology at all – there would not have been one computer on their premises’. We found a number of possible explanations in the literature for our finding. Abrahamson and Rosenkopf (1993) report that institutionally induced change may exert a pressure on organizations to embrace change when conditions required to achieve a level of technical efficiency in the adopting organization are not present.

Institutionally induced change serves as a partial explanation of the lack of relationship between organizational readiness and adoption in this sector. Another investigation of four firms reported in the literature also found a similar lack of relationship between organizational readiness and adoption of an IS implementation (Iacovou et al 1995). Iacovou et al explained their findings by reference to the ‘partner dependency effect’ – that is, the power of a stronger partner to enroll a weaker partner in a network. We suggest that the history of the EXDOC implementation strongly supports this hypothesis.

In any review of factors leading to adoption of an innovation, the immediate political and social context should not be overlooked (Sauer and Yetton 1997). For example, in the decade prior to the first implementation of EXDOC in the export sector, problems with product and documentation security had resulted in close government supervision and regulation of Australia’s meat exports. Under the umbrella of the Meat and Livestock Association, the major meat exporters in the sector had taken the lead in the demands for a new standard. The benefits for larger firms in this new electronic market were manifest. In this setting, AQIS as the official sponsor for EXDOC, represented an agency with the unique capacity or power to provide a universal standard for this market.

EXDOC thus provided a problem-solving strategy acceptable to the meat exporters at that time. Their initial acceptance of the EXDOC online documentation system and its subsequent development for the sector, (as set out in Table 3 below), provides a model of the implementation process for other export sectors and agencies.

Currently 90% of EXDOC meat certificates are signed electronically. Japan, a major trading partner, also accepts electronic transmission of health certificates for meat (SANCERT). Standards that underpin secure online documentation systems for regulating meat imports and exports are likely to be of growing interest to Australia’s trading partners – particularly following international health concerns related to beef imports.

As the EXDOC standard diffuses through and beyond this electronic market, AQIS as sponsor of the EXDOC implementation has achieved a number of significant gains – both tangible and intangible. The meat exporters who enrolled as users in the initial electronic market based on the EXDOC standard were shown to be a group with diverse and in many cases, divergent interests. While the trend is towards consolidation, in the early 1990s the beef industry was characterized by ‘the heterogeneity of its production, processing and distribution . . . whose development has owed little to co-ordination in the chain’ (Spitter et al 1998). Acceptance of the new technology appears most closely related to the presentation of EXDOC by AQIS and industry associations as an appropriate problem-solving strategy for industry needs at the time.

SUMMARY OF FINDINGS

In this paper we have considered the case of the EXDOC implementation in relation to two questions. First we considered the question: What are the organizational factors which lead to the successful development, implementation and diffusion of an industry standard in electronic markets? Three findings emerged in relation to this question. First we found that the timing of development

### Table 3. Development of the Innovation Process

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<th>Developmental Features of the Innovation Process</th>
<th>Application to EXDOC Implementation</th>
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<tr>
<td>More elements are fixed</td>
<td>Electronic signature for 90%+ of meat exporter documentation</td>
</tr>
<tr>
<td>More people enlisted in relevant group</td>
<td>All meat exporters now on EXDOC and increasing percentage in other fresh food sectors</td>
</tr>
<tr>
<td>New relevant, social groups enrolling</td>
<td>Other fresh food sectors now going online eg, dairy, fish or preparing to do so eg, horticulture, skins, hides</td>
</tr>
<tr>
<td>Elaborating the meaning of the artefact</td>
<td>Subsidized education programmes for other countries to utilize EXDOC eg, Singapore</td>
</tr>
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</table>

Source: Based on Bijker (1995)
and implementation of a standard across industry boundaries is crucial to ensure that all participants benefit. Second, the time made available for the implementation should also accommodate organizational learning. Explicit and implicit learning during the process of moving from manual to computerized information systems produces a legacy of understanding within organizations. Diffusion of a standard underpins such a transition. Successful diffusion and integration of a standard can be compromised where learning, and the time required for the learning to take place, is negatively labelled as resistance to change. Third, to be successful, the sponsors of an industry standard have to acknowledge and work with underlying tensions between accommodation and adoption.

Two findings emerged from our investigation in response to our second or subsidiary question: What is the role of government in supporting electronic markets and the standards that underpin them? We found that successful implementation of the new standard required coordination of the surrounding actors, institutional arrangements and work practices. We also found that government agencies such as AQIS are in a unique position to develop and diffuse the standards that underpin electronic markets. In the role of honest broker, a government can act as a guarantor for the integrity of a system in a way not open to a single vendor. In institutional markets a government agency acting as facilitator can engender trust not only in the standard but between participants. Once established, trust is then enhanced by the spread of the network and its increasing returns for participants.

CONCLUSION

For many meat exporters, the implementation of the EXDOC standard for the sector became a means of defining what they, as users, wanted from their organizational information systems, specifying their preferences and tradeoffs. Instead of tweaking the system to fit their part of the industry, these companies found that they could develop business rules from these definitions. Improvements in security and delivery mechanisms also now provide a network for expanding the conduct of AQIS information transfer and business outside the arena of export documentation – an option being actively pursued by firms in the dairy sector.

AQIS via EXDOC brought together key players in the export supply chain in Australia in a sector noted for its very traditional approach. It has effectively enlisted small to medium-sized businesses along with sector leaders in an electronic service delivery initiative. EXDOC has also provided a basis for facilitating the transmission of commercial information to other players in the export chain such as the transport, insurance and banking industries.

These are all implications for practice. While we have utilized Abrahamson and Rosenkopf’s work on institutional pressures (1993) and that of Iacovou et al (1995) on the partner dependency effect, there is room for further exploration of the problematic relationship between organizational readiness and adoption. Such research would benefit diffusion of innovation studies. We hope this study will also stimulate research on applications of Metcalfe’s Law and network effects underpinning other electronic markets. These kinds of investigations would add to our understanding of standards and what is required for them to gain momentum and achieve irreversibility.

References


