

SUCCESS AND FAILURE FACTORS FOR IMPLEMENTING EFFECTIVE ELECTRONIC MARKETS¹

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ABSTRACT

Despite the growth of research interest into electronic markets, there is still little information available on the ways in which an electronic market can be successfully developed. This article reports the development of a set of success and failure factors for electronic markets, specifically those within the electronic livestock and crop marketing area. A brief summary of the factors found is given, and some conclusions for successful development drawn.

INTRODUCTION

Despite the growth of research interest in the field (e.g. Clarke and Jenkins, 1993; Malone et al 1989; Powell, 1990), there is still little information available on the ways in which an electronic market can be successfully developed. This suggests a need to gain a greater understanding of the nature of electronic markets themselves and, in particular, to identify the factors which underpin success and failure in the majority of cases. This article summarises the results of the first phase of a long-term research project, presenting a set of initial success and failure factors developed from the investigation of electronic livestock and crop marketing, and possibly relevant to the wider grouping of electronic markets in general.

AGRICULTURAL ELECTRONIC MARKETS

The research project reported in this paper took a systematic approach to analysing a number of electronic markets within one industry, to investigate whether a generalised set of success and failure factors existed. Our aim was to begin building a theory of success and failure factors in implementing agricultural electronic markets. We used multiple case studies by literature survey² to collect a body of cases in one industry,

allowing us to engage in preliminary theory building which could then be extended and tested through further research. The case studies examined were:

- ◆ TELCOT
Electronic Cotton Marketing (U.S.A),
- ◆ HAMS
Hog Accelerated Marketing System (U.S.A),

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²Sekaran (1992, p37) defines a literature survey as "The documentation of a comprehensive review of the published and unpublished work from secondary sources of data in the areas of specific interest to the research".

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- ◆ CATS
Computer Aided Trading System for wholesale meat (U.S.A),
- ◆ CATTLEX
Cattle Exchange (U.S.A),
- ◆ HAM
Hog Auction Market (Singapore), and
- ◆ CALM
Computer Aided Livestock Marketing (Australia).

(Sporleder and Davis, 1981; Sarhan and Nelson, 1983; Sporleder, 1980; Lindsey *et al*, 1990; Clarke and Jenkins, 1993; Johnston, 1994; Neo, 1992)

All the selected cases document the modernisation of a traditional agricultural market into an electronic version of the traditional market. Among these cases, three cases (TELCOT, HAM and CALM) were considered successful because they evolved beyond a pilot into a full-implemented system, while the other three (CATS, CATTLEX, and HAMS) were classed as "unsuccessful", because the pilot projects did not evolve into commercial systems.

SUCCESS AND FAILURE FACTORS

After critical analysis of the individual electronic market case studies, we derived an initial set of *failure factors* to explain the high failure rate associated with such electronic market systems, especially during the 1970s and early 1980s. These failure factors for market operators were (for more information see Fong, 1997):

1. Over-developed systems
2. Lack of SUFFICIENT and ACTIVE market participants
3. Dual Marketing
4. Free-riders
5. Impersonal nature of an electronic market system

A set of *success factors* was also derived from the cross-cases analysis to complement the existing approaches in implementing successful electronic market systems. These factors are useful when conducting strategic planning of electronic markets and include:

1. Market operators should provide basic, core functions initially.
Commercial viability and growth can occur from low volumes if the initial system is cheap enough to operate and use. HAMS and CATTLEX failed because they were over developed: they were complicated and overly expensive for their target markets. Although simplicity is usually best, there are circumstances where larger size and sophistication are more appropriate: the optimal starting system for TELCOT was considerably larger and more sophisticated because the system had an initial captive audience within the cotton industry (Rickards *et al*, 1983).
2. Recognising that IT alone cannot produce optimal pricing and efficiency.
Recognising that information technology alone will not produce the desired effect is critical for the success of an electronic market system. In fact, the strategy used to attract user acceptance is more important than that used to implement the information technology. There is no point in building a technologically-advanced system with inadequate user participation, particularly in the case of an electronic market system which requires industry-wide commitment, rather than a single company to maintain its economic viability.
3. The System should complement the existing value chain for sales.
Two kinds of electronic market can be found in the selected cases: physical electronic markets and virtual electronic markets. An important difference

REFERENCES

AMLC "Australian Meat and Livestock Corporation Annual Report, " 1992.

Borman, M., K%orcher, K., Taylor, J.A., and Williams, H. "Electronic Agricultural Auctions in the United Kingdom", in *Electronic Markets Newsletter No. 9-10, October 1993, pp.27-28.*

Clarke, R. and Jenkins, M. "The strategic intent of on-line trading systems: a case study in national livestock marketing", in *Journal of Strategic Information Systems, 2(1), March 1993, pp. 57-76.*

Fong, T. "Success and Failure Factors for Effective Electronic Markets: An Agricultural Perspective", *Bachelor of Computing Honours Thesis, Monash University, Melbourne, February 1997.*

Johnston, T. "Where to Now For CALM,," *Australian Farm Journal, 2(2), April 1994, pp. 8-14.*

Lindsey, D., Cheney, P.H., Kasper, G.H. and Ives, B. "TELCOT: An Application of Information Technology for Competitive Advantage in the Cotton Industry", in *MIS Quarterly, 14(4), December 1990, pp346-357.*

Malone, T.W., Yates, J. and Benjamin, R.I. "The logic of Electronic Markets", in *Harvard Business Review, May-June 1989, pp.166-169.*

Millar, J. "Beef Producers' Perceptions of Electronic Marketing Of Livestock", in *Research Report Series no.31, Department of Agriculture and Rural Affairs, Victoria, Australia, 1985.*

is that the latter provides remote access to the market facilities. Both markets can streamline the existing value chain for sales (see Figure 1).

In terms of the virtual electronic market, it is possible to replace the role of stock agents by introducing an electronic market system. CALM decided to take advantage of the existing sales channel, rather than trying to shorten the chain by eliminating stock agents. As Millar (1985) points out, the adoption of electronic markets depends on the use of stock agents because producers do not see themselves as marketers. Agents can be used to provide information and advice on marketing for producers.

4. National government style can determine the success of the system.
Two government styles in which electronic market systems operated were observed – interventionist and non-interventionist. The style of government and culture of the country will influence the appropriate implementation approach.
5. Virtual electronic markets should be integrated into the existing sales value chain.
In order to integrate existing sales channels and increase trading, CALM introduced the concept of the "interface sale" which has become very popular with buyers and sellers. An interface sale takes place at a saleyard or property where an auctioneer puts up lots for sale. The auctioneer accepts bids from those physically attending the sale but, at the same time, a CALM operator is present to transmit bids to other buyers on the CALM network throughout the country. These other buyers can bid

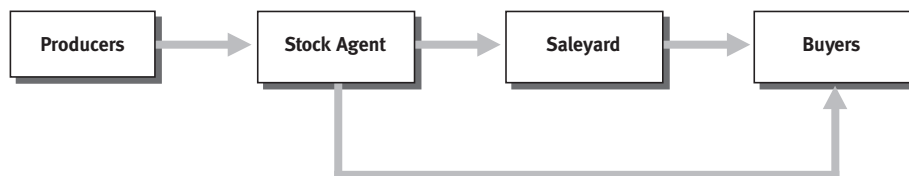


Figure 1
The Existing Value Chain
for Sales

through the operator who relays the bids to the auctioneer. When interface sales began, it was anticipated that CALM buyers would account for about 10 percent of total sales at any given auction. During the years 1991-92, the total sales via CALM at interface auctions were as high as 40 percent, a clear indication of the value of additional competition (AMLC, 1992). It also seems to be an important and strategic step in overcoming the problem of dual marketing.

6. Effective Ownership and Control of the system

Ownership and control of computerised markets is vital for the success of an electronic market system. A high volume of transactions is perhaps the critical ingredient for the development and maintenance of a computerised market. If ownership and control of the computerised market is not shared among market participants from various sectors within the industry, buyers and sellers are likely to ignore the system.

7. Accurate and objective product description is crucial

All electronic market systems studied except HAM used some form of standardised product descriptions, but the level of comprehensiveness of the standardised product description languages varied from case to case. The "unsuccessful" electronic market systems (CATTLEX, HAMS and CATS) only adopted the existing grading system to describe the product.

8. Statutory government support is important.

Two of the three successful cases investigated (TELCOT did not fall into this category), indicate that electronic mar-

ket systems cannot be developed without statutory support, because of the high initial costs and the problem of free-riders, where outsiders can use the system without making any contribution. TELCOT is an exception, because it was completely funded by cooperative members who were eager to see changes in their *main* marketing channels. The single view held by members of the cooperative ensured economic viability.

CONCLUSIONS

Developers of electronic markets in the 1970s and the early 1980s failed to position such systems as part of an overall existing marketing system. As most of the users (traders) were still relatively comfortable with the existing conventional marketing systems that provided them with multiple marketing channels, they did not adapt to the electronic market system as predicted. In addition, other failure factors included over-developed systems, lack of sufficient and active market participants, dual marketing, free-riders and the impersonal nature of electronic market systems which led to the termination of many of the systems.

Most successful electronic market systems took a different approach. Instead of using the electronic market system to replace existing marketing practice, the successful systems took a facilitative approach by integrating the electronic market with the existing marketing systems. This proved to be very successful, as the basic core functions of the market were retained. The most significant characteristic of the successful implementations, however, was that in each of the successful cases the electronic market fulfilled a strong, genuine existing need, regardless of any new facilities proffered.

- Neo B.S. "The implementation of an electronic market for pig trading in Singapore", in *Journal of Strategic Information Systems*, 1(5), December 1992, pp 278-288.
- Powell, W.W. "Neither market nor hierarchy: network forms of organisation", in *Organizational Behaviour*, 12, 1990 pp. 295-336.
- Rickards, P., Lacey, R. and Griffith, J. "Report on the Feasibility and Economics of Establishing a Network for Electronic Sale of Sheep and Cattle Throughout Australia", in *Agricultural Business Research Institute Working Paper, University of New England, Armidale, NSW, Australia, 1983.*
- Sarhan, M.E. and Nelson, K.E. "Evaluation of the pilot test of the computer Assisted Trading System, CATS, for wholesale meat in the United States," in *Univ. of Illinois Dept. of Agricultural Economics Working Paper, AE-4553, 1983.*
- Sekaran, U. "Research Methods For Business," 2nd Edition, John Wiley and Sons Inc, New York 1992.
- Sporleder, T.L. and Davis, E.E. "CATTLEX: A computerised cash and contract market for feeder and stocker cattle. Operating procedures and trading techniques.", *Texas Agr. Expt. Sta. Texas A&M Univ., College Station, 1981.*
- Sporleder, T.L. (ed.) "Proceedings, National Symposium on Electronic Marketing of Agricultural Commodities", *Texas Agricultural Experiment Station MP-1463, March 1980, pp. 43-47.*