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EBUSINESS & THE DAIRY AND GRAINS INDUSTRY VALUE CHAINS IN AUSTRALIA

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Abstract

The work presented looks at the "What", "Why" and "How" of doing business electronically in the Grains and Dairy industries in Australia. The investigation found that the use of internet-enabled business practices between members of both chains is increasing rapidly and is gaining respect as a means of improving efficiencies and productivity. It also found that the drive for electronically enabled business practices is coming from the larger food processing organisations, not only on the premise of improved internal efficiencies, but also because of increasingly tough food safety and quality assurance requirements that are prompting the need for real time quality information and decision support for product tracking back to source. Despite some similarities in the use of eBusiness processes and practices in the two chains, there were some different drivers and barriers to technology adoption, which are discussed.

Introduction

As it stands today, businesses in general in the 21Century not only have to adhere to the basic "Minimise Cost and Maximise Profit" maxim to be successful (Porter, 1985), but they also need to address the issues of doing business in a world that is rapidly becoming more electronically enabled and dependent. Indeed, it has become increasingly clear that the internet and associated electronically enabled business practices are, despite the demise of the dot.coms, business-supporting technologies that are here to stay forming an electronic landscape within which business is carried out (Ryan, 2000, Porter 2001, Bryceson, 2002).

The "Unique Selling Point" of the Internet is that it provides a timely and efficient method of communication and information flow 24hrs x 7days a week (24x7). Time and distance therefore collapse from a business perspective and an entirely new set of options for marketing, transaction processing, customer service and creating business value has become available (Amit & Zott, 2001).

In addition to the impact of new communication technologies on individual businesses in any industry sector, the potential impact on the supply and value chains of those businesses and the whole industry sector in which they trade, is a major consideration for the likely future success or otherwise of those industry sectors (Anderson & Lee, 2000, 2001).
Australian agri-industries are not isolated from this scenario. In fact, changes in technology, institutional structures, governance, increasingly tightly aligned supply and value chains that extend from genetics through producers, processors, and consumers, along with the globalisation of agricultural markets, are resulting in Australian agri-industries existing as integrated systems with producers increasingly interwoven into the food distribution chain (Todd, 2000; Newton, 2000). As a result, agri-industry value chain analysis has become a valuable tool in determining where added competitive advantage can be generated - both for individual businesses and the industry chain as a whole.

The framework chosen for the project presented here addressed a **"What", "Why", "How"** theme. That is: conceptually and practically, ***What*** are the Grains and Dairy industry value chains and what electronically enabled business practices are currently employed - as well as those likely to be in the future. From a business model perspective, ***Why*** are the Grains and Dairy industry value chains as they are, and why are electronic business practices being, or are likely to be, employed. And finally, from a management perspective, ***How*** have the chains been operated in the past, how are they managed currently, and what likely issues will impact on both the businesses in the respective chains as well as the whole of each chain, in an electronically enabled business world?

The PROJECT Approach
This study grew out of a Grains Research & Development (GRDC) funded project in 2001/2002 on *"The Impacts of electronic business technologies on the Grains Value Chain"* which focused on the Peanut and Wheat Industry chains, a project studying the export potential of dried Australian Dairy products and from a third project that is ongoing and which is looking at the differences between the Brazilian and Australian Dairy Industries with emphasis on technology adoption and required competencies.

There were two main components to the project - the mapping of generic Grain and Dairy Industry value chains and an investigation into what eBusiness technologies were being used, where those technologies were being used in the chains and with what impact.
Desk top research of current literature and other public domain data on both the Grains and Dairy Industry chains was reviewed to develop an overview of the local, regional, national and global industry sectors regarding size, volume, value, change and trends. This gave a general qualitative and quantitative description of the industries and the supply/value chains involved. A review of current eBusiness literature was also undertaken to ascertain the impact of eBusiness technologies on general business and to identify potential impact areas of eBusiness technologies on agri-industry chains specifically.

A value chain and eBusiness impact questionnaire was then developed using the "What", "Why", "How" framework (what is it, why is it so, how is it done), which was used in a series of face-to-face semi-structured interviews with stakeholders in both the Grains and Dairy Industry chains. These interviews formed the primary data collection mechanism to examine the components of the value chains and to determine which components are, or may potentially be, affected by eBusiness technologies.

Issues

A number of issues became clear early in the project. The first of these was that generally there is confusion associated with the jargon of chain management and the subtle but very important difference between supply and value chains. In particular, the management goals associated with each tends to be either unknown, unrecognised or simply discarded. In fact, this differentiation is crucial to the understanding of how a business and/or the industry is, can become, or remains, competitive.

For this project the term ***"Value Chain"*** was taken to mean a group of companies working together to satisfy market demands which involves a chain of activities that are associated with adding value to a product through the production and distribution processes of each activity. An organisation's competitive advantage is based on their product's value chain. The goal of the company is to deliver maximum value to the end user for the least possible total cost to the company thereby maximising profit (Porter, 1985).

"Value Chain Management" is about creating the added value at each link in the chain and a sustainable competitive advantage for the businesses in the chain. How value is actually created is a major concern for most businesses - Porter (1985), indicates that value can be created by differentiation along every step of the value chain, through activities resulting in products and services that lower buyers' costs or raise buyers' performance. In much of the food production and distribution value chain, the value creation process has focused on commodities with relatively generic characteristics. However, because of the nature of commodity production, competitive market forces have typically resulted in the cost of producing these products being very close to the value created so that profit margins have been relatively thin (Boehlje, 1999).

Secondly, it was also clear that in the main, most people equate eBusiness with buying and selling something via a web page on the Internet. This view harks back to the prevailing dot.com mania hype of the late 1990s. It does not reflect the current approach to the use of information and communication technologies as fundamental business infrastructure – infrastructure that is now regarded as crucial to simply doing business, as well as for developing efficiencies and competitive advantage *within* businesses and *across* the whole chain.

For this project the term *"**eBusiness**"* was taken to embrace all aspects of buying and selling products and services using electronically enabling business technologies - such processes may, or *may not* include the Internet. Initiatives are focused on the Business-to-Business model (B2B) and the major commodity traded is information. eBusiness is thus a *"gateway"* to a deal which increases EFFICIENCIES and creates VALUE for the business"

General eBusiness technologies were taken to include: telephone, fax, mobile (including SMS messaging); computerised office systems such as word processing, accounting packages, spreadsheets, databases; the Internet (including Intranet, Local Area Networks (LAN) and Wide Area Networks (WAN)) & email; Electronic Funds Transfer (EFT), EFTPos, BPAY, Internet banking; *and* Web pages that may either be used to provide information (Brochureware) and/or which may have some form of Transaction Processing capability (eCommerce). Additionally, for larger organisations including suppliers, processors, manufacturers, and retailers, the following technologies were included which are detailed in Bryceson (2002):

- Electronic Data Interchange (EDI);
- Materials Resource Planning (MRP);
- Enterprise Resource Planning (ERP);
- Customer Relationship Management systems (CRM);Electronic marketplaces;
- Electronic Supply Chain Management (ESCM);
- Electronic Demand Forecasting and Management (EDFM);
- Vendor Managed Inventory (VMI).

Such technologies enable the following potential value creating business strategies to be addressed (Bryceson, 2002):

- Improvement in business information flow (speed, timeliness, accuracy);
- Ensure best practice implementation of technology to better effect traditional business strategies (Bhatt *et al* 2001);
- Development of an agile business strategy and supply chain that enables the business to adapt to new business pressures quickly and smoothly (Martyn, 1999);
- Development of good business intelligence capability using the internet for real time market and competitor information (Allee, 2000a);
- Based on internet-based market intelligence, target and service different customers as well as launching new products to address new markets
- Alter distribution/warehouse strategies to utilise new technologies to minimise inventory;
- Electronically integrate the value chain.

VALUE CHAIN MAPPING

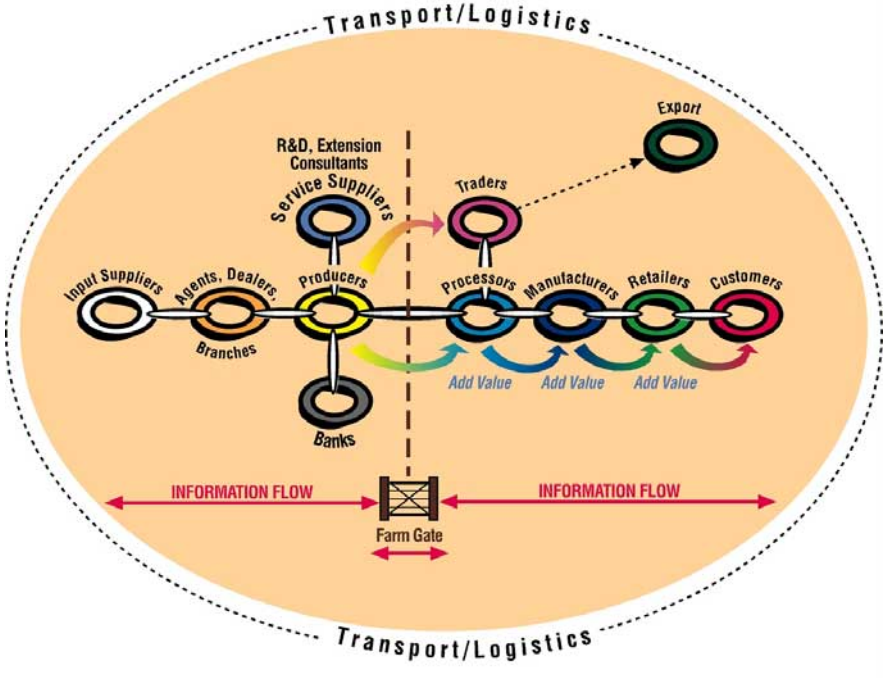
The Grains Industry Value Chain

The Australian Grains Industry has the largest farm gate value in Australian agriculture with production trending upwards during good climatic years to a record 39.7 million tonnes in 2001/2002 (Hooper et al, 2003). The Grains Industry value chain typically consists of one or more primary product or service suppliers interacting with other companies post farmgate, to add value to the product ultimately presented to the buying public. The actual components of the chain (Figure 1) vary slightly with each Grain and include:

- **Input Suppliers** *(e.g. Ag Chemical, Fertiliser companies such as Incitec Pivot Ltd etc.)*
- **Service Providers** *(e.g. Banks, R&D organisations, DPI, Consultants etc.)*
- **Producers** *(e.g. Growers)*
- **Traders** *(e.g. AWB, Grainco, GrainCorp, ABBGrain etc.)*
- **Processors** *(e.g. Peanut Company of Australia, Flour Mills eg Goodman Fielder, Weston Milling, Manildra etc.)*
- **Manufacturers** *(e.g. Food processing companies such as Cadbury Schweppes, Sanitarium, Greens, Uncle Toby's, Arnotts etc.)*
- **Retailers** *(e.g. Small traders such as Queensland Fruit & Nut and supermarkets such as Woolworths and Coles)*
- **Logistics** *(e.g. Transport and storage companies eg Grainco, AusBulk)*

Figure 1. A Generic Australian Grains Industry Value Chain

K.Bryceson, EBiz in Australian Grains & Dairy Industries.
Figure 1

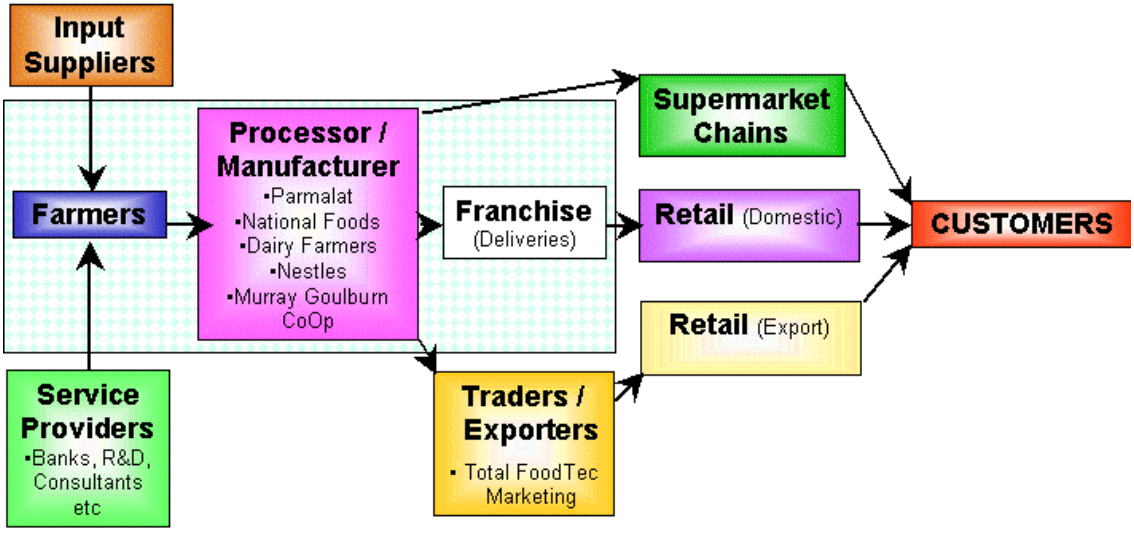


In general, it was found that poor technology integration exists across the Grains value chain preventing a free and transparent electronic information flow between chain members. In particular, there is a significant information discontinuity across the farm gate. Price premiums, supply contracts, forward purchasing options, supplier recognition programs are all incentives, motivators and drivers in this value chain. There are also "Pull" pressures on the chain and the downstream links drive the chain (Newton, 2000; Todd, 2000).

The Dairy Industry Value Chain

The Australian Dairy Industry has the third biggest farm gate value behind wheat and beef production (ADC, 2002) with a total value exceeding A$3 billion, and is also one of the largest value adding industries in agriculture today. As with the Grains Industry value chain, the Dairy Industry chain consists of one or more primary product suppliers interacting with other companies post farmgate, to add value to the product that is eventually presented to the customer. The actual components of the chain are shown in Figure 2 and may vary slightly depending on the Processor concerned

Figure 2. Generic Australian Dairy industryValue Chain



Apart from the obvious differences between the Dairy and Grains industry value chains in terms of product and participants, the major operational difference in the two chains is that in the Dairy Industry the Processors are heavily reliant on obtaining a constant supply of quality raw product on a daily basis and supplier agreements are therefore common (for example 95% of Dairy Farmers milk supply is based on supply contracts). Raw milk quality (which is determined on 10 days worth of supply), affects the payments farmers receive for their milk and can lead to bonuses or deductions (Bywater, 2002). Stringent quality testing of the raw milk is conducted both at the farmgate and at the Processor leading to the need for excellent record keeping and electronic traceback facilities and processes.

In addition, since deregulation of the industry in July 2000, the major changes to both the production and processing environments have been associated with reducing and controlling costs, improving efficiencies and improving the marketing of goods. It is at the Processor level where most of the value adding takes place (for example Dairy Farmers have something in the order of 600 product lines nationally) and thus access to electronic real time market intelligence is becoming a requirement to maintain a competitive edge in a now relatively lean and mean industry.

eBusiness Findings and Discussion

The interviews undertaken revealed that all links in both Industries have access to, and are using, electronic business technologies that are appropriate to their current business requirements – primarily to reduce costs and improve efficiencies. Currently no standard metric to quantify "value" or "value add" as it relates to employing electronic business processes in agri-industry chains exists although there is some current work being undertaken to develop such an instrument. Table 1 lists a number of benefits afforded by adopting current eBusiness technologies as identified by various sectors of the two industry chains involved in the project.

Table 1. Current impacts of eBusiness technologies on the Grains & Dairy Industries

Individual Business Impacts	**Impacts on Growers**	**Impact on Chains as a whole**
1. Improved communication across all mediums, particularly mobile phones and email. This has resulted in better, faster and more timely information flow.	• Improved administrative efficiency when systems are learned (there is a learning curve that can be off - putting). • NetBanking – reduces time • Good Weather information	Not significant as yet on the Grains Chain but highly significant in the Dairy Industry in relation to product tracking.
2. Automation of processes through the use of EDI, MRPII, and ERP systems which have reduced costs and increased efficiency.	• The creation of new business opportunities	
3. In the Dairy Industry, near real Time Product Tracking back to source as a result of stricter food and health safety regulations being enforced.	• Stricter quality control of product in the Dairy Industry in particular impacting on price for raw milk	

4. Inventory Management - particularly for downstream chain members where real time, accurate data and information flows are "saving millions of dollars".	• Convenience. For example, dealing with emails and other business matters can be undertaken when convenient.	
5. Creates business efficiency through better time management and product handling efficiencies.	• Real time information management and electronic record keeping gives better access to finance, and exceptional circumstance subsidies.	

From a theoretical standpoint these findings support at least one of Amit & Zott's (2001; p504) proposed four sources of value creation in eBusiness – "Efficiency".

However, despite these positive trends in the use of eBusiness technologies, a number of issues came to light that raise some concerns as to how agri-industry in general will realise the potential for adding value afforded by these technologies. These include the differing perceptions of chain stakeholders regarding eBusiness, information flow discontinuities in the chain and the power domination of the chain by downstream players. The most important for brief discussion here is the discontinuity of information flow across the farmgate and the power domination by downstream players

Discontinuity of information flow across the farmgate - The farm gate was identified as the major point at which the flow of information through the value chain ceases to be efficient. As it presently stands, information flow is essentially one way from grower to processor. Information from downstream chain members is thus not coming back down the chain to the grower. Historical factors, such as industry regulation are partly responsible for this. To realise efficiencies in the value chain the flow of information needs to be frictionless in both directions. This is particularly so with increasing food safety requirements leading to the need for fast and efficient product tracking capability back to source as is currently a capability in the Dairy Industry.

- **Power Domination by Downstream players** - It has become apparent that the drive for more eBusiness technologies is coming from the larger and more technologically advanced stakeholders. This is hardly surprising when many of the downstream stakeholders are multinational corporations, such as Parmalat, Cadbury Schweppes and Sanitarium and in the retail sector - Woolworths. The propensity for these organisations in the chain to adopt eBusiness technologies is higher due to their scale, financial position and the large number of stakeholders in their own individual value

chains with whom they need to communicate. This technology bias creates a potential breakdown in the flow of information in the both industry chains particularly as many of the upstream participants, such as farmers and smaller processors (particularly in the Grains chain), are unaware of, or do not use, the same technologies as the food processing giants.

Despite these issues, the likely future potential for eBusiness technologies in both industry chains are high. On a scale of 1-5 (1= no impact, 5 = major impact), every interviewee rated future impacts of electronically enabled business processes on their own business and on the chain as a whole, as a four or five. Moreover, there was no doubt across all interviewees that electronically enabled business processes would become part of every business model in the future.

CONCLUSIONS

The following conclusions suggest that currently there are a number of critical issues that need to be addressed to allow the "eIndustry" approach to develop in these two agri-industry chains

There is a substantial information flow discontinuity (particularly in electronic format) across the farmgate that has ramifications for the agri- industry value chain as a whole given the increasing requirement to product-track back to source. Two-way information flow, across the farmgate must be fostered and encouraged which essentially means engaging both producers and processors.

- Producers in particular, need to be aware of the business technologies that their supply/value chain partners are exploring to ensure that they can maximise their own business potential. This is an education issue.

There is a substantial discrepancy in knowledge between companies (and industry sectors) about the technologies available, their role in business, how they add value, the speed of uptake in other industries and thus the impact that they will have on the agribusiness sector in general in the next 2-3 years. This is also an education issue.

Integration from a technology perspective and information transparency and flow are also poor in some instances in the chain. This is a significant barrier to making the efficiencies necessary in the chain to create and maintain a competitive advantage in an electronic business world.

- In the longer term, it is likely that the drive for more electronically enabled business practices will come from the larger food processing organisations, not only on the premise of improved internal efficiencies, but also because of increasingly tough food safety and quality assurance requirements that are prompting the need for real time quality information and decision support for product tracking back to source. This business approach will drive changes throughout the Industry chain.

- It is highly likely that if an entity in the chain begins to do business electronically, other companies in that chain associated with it will need to follow suit or risk being substituted.
- The potential for innovative new business opportunities as a result of using electronically enabled business processes to leverage agri-industry "Know-How" (Cowey, 2002), is high (for example The Peanut Van – www.peanutvan.com.au). However, this is only the case if the appropriate business models and technology strategies are put in place which itself requires a knowledge base covering the business *and* technology issues.

In reality – Australian agribusiness culture is one where face-to-face relationships are extremely important. However, both in the service sector (e.g. banks) and downstream in each chain, time and cost pressures are already resulting in organisations looking to automate their dealings with both suppliers and customers – if not wholly, then in part. All interviewees recognised that electronic communication technologies will be used in the business transactions of the future and that by embracing the changes created by them for relationship management rather than resisting them, strategies can be developed by chain members to ensure suppliers and customers are well served.

The task of leveraging an electronically enabled knowledge economy in the Australian agri-industry sector will be facilitated by the promotion of a greater understanding of the *intangible assets* associated with a well developed knowledge economy in the agri-industry sector. In such a scenario, an awareness of the advantages that can come with better information flows and knowledge sharing, the building of collaborative business relationships, improving systems and work processes, and in actively seeking out new knowledge and appreciating its value (Allee, 2000b), will help in creating a sustainable competitive advantage and generating additional income and wealth for both individuals and businesses in agri-industry chains.

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