Perceived competitive advantage through information systems:

An examination of use by agricultural banks

by

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CHAPTER 1

INTRODUCTION

Many agricultural banks may soon be in for a struggle for their existence. Pressure from their environment appears to be changing the face of competition. Once a stalwart pillar of a rural community and its businesses, agricultural banks are facing an uncertain future amid rapid changes from their customers and their competitors.

Agriculture, the foundation of the sector's business, is undergoing a period of transition. There are fewer, but larger producers. Agricultural customers, like all customers, are becoming increasingly sophisticated and so are their financial needs. Increasing competition in the agricultural production sector will require bankers to become more sophisticated, more knowledgeable, and to offer access to a wide variety of services and products to fill the producers' needs. Fewer producers will result in fewer rural businesses and smaller communities. This, too, will impact agricultural banks as they are also valuable customers. As the customer base shrinks, so will the number of banks that are required to serve their needs. The agricultural finance industry is currently viewed as being overpopulated with financial institutions and it is not expected to grow in the near future [1].

Banking is also undergoing multiple changes. The overall trend is toward fewer banks that offer more services. The prevailing competitive forces have brought about what has been termed "a period of Darwinian Banking" where survival of the fittest is a reality [2]. As a result of mergers or failures, the number of FDIC insured banks dropped 16 percent between 1975 and 1990 (a decrease from 14,629 to 12,338) [3]. This trend is expected to continue and may reduce the number of banks by 50 percent by the year 2000. The increased number of mergers is partially a reaction by banks to increased competition and the need to decrease costs, improve efficiency, and increase profitability. Deregulation of the banking industry has

been one factor that has increased the number of financial providers vying for the consumers' business. Interstate banking and the ability to offer non-traditional products and services have created new threats and opportunities for banks. These changes have been expedited by the information technology explosion that has shaken the industry. Information technology is restructuring the method of competition in banking and increasing the potential products and services available to customers. The use of information technology as a competitive weapon is spreading through visionary banks as a means of positioning.

The sum of these changes would seem to present a cloudy future for agricultural banks unless they react or proact. Their survival may rest in positioning their firm in the market by gaining a competitive advantage over their rivals. Information systems have proven to be a potential source of competitive advantage for firms in a wide variety of industries. This would seem to be especially true for banks, considering the strategic role of information in the industry. Agricultural banks cannot ignore these forces and may find it necessary to examine the potential of information technology for competitive advantage. At the very least, agricultural banks must avoid being at a competitive disadvantage to their rivals who use information systems.

Purpose of the Study

This study is designed to:

1. Examine the use of information systems by agricultural banks for gaining competitive advantage.
2. Provide knowledge on how information systems may be developed and used effectively by agricultural banks to gain competitive advantage.
3. Examine barriers for agricultural banks in establishing sustainable competitive advantage through information systems.

Little work has been done in this area, perhaps due to the limited strategic use of information technology by agricultural banks. They have not been as quick to adopt new technology or ideas and are generally not known for their cutting-edge activities. This does not, however, decrease the importance of the strategic use of information technology. Knowledge in this area may assist concerned agricultural banks in their struggle for superior performance in a dynamic environment.

Understanding the effectiveness of use is significant for examining the ability of other banks to implement such systems. If systems are not being used effectively, then perhaps a reason can be established. If they are effectively using such systems, it should be important that the industry realize the potential of information systems. Examining development of information systems that have provided a competitive advantage for banks may help all banks realize how to implement new systems or improve existing ones.

Agricultural banks may not currently have developed a competitive advantage through information systems. If this is true, the study may reveal some possible reasons for this situation. If a reason (reasons) can be established, perhaps agricultural banks may overcome this barrier (barriers) and use information systems to position themselves.

Significance of the Study

The study is intended to serve three basic roles. First, it is intended to help agricultural banks compete more effectively. Practitioners may find the study useful when developing their strategies. Information technology is expected to play a major role in the future of agribusiness banks as it has already done in so many industries. By reviewing the results of the study, agricultural banks may increase their chance of successfully developing an information system for competitive advantage.

The study is also intended to add knowledge to the field of agribusiness. Little work has been done in the area of strategic information systems use by agricultural banks. The

study will address a growing trend in the industry that will not only have an effect on banking, but other sectors as well. Agribusinesses in general may benefit by either learning from agricultural banks' use of information systems or profit from the increased efficiency generated by information systems.

Finally, researchers may benefit from the study by viewing the potential applications of competitive advantage through information systems. Porter's concepts on competitive advantage have been criticized by many researchers as being too narrow and constrictive [4]. In addition, the ability to develop sustainable competitive advantage through use of information systems has been widely debated.

Overview of Thesis

The following section provides an overview of the organization and content of the thesis.

This thesis includes a search of the literature regarding the studied subjects which is reviewed in Chapter 2 and 3. Chapter 2 begins with a discussion of the concept of competitive advantage primarily developed by Porter. The chapter also examines competitive advantage in relationship to banks and then specifically to agricultural banks.

Chapter 3 explores the use of information systems in gaining competitive advantage. A discussion of its use by all firms begins the chapter in order to provide a framework of knowledge that has been developed from technology's strategic use in other industries. The focus then shifts to the application by banks and the studied area of agricultural banks. Lastly, a model is developed to provide a conceptual view of the relationship between competitive advantage, information systems and agricultural banks.

In reviewing the methodology, Chapter 4 includes definition of terms, sources of data, and method of analysis. Also included is a discussion of the thesis research questions. Concluding the chapter are potential limitations.

Chapter 5 presents the results of the study. Initially, case studies of the five banks are used to describe the use of information systems within each institution. These data are analyzed in tables and are used to answer the research questions. Lastly, matrices compare these institutions and their relative positions.

Beginning Chapter 6 are implications and the significance for practitioners, academics and the field of agribusiness. Limitations of the study are discussed. Concluding the thesis are recommendations for further research.

Endnotes

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CHAPTER 2

COMPETITIVE ADVANTAGE FOR STRATEGIC POSITIONING

Competitive advantage may be used by firms to examine their strategic position within an industry and position themselves accordingly. Michael Porter is a recognized expert in the development of the concept. His ideas on competitive advantage shall be discussed in this chapter and applied to the banking industry.

Porter's Competitive Advantage Model

"Competitive advantage is at the heart of a firm's performance in competitive markets" [1]. This statement acknowledges the importance of competitive advantage to a firm's strategy. Since most firms operate primarily in competitive markets, it is useful to understand the concept and application of competitive advantage.

Competitive strategy is defined by Porter as "the search for a favorable competitive position in an industry" [2]. Competitive advantage is use of a competitive strategy to provide a firm with an advantage over its rivals in a market and thus achieve superior performance. Porter has done extensive work in both areas. His ideas will be explored and used in this study.

Porter has suggested three generic strategies that can be used by firms to achieve competitive advantage: cost leadership, differentiation, and focus (see Figure 2.1). Cost leadership and differentiation are the basic means of strategy while focus is used to determine the breadth of the market served. Choosing one of the strategies will theoretically allow a firm to determine the path and the steps it will use to position itself ahead of its rivals.

Three Generic Strategies

Cost Leadership. In the cost leadership strategy, a firm exploits all possible means to make itself *the* low-cost producer in an industry. A firm can use economies of scale,

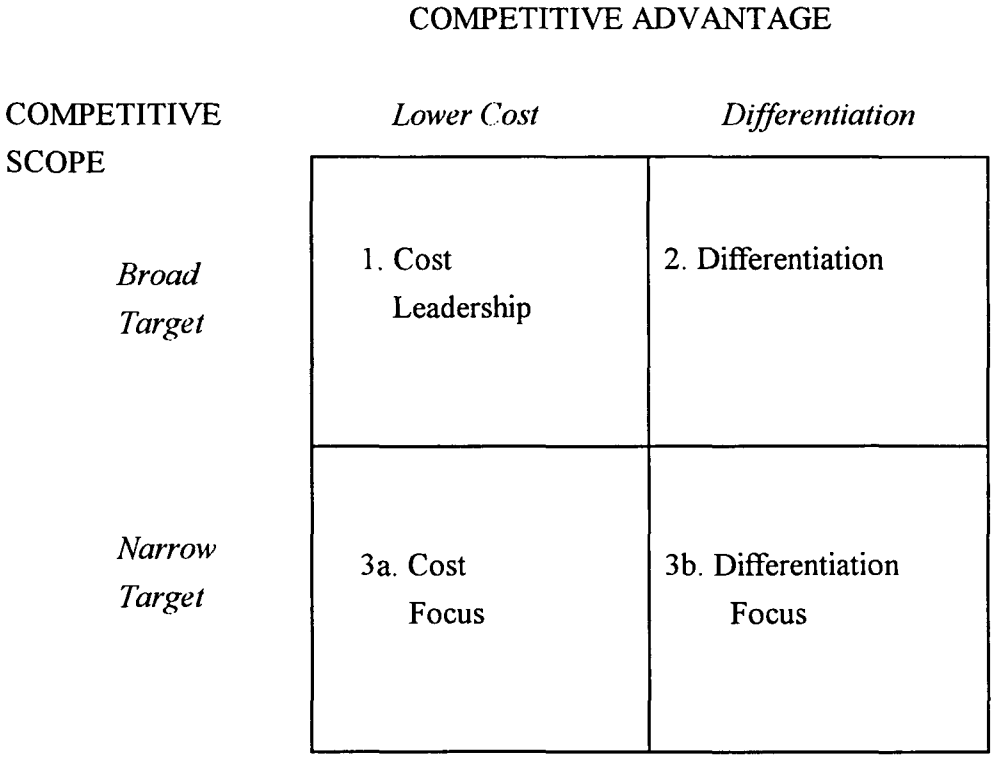

Figure 2.1: Three Generic Strategies

Source: Michael E. Porter, Competitive Advantage, (New York: The Free Press, 1985) p.12.

economies of scope, proprietary technology, preferential channels, unique structure, or any other means possible that it has as an advantage. These advantages may be natural or developed (refer to examples given later in this chapter). The key part is their use and configuration by the firm.

A firm should carve out a dominant cost advantage in its industry if it uses a cost leadership strategy. Fierce price competition for position in the industry can lead to low profitability and threaten the existing structure of the industry.

Differentiation. In the differentiation strategy, a firm attempts to make its product(s) or service(s) unique compared to its competitor's. The differentiation must be valuable to customers and the firm should be able to charge a premium that is greater than the cost of producing the differentiation. Whether the uniqueness is in the product or service, the marketing approach, the means of delivery, or another factor is up to the specific firm. Thus, there can be a variety of distinct approaches within an industry. Again, the advantages may be natural or developed.

Focus. In the focus strategy, a firm serves a specific group within an industry and tailors its product or service to its customers' needs in a superior manner compared to its competitors. Focusing can be done through either cost leadership or differentiation. Generally the buyers of the product or service have special needs that are not being served effectively by a competitor. Focus may be thought of as singling out a segment within an industry and using one cost leadership or differentiation to gain competitive advantage.

Selecting and Applying a Cost Leadership or Differentiation Strategy

A generic strategy can be selected by examining a firm's industry, structural characteristics, and value chain. Thus, both a firm's actions and its industry's actions influence competitive advantage. First, a firm must determine the composition of its industry by examining its relative market -- who are its direct and indirect competitors and what

customers they are attempting to serve. Next, the industry structure must be examined to determine competitive strategy [3]. The bargaining power of suppliers, threat of new entrants, threat of substitute products, bargaining power of buyers, and rivalry among existing firms must all be considered when analyzing the industry and a specific firm's position in it (see Figure 2.2). Objectives such as erecting barriers to entry into the market, making inhibitive switching costs for your customers, gaining economies of scale and/or scope, and developing brand identity for the product may be used in a firm's competitive strategy.

According to Porter, a generic strategy (cost advantage or differentiation) should serve as the centerpiece of a firm's strategic plan. Properly developing competitive advantage by using a generic strategy can lead to superior performance within an industry. The lack of a type of strategy can lead to inefficient competition by the firm.

Porter stresses the need to stick to one specific strategy instead of mixing them. He contends the basic generic strategies contain contradictory actions that can cause a firm to become "stuck in the middle" and thus have no competitive advantage. Stuck in the middle firms are generally condemned to below average performance and profits despite other superiorities they may possess because another firm in their industry may be using a pure generic strategy to better serve the customers' needs and thus have a competitive advantage. Nevertheless, a firm can employ both differentiation and cost advantages in their operations. For example, if a firm is using the cost leadership strategy, it should differentiate its product through all means that do not undercut its cost strategy. If it is using differentiation, it must exploit all cost advantages that do not sacrifice its specific uniqueness. In doing so, it will strengthen its competitive position and increase its strategy's sustainability.

The Value Chain

Porter emphasizes that competitive advantage should be considered by examining the distinct strategic activities that a firm performs instead of looking at the firm as a whole.

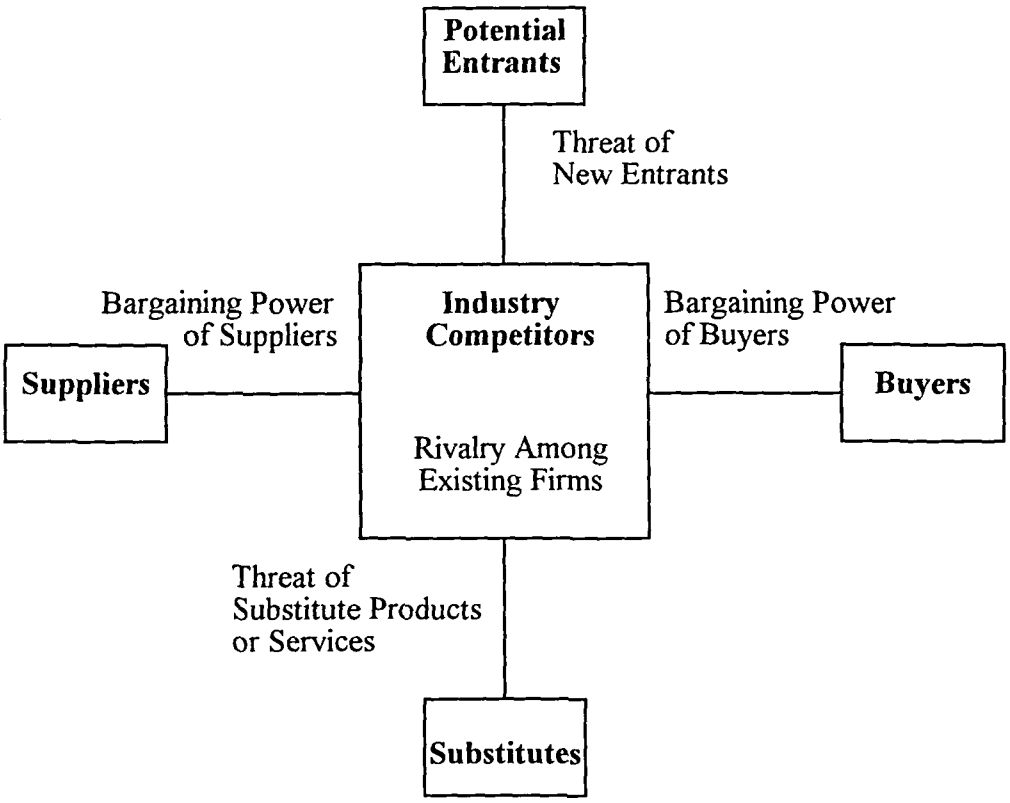

Figure 2.2: The Five Competitive Forces that Determine Industry Profitability

Source: Michael Porter, Competitive Strategy, (New York: The Free Press, 1980) p. 5.

How does a firm design, produce, market, deliver, and support its product or service and how can these functions lead to cost advantage or differentiation? What value can these specific activities or combination of activities create for a customer? Answering these questions may be improved and simplified by examining a firm's value chain [4]. Figure 2.3 is a generic representation of a value chain.

Both support and primary activities are involved in a value chain. The primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and service. Generally, these are the principal activities used to compete with other firms and are in direct contact with the environment. Procurement, technology development (including product and process development), human resource management, and firm infrastructure, comprise the support activities which are activities involved within the firm. The difference between the total costs of the firm and the total value produced by its actions constitutes the final category, margin.

The primary and support activities may be further broken down into smaller pieces for discreet analysis. By dissecting the activities, the firm may be able to pinpoint strategic areas where it can develop an advantage. Failing to do so may blur the analysis and not allow a firm to focus on the key activities. Activities should be separated and isolated if they (1) have different financial drivers, (2) have a high potential impact or differentiation, or (3) represent a significant or growing proportion of cost [5].

A firm must not only consider individual activities but also the linkages of the separate activities within the firm and the linkages between activities in the firm's value chain and activities in the value chain of its customers and suppliers. Lower costs or greater differentiation may be achieved by coordinating and optimizing linkages. For example, a firm may exploit an activity that reduces a cost in a customer's value chain. Within the firm, an

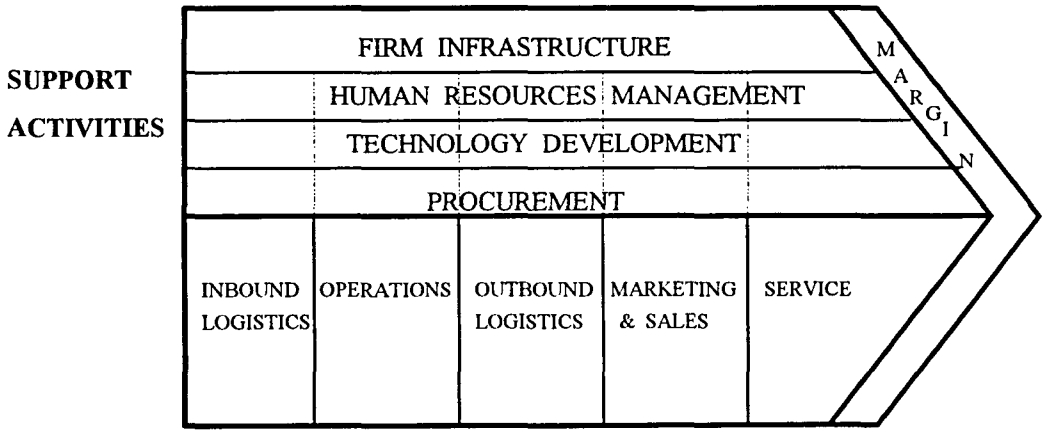

Figure 2.3: The Value Chain
Source: Michael Porter, Competitive Advantage, (New York: The Free Press, 1985) p. 37.

activity in its own value chain may impact an activity in another area of the firm. For example, improved quality assurance by car manufacturers can reduce recall costs and improve sales.

Within the unique activities and their configuration in a firm's value chain lie sources of competitive advantage. Every firm in an industry may possess a peculiar value chain. The key is developing and exploiting one that will lead to competitive advantage and thus superior performance for a firm.

Sustainability

When selecting a strategy, the potential for sustainability may need to be evaluated. A strategy lacking this potential may at best soon be devalued, and at worst eventually be worthless. Clearly, competitive advantage is difficult to develop and harder still to sustain. Methods of achieving sustainability include developing barriers to duplication (presenting a moving target to competitors through innovation), gaining significant first mover advantages (being the first to act on an opportunity), and exploiting industry characteristics that influence cost or differentiation in ways that benefit the firm.

Natural Sustainable Advantages. Another, less discussed source of sustainability, is a natural one. Natural competitive advantages are abundant in nature. For example, for centuries a giraffe's long neck has a been a sustainable advantage over its rivals in the pursuit for food from trees. The antelope's speed has been a source of survival from predators. Species without these advantages or the ability to adapt have perished. Natural advantages are not as common or apparent in industry since adaptations can be made more easily. Nonetheless, they are present and can influence a company's performance. For instance, local banks have had a natural competitive advantage over remote banks simply because of their locational convenience to customers. This advantage was sustainable unless a rival wanted to open a branch in the town. Other similar examples exist and should be exploited by firms.

Advancement through competition and the struggle for survival can erode a natural advantage.

Competitive Advantage by Banks

Banks need to develop a competitive advantage in order to position themselves for the future. This is especially true with the changes occurring including deregulation, increasing competition, and information technology. A model developed by Mckinsey & Co., based on the effects deregulation has had on other industries, suggests that the banking industry will face a "great variety of product and service offerings, price/service trade-offs for customers, rapid entry of new, low-cost producers and shrinking margins resulting in the intensified introduction of new technology and drastic cost reduction [6]." Some of these are already occurring. Four basic levels of competitive strategy are predicted to prevail: (1) national distribution institutions with a full line of products, (2) low-cost producers, (3) niche banks targeting a specific group, and (4) small local community banks. It would seem likely that both intergroup and intragroup rivalry will exist, with the primary focus on the latter. Developing a competitive advantage may improve a bank's ability to choose its path and prevail in marketplace rivalry.

Agricultural banks probably fall into Groups 3 and 4. Reports have suggested that both will be profitable sectors [7], but institutions must gain a competitive edge to ensure their survival up to that point. The process of natural selection may account for the strength of the sector. The following discussion will provide a framework for the analysis by examining the banking industry as a whole.

The Banking Industry

To follow the path of Porter, the banking industry is a possible strategic arena in which to use the fundamental concepts of competitive advantage. Banking may be described as a service industry that competes for a customer's financial transactions and funds. It is a subset

of the financial services industry in which a wide variety of organizations now compete for a customer's business. Representing the spectrum of competitors are General Motors (GMAC), American Express, John Deere, Merrill Lynch, and the Farm Credit Association. Credit unions and savings and loans are other sources of competition. Recent technology and industry changes have allowed competition to take place on a national and even international scale. Thus, banking is a broad industry in which different segments compete differently due to the available resources and existing restrictions. In order to effectively analyze strategy, this thesis will primarily focus on agricultural banks. Initially the entire industry will be examined regarding competitive advantage as the smaller segment will be in indirect competition with the whole.

Industry Forces. Porter's designated five industry forces may be evaluated in regard to banking.

- Increasing threat of new entrants: Due to the previously discussed opportunities presented by technology and deregulation.
- Strong intensity of rivalry: Due to the abundance of financial service providers. Although banking is more staid than other industries, the character may change as the survival instinct emerges.
- High threat of substitution: Because of the large number of competitors and ease of product imitation.
- Moderately strong bargaining power of suppliers and buyers: Due to the unique position of suppliers and buyers in the banking industry. A supplier (of funds) may also represent a potential buyer, thus causing the firm to serve the same person in conflicting ways.

Generic Strategy. Generic strategies may be selected by a particular bank to fit its situation. A bank may ask the question, "What can we do better or more effectively that

would be of benefit to a potential customer? Is this different from our competitors [8]?" In addition, a bank must decide upon the scope it will serve and avoid the hazard of being "stuck in the middle," a hole that many banks have fallen into [9]. A cost leadership strategy would seem most plausible for a very large bank due to economies of scope and scale, or a very small bank due to internal efficiencies and low overhead. Although a differentiation strategy is possible for any size bank, it may be most valuable to medium-sized institutions that cannot compete with the cost advantages possessed by rivals.

Value Chain. Examining the value chain and potential linkages is important for any bank in order to spot sources of differentiation or cost advantage. Establishing a meaningful chain for the industry as a whole would be difficult and somewhat meaningless so it will not be attempted here. A value chain will later be used to examine agricultural banks.

Sustainability. Sustainability is difficult to obtain in banking due to the similarity of products and services offered as well as the ease in copying them. Buffet has even gone so far as to claim that major sustainable competitive advantages "are almost nonexistent in the field of financial services [9]." Others claim sustainable advantage can be obtained by striking at the points of banking which have resisted change: organizational structure, work design, and corporate values (the view of the business)[10]. The latter view would seem to be reasonable as a method to reevaluate and reconfigure the value chain. Competitors may be able to copy their methods, but copying an entire organization and its culture would be extremely difficult.

Industry Segmentation. The banking industry involves a wide spectrum of organizations. Therefore, banking can be broken down into smaller segments since large institutions such as Citibank will use different strategies and have different competitors than a local $50 million bank. Although all institutions may be in competition for customers, specific types and sizes of banks may serve customers with different needs. Banks also compete on different geographical levels -- generally international, national, regional, and local. For the

purposes of this study, it is more useful to examine one segment of the industry, namely agricultural banking.

Agricultural Banks

Agricultural banks represent a specialized segment of the industry whose direct competition will generally be other agricultural banks. Many of these institutions act as a community bank and will serve the financial needs of a particular geographical area. Although agricultural banks compete with larger regional and national banks and financial service providers, their customers are probably looking to a financial provider for more than just pure financial products. Some of the smaller agricultural banks serve a segment that many larger institutions do not see as acceptably profitable. Thus, their unique customer base may serve as a separate segment in which to work for competitive advantage.

Industry Forces. Many of the concepts discussed earlier also apply to agricultural banks, although there are some unique factors to consider. Organizations such as John Deere, Farmland Industries, and the Farm Credit System have been stepping up their role in the agricultural sector with innovative programs and have thus increased the threat of new entrants. The threat of substitutes will also probably see a rise as the more conventional customers of the agriculture banks begin to take advantage of the many products available from the entire industry. The industry competition is probably even more staid due to the conservative nature of the sector. Although the rise of technology and large number of entrants and substitutes may have shifted an advantage in favor of the customer, agricultural banks may possess a unique edge. Some agricultural banks may have the advantage of being the only bank in the community and thus gain a significant amount of business simply for that reason. In that respect, they have a natural advantage. In addition, they serve small clients that many institutions may see as too insignificant to be profitable, thus decreasing buyer

power. Supplier power may be higher since many of the banks are primarily faced with the problem of where to get the funds to loan [11].

Generic Strategy. In attempting to serve a specific customer segment, agricultural banks may be viewed as employing a focus strategy. Variance will occur in the degree of focus. Banks are increasingly learning that those institutions who serve too broad a range of customers struggle to serve them all profitably [12]. As an example of focus benefits, agricultural banks have recently been experiencing the highest performance in the entire banking industry [13]. Again, a bank may benefit by choosing either focus/differentiation or focus/cost leadership to avoid being stuck in the middle. Many may use differentiation due to their location, personal service, and agricultural expertise that the sector requires. The differentiation may then become a matter of degree. Although being valuable for acquiring business [14], brick and mortar locations are becoming prohibitively costly.

One of the difficulties with agricultural banks developing competitive advantage through use of a generic strategy may be the lack of use of strategic management. Despite the use of strategic planning by banks, many fail to implement their plans [15]. Overcoming this management deficiency will be important in applying a generic strategy since it requires a commitment and direction by the entire organization.

Value Chain. Figure 2.4 represents a possible value chain for agricultural banks. Some of the strategic factors that will affect an agricultural bank under their current structure have been suggested. For example, loan write-offs (operations) can play a significant role as a cost driver and did so during the agriculture crisis of the 1980s. Community activities (marketing) can play an important role for differentiation since agricultural banks are generally very community oriented.

A variety of examples exist where linkages between activities in a bank's value chain can play a role in competitive advantage. Superior loan analysis can reduce the level of write-

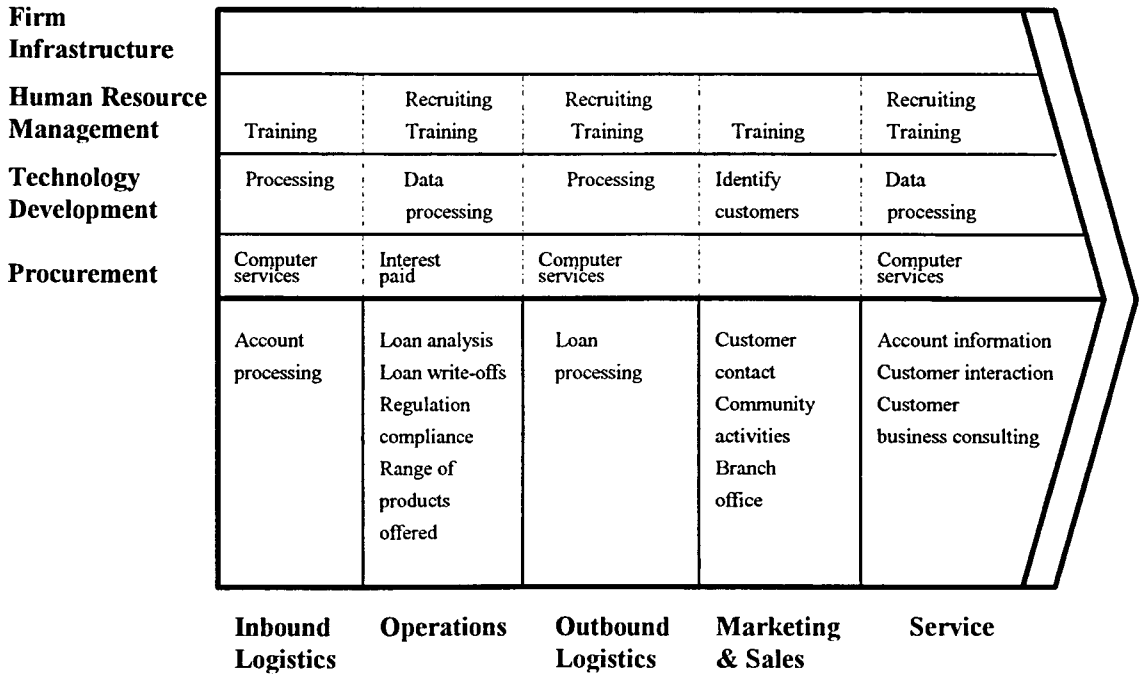

Figure 2.4: Possible Value Chain for an Agricultural Bank

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985).

offs. Improving service can decrease the amount spent on marketing by increasing customer retention. Providing customers (farmers) with business consulting can increase customer satisfaction and thus bring in more business. Business support may also decrease loan write-offs by increasing customer performance. The cost of providing a wide line of financial products may be decreased by providing a proper training program for employees. Linkages to the buyer's value chain is another option. Having a branch bank or extended open hours may meet the customer's need for convenience. A final activity that has been suggested has been to visit valued customers. This has three benefits: (1) it strengthens the relationship with the customer, (2) it allows the lender to get a better idea of the customer's business, and (3) it gives the lender an opportunity to sell other services. Thus, multiple links are presented. Sales to the customer may be increased by the visit. The lender will have a better handle on the loan and increase its quality. Finally, the bank is more visible and this may improve its reputation for caring about the customer.

Every bank may have a different value chain. Adding new activities to the value chain, changing their location or use in the chain, and exploiting linkages of activities can help create competitive advantage.

Sustainability. Here again, banks face the difficult task of sustainability. The agricultural sector may not face as difficult a task due to the nature of their competition. They focus on a particular group of customers that value service, personal relationships, and location. Copying all aspects of an institution is difficult despite the ease in offering similar products.

Summary

Porter's work on competitive strategy and competitive advantage can provide valuable insight on improving firm performance. The firm's industry and prevailing forces may be analyzed in order to determine potential for success. Choosing one of the generic strategies of

cost leadership, differentiation, or focus may help a firm to direct its strategic plan. To improve effectiveness of strategy implementation, a value chain can be used to analyze activities that may be sources of differentiation or cost drivers. Sustainability must also be considered when selecting a strategy in order to ensure the strategy's long-term value.

Banks may analyze their industry to determine sources of competitive advantage. With increasing competition from non-bank financial services, the ability to gain competitive advantage is becoming increasingly valuable. The focus of this study, agricultural banks, may be viewed as a distinct segment of the banking industry. Porter's methods can be used to analyze the sector and help its members position themselves. In the agricultural sector, the industry forces are becoming increasingly threatening, primarily due to the large number of competitors. Although agricultural banks probably fall into the focus category of generic strategy, they may either employ differentiation or cost leadership depending on their particular competitive strengths and those of their competitors. Examining particular activities such as loan writeoffs can be valuable in developing a competitive advantage, but exploiting linkages within the bank and with the customer's value chain may be most helpful. Despite using all of these tools, sustainability is still extremely difficult.

Endnotes

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3. Michael E. Porter, Competitive Strategy (New York: Free Press, 1980).
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CHAPTER 3

COMPETITIVE ADVANTAGE THROUGH INFORMATION SYSTEMS

Many of today's large, successful firms can testify to the power and importance of technology. For some of these firms, information technology (IT) has presented the opportunity for developing competitive advantage. Technology can be an advantage in itself or act as a tool to obtain one. This chapter will discuss the concept of competitive advantage through information systems (IS).

A General Overview for All Firms

Information technology can affect competition in three ways including [1]: (1) changing industry structure and the method of competition, (2) providing firms with new ways to outperform their rivals, and (3) allowing a new business to grow out of the existing business. Although this discussion will focus mainly on the second point, the other two certainly play a role in competitive advantage. Changing industry structure and the method of competition may cause a firm to reevaluate its strategy for gaining competitive advantage. Information technology may reduce entry barriers, change the use of economies of scale, and alter the power structure of buyers and suppliers. IT can also act as an equalizer between large and small firms. In giving birth to a new business, a firm may gain by exploiting vertical or horizontal linkages that exist or by reaping the increased profits that the new business represents.

The Quest for Competitive Advantage

One of the initial steps in gaining competitive advantage through information systems is the adoption of the emerging perspective of technology. Technology systems have traditionally been viewed from an operational perspective -- as a way of automating a mundane task or as an aid in decision making. This view ignores the most powerful uses of

information systems -- strategic ones. By viewing them as a tool to gain competitive advantage and exploring their potential uses, information systems can be turned into a strategic weapon. Computerworld surveyed its Premier 100 companies and found that three-quarters had installed a system within the past year that was designed to give them a competitive advantage (1990). This trend will probably continue as the capabilities of information systems develop as fast as the imagination will allow. Examples of classic cases of strategic systems may be used to highlight points discussed as well as provide a view of their use.

Examples of Strategic Systems

The following two examples are classic cases in the use of information systems. Use by banks will be reviewed later in this chapter.

American Airlines' Sabre. The search for competitive advantage may begin by attempting to address a basic problem. American Airlines (AA) tremendously successful Sabre system began as such and eventually affected competition in the three ways as listed above. Sabre is the technology system that travel agents use to book flights and make reservations. AA initially installed it in travel agents' offices, thus striking at a key information channel. The system eventually developed many strategic advantages including:

- Charging other airlines, hotels and car rental companies for listing on Sabre.
- Encouraging customers to use AA by controlling the information channel.
- Gathering sales data for all the airlines listed on Sabre and allowing the airlines to deal with travel agents who book other airlines extensively.
- Incorporating AA's frequent flyer program into the system.

Sabre helped American become the industry leader, thus forcing other airlines to develop similar systems to combat their powerful advantage. AA continued to press its advantage and added an information services company, AMR/IS, based on Sabre. Although

originally conceived only to help AA manage its seat reservations Sabre developed into a system far beyond that vision.

American Hospital Supply's ASAP. American Hospital Supply is another classic example of a firm that used an information system for competitive advantage. The company manufactured, marketed, and distributed health care supplies to hospitals, laboratories, and medical specialists worldwide. American introduced an order-entry system (ASAP) to "help customers by simplifying the ordering process and permitting customers to reduce their inventories [3]." By providing terminals located in the hospital ASAP made ordering through American invitingly easy and efficient and thus developed an "electronic bondage".

ASAP's strategic advantage was shown by its role in the marketplace. The system was credited with driving several rivals from the business. Simultaneously ASAP reduced customer costs and increased switching costs. The system is an excellent example of a strategic vision that helped a small company become powerful. Eventually American Hospital Supply faltered due to countervailing power and ASAP could not keep the firm afloat. Thus, even a powerful information system could not fully insulate the firm from outside forces.

Other firms can and have learned from the examples provided by these pioneers. Venturing into unexplored competitive areas was one of the reasons for the advantage gained by the systems. Max Hopper, one of the original developers of SABRE and now the senior vice president for information systems at AA, has suggested that the industries that have experienced the effects of information technology now require a new form of competition in order to gain a strategic advantage [4]. Nonetheless, these cases provide two selected examples of the powerful use of information systems. Conceivable similar potential would be possible for use of systems in other untouched industries (such as agricultural banking).

IT Position of Firm or Industry

Obviously industries will vary in the use of information technology. In the same manner, firms within an industry will vary in their use of information technology. Figure 3.1 illustrates the different impacts that IT has on a specific industry or firm based on the use of IT in marketing or manufacturing. The impact of IT on an industry can vary depending on the potential competitive use of information and technology by the firms of that industry. For example, banks and airlines reside in Quadrant IV because information is a key part of their competitive process while the lumber industry is in Quadrant I due to the relatively small amount of information required [4]. A firm can move from one quadrant to another based on a change in the form of competition or consumer demand. The same matrix may also be used to analyze the relative position of firms within an industry based on their form of competition. For example, use of IT for marketing may be primarily employed by firms that choose to differentiate while firms that use IT in manufacturing may pursue either strategy.

IT Environments: Strategic Relevance and Impact

When analyzing IT use, specific firms may be categorized into four basic environments (see Figure 3.2). These categories are divided into the current strategic relevance to a firm's performance and the future strategic relevance to a firm's performance [5]. The Strategic category includes firms in which IT is vital to the success of an organization both today and in the future. Turnaround firms require future applications to reach strategic objectives while Factory firms simply need to maintain the current system in order to reach its objectives. Firms in the Support category do not require IT to meet strategic objectives. Thus, a firm seeking a sustainable competitive advantage through the use of information technology would position itself in the Strategic quadrant. As demonstrated in the following discussion, Factory firms would lack sustainability, while Turnaround firms would not yet have reached a

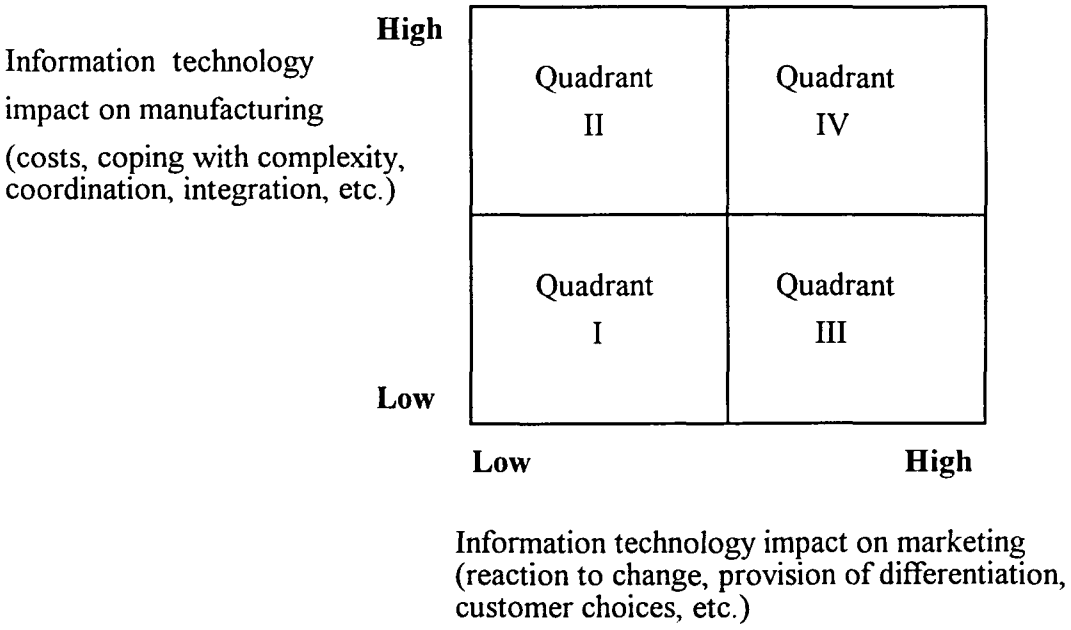

Figure 3.1: IT Impact: Position of Firm or Industry

Source: James Cash Jr., F. Warren McFarlan, James McKenney, and Lynda Applegate, Corporate Information Systems Management: Text and Cases, 3rd ed., (Boston: Irwin 1992), p. 35.

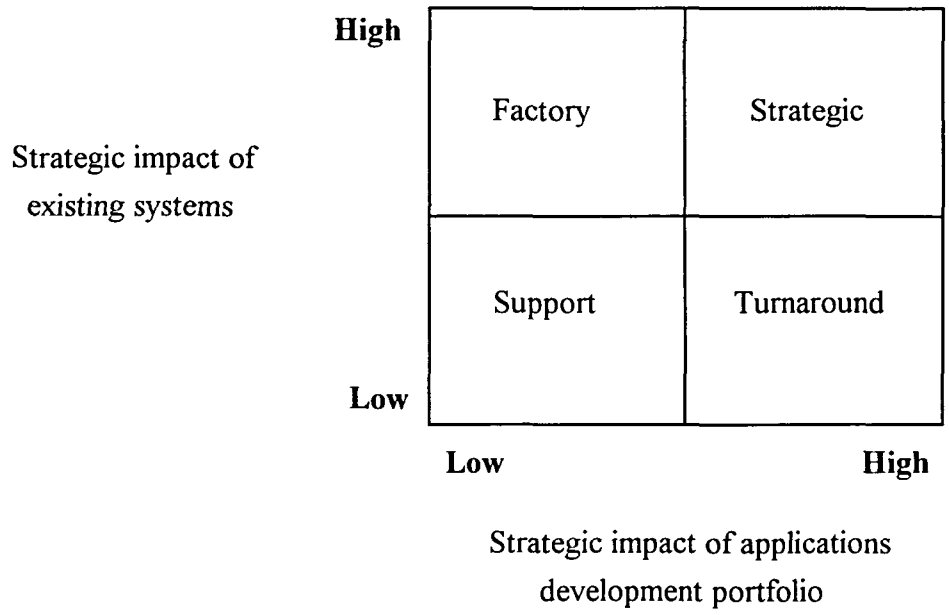

Figure 3.2: IT Environment: Categories of Strategic Relevance and Impact

Source: James Cash Jr., F. Warren McFarlan, James McKenney, and Lynda Applegate, Corporate Information Systems Management: Text and Cases, 3rd ed., (Boston: Irwin 1992), p. 39.

level of competitive advantage. Here again, a firm can move from one quadrant to another with a change in the method of competition.

The Value Chain

As discussed earlier, examining a firm's value chain may reveal sources of competitive advantage. Information technology may involve almost any activity in the value chain. Value activities require an information processing component in order to take place. They also create and use some type of information. As shown by example in Figure 3.3, technology can exploit these factors. The linkages between activities are rich sources of competitive advantage via information systems. For example, they may be used to create economies of scale or scope and allow a company to reap the advantages of size and reduce cost drivers. A different version of a linkage within the firm's value chain is exhibited by the use of supermarket scanner systems to reduce inventory and provide information about customers. Linkages between the activities in a value chain of a buyer or supplier and a firm's value chain can also provide competitive advantages. Developing switching costs can increase customer retention and efficiency of information transfers between a firm and its supplier or it may decrease a customer's costs as ASAP succeeded in doing. Another example of switching costs was AA's use of Sabre to coordinate its frequent flier program and thus providing customers an incentive to fly with them. Sabre also effectively developed entry barriers and changed the ante of competition by forcing new and existing rivals to use information technology in the channeling process. One of the strengths of using linkages is that they may be simultaneously of value to both customers and suppliers.

"Business reengineering" is a new trend information systems usage in a firm that has replaced systems integration. It is the "fundamental rethinking and radical redesign of an entire business system -- the business processes, jobs, organizational structures, management systems, and values and beliefs -- to achieve dramatic improvements in critical measures of

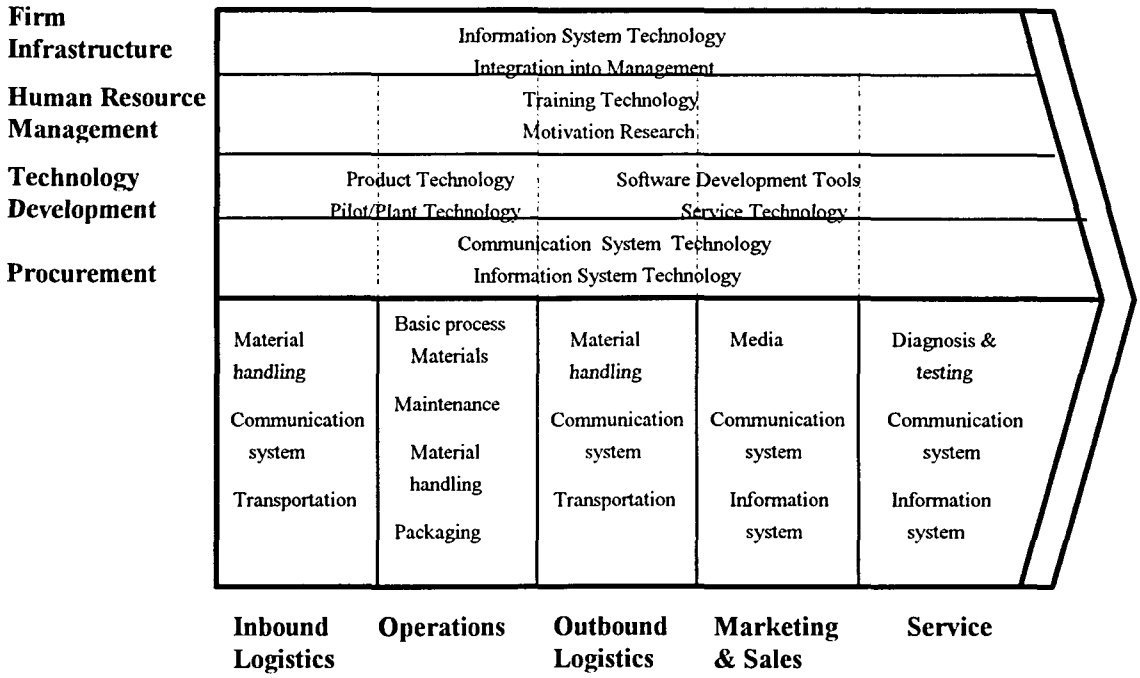

Figure 3.3: Representative Technologies in a Firm's Value Chain

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985) p. 167.

performance. [6]" In other words, instead of simply integrating information technology into a firm's value chain, it is becoming an inseparable piece of the organization and value chain.

Generic Strategies

Information technology can be used to develop the three generic strategies. Several examples used to develop cost leadership have already been discussed including economies of scale, economies of scope, and coordination of activities. Differentiation may be developed in a wide variety of ways. Information itself can be provided with a product to increase uniqueness. Customizing products and services through technology can satisfy the peculiar needs of buyers (as exhibited by many flexible manufacturing systems). In addition, bundling of products or services can provide more for a customer's money or offer a unique product. Lastly, firms attempting to focus can derive a variety of benefits from information systems. Perhaps one of the greatest benefits is the ability to use information to find the target audience that is being sought. Also, a firm can learn more about their customers' buying habits, as recently done by long distance telecommunications carriers.

Competitive Scope

Porter also suggests that technology may play a role in changing competitive scope, the ability to coordinate activities on a regional, national, or international basis, also known as alliance or vertical and horizontal integration. The past decade has revealed a larger arena of competition and bigger organizations through acquisitions and mergers. In addition, decentralization and horizontal organization have emerged as new strategies in business. Information technology has played a major role in making these changes possible. Firms can now interact with each other more effectively and easily than ever before. These interactions can be compared to linkages in a value chain except on a much larger scale. New products, services and combinations of the two can be provided through these linkages. For example, with AT&T's Universal card a customer can make a phone call, charge a purchase, or obtain

cash at a multitude of locations. As for alliances, the Chicago Board of Trade and Chicago Mercantile Exchange have recently joined together to form GLOBEX, an electronic system for trading futures and options around the clock and around the world.

Competitive scope can be a tool used to develop either cost leadership or differentiation. As more firms use information systems, these partnerships and linkages will become more feasible and probably more prevalent.

Sustainability

Information technology has not necessarily made competitive advantage more sustainable. In fact, it has probably made it more difficult to sustain because technology acts as an equalizer and allows firms to imitate a rival's strategy. As William McGowan, the chairman of MCI, put it: "The same technology that bestows competitive advantage can also snatch it back."

A recent estimate is that competitive advantage through information systems is sustainable for twelve to eighteen months [7]. Some IS researchers have even suggested that few cases of sustainable competitive advantage are actually found. Leapfrogging, the continual preempting activities by competitors, is a fairly common occurrence as rivals wage fierce technological battles to avoid being driven out of the market. Firms often implement a system simply to erode a competitor's advantage. Constant innovation and development is sometimes necessary to stay ahead of the competition.

Natural Sustainable Advantages. The advent of information technology has even eroded many natural advantages. Information systems can help firms scale barriers that were once impossible to overcome. Returning to the previous example of a bank with location convenience, information systems have eroded this once relatively sustainable advantage. Customers may now have access to remote banks through a variety of channels including ATMs, personal computers, and telecommunications (Citibank effectively developed this

concept). These uses are, of course, not valuable to every customer, but they are available and often used. Thus, firms must reevaluate the sustainability of their once untouchable sources of sustainable competitive advantage due to the advent of information technology.

Use of Structural Differences. Some researchers have hypothesized that by using structural differences, firms may create sustainable advantage with information systems [8]. They posit that the greater the differences in a competitor's structure, the harder their strategy is to imitate. Structure is basically assumed as the tangible and intangible resources a firm possesses and the unique configuration of these resources. Structure is more difficult to imitate than a specific information system because many strategic resources cannot be easily obtained. This is especially the case in tangible resources such as a brand name, know-how, customer relationships, or even the culture of a firm. Information technology may also make tangible structural differences possible, such as an increase in firm size or a unique combination of products. Using these methods should increase sustainability.

Leading or Following in Technology Use

Firms may choose to lead or follow in their use of technology to gain competitive advantage. Each role has its advantages and disadvantages for a specific situation. Being a leader can be very costly and risky but it can also provide some valuable advantages including [9]:

- Developing a reputation for innovation and performance
- Allowing preferential channel selection
- Developing switching costs
- Gaining early profits
- Developing standards that may be advantageous for the firm

Contrastingly, being a follower can also have its advantages including:

- Avoiding research and development costs
- Learning from the leader's experience
- Being able to adapt the product or service to meet the customer's needs more effectively than the leader
- Taking advantage of new technology that is more effective and efficient than the leader's.

A firm's choice of strategies may depend on its size, the sustainability created by the timing, and the advantages and disadvantages of the strategy relative to the industry. For example, a larger firm is more likely to be able to afford the costs and risks incurred from developing the process.

Relevance to a Specific Industry

Perhaps Porter has stated the impact of information technology best: "The question is not whether information technology will have a significant impact on a company's competitive position; rather the question is when and how this impact will strike [10]." The adoption of technology by industries will seemingly increase as a new generation of managers raised on technology enter the workplace.

Competitive Advantage Through Information Systems by Banks

Information systems have the potential to play a tremendous role in the strategy of banks since it is a business rich in information. Some have even suggested that banking is primarily a business of moving information. Citibank Chairman and CEO John Reed is well known for this view. As he states, banking is "an information business despite the monetary trappings" [11]. This perspective would seem to be supported by the rapid changes taking place in financial services. Information, not actual funds, is transferred between accounts or entities. Wages are direct deposited, ATMs allow customers to transfer funds, make

deposits, and pay bills from any location around the clock, credit cards are used extensively to purchase goods, and loans are credited to accounts.

Such a system presents several sources of competitive advantage. The information itself or its strategic use may be a source. Information technology is a channel that can be used to create differentiation or be exploited to gain a cost advantage. Both information and information technology can act as a tool to give competitive advantage through a variety of means. Thus, technology is a strategic weapon. The form of weapon is left up to the bank.

Banks as an Industry

This view of banking and the recognition of the strategic value of information is common at many of the most forward looking banks. At Mellon Bank for example, technology and business are inseparable. The bank has achieved a complete synthesis of information technology and the organization. The executives at Mellon even have a difficult time keeping their strategic plans up with the pace of technology. More banks may look toward their example as competitiveness in the industry continues to increase.

Competitive Forces, Generic Strategy and the Value Chain. Clearly, IT has impacted the competitive forces in banking. Expanded capabilities from information systems have substantially increased the threat of substitute products. The threat of new entrants is not as certain. On one hand, information technology costs may provide some barriers to entry due to the ante that is required in some markets. On the other hand, information technology can help institutions expand to new markets relatively easily. The latter has generally been the overall stronger force as banks are increasingly reaching outward to broaden their customer base. With this increase in competition, the rivalry among firms has heated up. Moreover, the supplier and buyer power are probably increasing due to the large amount of financial services that are easily accessible due to IT. Developing switching costs may help banks gain an edge.

Thus, an examination of the competitive forces reveals a decrease in the relative strength and level of profitability of the industry. Banks cannot change the effect of IT since it has already diffused into the industry. Instead they must recognize the competitive forces and react to them with strategy.

The increase in competition and decrease in profitability amplifies the need to choose a generic strategy for gaining a competitive advantage and to scrutinize the value chain for sources of cost advantage or differentiation. The following discussion will focus on trends and strategies that are relevant to the industry as a whole.

Relative Customer Trends. Trends in customer demands are dictating the way banks compete. For success in a service based business like banking, the strategy must be focused on serving the customer's needs. Customers want to be in control their financial future so banks must be a partner this goal. Increasing sophistication of customers has driven the desire for a variety of products and information that impacts their financial status. Customers are becoming more technologically literate. They desire transactional convenience -- the ability to easily conduct their business when and where they have time for it. Small business owners may want the ability to transact business from their place of work in order to increase their productivity. Businesses are increasingly looking for electronic delivery as a major option when selecting their bank. In 1988 the American Bankers Association reported that 60 percent of commercial customers rated this as an important factor. This rate probably increased significantly in the following years as technology has improved in quality and decreased in cost.

Banks must look to satisfy these needs if they are going to develop competitive advantage. If they do not, the bank that does meet the needs will prevail. A bank may want to choose the segment or scope they are going to focus on, as different customers have demonstrated different requirements. Most banks have difficulty in effectively serving all

needs of all customers. Retail banking has in fact, shifted its emphasis to focusing on serving selected groups [12]. This trend is expected to continue in the 1990s.

Gaining Competitive Advantage. Information systems can help banks gain competitive advantage through four basic routes [13]: (1) expanding the base of profitable customers, (2) increasing revenue per customer, (3) targeting a profitable customer segment, and (4) decreasing cost per customer.

One way of expanding the customer base is by expanding geographically. Mergers and acquisitions have been a popular method of extending service to a new region. This can provide location convenience, a natural source of competitive advantage. The ability to effectively and efficiently control remote locations is made possible through information systems. Merging different organization's information systems is difficult, yet it is necessary to do so in order to take full advantage of the situation. In doing so, the lead bank can establish a strong relationship with its new customers by marketing to their needs [14]. While in the growth stage, a bank must not forget service and relationships with its customers. Use of a Data Base Management System (DBMS) can help a bank achieve both [15].

The other way to increase the customer base is to employ information systems in offering a product or service that is desired by a different type of customer. For example, while focusing on serving the general public, a bank may offer an electronic delivery system to include businesses by linking the value chains. Naturally a bank must weigh the costs of the system against the benefits. Offering new products to expand the customer profile is an alternate method. Expanding the customer base through either method can decrease the risk of having all "the eggs in one basket", as well as realize economies of scale.

Banks may use information systems to increase revenue per customer. With the increasing sophistication of customers, banks can use technology to provide high value-added services and products to customers through customization of its marketing. This is an

excellent method of differentiation of a product or service. For example, Merrill Lynch developed the successful Cash Management Account (CMA), a comprehensive financial package. The whole package was worth more to customers than the sum of its parts.

Information systems may be used to cross-market services. Using information in customer information files can help select customers who may be able to benefit from other services the bank offers. Customized marketing may be used to target all customers. Because the customers already have a relationship with the bank, this may be a relatively inexpensive way of expanding market services.

Information technology may also provide competitive advantage by allowing a bank to target a profitable customer segment. By using detailed information from the bank's database, a profitable customer segment can be identified. This information may also identify customers' needs thus making it possible to bundle products to meet those needs. The final goal is to get the customers to integrate the bank into their business by linking value chains. This can be an effective way to develop switching costs for the customer, develop a reputation for serving that particular segment, and develop barriers to entry for new or existing competitors. A specific example of this process is a bank that decides to target its commercial customers by offering electronic product delivery (EPD). Cross-selling can help offer additional products and services, eventually bundling or unbundling specific products to profitably serve the targeted niche. Both sides may benefit from the arrangement as the bank exploits a profitable segment and the business makes its cash management more efficient and effective. From this, a strong bond is formed between the entities.

The final strategy is to decrease the cost per customer, thus taking more of a cost leadership approach. This route offers several options. The traditional view of automating mundane tasks is not the only factor to be exploited. Information systems may also be used to integrate customer files, thus reducing redundancy and increasing efficiency. Unfortunately,

these methods are easily imitated. A bank must go deeper than this if it is going to develop an effective strategy from cost advantages. For instance, forming some type of link to the customer's value chain can benefit both partners. A bank may also try to gain economies of scale or scope to lower costs. Chase Manhattan chose this tactic by acquiring the Visa traveler's check business of First National Bank of Chicago to take advantage of economies of scale in processing. This reduced their cost per check by twenty percent.

Cost can be reduced through various methods within a bank's value chain. For example, information systems can dramatically decrease loan processing time while increasing the quality of the loan portfolio. This may be accomplished through access to electronic databases such as Dun & Bradstreet or use of expert systems or other loan analysis tools. American Express has used an expert system in approving transactions. The system decreased the decision time, reduced the bad debt approval rate by 50 percent, decreased the denial rate by 33 percent. Thus, the firm was able to make better, faster decisions. Such a system would not only decrease costs and increase efficiency, it would also improve customer service.

Some experts have doubted the ability to increase long term earnings through cost reduction and instead stress the pursuit of additional products, services, and market share [16]. Cost strategy would, however, seem to hold if an organization can achieve sustainability. Sustainability in cost effectiveness would either require constant innovation to keep up with the new developments in technology, or a level of scale that could not be achieved by competitors.

Determinants of Strategic Use. Banks using certain strategies or facing specific environments may be more likely to use information systems strategically. A study of 167 Midwest banks revealed that banks emphasizing marketing and service differentiation were more likely to use strategic information systems (SIS) due to the increased intelligence requirements, especially in determining customer needs and service [17]. Product

differentiation was not highly correlated with SIS due to the general lack of its use in the industry. Institutions emphasizing cost focus were also not likely to place a high importance on the use of SIS.

Banks with an environment of competitive intensity and with a wide array of customer needs were shown to have a direct link with the use of SIS. Other industry factors such as the capacity of a market, the dynamism of marketing practices, and the level of competitive interdependence revealed indirect effects.

Sustainability. Although a bank may achieve short term benefits from the use of information systems, an end goal must be sustainability. This can very difficult to achieve. Without sustainability, implementing expensive systems can result in a vicious battle for dominance with its rivals where no one except the consumer benefits. Often a bank may even be forced to view implementation defensively as a strategy to avoid competitive disadvantage.

Several options can help banks in their quest for sustainability. Being one of the early users of information technology in a competitive group may provide 2-3 years of competitive advantage for some products [18]. This is primarily due to the capital and people required to implement a service or product. A change of the organization's infrastructure may also be required by the bank. As banks are noted for their resistance to change, an extended advantage may be gained. In order to make a system effective, support is required by all personnel, from the executives who make key decisions regarding the system, to the tellers who influence its use through their contact with customers.

In today's dynamic environment a system must be flexible enough to meet new market conditions and new demands for products or services. As shown by the Sabre example, flexibility and innovation allowed the system to expand into new areas. Without adaptability, a system may be easily leapfrogged as new developments occur.

Examples of Use. This section concludes with two examples of banks who have successfully used information technology to create superior performance. Other examples of many shapes and sizes of IT are found throughout banking. The most noticeable uses have been by the giants of Citibank and Banc One. Both have committed themselves to the use of technology as a competitive weapon and have benefited through tremendous growth. Examples of their activities may assist others in their use, whether growth is their goal or not. Size can be relative to a particular bank's competitive rivals.

Citicorp is the United States' largest banking organization with over $200 billion in assets and operations in 42 states through approximately 3100 locations. In 1976, Citicorp only had $64 billion in assets and was the second largest bank. This tremendous growth was primarily fueled through the strategic use of information systems under the leadership of John Reed. Despite controversy over the value of IT, Reed has consistently been a champion for technology. Citicorp's strategy has basically been one of differentiation, as they seek to be able to serve all of a customer's needs electronically (their customer lines include consumer, institutional, investment banking, insurance, and information). The organization's use of information systems is directed at solving specific problems. For example, in the consumer segment, Citicorp was at a disadvantage to financial service providers such as American Express and Sears who were not constrained by the strict banking regulations. Employing ATMs and credit cards, Citicorp competed by bringing in customers from remote locations. After gaining a customer, Citicorp would then use cross-selling to acquire additional business from them. As its growth continued so did its expansion. Citicorp integrated backwards into telecommunications to cut costs and assure that its communication needs would be met. It formed alliances with other organizations to gain new business, including one with McGraw Hill to develop a system to allow traders to buy, sell, and finance commodities from their own offices. Other information systems ventures have included interest rate swapping, stock

quotations (Quotron Systems) and the sale of financial information. Information systems have allowed Citicorp to overcome many constraints and to do many things that would otherwise have been unachievable. While economies of scale are used to cut costs, Citicorp's primary focus has been on literally being a full service institution.

Banc One has emphasized a cost leadership strategy by achieving economies of scale. Its growth was phenomenal under the leadership of John G. McCoy who, like Reed, acted as a champion for the use of information technology. In 1967 McCoy took the helm of a local bank with $150 million in assets and transformed it into a $7 billion bank with superior performance by 1984. Constant innovation spurred much of this growth. Up to three percent of annual profits were used for research and development, primarily in information systems. Like Citicorp, Banc One attacked specific problems. They too were at a disadvantage to other financial service providers. Banc One used acquisitions, innovation, and alliances to take advantage of economies of scale, especially in the area of credit card processing (with Merrill Lynch). Information systems helped expand customer service options including home banking. For Banc One, differentiation was secondary in importance, and was not designed to be at the expense of cost advantage.

Without the strategic use of information systems, neither Citicorp nor Banc One would have realized such tremendous growth. Although growth is not necessarily an end in itself it was obviously one of the major objectives of both banks. In the meantime, the entire industry has been impacted by their use of information systems.

Agricultural Banks

Due to the ventures of large, innovative banks into the strategic use of information systems, agricultural banks have been sparingly exploring the potential of technology for their own sector. The ideas and technology have diffused into the agricultural sector as pressures to gain competitive advantage have increased. Agricultural banks may learn much from their

bigger counterparts. Similarities in use may be found, but will certainly require peculiar applications and solutions.

IT Position of Agricultural Banks. The IT position matrix in Figure 3.1 can be used to analyze the agricultural banking sector. Banks should fit into Quadrant IV due to the potential for information and technology use. Currently most agricultural banks probably reside in Quadrant I, II, or III. They may be using technology to cut some costs or perhaps process transactions. Most agricultural banks are avoiding the key quadrant for banks and thus falling short of their potential. Doing so may leave them at a competitive disadvantage to the institutions that are employing information technology to the fullest advantage.

Building On Traditional Strengths. Perhaps a useful starting point is beginning with the traditional strengths agricultural banks have used to serve their customers. Abandoning their philosophy would neither be wise, in that it would alienate customers, nor would it be probable, in that such a sweeping change is not likely to occur. Since service has been the centerpiece of agricultural banks, a system must address this factor. Customers generally look for a bank that will provide exceptional personal service, is located in their vicinity or easily accessible, and one that has agriculture expertise and experience. A system failing to serve these needs is not likely to be adopted by customers.

Strategy. Agricultural banks are basically dedicated to a focus strategy by primarily serving a particular type of customer. Through the focus strategy, they can then choose to compete through differentiation or cost leadership. Differentiation through information technology offers a variety of possibilities for competitive advantage due to relatively little use. Cost leadership is probably most applicable to either large banks that exploit economies of scale or scope, or small banks that benefit through high efficiency and low overhead. Information technology is more cost efficient in a larger organization, although smaller banks may use a limited, inexpensive system. By helping a bank (1) expand in size, or (2) stay the

same size and serve their customers' needs more efficiently and effectively, IS can develop either differentiation or cost advantage.

Growth may come in three basic forms for agricultural banks: (1) providing additional products or services, (2) serving a larger geographic region, or (3) serving a wider customer profile. By providing additional products or services, a bank may serve more of a customer's needs, thus keeping them from looking to other sources. Customers seeking to fulfill all their financial needs at one institution may migrate from rival banks. Information technology can also allow a bank to serve a larger geographic region, either by allowing branch operations to be effectively linked through telecommunications or through the use of channels such as ATMs. ATMs may be more useful in avoiding being at a competitive disadvantage than at a competitive advantage when used to increase market share on a local level. A study by Banker and Kauffman found that ATMs may be strategically valuable on a regional level by participating in a network but found little evidence of a competitive advantage at a local level. (ATMs used to decrease cost drivers in the value chain may be another issue.)

Information systems may also allow agricultural banks to serve a wider customer profile that does not sacrifice their focus strategy. This may primarily be done by offering additional services or products that other potential customers seek. For example, a bank can offer electronic delivery of services to its large agricultural customers. Other community businesses not with the bank may also benefit by using this service. In this case, expanding the number of customers who use the service will probably lower the cost per customer by increasing the scale. Expansion into other sectors may reduce the inherent risk of a sector depression associated with a focus strategy (banks with a higher ratio of farmer loans to total loans tend to have a higher probability of failure [19]). This is especially true for agriculture since it can be a cyclical business [20]. A bank should not take this expansion to an extreme

unless is plans to reevaluate its focus strategy. Trying to serve too broad of a market can lead to a decrease in the effectiveness of service overall.

If a bank chooses to stay the same size it can use IT to service its current customers more efficiently and more effectively. Some of the techniques described in the previous paragraph can be used without the intention of growth. This strategy may be more directed at the cost leadership strategy.

Any of the discussed strategies require an expenditure. The bank must obviously weigh the added expenditure versus the value of achieving a competitive advantage or the cost of being at a competitive disadvantage.

The Value Chain. This section contains a variety of uses of information technology for competitive advantage in agricultural banks. Some of the activities discussed can be documented in current use by agricultural banks. Other applications are suggested in this chapter by the use of concept transfer from the banking industry or other industries. These activities are suggested by the author as potential uses.

When evaluating the potential for information systems, agricultural banks must consider both their value chain and their customer's value chain. Information systems may develop competitive advantage through the value chain of an agricultural bank and its customers in three key ways:

- Integrating into the infrastructure
- Developing the current sources of competitive advantage
- Developing new sources of competitive advantage.

Figure 3.4 identifies potential applications of information systems in the value chain of an agricultural bank.

Integrating IT into the infrastructure is uncommon but potentially valuable. This may lead to a reputation of the bank for the use of technology and help both employees and

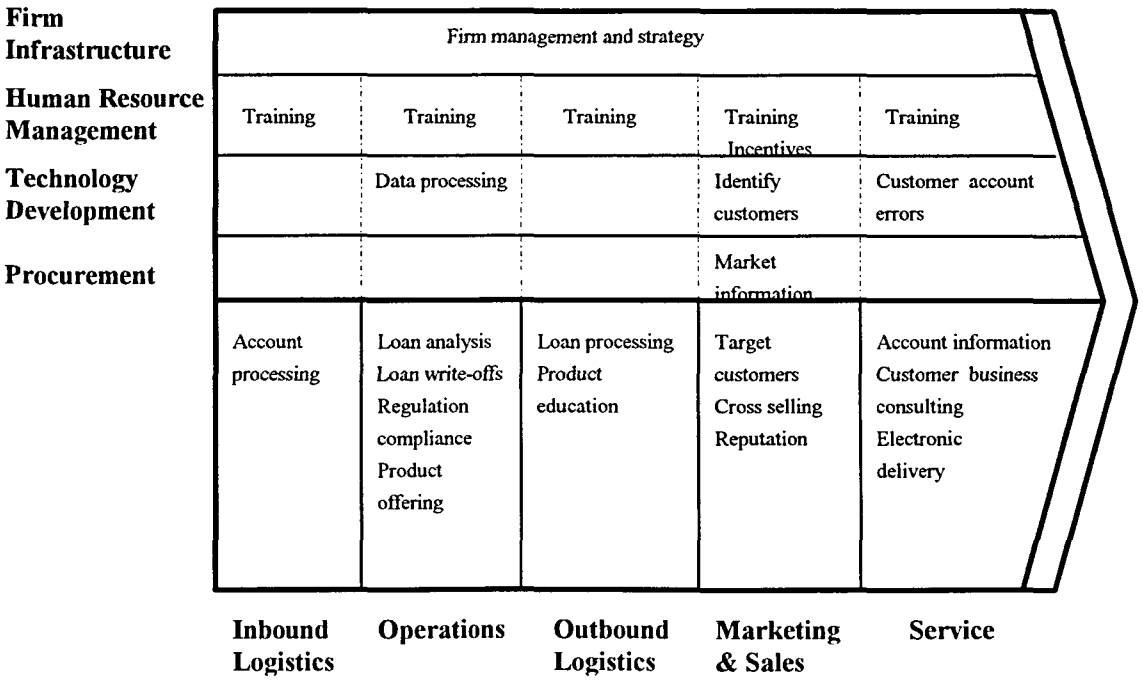

Figure 3.4: Potential Value Activities of an Agricultural Bank that may be Realized or Improved Through Information Systems

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985)

customers identify the two entities together. Making IT a part of the general management and culture may form a bond of the firm and technology. Competitive advantage through this use is more likely to be indirect than direct. Exploiting structural differences in the infrastructure can increase sustainability substantially since this is difficult to imitate.

A bank can also use information systems to develop the current (pre-system) sources of competitive advantage (see Figure 2.4). These are applications that may improve the level of competitive advantage of an activity. If the information system does not improve the process it may help provide a linkage. The potential uses within the value chain are as broad as a bank's vision and innovativeness. The following discusses possible uses for activities and as linkages of activities.

IS can improve loan analysis by using objective measures. An expert system or neural network (systems simulating the human thought process with the ability to handle vast amounts of information) may also be implemented to increase the effectiveness of analysis. Automating portions of analysis will hopefully allow a loan officer to focus on more crucial areas. For example, the system may free up time that a loan officer could use for visiting customers as previously discussed. Thus, the system could decrease the cost of loan write-offs (through a linkage) by improving the quality of loans as well as increase sales and public relations.

An information system may also be used to help a bank identify customers and improve communication with them by direct and selective marketing. Using a system to analyze and summarize a bank's current performance, as well as the effect of potential actions can aid in regulation compliance.

Linkages with the customer's value chain are valuable sources of competitive advantage. Providing quick and accurate account information can improve customer service. The ability to provide a wide range of products effectively can be important to customers who

want the convenience of fulfilling all their financial needs at one bank. Using an information system to decrease transaction errors may be highly valuable in increasing service and customer retention. Finally, agricultural producers may look to a bank for business consulting. For instance, a modeling system can help producers improve their operation, thus providing internal and external value chain linkages. If resulting in a producer's growth, the system may lead to increased lending to a solid customer. It can also improve loan quality, thus decreasing loan write-offs. Lastly, the system may lead to new customers at no cost to the bank by word of mouth advertising from satisfied customers.

New sources of competitive advantage may be developed from information technology. Database management is being effectively used by many banks to cross-sell additional services to customers by identifying potential beneficiaries. By utilizing the current customers to their full potential, sales can be increased relatively inexpensively. Sales may also be increased by using IT to track employees sales and overall performance so as to provide incentive programs. Adding information to products in the form of education can make products both inviting and effective for the customer. Technology can also be used to form alliances with other financial providers who are not direct competitors, thus allowing both parties to expand their customer base while offering all customers a wider variety of services and products. Lastly, information systems can permit electronic delivery of services to customers, thus linking value activities. This may be especially appealing to large customers. The customer may benefit from convenience and improved productivity while the bank gains a significant source of business.

Although any individual activity in the value chain may or may not lead to a competitive advantage via technology, the aggregate chain and its configuration can do so.

Strategies For Implementing IS. The idea of agricultural banks gaining competitive advantage via information systems is useless unless the systems can be implemented.

Although effective techniques for implementation are beyond the scope of this paper, some factors unique to agricultural banks will be discussed.

Agricultural banks are presented with several problems for managing technology [21]. First, agricultural banks generally have a limited number of employees to dedicate to technology and its development and implementation. Secondly, the employees may lack technical knowledge, skills, and exposure. Lastly, small banks probably have a limited amount of capital to invest in technology. These are definitely hurdles, but not insurmountable ones. Banc One's success certainly provides testimony to that fact.

Agricultural banks may even possess certain advantages that can aid in the effective use of technology. Small banks generally have a better understanding of their customers' values and needs, thus improving the potential for a successful market-oriented system. In an agricultural bank, management may possess an in-depth awareness of its organization due to its generally smaller size. This should certainly make implementation easier. Finally, smaller banks operate on a shorter time horizon and can implement systems more quickly than their larger counterparts.

While these advantages are helpful, agricultural banks must address the other problems as well. Most banks will probably want to use proven technology instead of experimenting on the cutting edge. Such systems may be tailored to the banks distinct needs. This can reduce the risk of serious problems, lower the cost of the system, and decrease the implementation time. In addition, the falling cost of technology is making its use feasible for small banks. The advantages of technological following are likely to outweigh the costs of leading for agricultural banks.

Another strategy that has been suggested is forming alliances between non-competing institutions to share information systems in order to make them affordable [22]. This may be

difficult to achieve, but it could help the institutions climb hurdles and erect barriers to entry. Currently several small banks are offering processing services to banks outside their territory.

Examination of the successful implementation by other firms may improve the process for agricultural banks. The following is a cursory list of suggestions:

- Look for a system to solves specific problems or takes advantages of distinct opportunities
- Use a system that fits your bank's strategy and culture
- Develop a system that has the potential to be sustainable
- Leadership from the top as well as support from operational employees is important
- Designate a champion to pull the system through the organization

An in-depth study of techniques is recommended in order to effectively implement a system.

Sustainability. Clearly sustainability of an agricultural bank's system is important. First-mover advantages may be possible due to the current limited use of such systems and the resistance to change of many banks. Integrating systems into the infrastructure can, as also discussed, improve sustainability. This can help build on the unique strengths a bank may have such as trust and service, thus striking at structural differences. Finally, using effective selling techniques to convince the customer of the advantages and superiority of a particular system may act as a barrier and incur switching costs.

Relationship of Competitive Advantage Through Information Systems to Agricultural Banking

Agricultural banking, competitive advantage, and information systems are three distinct fields. All three exist independently of each other, yet as exhibited in Figure 3.5, overlap. The overlapping fields reveal the complexity and numerous facets involved. A union of the three is rapidly emerging as competition in the banking industry increases. That union as represented by Segment IV, is the focus of this thesis.

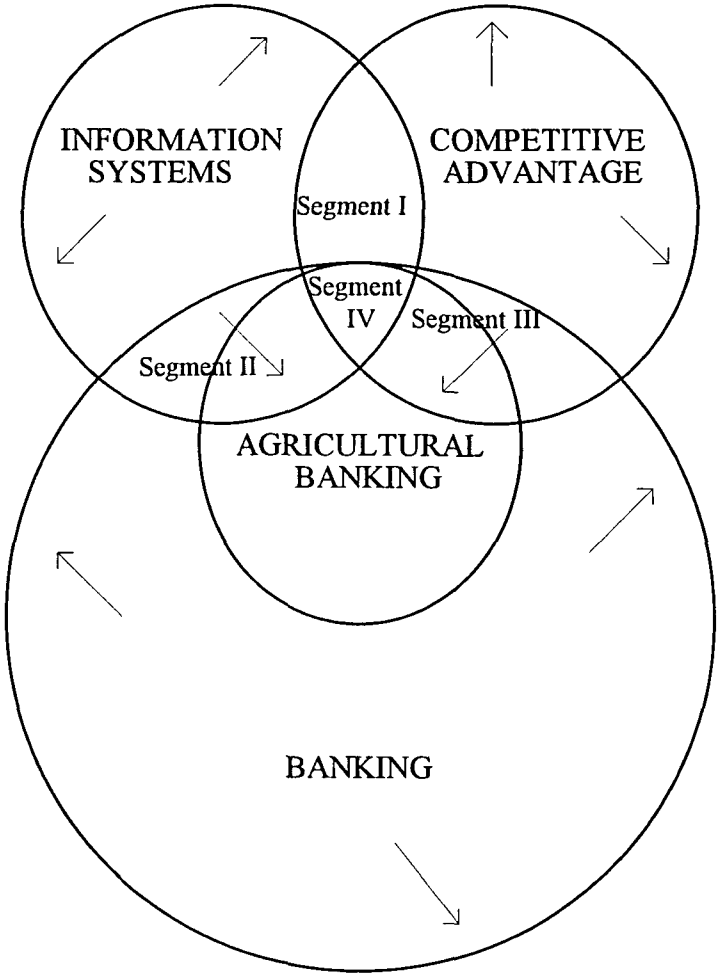

Figure 3.5: Relationship of Competitive Advantage Through Information Systems to Agricultural Banking

The marriage between competitive advantage and information systems (Segment I) has been widely studied. As technology has progressed, practitioners have been searching for new applications that may yield superior performance for their firm. In addition, researchers have been studying the relationship between the two areas and theorizing on the ability to create sustainable competitive advantage from information systems.

The banking industry soon realized the potential strategic applications of information technology (Segment II) in a information intensive business. Innovators such as Citibank and Banc One grew rapidly from the first mover benefits that were present. Other banks soon discovered they were at a competitive disadvantage without the systems, and hurried to imitate their competitors or develop their own versions. Adoption spread rapidly as banks fought to position themselves.

Now, agricultural banks, a segment of the banking industry, are seeking to hold or improve their position in the marketplace as competition intensifies. One method of doing so is through the use of information technology.

The forces that gave birth to these associations are still inducing changes in size and shape. Increasing competition has recently been a catalyst for industry changes. Firms have been seeking to position themselves for superior performance (or in some cases merely survival) through competitive advantage. Information technology is a dynamic field with strategic applications on the rise. Banking has undergone deregulation and has been assailed with new competition. These competitive forces are pushing the boundaries outward as there is either greater demand outside or simply not enough room inside. (The competitive forces are represented by the arrows in Figure 3.5) As a result, the alliance of the fields is becoming increasingly larger as agricultural banks react.

With the rapid changes occurring in technology and the increase in competition, tomorrow's agricultural banking sector will likely look quite different than it does today.

Those banks that effectively use information technology for competitive advantage will improve their chances in being a part of that future.

Summary

Information systems offer a variety of possibilities for obtaining competitive advantage. Technology impacts competition in three ways: (1) changing industry structure and the method of competition, (2) providing firms with new ways to outperform their rivals, and (3) allowing a new business to grow out of the existing business. Increasingly firms are recognizing the strategic uses of information systems and integrating them into their value chains. Employing matrices to examine the IT environment and IT impact on a firm or industry can help determine a proper strategy. The three generic strategies proposed by Porter may be attained or improved by utilizing IT. Due to the ease of imitation, sustainability has become increasingly difficult. Exploiting first mover advantages or structural differences may increase sustainability, and thus IS value to a firm. Perhaps Porter best states the relevance of IT to a firm: "The question is not whether information technology will have a significant impact on a company's competitive position; rather the question is when and how this impact will strike."

Banking offers an exceptional opportunity for the use of information technology due to the strategic value of information in the industry. Banc One and Citicorp are excellent examples of the power of information systems' use. Employing a customer-oriented system to expand the base of profitable customers, increase revenue per customer, target a profitable customer segment, or decrease the cost per customer can help banks compete effectively. Sustainability is still a major problem to be addressed.

Although facing the changes that information technology has brought to the industry, relatively few agricultural banks have considered the strategic use of information systems. Similarly to other industries and other segments of banking, information systems can help

agricultural banks develop a competitive advantage or avoid being at a competitive disadvantage. The uniqueness of agricultural banks and their customers present some peculiar challenges and opportunities. Agricultural banks can build on their traditional strength, namely customer service. Although most agricultural banks employ a focus strategy due to the nature of their business, they may choose either cost leadership or differentiation to compete. Examining the value chain will allow a bank to develop information systems that reinforce its current strategies as well as develop new ones. Looking for potential internal and external linkages for the value chain is especially important. The author suggests some potential value activities that may be improved with use of IS. Also included are some strategies for implementing IS.

Concluding the chapter is a model and discussion of the relationship between information systems, competitive advantage, and agricultural banking.

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CHAPTER 4

METHODOLOGY

Chapter 4 will provide an explanation of the methodology used in this study. Included are definitions, research questions, sources of data, and methods of analysis. In regard to the participating banks, all relevant dates and descriptors will be provided, with attention taken to preserve the confidentiality of the participants.

Definitions

The following definitions apply to the terms used in this study:

Agricultural Bank: a bank with less than $500 million in assets and a ratio of farm loans to total loans that exceeds 15 percent[1].

Competitive Advantage: a firm possessing a factor(s) that provides superior performance over a rival in a specific competitive arena[2].

Cost Leadership: a generic strategy in which a firm sets out to become the low cost producer in its industry [3]. Cost advantages are used to reach this position. In applying this strategy, a firm may choose to serve a broad market or focus on a specific group.

Differentiation: a generic strategy in which a firm seeks to be unique in its industry by offering some factor(s) that is valued by buyers [4]. Differentiation may be in the product, service, delivery system, marketing approach, or any other unique method for which customers are willing to pay a premium. In applying this strategy, a firm may choose to serve a broad market or focus on a specific group.

Holding company affiliated bank: a bank that is a independent or branch location of a large multi-bank holding company. Associating with the holding company is part of the institution's competitive strategy

Independent Bank: a bank not associated with a large multibank holding company. Although this form of institution may be owned by a holding company with more than one location, the holding company is generally not part of the institution's competitive strategy.

Information System (IS): technological system used to collect, process, and disseminate information [5]. Information system has been deliberately defined in a broad

sense to recognize the tremendous breadth and depth of applications that exist. The capacity of information systems for adapting to a specific need is, in fact, an invaluable attraction. Narrowing the definition would eliminate many valuable systems. The study is intended to recognize this assortment, not a selected part of it.

Information Technology (IT): all relevant forms of technology that collect, process, or disseminate information. Information technology is differentiated from an information system in that it does not have to perform all three functions. In addition, IT is a more general term to refer to a broader set of technology.

Strategic Use of an Information System: a use of an information system to support or shape the competitive strategy of a firm [6]. Loss of the system would seriously affect the specific organization's ability to compete. Purposefully using a system strategically would qualify the IS as a *strategic system.*

Sustainability: the ability of a competitive advantage to resist erosion by competitor behavior or industry evolution [7].

Value Activities: the physically and technologically distinct activities a firm performs that build value for the customer [8].

Value Chain: a representation of the strategic activities a firm uses to design, produce, market, deliver, and support its product or service [9]. A value chain consists of value activities.

Research Questions

Based on the purposes of the study and the information from the literature review, research questions arise. The following seven questions present the focus for the study.

1. *What strategic uses of IS are found in agricultural banks that may help develop competitive advantage?* A particular form of strategic system and its uses may be common or unique for developing a competitive advantage. Exploring this question may help other banks in developing a competitive advantage through use of IS. Specific uses may contain important characteristics for gaining an advantage.
2. *What activities are impacted in the value chain of agricultural banks that may be useful in developing competitive advantages?* Determining the specific activities that are associated with developing or not developing competitive advantage may be revealing.

This question may also determine value of using linkages, both within a bank's value chain, and with a customer's chain.

3. *Is cost leadership or differentiation derived by using information systems in agricultural banks?* One strategy may be more useful in developing competitive advantage through IS. Exploring this question may also help reveal the value of each strategy for use by agricultural banks. Finally, the question may determine if Porter's rule of using a single strategy is actually followed by the agricultural banking industry.
4. *If agricultural banks can develop competitive advantage from IS, is the advantage sustainable?* Sustainability is important if a bank's strategy is to have long-term value. Also relevant to this question is the source of sustainability or erosion. Examining the issue of sustainability is necessary in order to determine how to insure successful competitive advantage.
5. *How does the role of information technology within the bank, with a bank's competitors, and with a bank's customers, effect the ability to develop competitive advantage through IS?* Some factors may be integral in developing competitive advantage through IS. Examining the internal role of technology may reveal support or barriers for development. Both the competitors and the customers would also seem to play an important role in the ability to develop competitive advantage.
6. *How is competitive advantage through IS developed or what prevents it from being developed by agricultural banks?* This question is central to the purpose of the study and may determine the ability or inability of agricultural banks to develop competitive advantage through IS.
7. *Does the size or structure of an agricultural bank impact the development of competitive advantage through IS?* Different sizes and structures of agricultural banks could conceivably compete differently due to the available resources. This question may

certainly be relevant to the future of the industry as the sizes and structures are predicted to change.

Sources of Data

This section provides insight on the sources of data used in the study. Participants included, methods of selection, and the method of data gathering are detailed.

Participant Inclusion and Selection

The data were collected from five agricultural banks in Iowa who use information technology strategically. A sample of most technologically advanced agricultural banks was sought for the study. Technological leaders were targeted because they were probably the most likely to have a chance of gaining competitive advantage. Banks of three different structures were included in the study: 1) two independent banks, 2) two banks associated with statewide holding companies, and 3) one multi-regional bank. Within these groups, institutions of different sizes were used. Including different management and size structures may allow a more unbiased comparison of banks with different resources (including capital, information, and human).

Potential participants were chosen through assistance and information from the Iowa Bankers Association and other members of the financial services industry. Banks were then contacted by telephone and the researcher discussed the study to determine qualification and interest. The final five participants represented different communities throughout the state of Iowa.

Choosing a limited number of banks to be studied permitted an in-depth examination of the use of IS. A questionnaire distributed to a large number of banks may not reveal the subtle differences that exist and can be uncovered through an open-ended interview. The interview also helped decrease the misinterpretation of the questions and terms that could lead to faulty conclusions. Taking into account the multiple perspectives regarding the use of IS,

the study would have been susceptible to the misinterpretation problem. In addition a limited number of agricultural banks was perceived to be using information systems strategically, thus making it difficult to use a large sample size. Finally, the study was specifically designed to reveal information in a relatively unstudied area. Studying a narrow segment of information systems' employment in agricultural banking may be valuable in the future after a groundwork of information has been laid.

Data Gathering

Based on the literature review, a questionnaire was developed for use in an in-depth interview. See Appendix A for the questionnaire used.

Interviews were conducted at the institutions in March 1993. Two to five management representatives were interviewed at each bank to gain different perspectives (Banks C and D advised the researcher to also speak with operational employees). The interviews lasted between two and four hours and were tape recorded in order to avoid information loss. Following the interview, the information was transcribed to the interview form. Gaining missing or clarifying unclear information was done with each institution by a follow-up phone call.

Analysis

The responses in the interview are presented in five case studies to allow a continuante view of each bank and the interlocking pieces. The case studies were segregated into seven basic areas:

1. *Overview of the bank.* An overview of the bank including asset size, structure, community served and other relevant information is presented to demonstrate characteristics that may determine competitive strategy and information systems use.
2. *Strategic use of information systems.* The strategic uses of information systems as identified by the banks are presented and discussed. This section also includes the relative

strategic value of each system to the firm. By definition, a system must be strategic in order to provide a competitive advantage.

3. *Impact of information systems on the value chain.* What activities are impacted by use of the information systems that the bank possesses? This section identifies the specific activities and linkages that are present. Clarifying impacted areas is done by putting the individual activities into a value chain.
4. *Use of information systems for cost advantage or differentiation.* Gaining a cost advantage or differentiating products or services may help develop a competitive advantage. Which strategy does the bank use? This section may also help determine if banks follow Porter's rule of not mixing strategies in their use of IS.
5. *Existence of a competitive advantage.* This section answers a central question of this study. Do the bank's perceive a competitive advantage being gained from their use of information systems? Is it possible to gain a competitive advantage through information systems? In addition to answering these questions, reasons for the advantage or lack of it are included.
6. *Sustainability.* This section is applicable only to those banks that perceived the existence of a competitive advantage. The ability to sustain a competitive advantage, methods for doing so, and sources of erosion of the advantage are also examined.
7. *Role of technology.* The final section includes the role of technology from three perspectives: (1) the bank, (2) competitors of the bank, and (3) customers of the bank. The role of technology in all three areas may be important to the success or failure of information systems and development of competitive advantage.

For a contrasting perspective, the institutions also are compared with each other through the use of tables and matrices. The tables use the same information given in the case studies in similar segments and permit the reader to compare or contrast among all five banks.

The IT environment matrix and IT impact matrix discussed in Chapter 3 are used to relate the banks' positions relative to each other.

Based on the information taken from the interviews and presented in Chapter 5, conclusions are drawn.

Limitations of the Study

Due to the nature of the study, certain limitations were expected. Clearly, with only five banks included in the study, broad generalizations regarding all agricultural banks cannot be made. By providing a representation of technologically advanced banks at different levels in the agricultural segment, potential variables for future research may be revealed.

Considering the convenient sample chosen, the banks may reveal a slight bias regarding the use of technology as all the chosen banks have an investment in technology. The sample of advanced technology users was purposely chosen because it represents the banks that have the greatest potential for developing competitive advantage from information systems. Not studying this type of institution would probably reveal little information relevant to this study. Despite any potential bias, the details of the case are still expected to be revealing and realistic since bias is rarely absent from management decisions.

Lastly, a single consistent measure is not available to test the existence of a competitive advantage through the use of IS. The researcher included the facts that were available and used the expert opinions of a number of management level employees. Being consistent with the nature of agricultural banking, this opinion would be expected to be conservative.

Summary

This chapter details the methodology used in the study. Included are definitions for agricultural bank, cost leadership, competitive advantage, differentiation, holding company bank, independent bank, information system (IS), information technology (IT), strategic use

of an information system, value activities, and value chain. Seven research questions that help focus the study are also presented and discussed.

The data gathering process and sample selection are detailed. Five agricultural banks using IS strategically were chosen from throughout the state of Iowa. In order to examine different sizes and structures of institutions the sample purposely includes two independent banks, two banks from statewide holding companies, and a bank from a multi-regional holding company. Gathering the data was done through interviews based on a questionnaire with management representatives of the five institutions in March 1993.

Based on the research questions, the data are presented in a case study format. Complementing this are tables for a cross-sectional view of several areas and matrices for a comparative analysis. Finally, some expected limitations are addressed.

Endnotes

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CHAPTER 5

RESEARCH FINDINGS

This section reports the findings of interviews with five agricultural banks. The first part of the chapter presents case studies of the five institutions. The latter part is a comparative, cross-sectional analysis through the use of tables and matrices. Examining the research questions completes the chapter.

Case Study of Bank A

The situation faced by Bank A would seem to typify that of many small agricultural banks. How will the institution face a shrinking community and customer base with an increase in large competitors?

Overview of Bank

Bank A was the smallest institution included in the study with approximately $25 million in assets. Twelve employees work at the single location, including two loan officers and the president. It is located in a small rural community that is composed of lower middle class citizens.

Due to its competitive strengths and small asset base, the bank is attempting to establish a niche in the agriculture market. Bank A cannot effectively compete for the business of large, highly profitable producers because the institution cannot offer the large credit demands or low interest rates that are required. Instead, they are attempting to focus on the middle range of producers -- those producers that are moderately profitable and operate mid-sized farms. A "people-oriented" approach is used by the bank in gaining and retaining customers. "Helping and developing human beings" is an overt goal of the institution.

Strategic Use of Information Systems

Strategic use of information systems can be found in: (1) loan department operations and (2) bank interest margin and asset management. An officer in the loan department has developed a variety of spreadsheets that help the bank administer its loan policy. In attempting to expand the quality loan portfolio, the bank uses the spreadsheets to (1) better analyze and manage its customers (or potential customers), and (2) provide consistent decisions. The spreadsheets include balance sheet and cash flow analysis that are designed to improve the amount and quality of information that an officer can obtain from a customer. Profitable, quality customers may be identified by benchmarking the customer's operation. Without the system, loan analysis would be much more simplistic and based on traditional subjective methods. Analysis may also now be done on every customer, instead of a select few. Finally, the analysis may help the customer objectively view his/her operations and determine areas for improvement, thus increasing customer satisfaction.

The other strategic use is a recently implemented software package that aids the bank in management of its interest margin and assets. Included in the package are forecasting and risk management capabilities. Without such a system, a bank has extreme difficulty in controlling its net interest margin and thus, its profitability. The bank is now able to use the entirety of information it possesses to map its strategic path and increase profitability. Although the system is still new, the bank is very enthusiastic about its potential and sees it as a necessary tool for survival.

Impact of Information Systems On the Value Chain

The bank's uses of IS has an impact in many activities in the value chain. Figure 5.1 represents the value chain for Bank A. There is an effect on several activities that have not yet been discussed. Due to the increase in loan quality and retrieval of documentation, loan

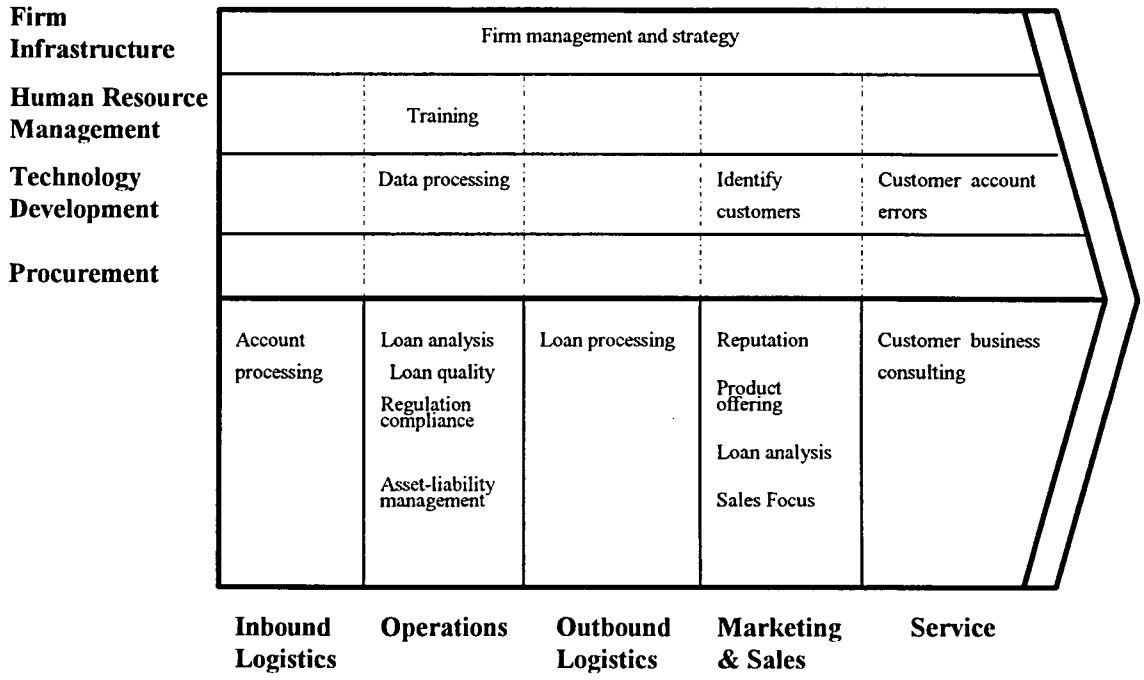

Figure 5.1: Impact of Information Technology on Bank A

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985).

compliance has been improved. In the operations area, the improvement in loan quality reduces the potential for loan write-offs.

The sales area has seen a number of improvements. One important benefit has been in the bank's reputation for knowledge. According to an officer, several agricultural customers have been extremely impressed with knowledge that the bank has of their business, thus gaining their trust. The loan analysis system has played a vital role in this knowledge acquisition and display. Product offering has been broadened due to the increased ability to offer FHA loan guarantees. Formerly, the paper work for getting a guarantee was nearly prohibitive. With a custom spreadsheet the process is significantly simplified. Thus, this may also bring in new customers. Lastly, loan analysis is linked to sales. According to an officer at the bank, the analysis system, "Allows a salesman to loan money." His statement was referring to the new emphasis in the banking industry on aggressive lending. As previously described, the spreadsheet analysis allows quality, objective decisions to be made by a "salesman" instead of a traditional banker. The statement is backed by a $5.5 million increase in loans over the past three and one-half years for the $25 million institution.

The majority of focus by Bank A has been on activities related to their own value chain. A limited number have been on the customer's chain or on linkages between the bank's chain and the customer's chain.

Use of IS for Cost Advantage or Differentiation

Currently, the bank views the primary use of information technology as a means of gaining cost advantages. Advantages gained include:

- Decreasing risk of bad loans through good analysis and monitoring.
- Allowing the bank to make and manage more loans with fewer people (Three officers, including the president, manage approximately $13.5 million in loans).
- Improving management of net interest margin.

The institution was uncertain if IS differentiated their products or services. An officer suggested that it may differentiate the bank's services by helping customers improve their (the customers) operations.

Existence of a Competitive Advantage

Bank A believes that their use of information technology provides them with a competitive advantage over their rivals. The advantage is due to the (1) reduced risk, (2) ability to grow, and (3) increased profitability that the systems provide. Information technology was not, however, consciously implemented to gain a competitive advantage.

Sustainability

The advantage is currently not being eroded because no perceived competitors are using information technology strategically at this time. Unfortunately, the president questions the ability to sustain an advantage due to the actions of large rivals. He sees keeping up with changes in technology as imperative in the attempt to sustain the bank's current advantage.

Role of Technology

In the past, technology had basically played a support role in the bank. Currently the institution is making the transition to strategic uses. Management sees technology as playing a key role in their bank's future and are looking for new applications.

Bank A does not believe that its perceived competitors use IS strategically. The president credits this partly to the support focus of technology vendors. Thus, a lack of available information regarding strategic technology for their rivals may exist and act as a barrier. Bank A's management contrasts this by seeking technology applications.

For the customer's of the bank, technology plays a minor role. According to the bank's president, "Customers are not impressed with technology, only the delivery of services that they need." This would seem to be exhibited by those customers that prefer the management assistance that the bank's loan analysis system can provide.

Analysis Summary of Bank A's Use of Information Systems

Due to the beliefs of Bank A's management, information systems are playing an increasingly strategic role. The institution appears to be using information systems internally to improve performance and to position itself. Externally, the bank is coupling IS use with customer service in order to increase its loan base. The internal-external combination is geared at allowing the bank to be flexible to change and to grow.

Case Study of Bank B

Bank B is the most technologically proficient bank included in the survey. The institution reveals a strong commitment to the use of information technology. Part of this commitment is due to a belief that technology is necessary to compete in tomorrow's banking environment.

Overview of Bank

Bank B is a highly profitable institution with approximately $125 million in assets. It has several locations in its community as well as one in nearby town. A wide variety of products and services are offered by the bank including ATM access, farm management, data processing, trust services, and brokerage services, as well as traditional loans and deposits. Although the medium-sized town where the bank is located includes a number of financial service providers, the bank views its competition as being on a much broader scale.

As an aggressive lender, the bank prefers to focus on the agricultural market. A sales philosophy is combined with a strong commitment to customer service. Exuding from the bank is a professional atmosphere that shows the institution's pride in its image.

Strategic Use of Information Systems

Bank B's strategic applications of IS include: (1) data processing services for other banks, (2) a forty-five personal computer network, (3) loan analysis, (4) a banking simulation model and (5) a CIF marketing system.

For agricultural banks, the data processing service is a unique strategic application. Processing for between seven and twelve banks, the operation acts as a profit center. One of the primary reasons for the service is that it decreases the bank's processing costs by up to fifty percent due to economies of scale.

The PC LAN (Local Area Network) puts technology applications at the hands of most of the bank's employees. Improvement in intrabank communication may be one of the systems key benefits. The bank believes so strongly in the value of this LAN that it employs a PC coordinator to develop and manage it.

Through the use of loan analysis software, the institution is able to reduce losses that otherwise occur with its aggressive lending policy. Not only will the system reduce risk, but it will also optimally price the loan according to evaluation of the customer.

The banking simulation model is an important tool for strategic planning. By utilizing and employing a large number of variables the bank can theoretically simulate the environment in which it operates. The system also helps efficiently manage assets to improve profitability. Although relatively new, the bank sees much promise for it in the future.

Also relatively new, but promising, is the bank's marketing CIF system. The revolutionary system has multiple applications. One use will be in gaining additional business from existing customers by rewarding customer loyalty with rate breaks on loans or bonuses on deposits. Another use will be in identifying and marketing to new or existing customers for a specific product or service. The system may be especially valuable since it is a trademarked product that includes exclusive use in a specified territory, thus fighting competitor imitation.

Impact of Information Systems on the Value Chain

Figure 5.2 provides a representation of the impact of information systems on Bank B's value chain. A large number of activities are impacted by the five systems.

Marketing and sales includes multiple activities as the bank believes that applications for the customer are important. Cross-selling of products and targeting customers are two important activities that the CIF aids. Bank B's reputation for technology also affects sales. Although the bank has not strictly marketed its use of technology, it has drawn customers from other communities (up to 75 miles) for this reputation.

In the operations area, regulation compliance has been aided by the use of information systems to automatically provide the correct documentation. This avoids oversights that may otherwise occur. The inclusion of data processing in the operations area is an important factor in cutting the bank's processing costs and generating fee revenue.

Finally, overall customer service is improved. Improving service may be via the analysis that the Bank does on their business. Bank B is interested in helping customers improve their operations. Customers, or potential customers, may also benefit from an electronic credit check system that decreases the time it takes to approve a loan. This activity is also linked with activities in marketing (getting customer's business before they go elsewhere), and operations (improved loan quality).

Although many of the applications are geared toward the bank's internal operations, their use of technology is targeted to serving the customer. The bank feels this is necessary in order to insure long term success of information systems. According to an officer at the institution, "The customer will respond if he/she feels you are trying to help him/her."

Use of IS for Cost Advantage or Differentiation

In being consistent with the purpose of using technology to benefit the customer, the bank identifies differentiation as the key strategy for technology. Bank B is moving toward a

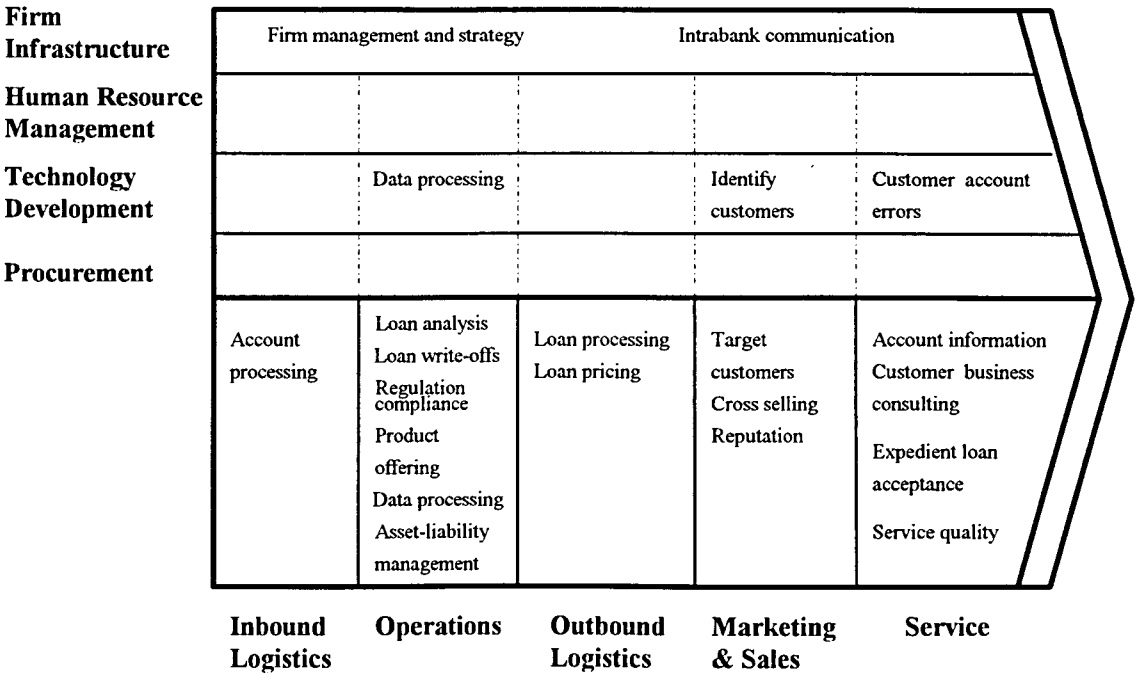

Figure 5.2: Impact of Information Technology on Bank B

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985)

sales organization. It also wants to, "Provide better customer service at a cheaper cost." In return, the institution feels the customer will generally pay a higher price for the added value that the bank provides.

Bank B also sees cost advantage as being necessary. It primarily gains this through information systems by reducing its processing cost and cutting the amount of personnel used to operate the institution.

Existence of a Competitive Advantage

Bank B feels that its use of information systems provides it with a competitive advantage over its rivals via three systems:

1. Marketing system: The system should help the bank identify and attract more customers as well a retain the existing customers.
2. Bank simulation system: The system will help the bank with planning and strategic positioning.
3. Processing business: The bank is able to process its work at a significantly lower cost due the existence of economies of scale.

Sustainability

The bank believes that it will sustain its advantages through several methods. In the immediate trade area, other banks do not have the resources required to implement similar systems at this time. Thus first mover advantages should continue as existing institutions have difficulty gaining these resources due to Bank B's advantage. In addition, the marketing system that the bank has purchased is not available to local competitors since it is trademarked. Although other marketing systems are available, the specific system may offer some unique advantages.

Lastly, innovation will be important to retaining an advantage. This is integral in the bank's philosophy as it strives to be at the leading edge of technology in the state. Innovating has had its cost's however, as the bank has admittedly made occasional mistakes.

Role of Technology

Technology plays a strategic role in the bank's operations. The management team is highly committed to the use of technology and its importance to future competition. Although the president does not personally use much of the bank's technology, he envisions IS as being necessary to his institution's performance and allows his employees to develop them. The bank sees its current problem as getting its employees up to speed with the technology it possesses. Training is necessary if the technology is to be optimally used.

Strategic technology use by the bank's local competitors is mixed. The bank estimates that perhaps one or two of the financial service providers are using information systems strategically, while the others are probably not. In a more broadly defined marketplace, other competitors would probably be using IS strategically.

The bank sees the customer as the ultimate beneficiary of IT, and therefore attempts to educate customers in the use of technology. Getting the customer comfortable with technology is necessary if the bank's IS are to be effective. The bank's younger customers have adopted IT, while the older ones often hesitate or refuse to use it.

Analysis Summary of Bank B's Use of Information Systems

Clearly, Bank B views information systems as being important to its future. The bank not only sees technology as helping it survive, but also as being necessary for profitability. The use of information technology is fortified by a commitment to the customer. Bank B uses a variety of information systems to accomplish its goals.

Case Study of Bank C

Bank C is undergoing a transformation in its use of IS. The institution provides a good profile of the development process in a bank associated with a large holding company.

Overview of Bank

Bank C has approximately $55 million in assets. Serving a rural, mid-sized community, the bank is one of over a dozen independent locations for a statewide holding company. The educational and business environment of the community served is fairly technologically progressive.

The competitiveness of Bank C's environment is exhibited in its location -- the bank sits on an intersection where three of the four corners contain financial institutions. Bank C tries to differentiate itself by being a premier financial services provider and offering excellent customer service. Targeting large producers or "superfarmers" is one of the objectives of the aggressive agriculture department.

Strategic Use of Information Systems

Information systems having strategic value to Bank C include: (1) a personal computer network (2) loan analysis and management, (3) farm management services, (4) marketing customer information files (MCIF) and (5) an asset-liability management system.

The bank's personal computer network has changed the organizational structure of the institution by eliminating employees and allowing officers to become more sales oriented. By allowing the current employees access to information and tools needed for their jobs, operations are more efficient. Almost all of a customer's needs can now be taken care of by a single officer, instead of separating capabilities. In addition, the system has helped project a more professional image for the bank.

The loan analysis system is a series of spreadsheet templates designed by the bank to evaluate and monitor bank loans through cash flow and financial statement analysis. This

analysis can now be done on every customer and updated easily to monitor a customer's operations. By using the system, officers may also improve the quality of their time spent with the customer instead of merely focusing on numbers and information acquisition -- a benefit appreciated by many customers. In addition, the loan analysis system helps the bank meet loan documentation requirements by automatically providing the necessary forms. This is especially helpful in the documentation-laden real estate area.

The farm management services have benefited from the use of technology being able to (1) provide the customer with an abundance of quality information, manage more farms effectively and present a more professional appearance. Overall, the system translates to increased revenue from the farm management business.

Although the MCIF system has been available through the central office, it is just being installed in Bank C. The system is expected to allow the bank to cross-sell and target market to customers. The institution has high hopes for the potential of the system.

Recently, the bank also replaced its old asset-liability management system with a dynamic simulation model. The system not only helps the bank manage its interest gap, but also develops scenarios that may arise from decisions the institution makes. The new system is expected to be a valuable improvement over the old version.

Impact of Information Systems on the Value Chain

Figure 5.3 provides a representation of the value chain for Bank C. A number of activities are impacted in the bank's chain, especially in the operations area.

The standardization of services (with the banks associated with the central holding company) is a unique activity that has been impacted. Due to the use of IS, all of the affiliates now offer relatively standard products and services. Standardization has been pushed by the holding company, primarily to ensure that the customer will find congruence among banks if moving to a new community (thus targeted at retaining customers). Making auditing easier

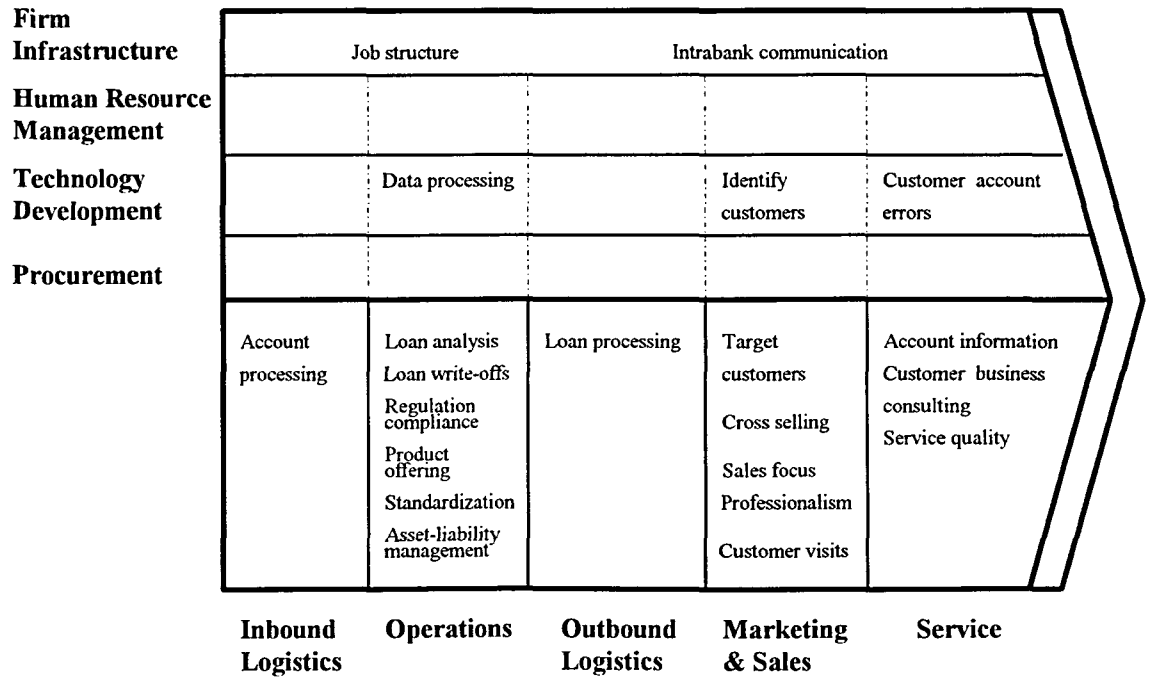

Figure 5.3: Impact of Information Technology on Bank C

Source: Adapted from Michael Porter, Competitive Advantage (New York: The Free Press, 1985).

and helping adaptation of employees transferring between locations, the organization also benefits internally. Regulation compliance has been simplified by the use of standard forms generated by the system. Due to the loan analysis system, loan quality is expected to increase due to improved management capabilities. Finally, product offering is increased by the ability to offer FHA guarantees (similar to Bank A).

In the service area, the ability to help the customer with business consulting has been improved. Not only is this done through loan analysis, but also through a record keeping service that the bank offers. Customer account information access has improved as a result of an automated telecommunications service the bank instituted. Naturally, this service provides a linkage to employee costs. Increasing the quality time spent with customers has improved customer service. Service to large, remote customers is enhanced by the use of a floating line of credit that the customer can access via telephone. This service is made possible by the institution's information systems and can allow the bank to expand its market base geographically.

The marketing area has been primarily impacted by the ability to be more focused on sales. Technology use also allows more time for loan officers to visit customers on their premises and thus be more aggressive. Lastly, the ability to target customer through use of central information files has improved the ability to cross-sell.

Use of IS for Cost Advantage or Differentiation

Bank C appears to use IS to gain both cost advantage and differentiation. Efficiency and cost savings were the initial benefits sought when the bank began using technology and seems to still have a slightly dominant role. Extensive cost savings have come in the form of personnel cuts. Over the years, the bank has increased its assets by approximately $10 million and manages them with eighteen fewer employees (decrease from forty to twenty-two).

Gradually the bank is shifting to additional marketing uses of its information systems. Some of this marketing focus comes in the form of differentiation through customer service and added sophistication. The consumer loan officer for the bank believes that her customers are willing to pay a small premium for the additional benefits that the bank offers through use of the information technology. The system helps customers view the bank as a more professional organization than the area competitors.

Existence of a Competitive Advantage

Despite gaining numerous advantages from IS, the bank does not necessarily perceive the existence of a competitive advantage at this point. Three reasons for this were presented: (1) cost, (2) growing pains, and (3) perception.

Implementing the systems has presented a large cost to the bank that may not yet have reached a payback point. Secondly, the bank is still going through what was termed as "growing pains." This is both within the bank and for the customer, as the learning process is in its early stages. Although benefitting from the system, some customer's are still skeptical of its value. Finally, up to this point, the bank has not fully considered the use of information systems for gaining a competitive advantage. Clearly, not viewing information systems from such a perspective would decrease the ability to gain an advantage.

The senior vice-president does see valuable potential for information technology in the bank. He states: "I have no question it will (provide a competitive advantage) in the future." Marketing applications are believed to play a significant part in this transition.

Sustainability

Although the question of sustainability is not relevant due to a perceived lack of competitive advantage, several factors reveal reasons for the institution being the technological leader among its competitors. Bank C has the necessary resources (monetary and human) and the attitudes that have allowed to reach its technological position. The

consumer loan officer and cashier have provided key roles in the bank's system development, partially due to their knowledge and interest in the area. The bank feels this is an important advantage that they hold. In addition, the bank has a fairly progressive attitude in relation to technology use, a necessary factor in the advancement of technology due to its dynamic nature.

Clearly, if the bank's information systems are to develop a competitive advantage, these factors will be essential in developing and sustaining that advantage.

Role of Technology

Due to its integration into the bank's operations, technology plays a strategic role in Bank C. The bank's officers appear to have a very positive attitude toward the use and benefits of technology. Despite not being viewed in a competitive role in the past, IT seems to be perceived as necessary for competing effectively in the future. Bank C's holding company is also helpful in the development of IS by providing support and available resources. Although the holding company does not generally direct the development of systems, there is information exchange between the independent locations.

Only one of the other banks in the community is perceived as being a strategic user of technology. Estimated to be lagging in development behind Bank C by approximately a year, the bank's competitors are seen to be increasing their use of technology.

Customer attitude (as perceived by the bank) appears to be mixed. Some customers have readily embraced the bank's use of information systems, while others view it with skepticism. Customer attitude (and perception) varies according to the experience of the customer with the bank's technology.

Analysis Summary of Bank C's Use of Information Systems

As stated by the bank's officers, information systems will play a key role in the competitive strategy of the bank in the future. The effectiveness of use would seem to

increase as the bank outgrows the development pains associated with technology and more customers realize the potential benefits. Marketing uses of information systems are believed to have tremendous strategic benefits for increasing sales. As one officer puts it: "We can go after people because we have a clearer target."

Case Study of Bank D

Bank D represents another member of a large statewide holding company. In the past, the organization has been one of the nation's largest agricultural lenders and thus is an obvious power in the marketplace.

Overview of Bank

Bank D has approximately $85 million in assets and is one of over twenty independent operations of its parent company. Operating a branch office within its community and one in a nearby community, the bank is one of the larger financial service providers in the local area. The bank serves a medium-sized, rural community with a number of competitors in town, as well as in a nearby, slightly larger community.

Perhaps because of its size, the bank targets larger, more progressive agricultural customers. The bank's management is fairly young and is looking for innovative ways to expand its business.

Strategic Use of Information Systems

Four applications of information systems are viewed as strategic: (1) a PC network, (2) a loan analysis system, (3) on-line access to credit bureau, and (4) an asset management system. The network has provided access to customer information and work tools for the bank's employees. By using the network and the tools on it, the bank has helped officers do more work and thus decrease staff overhead.

The loan analysis system assists both the bank and the customer. Through use of the system, the bank can better analyze and manage its loans. By benchmarking the customer's

operation against industry standards, (both for agricultural and commercial customers) the bank helps the customer evaluate his operation and spot areas for improvement. Thus, the quality of service has been improved and the loan risk decreased.

Loan risk has also been decreased by utilizing its on-line access to a credit bureau. This system helps the bank make faster decisions and gain business that may be time-reaction sensitive (i.e. car loans, etc.).

Finally, the bank has developed a spreadsheet application that helps it manage its assets. Projecting and controlling asset-liability gap is another key use of this system. Deficits or surpluses of funds can be foreseen and the bank can take necessary action, perhaps offering special programs to increase loans or deposits.

Impact of Information Systems on the Value Chain

Figure 5.4 represents the value chain for Bank D and the activities that are impacted by its use of information systems. Operations have seen a great deal of activity alterations. Loan analysis and management have been an important improvement, especially over other less sophisticated systems in the community. Associated with the loan process is a system that automatically prints out the necessary documentation. The vendor of this system helps keep the forms updated regarding legal changes. Both of these activities help with regulation compliance. Offering and managing a wide variety of products and services is feasible due to the use of information systems. The bank has, for example, just begun offering customers the ability to pay bills via ATM. Although valued by only a specific population (estimated one in ten) the product may draw in new customers since it is believed to be unique in the state.

The service area as a whole has been improved in several ways. The loan analysis system can help customers improve their operations. By printing with the information taken directly from the loan analysis system, the bank reduces errors, therefore improving customer

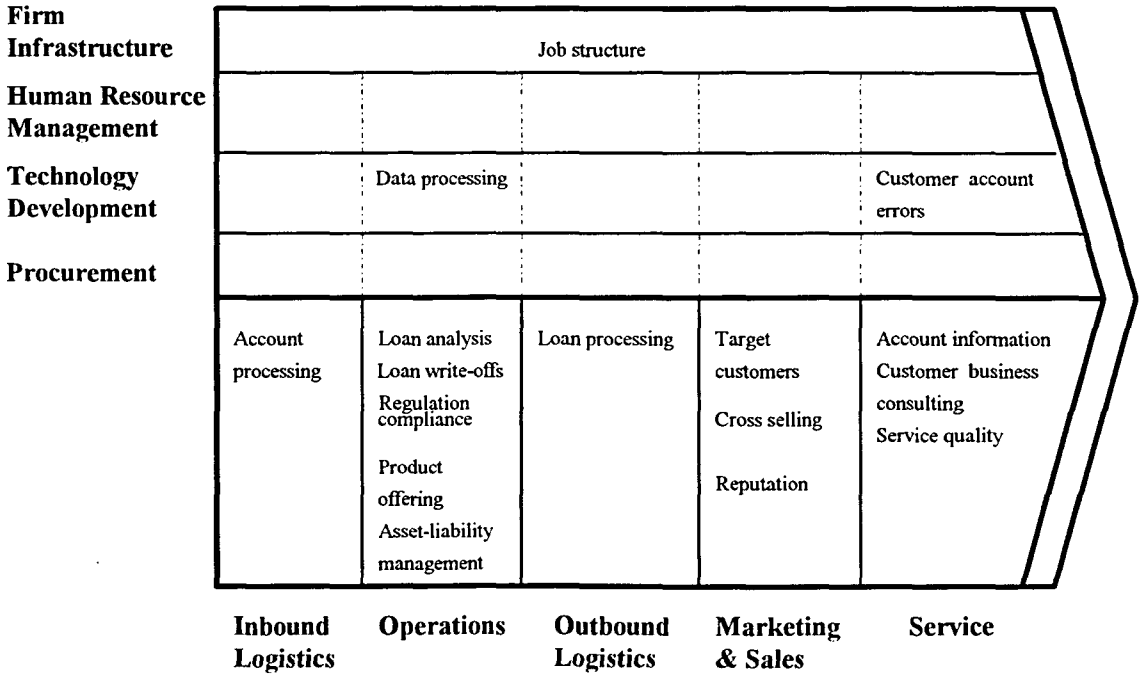

Figure 5.3: Impact of Information Technology on Bank D

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985).

service. In the near future the bank plans to have the ability download information from the loan documents to the mainframe to reduce handling and errors.

In the marketing area, the ability to target customers and cross sell services has been enhanced. For example, the bank uses its IS to monitor the over-50 (age) population, a targeted customer segment. The CIF system is admittedly somewhat limited in its capabilities, however. Lastly, the bank's reputation as being more technologically sophisticated is valued by some progressive customers.

Due to the use of information systems, the job structure has been altered. Since the officers now have increased job capabilities, their responsibilities have become greater. Unfortunately, the officers have probably become more specialized in their lending positions due to required knowledge in systems use.

Use of IS for Cost Advantage or Differentiation

Bank D has derived both cost advantages and differentiation from use of IS. As expected, cost advantages are not necessarily felt in the short run due to the necessary investment in technology. In the long run the bank is expected to glean savings in the form of reduced personnel costs. Approximately ten employees have been eliminated over the past eight years, while assets increased $10-15 million (with a corresponding increase in loans). Several years ago, a consulting firm was brought in to study the bank's operations and suggested it increase efficiency. Increasing the efficiency was partly accomplished by using information systems.

Differentiation may be gained after customers get over the barrier of technology apprehension. Naturally, the level of apprehension varies for each individual.

Existence of a Competitive Advantage

Bank D believes a competitive advantage has been achieved as a result of its information systems use. The advantage is primarily derived from the (1) time savings to the

bank and (2) ability for customers to improve their operations by using the loan analysis system. Other areas exhibited in the value chain would also probably contribute to the advantage. Gaining the advantage is possible because Bank D perceives itself as being a technological leader in its community.

Sustainability

Sustainability of the advantage may be beginning to erode as competitors are increasing their use of information systems. In order to sustain their current technological advantage, a vice-president states that a continued commitment to the use and development of information systems would be required.

Role of Technology

Clearly, technology plays an important role in the bank's competitive strategy, although this may not necessarily be intentional at the local level. Many of the bank's systems have come as a result of corporate requirements in order to improve operations. Although the employees are technologically proficient, they are admittedly not experts.

Despite some strategic use by competitors in the local area, Bank D perceives itself as being the technological leader. The bank does, however, believe use by competitors is increasing.

Customer acceptance of technology varies. Getting over the apprehension barrier is important for the bank to optimize customer use of the systems. Age appears to be a key predictor of technology resistance.

Analysis Summary of Bank D's Use of Information Systems

Use of information systems has helped Bank D gain a competitive advantage in its market. Being the technology leader in the community has made this advantage possible. Bank D appears to have profited by being part of a holding company that helps direct the

development of information systems. The primary barriers for the bank's IT performance seems to be the reluctance by customers and the limited internal technology proficiency.

Case Study of Bank E

Bank E resides in a surprising technology position, despite its tremendous resources. This position may be very revealing regarding for the future competition for agricultural banks due to the incoming regional institutions. A traditional banking perspective is provided by the institution.

Overview of Bank

Representing the large agricultural banking segment, Bank E has approximately $120 million in assets and is a holding company affiliate. Although the institution is an independent location it has ties to its $23 billion multi-regional parent organization. Perhaps due to the bank's size and parent company, it views its competitors as not only the numerous local institutions, but also as large financial service providers such as Merrill Lynch, Farm Credit Association, GMAC, etc. Serving a large-medium sized community, the bank has a strong agricultural focus.

Just as in all banks, customer service is viewed as a necessity. With Bank E it is viewed as the primary goal. The president sees his key responsibility as providing quality customer service -- the customer being a depositor, creditor, or stockholder. From this, he states that profitability will follow.

Strategic Use of Information Systems

Bank E possesses four basic strategic applications of information systems: (1) a PC network, (2) credit bureau check capability, (3) a loan analysis system, and (4) an asset-liability management system. Although not unique, they support the bank's competitive strategies of cost savings and customer service.

Nearly every employee is linked to the network. In providing access to a wealth of information, employees are better able to serve all of a customer's needs quickly and effectively. This saves both the customer and employee time, thus increasing the number of customers served. The network also improves and simplifies intrabank communication.

The direct link to the central credit bureau helps the bank make quicker and better decisions. The bank may not only be able to capture more business due to decision speed, but also increase customer satisfaction.

Similar to other institutions' loan analysis systems, Bank E's improves the quality of its loan and decreases risk. The customer may benefit from the ability to identify weak spots or trends in his operation.

The asset-liability management system increases Bank E's ability to project and control its liquidity and interest margin. Thus, this should translate to increased service to the stockholder through greater profitability.

Although not a current strategic application by Bank E, imaging technology is being experimented with by its parent company. Imaging technology is used to keep a digital record of an object and would be used to replace the current check processing system. Instead of sending the customers their canceled checks, a reduced image would be sent. Using this system would theoretically cut handling and transportation costs significantly, primarily in demand deposit area, a significant cost for the bank. The outcome of the experiment will decide the fate of the use by Bank E.

Impact of Information Systems on the Value Chain

Figure 5.5 represents the value chain for Bank E and the activities that have been impacted. Consistent with the bank's philosophy, service includes a significant number of activities. Due to the loan analysis system, customer business consulting is possible, thus providing a valuable link to the customer's value chain. Expedient loan acceptance by using

credit bureau information helps activities in both the bank's and customers' value chains. Finally, contact time with the customer is enriched as a result of the information available on the network.

Improving the customers' perceptions of the bank's knowledge, and increasing the quality of service have been important changes in the marketing area. Central information files may help the bank target customers and cross-sell services to new or potential customers. The bank believes it has more information on its customers than most banks but cannot always extract it as effectively as desired, due to the inflexibility of its system. Sales may also be improved by use of the bank's network. For example, when a representative is selling services to a customer, the network provides reminders of benefits from specific products. This may help the employee sell with all benefits and reinforce those points with the customer.

In the operations area, loan analysis and management is improved due to the use of the computerized system. This also reduces loan risk and write-offs due better analysis capabilities. Information systems allow the bank to effectively manage a wide variety of products and services. For human resources support, the parent corporation also occasionally uses teleconferencing for training employees in selected regional locations. This technique may cut training costs and standardize the process among the separate banks. Finally, use of information systems has altered the job structure of employees. Through increased access to tools and customer information, bank representatives have become more flexible in their ability to help the customer.

Use of IS for Cost Advantage or Differentiation

Use of information systems for cost advantage is the primary objective for Bank E. Results have partly come in the form of fewer personnel needs. In addition, employees can serve more customers by using the network, thus translating to more efficient use of the

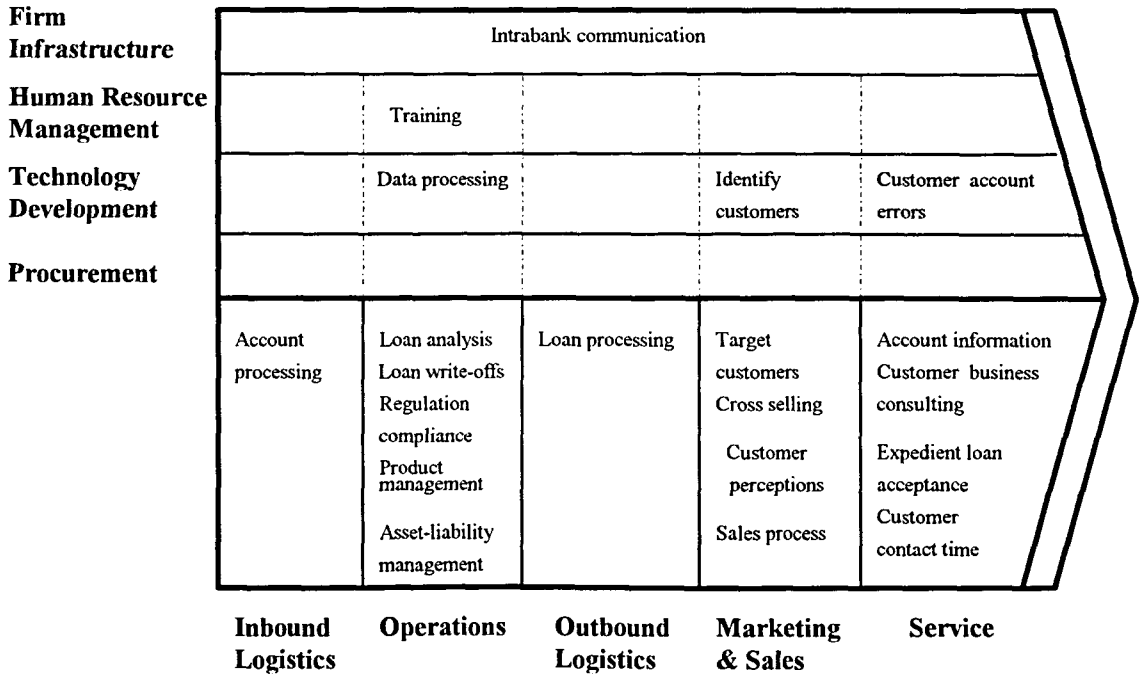

Figure 5.3: Impact of Information Technology on Bank D

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985).

bank's resources. The continued drive for cost advantages is exhibited by the experimentation with imaging technology.

Differentiation is not viewed as possible by Bank E due to the similarity of products in its market and the ease of imitation. The necessary constant innovation is not a strategy for the institution. A vice president for the bank states that, "People are the bank's differentiating factor."

Existence of a Competitive Advantage

Bank E does not believe its information systems provide it with a competitive advantage. Lack of an advantage is credited to the similarity of systems amongst the bank's competitors. Neither does the bank believe it is possible to gain an advantage due to the ease of technology acquisition and imitation.

Not possessing or utilizing information systems would probably put the bank at a competitive disadvantage, states a vice president.

Role of Technology

Although Bank E uses technology extensively (especially in its operations) IT is not directly focused on by management. Information systems are developed on a continuing basis to support the bank's strategy of cost savings and customer service. "Having enough technology to get the bank where they are going" is the objective. The holding company for Bank E plays a major role in systems development. Despite benefits, central development has limited the flexibility of applications.

Several of Bank E's competitors use technology, but do not have any differentiating systems. The president sees smaller community banks as considering bonding together in order to afford technology in order to compete with their larger rivals.

Perceptions of the bank's customers appear to be mixed. The bank feels that customer use and perception of information technology depends on the education of the customer --

i.e., education on its use. Exposing the customer to IT and explaining it at the time of first use is a tactic used by the bank.

Analysis Summary of Bank E's Use of Information Systems

For Bank E, information systems are a "tool to work toward a solution," they are not the solution. Instead, people are the key resource and method of competition for the bank, with applications of information systems helping them do their job more effectively and efficiently. Management of the Bank E appears to direct this view.

Cross-Sectional View of Banks

In contrast to the case format presentation, a cross-sectional view of the banks compares and contrasts specific areas of interest in the banks (see Tables 5.1-5.5). The tables include data from all five institutions and are designed according to the research questions. Table 5.1 gives an overview of the banks, including the size, structure, community served, and other descriptive information. The institutions are ordered first by structure (independent or holding company affiliate) and then by size. The strategic IS and the key uses of those systems are listed in Table 5.2. In Table 5.3 the existence of a competitive advantage and the reason for the advantage or lack of it are identified. If the advantage exists, the method of sustainability is also presented. Finally, the table reveals whether the IS are used for cost advantage or differentiation along with the corresponding targeted areas. Examining the role of technology within the bank, with the bank's competitors, and with the bank's customers is done in Table 5.4. Lastly, Table 5.5 lists the IS strengths and barriers for each institution. The tables are analyzed in the research questions.

Information Technology Positions of Banks

Based on the data gathered and value judgements of the researcher, the banks may be placed in the information technology matrices discussed in Chapter 3. The matrices should

Table 5.1: Bank Overview

Bank	*Structure*	*Asset Base ($)*	*Community served*	*Competitive Description*	*Other*
A	Independent; Single location	25 million	Small, rural; Lower middle class	Sales oriented; Goal of "helping human beings"	Targeting mid-sized, mid-level profitable producers; Looking for growth
B	Independent; Multiple locations including another community	125 million	Medium-sized, rural	Aggressive lender; Customer focused	Highly profitable; Goal to be a leader in technology use and development
C	Holding company affiliate, Independent sight; Over a dozen other locations statewide	55 million (Bank C) 1.3 billion (parent)	Small-medium, rural; Technologically progressive	Striving to be a premier financial services provider; Customer focused; Sales oriented	Aggressive agriculture department; Targeting large producers
D	Holding company affiliate, Independent sight; Over twenty other locations statewide	85 million (Bank D) 2 billion (parent)	Medium-sized, rural	Customer-focused	Targeting larger, more sophisticated producers;
E	Holding company affiliate, Independent sight; Multi-regional parent	120 million (Bank D) 23 billion (parent)	Medium-large, rural	Customer service; Cost focus	People are key resource; Competitors include national financial service providers

Table 5.2: Strategic Use of Information Systems by Banks

Bank	*Strategic IS*	*Key strategic uses*
A	1) Loan analysis and management system 2) Interest margin and asset management system	1) make consistent, quality decisions, benchmarks customer's operations for improvement 2) control net interest margin, manage assets for efficient use, project strategic path
B	1) Data processing service 2) PC network 3) Loan analysis and management system 4) Bank simulation model 5) CIF marketing system	1) cut processing costs for bank by one-half due to economies of scale 2) improve intrabank communication 3) reduce risk and losses on loans, price loans, help customer improve operation 4) strategic planning 5) gain business by rewarding customer loyalty, target new customers
C	1) PC network 2) Loan analysis and management system 3) Farm management control system 4) Marketing customer information files (MCIF) 5) Asset-liability management system	1) reduce employee overhead, provide employees needed tools 2) reduces risk and losses on loans, improves quality of time spent with customers 3) provides customers with wealth of information, increases number of farms bank can manage 4) cross-sell services, target customers 5) helps project asset-liability gap; allows efficient use of assets, develops scenarios
D	1) PC network 2) Loan analysis and management system 3) Credit bureau access 4) Asset-liability management system	1) reduce employee overhead, provide officers with information on customers 2) reduces loan risk, benchmarks customer's operations for improvement 3) allows quicker, better decisions 4) helps project asset-liability gap, allows efficient use of assets
E	1) PC network 2) Credit bureau access 3) Loan analysis and management system 4) Asset-liability management system	1) improves customer service, increases amount of customers served, improves intrabank communication 2) allows quicker, better decisions 3) reduces risk, helps customer improve operations 4) helps project asset-liability gap, allows efficient use of assets

Table 5.3: Existence of Perceived Competitive Advantage and Related Factors for Banks

Bank	*Existence of competitive advantage*	*Reason for advantage or lack of*	*Sustainability method*	*Differentiation or cost advantage provided by IS*
A	Yes	1) Reduced risk 2) Ability to grow 3) Greater profitability	Keeping up with changes in technology; Ability questionable	Cost advantage; 1) Decreased risk 2) Manage more loans with fewer people 3) Manage net interest margin
B	Yes	1) Marketing ability 2) Simulation and planning ability 3) Reduced processing costs	1) Resources - capital and human 2) Innovation 3) Use of a trademarked, restricted product	Cost advantage and differentiation; 1) Customer service 2) Added-value to services 3) Reduced personnel costs 4) Reduced processing costs
C	No	1) Cost 2) Development 3) Perception regarding IS	N/A	Cost advantage and differentiation; 1) Manage more loans with fewer people 2) Added-value services
D	Yes	1) Time savings 2) Helping customers improve operations	Commitment by management to continued development and innovation	Cost advantage and differentiation; 1) Reduced personnel costs 2) Added-value services
E	No	1) Ease in imitation of products or services	N/A	Cost advantage; 1) Reduced personnel costs 2) Ability to serve more customers

Table 5.4: Role of Technology for Bank, Customers and Competitors

Bank	*Within bank*	*Competitors*	*Customers*
A[a]	1) Recent move to strategic uses 2) Strong support from management	Perceived lack of strategic use by competitors	Minor role with customers - "Customers not impressed with technology, only the delivery of services they need."
B[a]	1) Management highly committed to use of information systems 2) Bank has consistently been on leading edge of technology	Strategic use of information technology is limited -- local marketplace is just beginning while larger arena is advanced	1) Customer is targeted beneficiary of IS 2) Bank attempting to educate customers on use of IT
C	1) Support by management and holding company 2) Seen as a key to the future, despite lack of competitive advanatage	One other bank in community seen as strategic user of IS	Customer attitude is mixed, depending on experience with IT
D[a]	1) Systems a result of corporate development	Currently limited, but increasing, use by competitors	1) Customer attitude mixed 2) Age is a predictor of acceptance
E	1) IS important to reach ultimate goal 2) Management does not believe in ability to gain competitive advantage 3) Systems derived from corporate development	Competitors have similiar systems	1) Customer attitude mixed 2) Systems education is key to adoption by customers

[a]Bank perceiving a competitive advantage from its information systems.

Table 5.5: Comparative Strengths and Barriers for Strategic Use of IS

Bank	*IS strengths*	*IS barriers*
A	1) Management support and vision 2) Lack of use by immediate competitors	1) Resources (capital) 2) Difficulty in obtaining information regarding strategic products 3) Customer education and acceptance
B	1) Resources (capital and human) 2) Management support and vision 3) Experience in development	1) Training of employees 2) Customer education and acceptance
C	1) Resources (human) 2) Part of large organization 3) Management support	1) Customer education and acceptance 2) Developing strategic perspective
D	1) Part of large organization developing systems 2) Lack of use by immediate competitors	1) Customer education and acceptance 2) Technology knowledge by bank
E	1) Resources (capital) 2) Part of large organization developing systems	1) Customer education and acceptance 2) Widespread use by competitors 3) Management view of limited competitive value of SIS 4) Lack of flexibility from centrally developed systems

highlight the differences in use by the institutions as well as provide an overall view of strategic positions.

IT Impact

Figure 5.6 displays the impact of information technology on the five institutions. The majority of banks are clustered in the quadrant with a high impact on operations and cost savings and a low impact on marketing. Only Bank B is placed in the quadrant with a high impact in both areas. This is position is probably due to a conscious effort to focus information systems development on benefiting the customer. Bank C may be the first to move to a high marketing impact as it is just implementing its MCIF. Due to the lack of IT use by competitors, Bank D has experienced some differentiation. Moving to a new quadrant will primarily depend on the development of new systems. Overall, each bank is expected to move toward the right as they have expressed a desire to increase the marketing capabilities of their systems. Bank E may move upward if imaging technology is successful and implemented.

IT Environment

Figure 5.7 represents the IT environment that the five banks reside in. All five banks are located in the strategic quadrant because information technology supports their competitive strategy. In addition, all the banks have recently implemented or are looking to implement new strategic systems. Once again, Bank B has the furthest northeast position, primarily due to their past and future desire to be a leader in technology development. Residing in the furthest southwest position is Bank E. It has chosen to focus its efforts in human resources instead of technology use, although imaging may be an important development. Bank C has experienced limited impact from its current systems, while its recently implemented ones hold significant potential. The other banks hold varying positions between Banks B and E, depending on their focus, and the significance of their development.

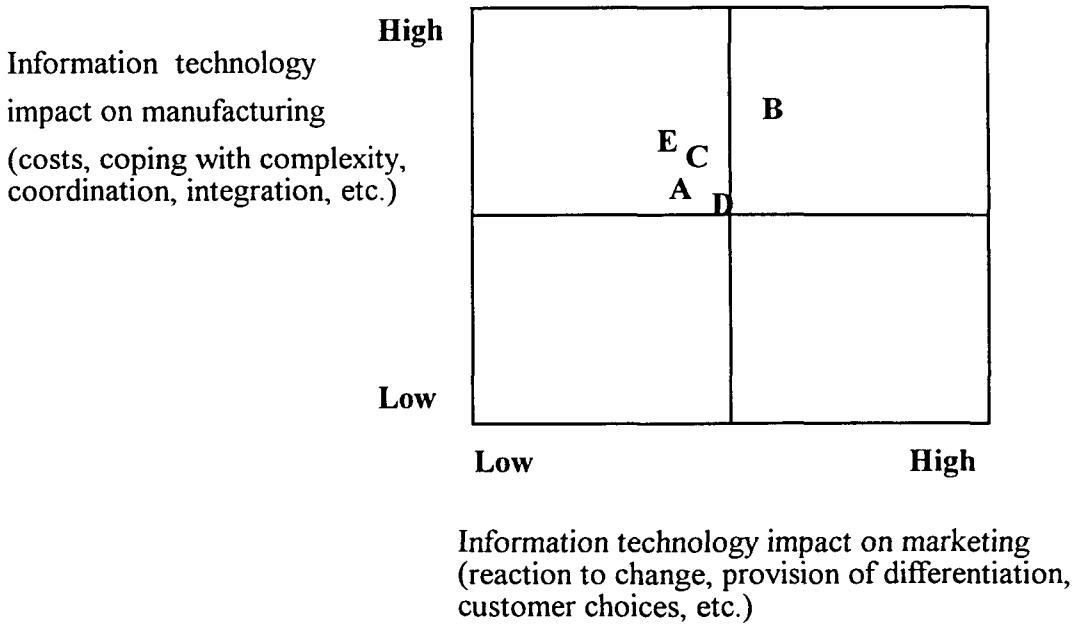

Figure 5.6: IT Impact: Position of Banks

Source: Adapted from James Cash Jr., F. Warren McFarlan, James McKenney, and Lynda Applegate, Corporate Information Systems Management: Text and Cases, 3rd ed., (Boston: Irwin, 1992).

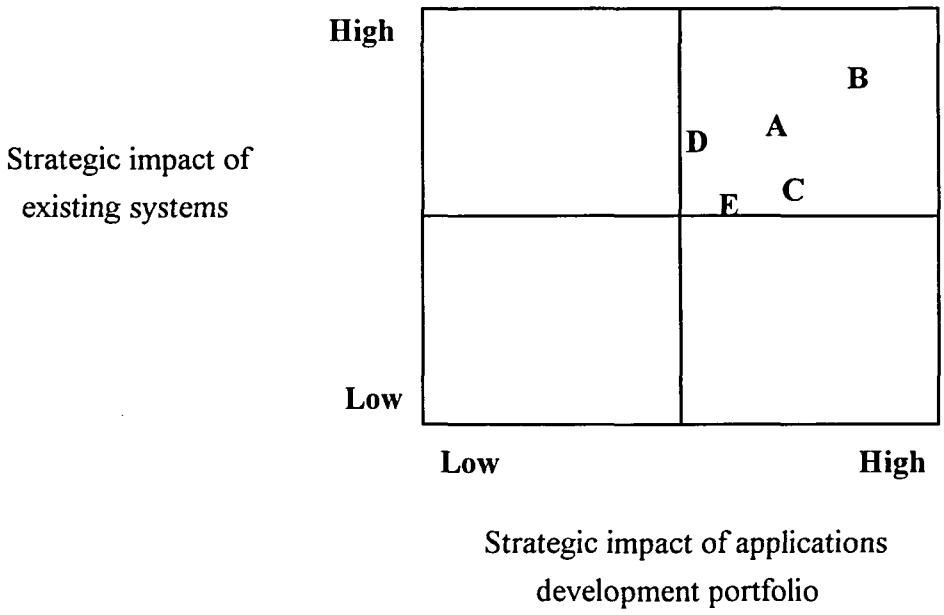

Figure 5.7: IT Environment: Strategic Relevance and Impact on Banks

Source: Adapted from James Cash Jr., F. Warren McFarlan, James McKenney, and Lynda Applegate, Corporate Information Systems Management: Text and Cases, 3rd ed., (Boston: Irwin, 1992).

Summary of Data

The data is from five agricultural banks of different sizes and structures that use information systems strategically. Initially, it is presented in a case study format to allow the reader to get a continuante feel for the overall strategy and operations of the bank as well as clearly view the linkages between each area. Next, five table give a cross-sectional view of the similarities and differences between the banks in specific areas. The tables will be discussed in the research questions. Finally completing the presentation of data are matrices that compare the IT impact and environment of the five banks.

Three banks (A, B, and D) have developed a perceived competitive advantage by using information systems. Due to the early stages of systems development and some resistance by customers, Bank C has not developed an advantage. The inability to gain an advantage by Bank E is credited to the widespread use of IS among competitors. All five banks possess relatively similar strategic systems ranging from two to five in number. Using IS for cost advantages is done by each institution, while the mid-sized banks also look to differentiate themselves through value-added services. By examining the IT matrices, Bank B's systems appear to be the most developed. Most of the banks' systems appear to focus primarily on operations, while Bank B has a more balanced portfolio. The three banks with an advantage believe their major source of sustainability lies in keeping technologically ahead of their competitors. Reluctant customer adoption appears to be a common barrier for the institutions while limited strategic use by local competitors is a leveraged edge. Although all five banks do not perceive a competitive advantage from IS, all agree that their institution would be at a competitive disadvantage if IS were not employed.

Examination of the Research Questions

Based on the data collected from the five banks, the research questions can be examined from the case studies, tables, and matrices. Tables 5.1-5.5 are specifically analyzed in this section.

1. *What strategic uses of IS are found in agricultural banks that may help develop competitive advantage?* Several systems seem to be common throughout each bank (See Table 5.2). Some type of loan analysis and management system has strategic uses for each bank as they attempt to manage their risk and help their customers improve their operations. To help improve profitability and planning, each bank utilizes some form of asset-liability management system. All but Bank A have implemented PC networks (perhaps due to their size). Credit bureau access was mentioned by two banks as having strategic value, although others may have such systems. Finally, using a marketing system (CIF) to target customers is done by two banks. Banks D and E had CIF files but they were not deemed as being flexible enough to be of significant value. The only unique strategic systems were the data processing service and the farm management system. Both may be a niche system for specific markets. Although for the most part there was significant similarity in the strategic systems, all were somewhat different and some were more effective than others. The more effective systems seem to be more customized to the particular bank's needs. The strategic uses are generally the same, with different systems having unique purposes or features to address specific problems. For example, Bank C's network specifically is intended to reduce employee overhead costs by providing employees with the tools necessary for their jobs.
2. *What activities are effected in the value chain of agricultural banks that may be useful in developing competitive advantages?* Figure 5.8 exhibits all the activities identified being impacted by the agricultural banks use of information systems. Operations appear to be

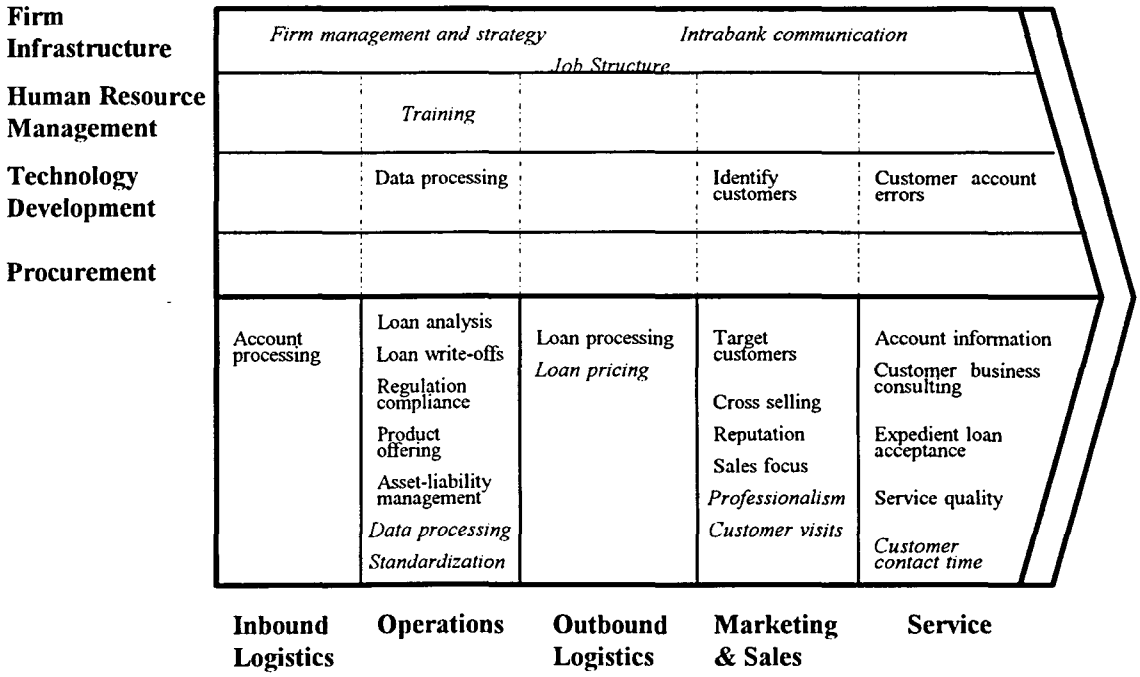

Figure 5.8: Impact of Information Technology on All Banks

Source: Adapted from Michael Porter, Competitive Advantage, (New York: The Free Press, 1985).

the area most affected by use of IS with eight different activities having been identified in the area. This is consistent with the general focus on cost advantage. Marketing & sales is also heavily impacted by the use of IS with seven activities. The shifting emphasis of banks to sales activities may partially explain this phenomenon as well as predict increasing use in the future. Six activities are affected in the service area thus having a significant impact on customer relationships. Since outbound and inbound logistics play a unique role in banks as compared with other industries, these two areas are not heavily influenced. Probably the most uniquely impacted area in the banks is firm infrastructure with three total activities and only one generally affected within a single bank. This spread may be due to the wide variance in views on the value of IS.

Although a number of activities are targeted to the customer's value chain with linkages from the service activities, the majority of activities have an internal impact for banks. This lack of an external focus may: (1) be a reaction to the bank's perception of IT view by customers and/or (2) have an impact on the view of IT by customers. Due to the negative or apathetic attitudes of some customers regarding IT, banks may tend not to focus on customer linkages or advantages. Either opposed or complimentary to this proposition, the customer's apathetic feelings toward IT may be nurtured by banks because they (the customer) do not gain many benefits or are not aware of those benefits.

Due to the similarity of systems, many of the activities are common among several banks. Especially prevalent are asset-liability management and activities associated with the loan analysis system (loan analysis, loan write-offs, and customer business consulting). Regulation compliance is impacted as banks face rising costs in this area. IS have generally been credited with decreasing customer account errors although technology is sometimes viewed skeptically by customers.

There are also a variety of unique applications by the banks studied. These activities are displayed in italics in Figure 5.8. Many of the peculiar activities are useful or available to only a certain type of bank. For example, data processing is extremely valuable for Bank B, but would not be feasible for a small bank. Standardization and training via teleconferencing would probably only be useful for large, "brand name" banks. Other activities may be valuable to other institutions such as pricing loans, allowing time to visit customers, and improving customer contact time.

The wide array of impacted activities (28 unique activities) suggests that IS can significantly impact the value chains of agricultural banks and their customers.

3. *Is cost leadership or differentiation derived from using information systems in agricultural banks?* All the banks used IS for cost advantage, primarily to decrease personnel costs and manage more loans with fewer employees (see Table 5.3). The three middle-sized banks also attempted to differentiate themselves by providing value-added services. This would seem to be consistent with a previously stated hypothesis that the smallest and largest banks may compete through cost leadership, while the middle-sized banks must look to differentiate themselves due to an inability to compete effectively in the niche of the small bank or with the size of a large bank. Since most of the studied banks view the two uses as being equally proportioned, the finding does not appear to be consistent with Porter's statement that firms must not mix the two strategies (whether cost advantage and differentiation have been employed to the detriment of each other is unclear). The significant use of cost advantage with differentiation appears to result from customers requiring competitive interest rates. Due to the gains already made in seeking cost advantage, it would seem possible that the marginal returns would begin to decrease and thus shift the focus slightly toward differentiation.

4. *If agricultural banks can develop competitive advantage from IS is it sustainable?* Sustaining competitive advantage seems to be a difficulty for the three banks in the study that qualify for this question. The ability to imitate a bank's IS appears to be the reason for the difficulty in sustainability (see Table 6.3). Constantly innovating or staying ahead of the competition may be one of the few ways to sustain an advantage. In addition, a commitment by management and the resources (human and capital) to implement systems are necessary. A unique method of sustainability is exhibited by Bank B with their purchase of a trademarked, restricted product. This method may become increasingly popular in the future for select systems.
5. *How does the role of technology (1) within the bank, (2) with a bank's competitors, and (3) with a bank's customers, impact the ability to develop competitive advantage through IS?* Within the banks, management support appears to play a necessary role in the successful use of information systems. The bank with one of the weakest commitments by management (Bank E) had the least successful system, while the bank with the strongest commitment (Bank B) had the most successful system (although this is not the only factor involved for either institution). Training employees in the use of the IS possessed appears to be one difficulty encountered. Training will certainly be hard since technology changes rapidly and firms must constantly be improving their systems to keep current. To maximize the current systems and gain an advantage, training would seem necessary.

   Strategic use by competitors appears to play a role in the ability to develop a competitive advantage for agricultural banks. The larger institutions (with the exception of Bank D) have competitors using a significant amount of information technology. In the case of Bank E, use by competitors has progressed to such a level that it is a significant barrier to obtaining a competitive advantage. Bank A appears to be in a competitive arena that is relatively untouched by the strategic use of IS. This presents a unique opportunity

for them in gaining benefits. All the banks perceived their competitors as increasing their strategic use of information systems.

With customers, perception of IT is a major problem for agricultural banks. This may partially be due to rural communities limited exposure of IT. Some customers appear to readily adopt IT while others are hesitant. Being ignorant of the potential benefits of IT seems to be one barrier that banks have met regarding customers. For example, a representative of Bank C stated that many of their customers have not realized the efficiency increases and cost decreases that have been as a result of using IT. This, of course, translates to lower cost for the consumer. Several banks are trying to improve the adoption rate by educating customers on the use of their systems to make them more comfortable with IT.

6. *How is competitive advantage through IS developed or what prevents it from being developed by agricultural banks?* No universal commonality can be firmly established for either establishing or not establishing competitive advantage. There do, however, appear to be two factors that have a notable impact on the ability to establish or not establish an advantage: (1) the support and vision of management, and/or (2) the strategic use of IS by competitors (see Table 6.5). Support may be suppositioned from the existing perception and attitude toward technology as possessed and presented by management. Vision is complementary to support and may be seen as the past and present views of management in utilizing technology. Based on the interviews and data collected, the researcher made judgments on the level of these two areas.

Beginning with the banks noting an advantage, Bank A has support by management with an ongoing vision and no known competitors that use IS strategically. Bank B has superior vision and support from management that have helped it overcome some strategic use of IS by rivals. In contrast, Bank D has no significant, known competitors using IT

while its vision is somewhat limited. Moving to Bank E who does not perceive an advantage, it has limited management support with a number of rivals using IS strategically. Finally, Bank C has management support, but has not previously held a strategic vision of IS. Other barriers include employee training and knowledge, lack of flexibility of the systems, and available resources.

All banks felt that they would have a difficult time competing in the future without using IS effectively. This belief is supported by a continued development of their IS.

7. *Does the size or structure of an agricultural bank effect the development of competitive advantage through IS?* The size and structure of the banks seem to play a role in the development of IS. Among independent banks, increased size provides necessary capital to develop systems. Clearly, comparing Bank A and Bank B, the former does simply not have the available capital or personnel to match its bigger counterpart. This statement does not appear to apply to agricultural banks associated with a larger holding company (although differences may or may not be found among larger banks than those included in this study). Although Bank E has approximately twice the available capital that Bank C does, Bank C may actually be more advanced than E. Neither is there a significant difference between D and E.

The structure of a bank may also have an impact on the development of systems. Two comparisons may be made between: (1) independent banks and holding company affiliates and (2) holding company affiliates banks, depending on the strength of the tie with the central firm. Examining the first comparison, holding company affiliates have greater resources to draw from -- greater overall capital available, information exchange regarding systems between members, and the potential for a specialized IS development department or associated personnel. Independent banks may have to use non-IS experts to develop systems and must learn from their own mistakes. When comparing available resources

among the banks in this study, the independent banks were probably more innovative and successful with their IS. Bank B's systems appear superior to any of the others included in this study. Even though Bank A's systems portfolio is small, the collection is relatively good when all available resources are taken into account and compared with the other institutions. The reason for this apparent difference is unclear.

Between holding company affiliates, differences may also exist due to the role that the central firm plays in the systems development. For example, Bank C has a highly decentralized development system while Bank E has a more centralized approach. Bank E states that its systems lack some desired flexibility due to the centralized development. Apparently contrasting this, Bank C systems are becoming more decentralized and are relatively flexible. Thus from Bank E's experience, being part of a large holding company that develops systems through a central location can have some drawbacks. These contrasting styles may be related to the difference in systems innovation discussed in the previous paragraph.

Summary of Answers to Research Questions

The data gathered in the study was used to answer the research questions. The strategic systems used were relatively similar, with some form of loan analysis and management system and asset-liability management system being used by every institution. This caused many activities to be similar. Altogether twenty-eight unique activities were identified as being affected in the value chain of the agricultural banks. Internal activities were the primary focus of the systems with the areas of operations (8 activities), marketing (7 activities), and service (6 activities) all being heavily impacted. All banks used IS for cost advantages, while the mid-sized institutions also attempted to differentiate themselves with value-added services. Sustaining an advantage appears to be difficult, with innovation being the key method. Although no universal commonality could be firmly established, support and

vision of management, and the use of SIS by competitors seem to play an important role in the ability to develop a competitive advantage. Customer resistance to IT appears to be a major barrier for agricultural banks in the effective use of their systems. Lastly, there are apparent differences in IS development between independent banks and banks associated with a large holding company, with each approach having strengths and weaknesses.

CHAPTER 6

CONCLUSIONS AND SUMMARY

The study has achieved its purposes of (1) examining the use of information systems by agricultural banks for gaining competitive advantage, (2) providing knowledge on how information systems may be developed and used effectively by agricultural banks to gain competitive advantage, and (3) examining barriers for agricultural banks in establishing sustainable competitive advantage. This chapter provides conclusions from the study, details limitations, proposes a preliminary causal model, and offers suggestions for further research.

Conclusions

Based on the research finding from Chapter 5, several conclusions may be drawn. These conclusions have significance for practitioners, the field of agribusiness, and researchers.

Significance for Practitioners

The study holds a number of significant implications for practitioners. Beginning with the purpose of the study, it appears some agricultural banks have been able to gain a competitive advantage by using information systems. At the minimum, this addresses critics that dispute the value of information systems in agricultural banking. From this study, other bankers may see potential in their market for applications, or at least realize the potential impact of rivals using SIS. Whether or not an agricultural bank attempts to gain a competitive advantage by using information systems, IT will apparently play an important role in the future of the segment. Based on the opinions of the banks in this study, an institution not using IT will probably be at a competitive disadvantage.

The similarity of the strategic uses of the systems was extremely interesting. This has some interesting implications for all banks. The banks not using such systems strategically

may be able to gain a competitive advantage if their rivals do not possess such systems. Contrastingly, when all banks possess similar systems (as shown by Bank E), gaining competitive advantage is difficult. Thus, maintaining a current advantage through IS will require: (1) developing new applications, (2) improving the technology of their existing system, or (3) finding a non-technology method of sustainability that is tied to the system. All three would appear to be viable choices. Related to this area is an apparent move toward use of marketing systems. This trend would seem to continue as agricultural banks are becoming increasingly aggressive due to pressures from their external environment.

Banks looking to gain or maintain a competitive advantage through IS apparently require strong management support and vision. In order to complement management's role, training of employees in the effective use of systems seems to be required for operational support. These concepts would support current beliefs in the IS field.

A barrier for gaining a competitive advantage appears to be acceptance of IT by customers. Based on the studied banks' perceptions of customer attitudes toward IT, this is consistent problem. Although the systems focusing strictly on internal benefits are not affected, those that seek to establish linkages to the customers' value chains may be negatively impacted. Apparently, the negative or apathetic attitude stems partly from lack of information and education on technology as well as limited exposure to it (customer age may be correlated to both). Banks seeking to establish linkages to customers' value chains on a wide-spread basis must deal with these problems if their systems are to be optimized. Proactively addressing these three issues and presenting a positive view of a bank's IT may also help establish a commitment by customers to that particular bank's systems and therefore present a method of sustainability.

Practitioners from all banks may be interested in the potential differences concerning different sizes and structures of banks. Independent banks seem to have a strength in the

flexibility of their systems, while banks associated with a large holding company may benefit from their large resource base. This information may allow these two sectors to exploit their advantages or surmount their weaknesses. For example, small non-competing banks may band together to increase their resource base, while holding companies may partially decentralize their development.

Perhaps one of the greatest benefits of the study is a new perspective on the strategic use of information systems by agricultural banks. Prior to contact by the researcher, a majority of the banks had not viewed IS from the perspective presented by the study. Hopefully, a new perspective with greater awareness of the potential for SIS use will bring increased performance and help agricultural banks position themselves in their changing competitive environment. Exploring IS use in other industries or other segments of banking may be useful.

Significance for the Field of Agribusiness

For the field of agribusiness, the study reveals an area that will apparently play an increasing role in the agricultural banking industry. Where relatively little information has previously existed, the study has provided some basic knowledge on the use of information systems by agricultural banks. This may suggest changes in the strategic use of IS occurring in less conservative sectors of agribusiness.

Significance for Researchers

The study has significance to two primary areas of academic interest: (1) competitive advantage and (2) information systems. Examining issues in both fields shall hopefully present new knowledge as well as explore existing knowledge.

Regarding competitive advantage, agricultural banks do not seem to follow Porter's work very closely. Although the sample size was small, none of the banks specifically attempted to be a cost leader or provide differentiation. The mid-sized banks appeared mix

the cost advantage and differentiation strategies, although it is unclear whether one was done to the detriment of the other. The two banks that used cost advantage exclusively (A and E) did so because they perceived limited ability for differentiation. Despite mixing the strategies, Bank B and D were still able to gain a perceived competitive advantage. Thus, this would seem to support critics that have claimed Porter's work is too narrowly defined. A potential reason Porter is not followed closely by agricultural banks is a lack of knowledge regarding his work.

The field of information systems may also gain some benefits from this study, primarily in the areas of SIS, and IS use for competitive advantage. Based on the results of this study, information systems can be a tool for gaining competitive advantage. The research supports beliefs in the information systems field that management support and vision are needed for effective use of SIS. In addition, the study reveals that sustainability is difficult due to the ability of competitors to imitate. One of the new methods of sustainability revealed was the use of a trademarked and restricted product by Bank B.

Limitations

Several unexpected limitations were encountered while conducting the study. The primary one was the differing perspectives of bank management regarding the strategic uses of IS. Perspectives of what is or is not of strategic value appears somewhat relative to each institution. In addition, many of the interviewees had not overtly considered IS from the viewpoint presented by the researcher. The researcher attempted to help provide consistency by using the standardized questionnaire and a single definition of the strategic use of IS.

The other limitation is the difference in defining competitors. The banks tended to define their competitors at differing levels, whether they be local community banks or national financial service providers. The researcher chose to use the individual institution's definition

of competitors since each bank's strategies depend upon their unique views and perceived rivals.

A Preliminary Causal Model

Based on the exploratory work done in this study, a preliminary causal model may be proposed. In the relatively unstudied area of the strategic use of information systems by agricultural banks, the model is intended to help future researchers and practitioners focus their efforts.

Four forces apparently impact the ability of an agricultural bank to use IS to gain a competitive advantage (see Figure 6.1). Examining the internal environment, management vision and support is a primary force while employee training and knowledge is a secondary force. In the external environment, the strategic use of IS by competitors (primary) and customer adoption and education (secondary) are influencing factors. Each of these forces was identified by the five institutions used in this study. Primary forces apparently play a stronger role than secondary forces in the ability to gain a competitive advantage.

Although no evidence is available, the result of the impacting forces on the ability to gain a competitive advantage would seem to cause an equal and opposite reaction on the original influencing force. For example, use by competitors would probably increase as rivals attempt to combat the advantage or gain one of their own. Contrastingly, if a bank failed to gain an advantage, competitors would not invest in something that does not have a payback. In addition, a bank gaining an advantage would seemingly want to educate its customers to increase the advantage, while if being unable to gain an advantage, the bank would market its other attributes and downplay the role of IS. The internal circular forces would seem to be a result of reward or lack of one for a specific action. These propositions would obviously cause the arrows to be point both ways in Figure 6.1.

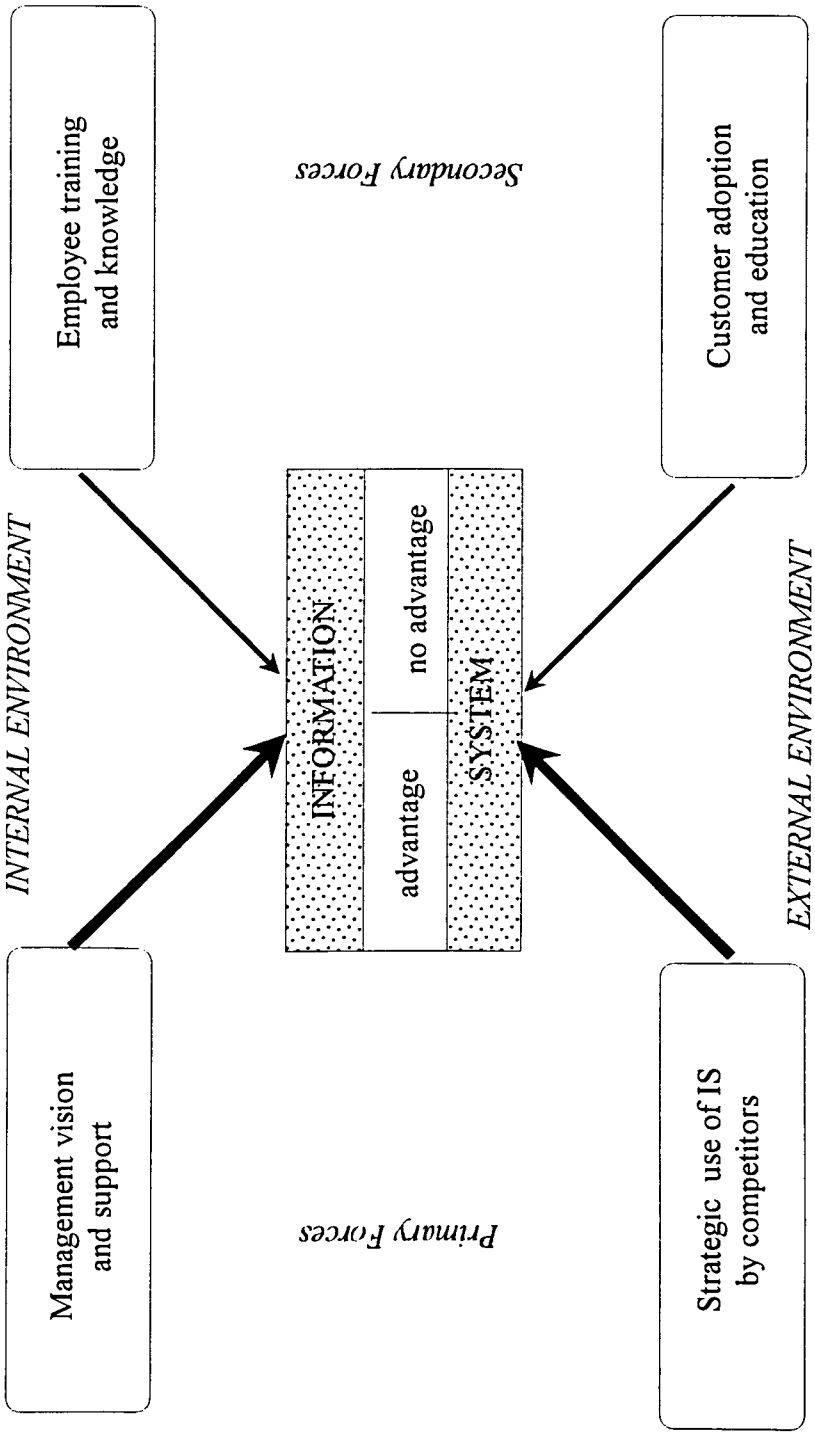

Figure 6.1: Preliminary Causal Model of Forces Impacting Agricultural Banks Use of Information Systems for Competitive Advantage

Clearly additional research is needed to test this preliminary model. Other factors may also impact the process.

Suggestions for Further Research

This study has provided some basic information regarding the use of information systems for competitive advantage by agricultural banks. Further research would be useful to empirically evaluate some of the concepts suggested in this study. The following are suggestions for additional research in the area:

- Examine the differences in strategy and performance between agricultural banks strategically using IS and those not strategically using IS.
- Determine the number of agricultural banks in the state actually perceiving a competitive advantage being gained by use of IS. What systems do they use strategically?
- What role does (1) support and vision of SIS by management and (2) SIS use by competitors play in all banks that have gained a competitive advantage?
- What are the major differences in use and development of SIS that exist between independent banks and banks associated with a large holding company?
- Examine the attitudes of customers regarding IT and barriers to customer adoption of IT of agricultural banks.
- Examine the potential for and methods of sustainability of competitive advantage gained by using IS.
- Explore the role of employee training and knowledge in the ability of agricultural banks to develop competitive advantage by IS.

Summary

This chapter concludes the study by offering conclusions drawn from the research. The study offers significance for (1) practitioners, (2) the field of agribusiness, and (3)

researchers. The ability of some agricultural banks to gain competitive advantage through IS reveals to practitioners that it may be valuable for them to develop such systems. Gaining insight on strategic uses of IS, barriers for IS success, and differences in IS between varying sizes and structures of agricultural banks may also be of use to practitioners. The field of agribusiness may be enriched by the study of a relatively untouched area so that IS may diffuse effectively through the field. Finally, the study may have significance for academics in the areas of competitive advantage and information systems. In support of critics that claim Porter's work is too narrowly defined, the study finds potential evidence that agricultural banks have successfully developed a competitive advantage without using a singular generic strategy. For information systems, the study reaffirms that sustainability of an advantage is extremely difficult with information systems.

Unexpected limitations of the study were discussed including (1) the differences in perspectives of agricultural banks concerning strategic use and (2) variations in defining competitors. Lastly, the researcher offered suggestions for further research that may help empirically support the findings of this study.

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APPENDIX A

THESIS QUESTIONNAIRE

Bank:

Date:

Persons interviewed:

Bank overview:

Community summary:

1. What information technology does your bank use strategically?

2. What operations does it affect within the bank? for the customer?

3. What led your institution to implement this system(s)?

4. Does this system provide you with an advantage over your competitors?
   Yes: How?
   No: Why not?

5. How long has the system provided you with an advantage? How long will it continue to sustain that advantage? (If applicable)

6. Is the advantage being eroded? (If applicable)
   Yes: What is the source of erosion?

7. Does it help your bank achieve goals or objectives? If so, which ones?

8. Is the system designed to increase the efficiency and cost savings for your institution?
   Yes: How?

9. Is the system designed to differentiate your products or services?
   Yes: How?

10. Is one objective primary? (cost advantage or differentiation)
    Yes: Which one?

11. Does it help you offer additional services or products?
    Yes: Which ones?

12. Does the system increase your market or customer base?
    Yes: How?

13. Does your bank use formal strategic planning?
    Yes: Does information technology have a role in that plan? If so, what role?
    No: Do you guide the use of technology through some method? If so, how?

14. What role does information technology play in your bank? (strategic, support, or other?)

15. Who is the targeted beneficiary of the system? (bank, customer, or other?)

16. What percent (estimate) of potential customer users use the system? (If applicable)

17. Do your competitors use information technology strategically?
    Yes: How many and how?
    No: Do you expect them to do so soon? How soon?

18. Other comments.