A Roles-Linkage Perspective of the Mortgage Marketplace: 
Strategic Integration of Electronic Coordination Systems and Business Network Redesign

by

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ABSTRACT

This research applies preliminary theories developed for the effects of electronic integration (EI) at the level of the business network to the mortgage marketplace. Electronic integration refers to strategic choices made by firms to exploit electronic data interchange (EDI) and inter-organizational systems (IOS) to transform internal business processes, the external business network and the firm’s business scope. The business network is defined as the structure of interdependent relationships between the activities of a given firm and those of other firms in its competitive environment that influence each others’ strategies.

Using a roles-linkage model, a model that provides a useful, conceptual schema with which to study electronic integration of network roles, I examine how electronic integration can shape organizational structures and strategies in the mortgage marketplace. The roles-linkage model provides a useful tool to examine the way firms create value in networks through information technology-based roles and firm-level strategies that link them.

The results of this exploratory research suggests that electronic integration is allowing mortgage marketplace participants to engage in new modes of competition through coordination and exploitation of complementary services across different product market segments. New modes of competition were identified by interviews with representatives from 13 companies and included: 1) expanding roles, 2) increasing use of alliances, 3) expanding the boundaries of the network and 4) positioning strategies that include elements of both cost and differentiation.

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1 INTRODUCTION

This research applies preliminary theories developed for the effects of electronic integration (EI) at the level of the business network to the mortgage marketplace to answer the following question: Does electronic integration allow mortgage market participants to engage in new modes of competition through coordination and exploitation of complementary services across different product market segments? If so, how does electronic integration alter the business scope of firms, business transactions between firms, business strategies of firms and the mortgage marketplace in general?

1.1. Electronic Integration

Technologies affect the structure of inter-firm electronic data interchange (EDI) and inter-organizational systems (IOS). These refer primarily to information technology (I/T) platforms enabling information exchange between firms and trading partners and to shared information systems applications providing greater systems functionality between firms (Cash and Konsynski 1985; Bakos 1991).

Electronic integration refers to strategic choices made by firms to exploit EDI and IOS platforms to transform business processes and relationships, the business network, or the firm's business scope (Kambil and Short 1993). The business network is defined as the structure of interdependent relationships among the activities of a given firm and those of other firms in its competitive environment which influence each others' strategies. In contrast to applying information technology to merely automate existing firm processes, electronic integration strategies impact beyond the firm's boundaries at the level of the business network. Analyzing the inter-firm relationships of participants in the mortgage marketplace will illuminate prospective electronic integration strategies that mortgage marketplace participants are using or plan to use.
The business environment of the 1990s is characterized by heightened competition, turbulence and transformation in firm and market relationships. Environments are changing rapidly due to innovations in products and services, market structures and technology, as well as shifting firm, industry, and national boundaries (Antonelli, 1988; Drucker 1988; Johnston and Lawrence 1988; Powell, 1990; Scott Morton 1991). Information technology (I/T) is seen as one force reshaping competition (McFarlan 1984; Porter and Millar 1985; Clemons and Row 1988; Venkatraman 1991).

Strategies for electronic integration (EI) can be used to redesign economic production and exchange relationships, as well as the firm's organization of work, and to reshape firm boundaries (Clemons and Weber 1990; Malone, Yates and Benjamin 1987; Piore and Sabel 1984; Venkatraman and Kambil 1991). These transformations are widely acknowledged to be leading to a new form of industrial organization variously called the "network organization," the "flexible corporation" or the "virtual firm" (Drucker 1988; Miles and Snow 1986; Powell 1990; Eccles and Crane, 1988; Rockart and Short 1991). Firms implementing these structures may also organize to work with a variety of external organizations through alliances, strategic partnerships and other modes of relational governance (Henderson 1990) to quickly bring products to market and to take advantage of changing markets by collectively leveraging each others' strengths (Johnston and Lawrence 1988; Ring and Van de Ven 1992; Bowman and Singh 1993).

For managers, turbulence and transformation in business environments gives rise to new strategic management challenges. As traditional buffers between the firm and its environment are reduced - for example time, inventory, people and geography - managers must carefully position the firm to undertake specific activities within an increasingly complex business network to ensure continued growth and success of the firm. They must also select and build suitable governance mechanisms both to coordinate and to integrate the activities of the firm with those of its customers, suppliers and other organizations in the environment. A central management challenge for the 1990s, therefore, can be seen as the effective design and management of inter-
dependence in business networks (McCann and Ferry 1979; Victor and Blackburn 1987; Rockart and Short 1989).

However, despite the increasing importance of the business network as a unit of strategic analysis, there are few conceptual frameworks or planning tools guiding analysis or defining planning agendas at this level. In addition, current theories, frameworks and tools are incomplete in helping decision makers manage the complexity of these emerging interdependent, networked environments (Kambil and Short 1993). Shifting the level of analysis from the firm-level to the business network level thus adds new complexity to research on the effects of electronic integration and to the development of strategic planning tools for use by managers. This complexity arises from the multitude of strategies, organizational capabilities, and other factors defining a typical network that contribute to turbulence and uncertainties in a given firm's environment.

1.2. Importance of Research

Technology in the mortgage marketplace is enabling the commoditization of products and services in the industry which may diminish profit margins on standardized products and services that already exist. This has industry participants querying the purchase or development of electronic systems that will allow them to remain competitive. In this competitive environment, industry participants need to remain competitive by either being a low cost producer, offering a unique mortgage product, maintaining a cost focus in a segment of the industry or differentiating themselves in a target segment of the mortgage marketplace.

EDI and IOS are examples of electronic systems that are furthering the standardization of transactions within the mortgage marketplace. This raises industry participants' concern over their ability to differentiate themselves to their client base. One aspect of this research seeks to demonstrate whether or not electronic integration will allow participants to differentiate themselves despite the commoditization of routine transactions.
Although it makes great sense from an efficiency standpoint, moving toward EDI does require specialized personnel to implement the standards correctly. Partnership is essential between sending and receiving institutions. Unfortunately, the great promise of EDI will not be realized until the mortgage marketplace reaches a critical mass whereby a significant proportion of the major players are willing to transmit electronically (Allen 1994). The purpose of EDI is to create industry standards that will be integrated and used by all industry participants. If participation is not widespread, then industry participants will continue to focus their attention on their own proprietary systems. This is why it is critical for the major industry participants to commit to participate.

1.3. Why is Electronic Data Interchange (EDI) Important in the Mortgage Marketplace?

Electronic Data Interchange (EDI) refers to the process by which one computer transmits data directly to another computer, which then uses the data in some productive way. EDI is supported by a series of standards that allows computer-to-computer exchange of business documents, such as loan applications, credit reports, appraisal reports, etc., between different firms.

Several years ago, the Mortgage Bankers Association of America (MBA) began to establish uniform EDI standards for the mortgage marketplace much like those used by manufacturers and retailers. The mortgage marketplace is a group of related, but separate industries. Beyond mortgage lenders, there is the credit industry, the appraisal industry, private mortgage insurers, hazard insurers, title insurers and flood insurers as well as other service related participants.

To achieve acceptance and speed the development of these new industry-wide standards, the MBA set up the Mortgage Data Standards Task Force (MDSTF) in 1988. The current EDI Work Groups evolved from that effort. The MDSTF then sought the support of the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 to approve and maintain these data standards. In response, the ASC X12 Finance Subcommittee
formed a Lending Task Group to develop and approve Mortgage & Real Estate Finance Transactions. At the same time, government offices such as the U.S. Department of Housing and Urban Development (HUD) began to convert selected business operations to ASC X12 formats to reduce the growing volumes of paper created in the exchange of business documents (and in response to the Federal Paperwork Reduction Act). The stage was set for the introduction of EDI as a powerful facilitator to shape organization business strategies around business processes, information technologies, and communication with trading partners. The recognition that common standards usage would allow linkage among trading partners in the mortgage marketplace was the critical element in MBA’s EDI strategy. See Appendix A for a complete description of the transaction sets.

1.4. Electronic Integration in the Mortgage Marketplace

The MBA recently conducted a survey and compiled an EDI Readiness Survey Report in July, 1995. The MBA asked five other national associations to participate in the study which resulted in a comprehensive industry-wide survey of the real estate finance industry. The overall response rate was eight percent. Figure 1 on page 15 is a summary of the results from the Real Estate Finance Industry EDI Readiness Survey Report conducted by the MBA in July 1995.

The most popular EDI transaction set is ordering and receiving credit reports. Other uses include ordering appraisals, inspections, flood certificates, mortgage insurance, hazard insurance and title reports. The benefit to the mortgage company is that when the credit report is received back by modem, their own software automatically updates the borrower file. This saves the loan processor from having to manually enter debts and liabilities to complete the 1003 loan application. Federal National Mortgage Association (FNMA) prefers the list of debts on the 1003 to be in the same order as the Residential Mortgage Credit Report (RMCR) and having the debts in the correct order and knowing they are accurate is a great relief to processors. Other companies are further integrating EDI into their systems and this allows
EDI Readiness Survey Summary

The results of the survey were generally consistent with the expectations of the designers; although few mortgage market participants are using EDI transactions sets today, usage should grow dramatically over the next three years. As anticipated, the most rapid growth in the origination area of the business is expected to be for credit reporting, loan applications, and appraisals, with over 50 percent projected usage within three years.

The results for servicing-related transaction sets indicate lower usage than anticipated, especially in the area of investor reporting (36 percent within three years) which is mandated for use by Fannie Mae and Freddie Mac servicers by September 1996.

Of the nine transaction sets currently under development, five have projected usage rates of over 50 percent in three years.

These results suggest that the real estate finance industry is beginning to understand and appreciate the value of non-proprietary data standards for electronic data interchange. However, it is also evident that a significant educational gap exists, especially among business decision-makers in smaller organizations. The overall eight percent response rate to the survey also suggests that many people who received the survey did not have a sufficient understanding of EDI concepts and benefits to respond. The low response rate is not interpreted as a lack of interest in EDI, but as an opportunity to promote greater understanding and knowledge.

Survey results indicate that the most effective way national associations and service providers can promote a better understanding of EDI is to sponsor conferences dedicated to this technology. Publications devoted to EDI are another means to communicate its benefits.

The majority of respondents to this survey are planning on implementing at least two transaction sets in the next twelve months.

Source: Mortgage Bankers Association of America, EDI Readiness Survey Report. 1995

mortgage companies to order reports for credit, title, appraisal, survey and home inspection simultaneously. Again, information flows to and from the loan processing software.
EDI networks currently facilitate loan processing starting with the initial application. Computer Power, Inc./ALLTEL, Contour Software, Inc., GHR Systems, Inc. and MortgageFlex-Systems are just a handful of software vendors that currently offer desktop Computerized Loan Origination systems (CLOs) that link the transactional process with EDI. The networks into which new loans will be submitted will be connected to hundreds of service providers. Mortgage companies can now begin transforming their software to send and accept electronic transmissions from external sources (Allen 1994). The mortgage broker will get to choose which vendors to work with or open the file to bids for everything from the appraisal to the final lender. In the mortgage brokerage industry, two leading companies, Chase Credit Research (and their affiliated organizations) and Financial Databank, Inc., have functioning EDI links to many of their clients (Cooley, 1993). These mortgage companies can order preliminary reports and full credit reports from their PC using standard modems. To prevent redundant data entry, these two credit reporting companies can pull borrower data from their clients' loan processing software.
2 THEORETICAL MODEL RESEARCH AND SELECTION

Because this paper considers the effects of electronic integration (EI) at the level of the business network, a critical review of prior research on I/T-enabled electronic integration was conducted to select and develop a model. The study of electronic integration (EI) at the level of the business network suggests that the roles linkage model provides a useful, conceptual schema with which to study electronic integration.

2.1. Electronic Integration and Business Networks: A Critical Review

Research on electronic integration at the business network level recognizes the pattern of interdependence among multiple economic actors and how roles in the network are altered through information technology-based strategies. Selecting this level of analysis seeks to bring the "environment back in to the analysis" (Marsden 1982) and to understand the broader impacts of EI strategies on market structures, competition and the actions of firms in relation to their environment. Dill (1958) defines the organization's task environment as those activities and institutions that have an immediate influence on a firm's operations. The task environment includes customers, suppliers, competitors, shareholders and government agencies. In addition, the wider contextual environment of social, political, technological and demographic factors influences the longer term activities of the firm. The nature of both task and contextual environments critically influences the selection of strategies undertaken by the firm (Miller and Friesen 1980; Porter 1980).

Given the emergence of networked organizations and markets with multiple coalitions deploying competing I/T-based strategies, the business network promises to be an attractive level of analysis (Kambil and Short 1993). However, to date there are few systematic studies at this level. Prior studies generally examine the impact of information technology on the
competitive dynamics of a firm or, in a few cases, a firm dyad (Venkatraman and Zaheer 1990; Nidumolu 1989). Analyses at this level consider I/T’s impact on the focal firm’s core business processes (e.g., order management; product development; distribution and logistics; sales and marketing) and on the pattern of business relationships between a given focal (producer) firm and customer. Generally, there has been minimal consideration for how an electronic integration strategy could alter the strategies of other firms in the environment or, more generally, the structure of the business network (Clemons 1992; Short and Venkatraman 1992). Most research focuses on the organizational and technical issues related to the implementation of an EDI or IOS-based strategy (Copeland and Mckenney 1988).

Adapting the work originated by Kambil and Short (1993), Table 1.2.1 provides a framework which classifies prior research by 1) the basic units of analysis adopted for investigating the I/T-based integration strategy, the focal firm, the dyad and business network; 2) the conceptual frameworks and research methods employed.

**TABLE 1.2.1 SELECTED RESEARCH ON ELECTRONIC INTEGRATION**

<table>
<thead>
<tr>
<th>Reference Frame Level of Analysis</th>
<th>Conceptual Frameworks</th>
<th>Case Research</th>
<th>Variance</th>
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<tr>
<td></td>
<td>McFarlane 1984</td>
<td>McFarlane 1986</td>
<td>Banker et al 1988</td>
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<tr>
<td></td>
<td>Benjamin et al 1984</td>
<td>Konsynski &amp; Vitale 1988</td>
<td></td>
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<tr>
<td><strong>Firm Dyad</strong></td>
<td>Porter &amp; Miller 1985</td>
<td>Clemons &amp; Row 1988</td>
<td></td>
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<tr>
<td></td>
<td>Malone et al 1986</td>
<td>Clemons &amp; Weber 1990</td>
<td></td>
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<tr>
<td></td>
<td>Barrett &amp; Konsynski 1982</td>
<td>Hart &amp; Estrin 1991</td>
<td></td>
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<tr>
<td></td>
<td>Cash &amp; Konsynski 1985</td>
<td>Short &amp; Venkatraman 1992</td>
<td></td>
</tr>
<tr>
<td><strong>Business Network</strong></td>
<td>Clemons &amp; Kimbrough 1988</td>
<td>Venkatraman &amp; Kambil 1991</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antonelli 1990</td>
<td>Antonelli 1988</td>
<td></td>
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<tr>
<td></td>
<td>Malone et al 1987</td>
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<tr>
<td><strong>Underlying Theoretical Perspectives</strong></td>
<td>IO Economics -- SCP Paradigm (Scherer 1980)</td>
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<td></td>
<td>Information Processing (Galbraith 1977)</td>
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<td></td>
<td>Coordination Science (Malone 1989)</td>
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<tr>
<td></td>
<td>Interdependent Value-Chains (Porter 1985)</td>
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<td>Transaction Costs Theory (Williamson 1975)</td>
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<td>Game-Theory (Bakos 1987)</td>
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<td>Social Network Theory (Cook et al 1987)</td>
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<td></td>
<td>Resource Dependence (Pfeffer &amp; Salanick 1979)</td>
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<tr>
<td></td>
<td>Political Economy (Benson 1975; Piore &amp; Sabel 1984)</td>
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</table>
Based on analysis of work included in Table 1.2.1 and related studies, Kambil and Short observe:

- **Theory development and conceptual frameworks identifying IT-based, IOS and electronic integration strategies and their effects on business networks are still in their infancy.**

Kambil and Short observe that different theoretical perspectives can be adapted to the study of electronic integration - e.g. industrial organization (IO) economics (Tirole 1988; Williamson 1985), information processing and behavioral theories of the firm (Galbraith 1974; Mintzberg 1979). These theories generally view firms and industries in discrete terms. This sheds little light on the structure of business networks and their relationship to blurring industry boundaries and inter-industry and inter-firm alliances. At the network level, resource dependence, political economy and intra-organizational network perspectives (Benson 1975; Pfeffer and Salanick 1978; DiMaggio and Powell 1983; Piore and Sabel 1984) are possible frames for analyzing emerging network structures and processes. However, the lack of a dominant theoretical paradigm serving to integrate this work has produced a lack of consensus on key constructs and, similarly, a lack of consistent language to characterize network level phenomena (Kambil and Short 1993). Moreover, these general theories to date have yielded relatively few operationalizable and testable hypotheses (Kambil and Short 1993). This adds to difficulties in establishing a cumulative body of theoretical and empirical knowledge. While conceptual frameworks are valuable in the initial stages of theory development, Kambil and Short note a weak link between existing frameworks and relevant theoretical perspectives or empirical data at the business network level.

- **There is little empirical research on electronic integration at the business network level. Indeed, suitable approaches and analytic methods for studying electronic integration remain unresolved (Kambil and Short 1993).**

Kambil and Short identify two different frames for empirical research: case-based and variance research. Case research uses single or multiple case studies to investigate emerging phenomena. Case studies are generally focused on understanding 'leading-edge' companies and are especially useful for studying novel phenomena. Following Bonoma (1985) and Yin (1981), Kambil and Short distinguish between cases prepared for pedagogical purposes and cases for
research purposes. The latter represent inductive approaches to understanding novel phenomena and constitute a basis for refuting or constructing conceptual frameworks and theories. To date there are relatively few instances of such research at the level of the business network (Kambil and Short 1993). (See Table 1.2.1).

Variance research refers to empirical studies of electronic integration through multivariate analysis of survey, experimental, archival and other quantitative data. Generally variance research is based on a set of theoretical arguments and propositions used to generate hypotheses. Hypotheses are then tested through the collection of data and the application of statistical methods to establish the degree of support for the hypotheses. Multivariate techniques can also be used to infer structures in data. For example, network and cluster analysis techniques can be used to identify patterns of inter-firm relationships and to characterize the structure of networks (Luke et al 1989). However, research to date is sparse and has not generally adopted these methods for inferring patterns or testing hypotheses (Kambil and Short 1993).

Given the importance of understanding EI-based strategies and the business network as a unit of analysis, it is necessary to use efficient approaches to inquiry and theory development. This requires consensus on key constructs and their representation, as well as the refinement of methods to manage the complexities of case development and/or variance studies (Kambil and Short 1993). Careful selection of constructs and representation schemes is especially crucial to the development of a multi-level theory (Rousseau 1985).

2.2. Related Theoretical Model

A framework that articulates the fundamental logic and rationale for exploiting I/T capabilities as well as complexities of the organizational transformation required to leverage technological capabilities was developed by Henderson and Venkatraman (1990). Strategic Alignment: A Model for Organizational Transformation, is based on a pivotal premise, namely:
the role of information technology in organizations has shifted beyond its traditional, 'back office, support' role towards an integral part of the strategy of organizations. Following King (1978), Rockart and Scott Morton (1984) and others, Henderson and Venkatraman differentiate among three major roles for I/T -- 'administration'; 'operations'; and 'competitive.'

The administration role signifies the scope of I/T as the automation of accounting and control functions, which is reasonably well-understood in the traditional literature on management information systems (see for instance: Ein-Dor and Segev 1978; Ives, Hamilton, and Davis 1980). This role requires the deployment of an efficient I/T platform (including hardware, software and communication systems) for administration and control and is independent of the strategic management of the organization.

The operations role is an extension of the first role and is distinguished by the creation and deployment of a technology platform that creates the capability to automate the entire set of business processes as opposed to only the administrative activities. This role requires the deployment of an I/T infrastructure that responds to and supports the chosen business strategy (King, 1978; McLean and Soden, 1981).

In contrast, the competitive role represents a significant point of departure. Extending beyond internal efficiency focus, the capability now exists for organizations to deploy new I/T applications that leverage information and technological attributes to obtain differential sources of competitive advantage in the marketplace (Cash and Konsynski, 1985; Copeland and McKenney, 1988; McFarlan, 1984; Venkatraman and Kambil, 1990). Increased attention is being paid to the potential role of I/T to influence structural characteristics of markets (e.g., Clemons and Row, 1988) and to shape the basis of competition (see for instance, Rotemberg and Saloner, 1990; Malone, Yates, and Benjamin, 1986). According to Henderson and Venkatraman, it is becoming increasingly clear that a limited consideration of the first two roles for I/T in modern corporation is sub-optimal with potentially dysfunctional consequences. More importantly, the emergence of the competitive role has significant implications for organizational transformation. This is because the mere superimposition of powerful I/T capabilities on the
existing organizational structure and processes is unlikely to yield superior competitive benefits. This is supported by one of the central messages from the recently concluded MIT Research Project, Management in the 1990s (Scott Morton, 1990). The authors found that successful organizations can be distinguished by their ability to leverage I/T capabilities to transform their businesses (structures, processes, and roles) to obtain new and powerful sources of competitive advantage in the marketplace.

Messrs. Henderson and Venkatraman Strategic Alignment Model is based on four key domains of strategic choice: business strategy, organizational infrastructure and processes; I/T strategy; and I/T infrastructure and processes. Considering strategic alignment as an element of organizational transformation, the model specifically addresses the requirements of leveraging the emerging developments in information technologies. This model is based on the need to achieve alignment across internal and external domains as well as functional integration across business and I/T areas. The value of the model is argued with propositions for research and practice.

Henderson and Venkatraman provide some support for the conceptual validity of their strategic alignment model with some industry examples they cite. The model's competitive role segment provides a useful construct to study competitive advantage through electronic integration and thus is used in conjunction with the roles-linkage model for the data analysis section of this research project. I next discuss the selection of the roles linkage model as the theoretical foundation for this research and the usefulness of its conceptual schema in combination with the strategic alignment model to study electronic integration.

2.3. Roles

Roles are distinct value-added activities undertaken by firms in the network. Using the notion of technological separability as a basis for business segmentation (Gort 1962), roles can be defined as technologically separable, value-added activities in a given business net-
work. Technology is defined as inclusive of specialized types of applied knowledge and equipment (Perrow 1986; Nelson and Winter 1982).

In any business network I can identify firms that provide value by undertaking distinct value-adding activities or roles. For example, traditional insurance firms add value by combining money management with risk pooling and claims management services. Each of these activities requires different technologies, in terms of knowledge and skills as well as equipment. Hence I can consider the traditional insurance firm as combining these roles into one organization through vertical integration. Alternatively, firms may create value in a business network by undertaking a single core role or by coordinating many different roles using various modes of governance.

Sociologists and organization theorists have used role abstraction for classification of individuals or organizations into common groups to simplify data collection and analysis (Banton 1965; Nadel 1957; Barley 1990). Occupational roles typically classify individuals on the basis of non-relational attributes such as activities that require different skills, knowledge or task behaviors. In defining the concept of business network role, the common role concept is expanded beyond individuals to organizations in an economic system (Kambil and Short, 1993). Like occupational roles, mortgage marketplace participants undertake a variety of different functions or value-added activities in the business network. These roles are delineated based on the skills and applied knowledge required for the tasks undertaken to accomplish the residential loan transactional process.

2.4. Linkage

Linkage refers to different ways of managing economic interdependence across value-adding roles in the network, which is in essence an economic transaction. Adapting work by Williamson (1975) on economic governance and Galbraith's (1974) work on information processing organizations, six different classification types for linkages in a business network are speci-
fied (Kambil and Short, 1993). These are: simple market exchange, standard linkage, specialized linkage, customized linkages (alliance and hierarchy), and mandate. These forms of linkage reflect different models of coordinating and influencing economic transactions between network roles.

2.5. Simple Market Exchange

A simple market exchange refers to mechanisms typically used to manage infrequent transactions characterized by low levels of relationship-specific investments between a buyer and a seller. Typically the buyer and seller negotiate the price and exchange a standard or well-specified good of relatively low value. The potential for opportunism is attenuated by the existence of alternative suppliers for similar or equivalent goods. Thus the market mode of governance is used to manage the exchange relation. In repeated transactions by actors across roles the terms of the exchange relation are typically redefined for each transaction between the parties (Kambil and Short 1993).

2.6. Standard Linkage

A standard linkage refers to mechanisms typically used to manage frequent and routine transactions of relatively low value by actors across roles. Relationship-specific investments are relatively low, but the relationship is more routine than a simple market exchange and the terms of the agreement are generally not differentiated for each transaction between parties. The two parties therefore commit a low level of investment for administering repeated transactions. The existence of alternative suppliers and legal recourse attenuates opportunism. A standard linkage is exemplified by the use of standard contracts such as the agreements that govern repeated credit card transactions. Again a market mode of governance is typically used to govern these transactions.
2.7. Specialized Linkage

A specialized linkage refers to mechanisms used to manage complex, infrequent transactions that require a significant a priori relationship providing specific investments or the acquisition of specialized information for valuation. Unique and specialized resources are committed to the transaction by at least one of the parties, as in the case of a transaction between a real estate holding company and a developer. To attenuate exchange risks, complex contingent contracts or specialized third party arbitration and intermediation structures are specified and implemented between the parties. In addition, complex coordination mechanisms may be deployed between parties to the exchange. These structures are unlikely to be modified frequently during the course of an exchange relation.

2.8. Customized Linkage: Alliance or Hierarchy

Customized linkages are used to manage frequent complex and long-term transactions that require relation specific investments and adaptive behavior by parties across roles. This requires frequent modification of the exchange relation in terms of the structures and processes implemented to coordinate and influence the relation. Prior work by Williamson (1979, 1985) has identified two principal modes for governing these types of exchange relations. Prior work by Kambil and Short (1993) denotes these as alliances and hierarchies.

In an alliance or partnership both parties have committed specialized assets to the relationship and share risks. Typically, authority is decentralized between the two parties for resource allocation and dispute arbitration. To coordinate activities, the parties may implement complex bilateral coordination mechanisms such as joint strategic and operational planning (Henderson 1990). These structures and processes are modified during the course of the exchange to respond to changing governance requirements.

In a hierarchy, authority is centralized to coordinate and influence activities across roles, this authority based on the ownership of the assets of production or the ownership of in-
formation assets. Complex and/or specialized routines and mechanisms are deployed in order to coordinate and influence activities between roles. Hence these types of linkage are appropriate for complex transactions that extend over long periods of time and are characterized by significant uncertainty.

While ownership provides the general means for control, not all vertically- or horizontally-integrated firms manage actors in different roles through a hierarchy. Indeed actors in different roles within the same firm may be allowed significant autonomy over the design of their transactions. Hence hierarchy is not synonymous with vertical or horizontal integration (Kambil and Short, 1993).

2.9. Mandate

Mandates provide another form of managing interdependence. In mandated linkages, there need not be a direct exchange of economic goods between parties. Instead, actors in one role can influence resource allocation by those in other roles through legal or professional authority, and the ability to make rules over the behavior of those in other roles. For example, hazard insurance companies have traditionally had a strong mandate over the ability of financial institutions to sell hazard insurance. Mandates may be denoted as strong or weak.

Figure 2.9.1 on page 27 graphically demonstrates the various linkages relative to the economic transaction taking place between role providers. Linkage classification begins by first determining if an economic transaction takes place. If an economic exchange occurs, the type of transaction is classified based on the above linkage descriptions.

Using the above definition of roles and linkages, a business network can thus be represented as a matrix or grid that specifies the roles-linkage model. As shown in Table 2.9.2 on page 28, the grid axes correspond to network roles, and the values within each cell of the matrix represent the type of linkage between roles. Completing the matrix provides a graphical representation of the dominant or critical modes of relationships between roles in the network.
While alternative schemes for representing networks are possible, the roles-linkage model isolates and represents the business network in terms of a few key constructs, excluding unnecessary detail. This reduces the complexity of analysis in contrast to traditional network analysis which typically examines all direct and indirect ties between firms in a given network, without simplification through abstraction (Kambil and Short 1993).

Table 2.9.2 on page 28 presents an idealized roles linkage matrix for a business network with five generic (simplified) roles: product producer, service producer, service integrator, network provider (electronic network), and buyer.

Using the above definition of roles, roles are easily identifiable in the mortgage marketplace. It is also easy to categorize the type of roles using the simple role identifiers in figure
TABLE 2.9.2 IDEALIZED ROLES-LINKAGE MODEL FOR SIMPLIFIED PRODUCT SERVICE EXCHANGE

ROLES-LINKAGE MODEL:

<table>
<thead>
<tr>
<th>ROLES</th>
<th>Product Producer</th>
<th>Service Producer</th>
<th>Service Integrator</th>
<th>Network Provider</th>
<th>Buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Producer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Producer</td>
<td>Linkage Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Integrator</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Provider</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buyer</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td>Linkage Type</td>
<td></td>
</tr>
</tbody>
</table>

Source: A. Kambe and J. Short. Electronic Integration and Business Network Redesign. 1993

3. Another reason for selecting the roles-linkage model is the easily identifiable linkages between the role players within the mortgage marketplace. A number of economic transactions take place between the various role players in the mortgage marketplace that are both identifiable and easy to categorize using the above definitions of linkages. See Appendix A.

The relatively recent occurrence of electronic integration in the mortgage marketplace has resulted in few research constructs specific to the mortgage marketplace. Preliminary research indicates the roles-linkage model is a useful construct to analyze electronic integration in the mortgage marketplace.

2.10. Materials and Research Methodology

Preliminary library research was conducted to investigate the nature of the mortgage marketplace, participants in the mortgage marketplace, developments in the mortgage marketplace and prior research on I/T-enabled electronic integration.
2.11. Methodology

My research focuses on industry practice of electronic integration in the mortgage marketplace. Defining industry as the mortgage marketplace, and industry participants as loan originators, mortgage lenders, appraisal companies, HUD, FNMA & FHLMC, hazard insurers, title companies, mortgage insurers, flood insurers, credit agencies, wholesalers and secondary market participants, I interviewed thirteen (13) industry participants by direct telephone interview. The interview questionnaire addressed industry participant roles, industry transactions, products and services, and practices related to strategic choices made by participants to exploit electronic data interchange (EDI) and inter-organizational systems (IOS) to transform internal business processes, the external business network and the firm’s business scope within the mortgage marketplace.

2.12. Procedures

After completing preliminary research specific to the mortgage marketplace, I analyzed the applicability of existing electronic integration models to this research and developed an appropriate model.

I complemented the interview data with extensive searches of archival material from reference resources including the Mortgage Bankers Association of America (MBA), the Federal National Mortgage Association (FNMA) and the Department of Housing and Urban Development (HUD). I inferred role-linkage classifications from interview data. I compared my own classifications of roles and linkages with industry participants who I asked to identify basic functional and value-added activities in their respective industry role and to construct network roles as they saw them. To simplify my analysis, roles were not specified to the finest level of granularity. Instead, I defined key roles by a common aggregation of functions requiring a distinctive combination of technology and knowledge. Furthermore, my definition of the mortgage
marketplace is bounded by a collection of roles that is not exhaustive but is based on identifying the primary roles of existing firms and the various products and services that they provide in the mortgage marketplace.

I classified linkages based on descriptions of inter-role relationships that I obtained from reference resources, trade press and the interviews with industry participants. I used the following criteria for classification:

- the forms of economic exchange among actors and across roles;
- the nature of contracts emerging in the industry;
- the influence of authority over economic exchange and regulation of the economic exchange.
3 ROLES-LINKAGE PERSPECTIVE PRIOR TO ELECTRONIC INTEGRATION

3.1. Network Roles Prior to Electronic Integration

Using the roles-linkage model as a research tool, see Appendix A, I began by identifying the primary roles in the mortgage marketplace prior to the implementation of electronic tools to automate business transactions and processes. Role provider is defined as all firms or organizations that have the capacity to perform the identified role. The identified roles are listed along the horizontal axis in Table 3.2.1 below. See Appendix D for a more detailed description of the listed roles.

3.2. Network Linkages Prior to Electronic Integration

Linkages prior to electronic integration were identified through literature reviews and discussions with industry experts. Linkages are listed along the vertical axis of Table 3.2.1. Linkages between role providers were identified by respondents based on the type of transaction(s) most likely to occur between the selected role provider and other role providers.

As discussed in the methodology section, simple market exchange refers to infrequent transactions between a buyer and a seller in which the buyer and seller negotiate the price and exchange a standard or well-specified good of relatively low value. Prior to electronic integration, simple market exchanges took place primarily between loan originators and providers of third party reports that included appraisal reports, title reports and hazard insurance. Most loan originators were affiliated with a mortgage bank or a lending institution and simple market exchange took place at the lender level. Transactions relied on local service providers and often there were multiple service providers within a local area to choose among.
TABLE 3.2.1: ROLES-LINKAGE IDENTIFICATION IN THE MORTGAGE MARKETPLACE -- PRIOR TO ELECTRONIC INTEGRATION

<table>
<thead>
<tr>
<th>Linkages</th>
<th>Product/Service</th>
<th>Service Producer</th>
<th>Service Integrator</th>
<th>Network Provider</th>
<th>Buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consumer/Borrower</td>
<td>Loan Origination</td>
<td>Loan Processor</td>
<td>Appraisal/Company</td>
<td>Credit Agency</td>
</tr>
<tr>
<td>Simple Market Exchange</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Standard Contract</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Specialized Contract</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Alliance</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mandate</td>
<td>X X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

An "X" is placed within the matrix at the intersection of an industry role and transaction type to identify the type of transaction that occurred between the identified role provider and another role provider. Transactions identified could result from a single transaction between two role providers or multiple transactions between multiple role providers. As mentioned above, observations were obtained from literature review, industry participants and author's prior knowledge of industry transactions. Linkages prior to electronic integration were primarily split between simple market exchange, standard contracts, specialized contracts and mandates. It is interesting to note that few alliances appeared to exist between the various role providers identified. This is not to say alliances did not exist, only that alliances were not readily apparent from the literature reviews and industry expert discussions.
Standard contracts entailed frequent and routine transactions of relatively low value between industry participants. The relationship is more routine than a simple market exchange and the terms of the agreement are generally not differentiated for each transaction between parties. Loan wholesaling often required a standard contract that would specify the terms and conditions of loan packages sold by a wholesaler to secondary market buyers. Standard contracts ensured consistency in the deliverable and ensured a system of measure between the two parties. Standard contracts were often the result of demonstrated quality and efficiency in providing specific loans packages.

Specialized contracts were complex, infrequent transactions that require a significant a priori relationship providing specific investments or the acquisition of specialized information for valuation. Shipping and delivery agents, by the complex and infrequent nature of the product and service being provided, entered into specialized contracts with secondary market participants. Both the shipping and delivery role provider and secondary market role provider committed significant resources, time and money, to the infrequent transaction. Specialized contracts extended to all of the role providers given their level of responsibility for product and service delivery in the transaction.

In an alliance, both parties have committed specialized assets to the relationship and both share risks. As shown in Table 3.2.1, few of the transactions between the various role providers were classified as alliances.

In a hierarchy, authority is centralized to coordinate and influence activities across roles. Authority is based on the ownership of the assets of production or the ownership of information assets. Hierarchies were identified between the lender and the lender’s affiliated service providers. Often there were complex and/or specialized routines and mechanisms deployed in order to coordinate and influence activities between the loan originator, processor, underwriter, closer, lender and servicing agent.

The role of regulation, consumer protection acts and government subsidized lending programs created a mandate between all of the role providers. Through resource allocation, legal
and/or professional authority, certain role providers, Fannie Mae, Freddie Mac and Ginnie Mae, had the ability to dictate rules governing the behavior of the other role providers.

3.3. Mortgage Marketplace (Network) Prior to Electronic Integration

Dating back to the early 80s, most transactions were performed manually and in paper form. Lender and loan selection by the borrower were only the first of ten steps in the transactional process of a residential mortgage.

Subsequent steps were application, processing (credit report, appraisal, title report), underwriting, hazard insurance selection, title insurance selection, mortgage insurance (discretion), closing, servicing, warehousing, shipping and delivery. After an application for a mortgage was submitted, the processor began the task of gathering supporting loan documentation such as credit reports, bank deposit verifications, employment verifications, W-2s, past tax returns, and appraisal reports. Written requests were sent to collect the data on hard copy forms and were typically distributed through the mail. Once the documents were received back by the processor, they were passed on, along with the completed loan application, to underwriting for evaluation.

An underwriter evaluated the supporting loan documentation using pre-established qualifying ratios by manually calculating the ratios from the income and liability figures supplied on the application. In addition, the underwriter manually reviewed the credit report and other supporting material to determine ultimate approval or denial of the loan. Upon loan approval, a title examination report would be ordered. A title company then provided services that included a title search and a title report. Some title companies also provided title insurance, mandatory by most lenders. In certain circumstances, low-income borrowers or borrowers with risky credit histories were required to obtain private mortgage insurance that guaranteed repayment of the mortgage loan.
Once a low-income borrower or borrower with risky credit history received loan approval, a private mortgage insurer was manually selected, and provided with both borrower specific and property specific information. In most cases, this required the duplication of the loan file information which was distributed to the mortgage insurer in hard copy. Upon approval and verification of clear title, hazard insurance was required by the lender to protect the lender against certain risks and property losses. This typically required the borrower to call multiple hazard insurers to get quotes and ultimately obtain an insurance binder to present at the closing.

Closing required all parties to the transaction to be present. This included the borrower(buyer) and seller, legal counsel, real estate agent(s) and the bank representatives. If the lender was a portfolio lender, then the loan was kept in-house. If not, then the closed loans were held in inventory until they were sold to investors. Prior to the sale to investors, all physical documentation specific to loans files was manually organized and filed in preparation for delivery to a buyer.

Servicing or loan administration typically required the collection of mortgage payments from borrowers and the remittance of funds to investors. Payments were collected as checks received by mail or cash deposited to the lender. Servicing agents would also maintain escrow accounts for the payment of real estate taxes and property insurance, as well as perform collections on delinquent loans. Institutions engaged in the buying and selling of mortgage loans had to maintain contact with a relatively close group of direct investors or middlemen (conduits, brokers, and investment bankers). See Figure 3.4.1.

3.4. Products and Services Prior to Electronic Integration

The primary product in the mortgage marketplace is the mortgage loan. Appraisal reports, hazard insurance, title insurance, flood insurance and mortgage insurance are examples of complementary services. A multitude of mortgage loan products exist in the market that differ

32
substantially from one another. For the purpose of this presentation and analysis, mortgage loans are categorized as a single product offering and are not distinguished by the various characteristics of loan types available in the market.

As demonstrated in Figure 3.4.1 on page 34, the mortgage marketplace was a relatively linear market. Each step of the mortgage loan process was an incremental step and was essentially dependent upon completion of prior steps before being advanced to the next step. This linear process would usually take four to six weeks, often longer, to originate and close a mortgage loan. Certain roles identified, loan origination, loan processing and underwriting, often took place under the same roof under direct guidance of a lender. The linear nature of the transactional process dictated that certain roles locate within close quarters or proximity to gain whatever levels of efficiency could be gained under such circumstances.

From observations made of Figure 3.4.1, products and services appear very specific to the role providers' core competency in the transactional process. Specifically, processors were providing processing services, appraisers were providing appraisal services and title companies were providing title reporting and title insurance services. Little deviation from the core competency appeared to occur according to the literature review material. Expanded product or service markets were not readily identifiable.
FIGURE 3.4.1: MORTGAGE MARKETPLACE PRIOR TO ELECTRONIC INTEGRATION

Home Buyer

1. Shop for a house
   - Players: mortgage banker, S&L, comm. bank
   - Product/Service: mortgage loan

2. Shop for a loan
   - Players: mortgage broker, loan officer
   - Product/Service: mortgage loan

3. Originate a loan
   - Players: lender affiliated processor
   - Product/Service: obtain data, enter data, compile documents, employment verification, income verification

4. Process loan
   - Players: appraisal co's, real estate co's
   - Product/Service: appraisal reports, property valuation reports

5. Appraise property
   - Players: credit agencies
   - Product/Service: credit reports

6. Credit report
   - Players: title agencies, title insurers
   - Product/Service: abstracts, title reports, title insurance

7. Close loan
   - Players: lender affiliated closer
   - Product/Service: prepare and complete closing docs: note, title, hazard, mort, flood, etc.

8. Underwrite loan
   - Players: lender affiliated underwriter
   - Product/Service: verify documentation, evaluate application, approve/disapprove

9. Lender wholesale warehouse portfolio
   - Players: institutional lenders and mortgage banks
   - Product/Service: loan packaging and resale

10. Servicing agent
    - Players: institutional lenders and mortgage banks
    - Product/Service: loan administration and management

11. Shipping & delivery
    - Players: investment banks, agencies-FNMA, FHLMC, GNMA, other institutions
    - Product/Service: loan acquisition

12. Loan investor
    - Players: institutions, lenders, and mortgage banks
    - Product/Service: provider of funds, purchaser of loans

13. Home buyer
    - Players: shop for a house

14. Property listing
4 ROLES-LINKAGE PERSPECTIVE UPON EMERGENCE OF ELECTRONIC INTEGRATION

My interview of mortgage marketplace industry participants gives rise to the following effects of electronic integration on the business scope of firms, business transactions between firms, business strategies of firms and the mortgage marketplace in general. I present these observations in terms of (1) network roles, (2) network linkages, (3) network products and services and 4) modes of competition.

4.1. Findings on the Effect of Electronic Integration on Network Roles

There are two primary key findings that resulted from the interview of 13 industry participants. The first indicates that roles carried out prior to electronic integration are being either partially or fully enhanced through the use of I/T according to 10 out of the 13 industry participants interviewed. The second key finding indicates that all new roles created, post electronic integration, are enabled as a direct result of I/T capabilities. The new roles created are the result of the value-added services demanded by consumers in the mortgage marketplace.

Roles Enhancement by Electronic Integration

Traditional roles such as loan origination, processing and underwriting are being enhanced through the use of I/T according to the four lenders who were interviewed. Desktop loan origination, processing and underwriting is allowing data to be input once and passed along through a communications medium, thereby minimizing costly redundancy and handling of documents. Table 4.1.1 compares roles enhanced by electronic integration to the integration of new roles enabled by electronic coordination tools. Roles enhanced by electronic integration are complemented by new roles that are enabled by electronic coordination tools. As demonstrated by Table 4.1.1, nine new roles have evolved in the mortgage marketplace.
TABLE 4.1.1: COMPARISON OF PRIOR AND POST ELECTRONIC INTEGRATION ROLES

<table>
<thead>
<tr>
<th>Roles Prior to Electronic Integration</th>
<th>Roles Post Electronic Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>consumer/borrower</td>
<td>consumer/borrower</td>
</tr>
<tr>
<td>loan origination</td>
<td>loan origination</td>
</tr>
<tr>
<td>loan processor</td>
<td>loan processor</td>
</tr>
<tr>
<td>appraising</td>
<td>appraising</td>
</tr>
<tr>
<td>flood hazard insurer</td>
<td>flood hazard* insurer</td>
</tr>
<tr>
<td>credit agent</td>
<td>credit agent</td>
</tr>
<tr>
<td>underwriter</td>
<td>underwriter</td>
</tr>
<tr>
<td>hazard insurer</td>
<td>hazard insuring</td>
</tr>
<tr>
<td>title insurer</td>
<td>title insurer</td>
</tr>
<tr>
<td>mortgage insurer</td>
<td>mortgage insure</td>
</tr>
<tr>
<td>closing/doc prep</td>
<td>closing/doc prep service</td>
</tr>
<tr>
<td>shipping and delivery</td>
<td>shipping and delivery</td>
</tr>
<tr>
<td>servicing</td>
<td>servicing</td>
</tr>
<tr>
<td>lender</td>
<td>lender</td>
</tr>
<tr>
<td>wholesaler</td>
<td>wholesaler</td>
</tr>
<tr>
<td>FNMA, FHLMC, GNMA</td>
<td>FNMA, FHLMC, GNMA</td>
</tr>
<tr>
<td>secondary market</td>
<td>secondary market</td>
</tr>
</tbody>
</table>

*Regulatory Mandate

Roles Enabled by Electronic Integration

Eleven of the thirteen industry participants interviewed indicated the creation of a new role. As described in Table 4.1.2, each of the new roles created utilizes electronic coordination tools to effectively carry out the role and I/T was directly related to the implementation of the new role.
There are two general observations from the interviews. First, the highest incidence of a role among industry participants is contract underwriting. Four out of the thirteen industry participants interviewed indicated they performed a contract underwriting role. Loan origination, processing and underwriting roles are being complemented by centralized processing and automated underwriting through artificially intelligent systems that have the capability to match the detail of information input into the system with the criteria established for the system (expert systems).

Second, third party service providers that include appraisal firms and title companies, create roles to complement lenders efforts to expedite loan processing. Statistical regression analysis systems and databases have been introduced into appraisal service firms providing a mechanism for appraisers to value real property assets without spending long periods of time in the field collecting data. This process appears to complement loan originators efforts to expedite loan origination and processing procedures for expedient loan approval. In addition, the statistical valuation process also allows portfolio underwriters to gain access to portfolio value without commissioning extensive appraisal reports. I/T helps appraisal management role pro-
providers to design local market databases for lenders and investors in need of property valuation services by coordinating the efforts of local appraisers.

**TABLE 4.1.3: POST ELECTRONIC INTEGRATION ROLES AND VALUE-ADDED SERVICES**

<table>
<thead>
<tr>
<th>Industry Participant</th>
<th>New Role(s) Post Electronic Integration</th>
<th>Value-Added Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lender</td>
<td>• Financial service specialist</td>
<td>• Contract underwriting</td>
</tr>
<tr>
<td></td>
<td>• Contract underwriter</td>
<td>• Point-of-sale loan origination</td>
</tr>
<tr>
<td></td>
<td>• Warehouse agent</td>
<td></td>
</tr>
<tr>
<td>Lender</td>
<td>• Financial service specialist</td>
<td>• Contract underwriting</td>
</tr>
<tr>
<td></td>
<td>• Data management</td>
<td>• Appraisal management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Credit scoring</td>
</tr>
<tr>
<td>Lender</td>
<td>• Financial service specialist</td>
<td>• Point-of-sale loan origination</td>
</tr>
<tr>
<td></td>
<td>• Warehouse agent</td>
<td>• Multi-lender origination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Table-funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Statistical reporting</td>
</tr>
<tr>
<td>Lender</td>
<td>• Financial service specialist</td>
<td>• Contract underwriting</td>
</tr>
<tr>
<td></td>
<td>• Contract underwriter</td>
<td>• Point-of-sale loan origination</td>
</tr>
<tr>
<td></td>
<td>• Software vendor</td>
<td>• Credit scoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expedited loan approval</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Real-time on-line access to view pipelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multi-platform inter-operability</td>
</tr>
<tr>
<td>Mortgage Insurer</td>
<td>• Contract underwriting</td>
<td>• Contract underwriting using AI</td>
</tr>
<tr>
<td></td>
<td>• Central processing</td>
<td>• Central processing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Doc. prep and custodian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Credit enhancement</td>
</tr>
<tr>
<td>Mortgage Insurer</td>
<td>• Contract underwriting</td>
<td>• Contract underwriting using AI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Software-artificial intelligence</td>
</tr>
<tr>
<td>Title Company</td>
<td>• Central processing</td>
<td>• Database management</td>
</tr>
<tr>
<td></td>
<td>• Data management</td>
<td>• Real estate tax service</td>
</tr>
<tr>
<td></td>
<td>• Closing/doc. prep</td>
<td>• Imaging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Geographical information system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Universal loan registry</td>
</tr>
<tr>
<td>Credit Agency</td>
<td>• Portfolio analysis</td>
<td>• Due diligence reporting</td>
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<tr>
<td></td>
<td></td>
<td>• Portfolio analysis</td>
</tr>
<tr>
<td>Credit Agency</td>
<td>• Portfolio analysis</td>
<td>• Portfolio analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open access to multi-product vendors</td>
</tr>
<tr>
<td>Appraisal Firm</td>
<td>• Data management</td>
<td>• Property valuation (statistically inferred values)</td>
</tr>
<tr>
<td></td>
<td>• Software vendor</td>
<td>• Software vendor</td>
</tr>
<tr>
<td>Appraisal Firm</td>
<td></td>
<td>• Property valuation (statistically inferred values)</td>
</tr>
<tr>
<td>Flood Agency</td>
<td>• Flood insurer</td>
<td>• Automated census tracking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On-line application(pc e-mail, download, EDI)</td>
</tr>
<tr>
<td>Underwriter</td>
<td>• Warehouse agent</td>
<td>• Point-of-sale loan origination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warehousing</td>
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<tr>
<td></td>
<td></td>
<td>• Servicing</td>
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<td></td>
<td></td>
<td>• Ancillary conduit for services</td>
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</tbody>
</table>
Table 4.1.3 demonstrates the degree to which respondents interviewed indicated new roles have abounded from the creation and implementation of value-added services. Most of the respondents indicated that a need existed to add services to meet buyer demand for expeditious and efficient loan transactional processing. The value-added services described by respondents appear to meet this demand.

In the case of “one-stop shopping” at the real estate agents office, an observation from my interviews, firms such as PNC Mortgage Corporation and Coldwell Banker through a strategic alliance have invested in expert systems (Approval First, Open House Kit) to formalize loan origination routines and to structure product and service offerings (hazard, flood, title, and mortgage insurance) along a common set of business rules used to define the expert system. The system provides borrowers with the convenience of “one stop shopping” while coordinating the product offerings of the traditional loan origination routines into one primary routine.

4.2. Findings on the Effect of Electronic Integration on Network Linkages

Based on the industry participant interviews, linkages between role players appears to have expanded upon emergence of electronic integration, in particular, alliances. There are two noticeable changes that have taken place upon electronic integration. First, according to the industry participants interviewed, 11 out of 13 indicated that an alliance is presently in place with another industry participant. Second, the number of linkages between participants has also increased—that is, where there were two or three participants involved in a direct transaction before electronic integration, respondents indicate now describe seven or eight.

Respondents indicated that I/T is being used to assist in coordinating the efforts and services of industry participants which, according to respondents, is leading to the creation of alliances. Respondents also indicated that the alliances are being creating with a diverse group of industry participants. Table 4.2.1 details the level of transactions between the various role providers identified upon emergence of electronic integration. An interesting
TABLE 4.2.1: LINKAGES UPON EMERGENCE OF ELECTRONIC INTEGRATION

<table>
<thead>
<tr>
<th>Linkages</th>
<th>Service Producer</th>
<th>Service Integrator</th>
<th>Newwor</th>
<th>Buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Market Exchange</td>
<td>C</td>
<td>L</td>
<td>L, M,</td>
<td>L, C</td>
</tr>
<tr>
<td>Specialized Contract</td>
<td>M</td>
<td>U</td>
<td>M, F</td>
<td>L, M, A</td>
</tr>
<tr>
<td>Alliance</td>
<td>C, F</td>
<td>M, T, U</td>
<td>L, U,</td>
<td>L, C, U</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>L, T</td>
<td>L</td>
<td>L</td>
<td>A, C</td>
</tr>
<tr>
<td>Mandate</td>
<td>L, A</td>
<td>L, C, U</td>
<td>L, U</td>
<td>L, M, C</td>
</tr>
</tbody>
</table>

Key: Industry Participant  Symbol
Lender                    (L)
Mortgage Insurer           (M)
Title Company              (T)
Credit Agency              (C)
Appraisal Firm             (A)
Flood Insurer              (F)
Underwriter                (U)

Industry participants who were interviewed, indicated with whom they transacted and what type of transaction took place according to the pre-specified transactional definitions described earlier. An industry participant symbol is placed at the appropriate intersection of the role provider and transaction type. For example, if a lender indicated a standard contract transaction took place between themselves and an appraisal firm, then an "L" is placed at the intersection of Standard Contract and Appraisal Company.
observation is the increase in the number of alliances and decrease in the number of specialized contracts when compared with linkages prior to electronic integration.

4.3. Findings on the Effect of Electronic Integration on Network Products and Services

According to responses from industry participants, Table 4.3.1 summarizes respondents value-added product and service offering. The table consolidates similar roles according to industry participant type and demonstrates the diverse nature of products and services currently being offered, as indicated by the industry participants interviewed.

<table>
<thead>
<tr>
<th>Industry Participant Type</th>
<th>New Role(s) Post Electronic Integration</th>
<th>Value-Added Products and Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lender</td>
<td>• Financial service specialist</td>
<td>• Contract underwriting</td>
</tr>
<tr>
<td></td>
<td>• Contract underwriter</td>
<td>• Point-of-sale loan origination</td>
</tr>
<tr>
<td></td>
<td>• Data management</td>
<td>• Appraisal management</td>
</tr>
<tr>
<td></td>
<td>• Warehouse agent</td>
<td>• Credit scoring</td>
</tr>
<tr>
<td></td>
<td>• Software vendor</td>
<td>• Multi-lender origination</td>
</tr>
<tr>
<td>Mortgage Insurer</td>
<td>• Contract underwriter</td>
<td>• Table-funding</td>
</tr>
<tr>
<td></td>
<td>• Central processing</td>
<td>• Statistical reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expedited loan approval</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Real-time on-line access to view pipelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multi-platform inter-operability</td>
</tr>
<tr>
<td>Title Company</td>
<td>• Central processing</td>
<td>• Contract underwriting using AI</td>
</tr>
<tr>
<td></td>
<td>• Data management</td>
<td>• Central processing</td>
</tr>
<tr>
<td></td>
<td>• Closing/doc. prep</td>
<td>• Doc. prep and custodian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Credit enhancement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Software-artificial intelligence</td>
</tr>
<tr>
<td>Credit Agency</td>
<td>• Portfolio analysis</td>
<td>• Database management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Real estate tax service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Imaging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Geographical information system</td>
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<tr>
<td></td>
<td></td>
<td>• Universal loan registry</td>
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<tr>
<td>Appraisal Firm</td>
<td>• Data management</td>
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<td></td>
<td>• Software vendor</td>
<td>• Portfolio analysis</td>
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<tr>
<td></td>
<td></td>
<td>• Open access to multi-product vendors</td>
</tr>
<tr>
<td>Flood Agency</td>
<td>• Flood insurer</td>
<td>• Property valuation (statistically inferred values)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Software vendor</td>
</tr>
<tr>
<td>Underwriter</td>
<td>• Warehouse agent</td>
<td>• Automated census tracking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Point-of-sale loan origination</td>
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<td>• Warehousing</td>
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<td>• Servicing</td>
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<td></td>
<td></td>
<td>• Ancillary conduit for services</td>
</tr>
</tbody>
</table>

41
With the introduction of value-added roles, new products and services have also been introduced into the market. As evidenced by Table 4.3.1 below, there appears to be coordination and exploitation of products and services across different product and service market segments. For instance, lenders are providing appraisal management services and appraisal firms are providing data management services.

New and existing roles are being combined to provide new products and services, reshaping the business network and competition across markets. For example, Monument Mortgage’s Green Light program—which promises loan applicants a loan decision substantially faster (within two hours) than if they applied on paper—combines four primary roles—electronic loan originator, automated underwriting provider, network provider, and software provider, to introduce a new product in the market. This product is a result of industry participants' efforts to bring efficiency and cost savings to the loan origination process as well as differentiate their product and service offering from that of their competitors. In this particular case, electronic implementation has enhanced and enabled an already existing process to create a perceived new product.

Coordination between credit agencies and appraisal companies provides portfolio underwriters with more precise portfolio valuation data. This level of coordination provides a valuable service to portfolio underwriters, which ultimately enhances their competitive position in the marketplace.

4.4. Findings on the Effect of Electronic Integration on Modes of Competition

To discern the modes of competition by industry position and strategy, a detailed questionnaire specific to competitive advantage issues was asked of the 13 industry participants. The information gathered from this questionnaire is not intended to be conclusive for the indus-
try as a whole, but to sample a cross section of industry participants concerning their specific industry position and related strategy.

4.4.1. Industry Positioning

There are three interesting observations regarding industry participants responses to the Competitive Advantage questionnaire. See Appendix F. When asked to indicate how their firm competes: as a low cost producer, offerer of unique product or service, low cost target producer or offerer of differentiated product or service target, the following responses were given. First, two out of the thirteen respondents indicated that they are all four, a low-cost producer, offer a unique mortgage banking product or service, have a cost focus in a target segment of the mortgage industry, and maintain a differentiation focus in a target segment of the mortgage industry. Five (5) indicated they are low cost producers, and three of the five low cost producers also indicated that they have a differentiated focus for a target segment of the industry. Eight (8) indicated they offered a differentiated product, and four of the eight differentiated focusers indicated that they had a cost focus on a target segment of the industry. An interesting observation from this is that most of the industry participants interviewed are positioning themselves as both a low cost producer and offering a differentiated product or service, whereas prior research pointed to industry participants being either a low cost producer or differentiated, not both.

4.4.2. Strategy

There are two apparent strategies that surfaced from the interview process. Vertical integration and the creation of alliances appeared to be a common theme among the industry participants interviewed.

Vertical Integration:

Nine out of the thirteen industry participants indicated that vertical integration exists in their business processes. Several of the respondents also indicated that the vertical integration
is directly attributable to electronic integration. Title, appraisal and real property data management services are integrated into one lender’s business processes. Another lender indicated vertical integration by integrating credit related services into its current business processes. A mortgage insurer has integrated software and title services into its core business processes.

**Alliances:**

Eleven out of the thirteen industry participants interviewed indicated their participation in some form of an alliance with another industry participant. Some respondents noted that the alliances are necessary for industry participants to coordinate and exploit complementary services.
5 ANALYSIS OF THE MORTGAGE MARKETPLACE UPON EMERGENCE OF ELECTRONIC INTEGRATION

My interview of mortgage marketplace industry participants and classification scheme gives rise to the following insights about the effect of electronic integration on the mortgage marketplace business network. I discuss these observations in terms of (1) mortgage marketplace challenges, (2) emerging network structure and network complexity, (3) technology leverage, (4) information leverage and (5) competitive integration.

5.1. Mortgage Marketplace Challenges

Industry participants in the mortgage marketplace indicate they are challenged by the need to integrate standardized tools into their business processes for the purpose of conducting transactions. In addition, industry participants perception of competition has been to maintain differentiated products and services to maintain profit margins in the highly competitive industry. Eroding differentiation through the implementation and integration of electronic coordination systems has industry participants reeling to find new strategies that will effectuate their transition to new strategic business processes.

Products and services are being packaged in conjunction with other products and services. Some participants interviewed did indicate a concern over the ability to differentiate their product or service from their competitors under these conditions.

5.2. Emerging Network Structure and Network Complexity

Upon emergence of electronic integration, loan originators now prepare the loan application with the borrower in paper or electronic form right on a laptop or desktop computer, and transmit the documents electronically to the processor or underwriter. The initial transmission to the underwriter or processor activates an order for a credit report and appraisal report to expedite the decision making process. The electronic network provider provides the value-added
network (VAN) supporting data transmission between the lender, wholesaler or warehouse and loan originator or underwriter depending on the relationship between the various participants. Software vendors provide mortgage and/or communications software supporting these transactions. These roles can be seen as the minimum role set required to implement the simplest form of electronic loan origination in the business network.

Other roles combine with this minimum set to provide financial, information and related value-added services. These are: flood hazard insurance which was federally mandated in 1994; contract underwriting which is an outsourcing service using both manual underwriting techniques and automated underwriting through artificial intelligence; central processing to facilitate the transmission and storage of data at a central repository for nationally located offices; data management which includes appraisal management services (the ordering and distribution of appraisal reports), and fee panel management (management of licenses and filing fees). In addition, loan originators are experiencing a transformation in their role from that of an information taker to that of a financial services representative providing valuable financial information and one-stop shopping services to consumers (borrowers and sellers).

The net effect of firm-level strategies attempting to shift roles and redefine linkages in the business network is to shift network boundaries from a relatively linear transactional process involving 6 role providers to a concentric transactional process involving more than 12 role providers. As a consequence, new information processing based roles become strategically relevant, creating new sources of value through the coordination of complementary roles. New linkages can be seen to emerge to integrate these new roles into the network. The creation of alliances in the industry is helping to expand the network boundaries. An example is the recent alliance between Coldwell Banker and PNC Mortgage Corporation tapping into Coldwell’s point-of-sale capacity and PNC’s financing.

The expansion of roles and linkages is exemplified by changes observed in the mortgage marketplace. I have earlier noted the emergence of nine new roles and suggested factors which influence role creation and role differentiation. A factor not discussed in detail here, but
Cycle time has been reduced from the traditional four to six week period to four to six days as a result of electronic integration. In addition, seven new roles have been created as a result of the integral role of the new business network and electronic integration, which relies on the implementation and use of electronic tools (hardware and software). This integrated process has also helped to reduce the transaction time by linking specific functional processes in a more efficient and concentric manner, essentially creating shorter paths. Functional processes now occur concurrently as compared with the linear process prior to electronic integration.
suggested by observations from my industry research and literature review on network analysis, is the relationship between network expansion and network complexity. I noticed the increasing complexity of the pattern of inter-role linkages in the mortgage network, with firms diversifying and/or acquiring equity positions in these new roles, and developing linkage strategies across roles. CLT Appraisal Services has acquired an appraisal software firm as part of their vertical integration strategy. The acquisition of software providers was evident among other industry participants I interviewed as well.

5.3. Technology Leverage

Five of the industry participants interviewed are leveraging their technologies by providing automated underwriting services to third parties within the mortgage marketplace. Traditionally these firms were conducting underwriting for internal purposes. Through the integration of electronic tools utilizing artificial intelligence to perform the underwriting process, these industry participants are leveraging their systems by providing underwriting services to outside third parties. This technology is also improving the performance of the underwriting process. It is not clear though from the interviews whether the industry participants installed these tools to satisfy their internal needs and then recognized a market for excess capacity, or whether they saw a demand for underwriting services and integrated the technologies for both their internal purposes and external markets.

5.4. Information Leverage

For the purpose of this research, information leverage is defined as the ability to package information to meet a demand or create a market opportunity. When information is collected as part of routine processes, the culmination of information from various sources parleys an opportunity to find new and marketable uses for the information compiled in the databases.
One lender interviewed is leveraging information collected in its point-of-sale system to other lenders and service providers. The collection of this information and re-distribution to third party service providers allows the lender to offer a complete package of services to the prospective borrower. Credit agencies have found a new niche market for their services from the secondary markets. Specifically, Wall Street analysts are eager to understand the default characteristics of the portfolios they have purchased or intend to purchase and credit agencies, with their extensive databases, can provide the answer. By taking advantage of the information contained in the existing database, a credit agency can provide an analyst with multiple snapshots of a borrower's history thereby contributing to the overall strength or weakness of the portfolio. The cumulative assessment is what benefits the analysts which is achieved using artificial intelligence to statistically evaluate the portfolio in its entirety.

In general, electronic integration enables firms to extend their influence across markets by leveraging information assets acquired in one market to differentiate products and services in another. For example, the loan originator, underwriter, data management, and investor roles can be linked - financial information provided by a loan applicant to a loan originator allows the data management system to create a customized loan designed to meet the investors requirements and reduce future liabilities of default. By linking these roles, an automated underwriting system can broker the loan to the investor whose criteria is satisfied by the borrower's characteristics but whose services are optimal to the borrower. In addition, the financial information available now in the data management system can be re-configured and sold to a financial services firm to provide financial services and products to the borrower. Chase Manhattan, for example, coordinates across these three roles within the Chase Manhattan organization to provide various financial services to clients.

5.5. Competitive Integration

I next attempt to systematically address the issue of competitive integration in my analysis. This is an important dimension to consider for mapping the dynamics of firm structure
and competitive strategies and network expansion and/or contraction in business network. The final section of my interview questionnaire detailed the nature of competitive advantage among the industry participants interviewed.

5.5.1. Distinguishing Between Cost Advantage and Differentiation

Through the combination of size, electronics, and market power, major retail establishments - like Norwest, PNC/Coldwell, or Countrywide - are seeking both maximum flexibility or differentiation and lowest cost at the marketplace level, suggesting a possible link with theories calling into question “generic strategies,” which hypothesize that low cost, flexibility and differentiation are inherently incompatible (Quinn, 1992).

5.5.2. Differentiation in the Mortgage Marketplace

Eleven of the thirteen industry participants interviewed indicate that they compete effectively by attempting to offer unique products or services to a target market in the mortgage marketplace compared to their competitors. The logic of the differentiation strategy requires that a firm choose attributes in which to differentiate itself that are different from its rivals (Porter, 1985). In contrast to cost leadership, however, there can be more than one successful differentiation strategy in the mortgage marketplace if there are a number of attributes that are widely valued by buyers. This is supported by industry participants' indication that through differentiation, they produce a unique mortgage banking product or service, as well as the high degree of variability among transactions that take place in the mortgage marketplace.

Since a role provider's technology is often interdependent with its buyers' technology, technological change by the buyer can affect competitive advantage just as can technological change within the firm. This is particularly true in differentiation strategies. For example, mortgage insurers that differentiate themselves by performing contract underwriting services for loan originators may lose that differentiation if loan originators switch to central processing systems that handle “soup-to-nuts” transactions. Certain title insurance companies utiliz-
ing title plants and consolidated data bases can deliver title information to an underwriter or automated underwriting system within minutes of the loan application filing.

5.5.3. Technology and Mortgage Marketplace Structure

Technology is also an important determinant of overall industry structure if the technology employed in a value activity becomes widespread, for example, the implementation of EDI for transaction sets among the various role providers. Technological change that is diffused can potentially affect each of the five competitive forces described below, and improve or erode industry attractiveness. Thus even if technology does not yield competitive advantage to any one role provider, it may affect the profit potential of all firms. Conversely, technological change that improves a firm's competitive advantage may worsen structure as it is imitated (Porter, 1985). The potential effect of technological change on the mortgage marketplace means that a role provider cannot set technology strategy without considering the structural impacts.

5.5.4. Technology and Entry Barriers in the Mortgage Marketplace

Technological change is a powerful determinant of entry barriers. It can raise or lower economies of scale in nearly any value activity. For example, flexible underwriting systems often have the effect of reducing scale economies. Technological change can also raise economies of scale in the technological development function itself, by quickening the pace of new product introduction or raising the investment required for a new model. Again, using underwriting as an example, automated underwriting using artificial intelligence requires a substantial investment and requires economies of scale. More than half of the industry participants interviewed indicate that economies of scale exist in their electronic products and services that would preclude potential entrants to their segment of the mortgage marketplace.

Technological change also is the basis of the learning curve (Porter, 1985). The learning curve results from improvements in such things as Computerized Loan Origination systems via
laptop loan origination, multiple service providers on a network, and software to manage portfolio underwriting—all of which are types of technological change. Technological change can lead to other absolute cost advantages such as low-cost service enabled through the direct linkages of the loan originator and investor. It can also alter the amount of capital required for competing in an industry. The shift from warehousing loans to continuous process technology via table funding for loan origination has significantly increased the capital requirements in computer hardware but has dramatically reduced the capital requirements of warehousing loans.

Technological change can also influence access to distribution by allowing role providers to circumvent existing channels (as demonstrated by Fannie Mae’s and Freddie Mac’s capability to go direct to the consumer and originate loans) or, conversely, by increasing industry dependence on channels (if Fannie Mae and Freddie Mac become the primary source of funding then lenders and role providers will become dependent on the agencies network to process transactions).

5.5.5. Technology And Buyer Power in the Mortgage Marketplace

Technological change can shift the bargaining relationship between role providers and their buyers. Investors via mortgage wholesalers mandate loan originators to use standardized electronic forms to expedite the transactional process and reduce redundancy in data entry. The role of technological change in differentiation and switching costs is instrumental in determining buyer power. Only a third of the industry participants interviewed indicate that the buyers of their electronic products and services never face switching costs. Eight of the thirteen respondents indicated that buyers face switching costs. Despite efforts to standardize the transactional process using EDI, there still remains a large number of role providers using proprietary software and systems that link only certain trading partners to the transactional process.

Technological change can also influence the ease of backward integration by the buyer, a key buyer bargaining lever. In the appraisal software segment of the mortgage marketplace,
for example, appraisal companies are acquiring appraisal software vendors and integrating the products and services into their own operation as well as providing excess capacity to other industry participants.

5.5.6. Technology And Supplier Power in the Mortgage Marketplace

Technological change can shift the bargaining relationship between role providers and their suppliers. It can eliminate the need to purchase from a powerful supplier group or, conversely, can force industry participants to purchase from a new, powerful supplier. Technological change also allows a number of substitute inputs to be used in a role provider's product, creating bargaining leverage against suppliers. For example, the use of instant consolidated credit reports, flood hazard reports, title reports and property valuation reports has minimized the need for underwriters to commission full blown reports that require more than several days to produce but yield relatively the same results. Technology investments by role providers can also allow the use of multiple suppliers by creating in-house knowledge of supplier technologies. This can eliminate dependence on any one supplier. There are approximately 1,200 credit reporting companies that obtain their data from three main repositories, TRW, Equifax and Trans Union. Buyers of credit reports only need to understand the role of the repositories and can choose from a vast number of suppliers.

5.5.7. Technology And Substitution in the Mortgage Marketplace

Perhaps the most commonly recognized effect of technology on the mortgage marketplace structure is its impact on substitution. Substitution is a function of the relative value to price of competing products and the switching costs associated with changing between them. Technological change creates entirely new products or product uses that substitute for others, such as real estate agents taking loan applications in place of the traditional loan officer or mortgage broker. Statistical property valuation methodologies are replacing traditional field
appraisal reports, and consolidated credit reports are replacing multiple party reports. Technological change influences both the relative value/price and switching costs of substitutes. The technological battle over relative value/price between role providers producing close substitutes is at the heart of the substitution process.

Industry participants indicate that substitute products do exist in the mortgage marketplace and that their products and services are priced competitively. Appraisal companies and title companies both face competition from similar firms offering similar services as well from lenders who are integrating appraisal management and title services into their business processes.
6 CONCLUSION

Electronic integration is allowing mortgage marketplace participants to engage in new modes of competition through coordination and exploitation of complementary services across different product market segments.

6.1. New Modes of Competition

Electronic integration is creating new modes of competition for industry participants by expanding roles, increasing alliances, expanding the boundaries of the network and allowing industry participants to be differentiated low cost producers.

Individual borrowers using a personal computer may now access specialized electronic loan information providers such as HomeFair, America Online or Compuserve, which provide loan information that includes current loan rates, availability of services and on-line loan application. Through a specialized contract or partnership with different loan originators, lenders, software vendors and communication network providers, on-line service providers are adding value to their product and service offerings by coordinating with mortgage marketplace industry participants.

Another new service in the business network is the one-day appraisal report. Here the loan originator and appraisal management company link to implement the ordering of an appraisal report that is generated by a local appraisal firm within 24 hours using statistical regression analysis on a local property database to generate an approximate value for the property being purchased.

Another example of coordinated, across market competition is illustrated by real estate companies who provide prospective borrowers with access to loan information, application and services through Computerized Loan Origination systems linked to multiple lenders. Specifically, real estate companies, in partnership with a mortgage broker or lender and insurers (flood, hazard, title and mortgage), can provide discounts on a mortgage loan and services if
the borrower “one-stop shops” for the combined services at the real estate agents office thereby minimizing redundancy in the input data to the service providers. Such initiatives transform and create incentives for borrowers to purchase products from a specific service provider whose services are immediately available at the real estate agents office. These emerging linkages may also lead to more complex business ties between real estate companies and lenders, transforming the relationship from a specialized contract to alliances. This is the result of the need to coordinate product and service offerings.

6.2. Electronic Integration and Emergent Business Network Strategies

Consistent with prior studies of electronic integration (Porter and Millar 1985; Rockart and Scott Morton 1984) I observed that firms undertook electronic integration strategies for product and service differentiation through technology and information leverage. Technology leverage strategies enable differentiation by exploiting the performance/cost improvements in information storage, communications, processing and input/output (Venkatraman and Kambil 1991). Information leverage strategies enable differentiation through using new information made accessible by information technology applications to alter business processes, products and services. Differentiation strategies are fundamental to creating disequilibrium in markets and enabling firms to achieve higher than normal profits (Porter 1980; Tirole 1988).

Coordination across roles is also used to exploit weak consumption externalities across markets, for example, The Credit Network leverages information assets gained from credit reports into the sale of portfolio analysis services to Wall Street analysts and underwriters. This strategy exploits consumption externalities across two weakly coupled markets (credit reporting, portfolio underwriting) through internal coordination leveraging electronic integration. Another example is the weak tie between Computerized Loan Origination systems and their use by real estate companies for originating loans and selling services. Real estate companies can benefit from this weak interdependence and positive externality by offering “one-stop shopping” services. This way real estate companies convert a weak interdependence between activi-
ties into a strong interdependence. I note that the exploitation of weak interdependencies across markets and roles is a key new source of competitive advantage from electronic integration. As firms must incur extra costs for such coordination it establishes barriers to entry for new firms and also increases the scale and capital requirements of existing firms in the inter-related markets.

Finally, I observe that firms will seek to develop strategies which effectively combine information leverage with technology leverage as a means for electronic integration. For example, I noticed a shift in the mortgage marketplace from technology leverage (e.g., automated underwriting) to strategies combining technology and information leverage (e.g., the coupling of automated underwriting with central processing, etc.). In contrast to technology leverage strategies which may be quickly matched by competitors (Benjamin et. al., 1988), information leverage strategies increase in value as more useful information is acquired and utilized as an asset by the firm.

6.3. Electronic Integration: Two Frontiers

The first frontier is the simple implementation of EDI or inter-organizational systems to facilitate loan production. The industry is rapidly embracing technology through the creation of partnerships and alliances to provide both convenient and efficient “one-stop shopping” services to consumers. The implementation of EDI does not in itself create new modes of competition but simply commoditizes the existing product and services. There is fear among industry participants’ that standardization and commoditization will eliminate their already slim profit margins. To a certain degree, this dilemma of efficiency and rapid erosion of profit margin is a predicament. On the other hand, continued participation in the mortgage marketplace will require the implementation of standardized tools as a common and necessary element of the transactional process.

The second frontier, and competitive advantage, rests with individual industry participants willingness to differentiate their products and services as a direct result of the effi-
iciencies afforded through electronic integration. Industry participants can be both a low cost producer and offer a differentiated product of service in the mortgage marketplace. This has been demonstrated in other industries and is exemplified by the exploratory research contained in this report.

Standardization is a vehicle that brings with it efficiency and the capacity to exploit new opportunities. The development of a self-sufficient standardized transactional process is occurring today through EDI and now is the time for industry participants to develop strategies critical to the deployment of new products and services.
## APPENDIX A: ROLES-LINKAGE OPERATIONALIZATION OF THE MORTGAGE MARKETPLACE--PRIOR TO ELECTRONIC INTEGRATION

<table>
<thead>
<tr>
<th>ROLES</th>
<th>Service Producer</th>
<th>Service Integrator</th>
<th>Network Provider</th>
<th>Buyer</th>
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<tbody>
<tr>
<td>Product Service Provider</td>
<td>Loan Origination</td>
<td>Loan Underwriter</td>
<td>Hazard Insurance</td>
<td>Title Insurance</td>
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<tr>
<td>Consumer/Borrower</td>
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<tr>
<td>Loan Origination</td>
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<tr>
<td>Loan Processor</td>
<td>SC, H</td>
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<td>Appraisal Company</td>
<td>M, SC</td>
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<td>Credit Agency</td>
<td>M, SC</td>
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<tr>
<td>Loan Underwriter</td>
<td>H, SC, M,SC, SP</td>
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<tr>
<td>Hazard Insurance</td>
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<td>Closing Doc Provider</td>
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<td>Shipping &amp; Delivery</td>
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<td>FNMA FHLMC</td>
<td>MD, MD, MD, MD</td>
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<tr>
<td>Secondary Market</td>
<td>MD, MD, MD, MD</td>
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<td></td>
</tr>
</tbody>
</table>

Key: M = market; SC = standard contract; SP = specialized contract; A = alliance; H = hierarchy; MD = mandate, blank if no linkage exists
Appendix A summarizes the identified role providers and linkages between providers prior to electronic integration. Using the roles-linkage matrix, roles identified from literature review and by industry experts were first categorized within the matrix along the horizontal and vertical axis using the five generic(simplified) roles of product producer, service producer, service integrator, network provider(electronic network), and buyer. Corresponding vertical and horizontal role cells within the matrix are blocked out because a role provider cannot transact with itself for the purposes of this analysis.

Starting with the role provider located on the left hand side of the horizontal axis(Consumer/Borrower), linkages were identified between the selected role provider and each of the other role providers located along the vertical axis moving down. If a linkage did not exist, then the cell was left empty. The matrix consolidates and demonstrates the nature of transactions between each of the role providers identified prior to electronic integration.
## APPENDIX B: Roles-Linkage Operationalization of the Mortgage Marketplace -- Upon Emergence of Electronic Integration

<table>
<thead>
<tr>
<th>ROLES</th>
<th>Product Producer</th>
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<td>M.SPC. A.H</td>
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<td>Secondary Market</td>
<td>MD</td>
<td>MD</td>
<td>MD</td>
<td>MD</td>
</tr>
</tbody>
</table>

*Servicing: Master Servicing, Sub-Servicing

**Data Management: Appraisal Management, Fee Panel Management, Data Property Services, Multiple Listing Service

Key: M = market; SC = standard contract; SpC = specialized contract; A = alliance; H = hierarchy; MD = mandate; blank if no linkage exists

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Appendix B summarizes the newly identified role providers and linkages between providers upon emergence of electronic integration. The same methodologies used to categorize roles prior to electronic integration were also used to categorize the newly identified roles obtained from the interview questionnaire.

Starting with the role provider located on the left hand side of the horizontal axis (Consumer/Borrower), linkages were identified between the selected role provider and each of the other role providers located along the vertical axis moving down. If a linkage did not exist, then the cell was left empty.

By comparing the relationships documented by others prior to electronic integration to relationships documented in this research upon emergence of electronic integration, it is interesting to note the emergence of alliances among role providers in several areas: lending, appraising, insuring and servicing. It is also interesting to point out the departure from a relatively linear transactional process to a more concentric transactional process in which multiple phases of the transactional process are completed simultaneously, thereby greatly decreasing the loan processing period.
APPENDIX C: EDI AND ASC X12 STANDARDS IN THE MORTGAGE MARKETPLACE

EDI refers to the process by which one computer transmits data directly to another computer, which then uses the data in some productive way. X12 is a set of specifications for the structure of the data transmission. In other words, X12 governs how one computer will order and identify the data the two computers will exchange. This structure is important because it helps one computer to recognize the information that the other computer sends it.

Industry participants need to fully understand transaction sets to put information in a structure that their trading partner can accept and understand. Unlike many paper forms, their trading partner—and all of its X12 capable competitors—have agreed to accept the same standard transaction set. Figure 9 indicates which X12 transactions are available in the mortgage marketplace, as well as the type of industry participant (trading partner) that uses them. Lender transmitted transactions are shown above the industry participant boxes, and response transactions are shown below. Although not shown in the diagram, the X12 864 text message and 997 functional acknowledgment are used by all types of trading partners.

Mortgage Industry Transaction Sets

The following is a list of mortgage marketplace transaction sets:

**Lending/Origination**:

Residential Loan Application - Transaction Set 201 can be used to transfer the data contained in the Uniform Residential Loan Application between mortgage lenders, mortgage service vendors, insurance companies, credit reporting agencies and secondary market organizations.

Mortgage Credit Report Order - Transaction Set 833 contains the format and establishes the data contents that can be used by a mortgage originator to request, track, and cancel a series of value-added, investigative credit reports which are typically required in mortgage lending. It is a collection of borrower information that is needed to order a mortgage credit report.

Mortgage Credit Report - Transaction Set 200 contains the format and establishes the data that can be used to transmit mortgage credit reports which are the electronic response to credit report orders.
APPENDIX C, FIGURE 1: ASC X12 STANDARDS IN THE MORTGAGE INDUSTRIES

<table>
<thead>
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<tr>
<td>201</td>
<td>824 Application advice</td>
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<td>833 Mortgage credit report order</td>
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<td>262</td>
<td>864 Text message</td>
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<td>263</td>
<td>872 Mortgage insurance application</td>
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<td>925 Claim tracer</td>
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<td>265</td>
<td>926 Claim tracer report/status reply</td>
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<td>266</td>
<td>997 Functional acknowledgement</td>
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<tr>
<td>811</td>
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</table>

Residential Appraisal Request - Transaction Set 261 can be used to initiate, modify, or cancel requests for residential appraisal among mortgage lenders, real estate agents, appraisal companies and interested parties.

Residential Appraisal Report - Transaction Set 262 can be used for the transfer and reporting of mortgage appraisal information between mortgage brokers, mortgage servicers, mortgage service bureaus and secondary mortgage market organizations.
Residential Mortgage Insurance Application - Transaction Set 872 can be used by a mortgage originator to request mortgage insurance from a mortgage insurer and provide supporting information needed to obtain a mortgage insurance commitment on one or several residential mortgage loans.

Residential Mortgage Insurance Application Response - Transaction Set 263 can be used by a mortgage insurance company to communicate the receipt and disposition of a residential mortgage insurance application transaction set (872). It is used to provide the mortgage originator with the results of the insurance application and, if accepted, will provide basic information about the insurance coverage. It is not intended to replace the legal commitment (Certificate of Coverage of Insurance) which will continue to be delivered in its current form.

Real Estate Title Evidence - Transaction Set 197 can be used to transfer information contained in standard title reports, title commitments and title policy forms among title insurers, title insurance agents, real estate attorneys, lenders, appraisers, contractors and others in the real estate process.

Loan Verification Information - Transaction Set 198 can be used to transfer information contained in standard mortgagor information verification forms for deposits, employment and housing expenses (mortgage/rent) among lenders, employers, credit agencies and financial institutions participating in the loan underwriting process.

Mortgage Settlement Information - Transaction Set 199 can be used to transfer mortgage settlement information among mortgage lenders, real estate closing agents and other interested parties.

Real Estate Title Insurance Services Order - Transaction Set 265 can be used by a real estate agent, mortgage lender or other real estate company to order, update, or cancel title services from a title insurance services company.

Servicing:

Mortgage Loan Default Status - Transaction Set 264 is used to initiate two types of monthly reports that will facilitate monitoring of delinquent mortgage loans. It can be used by mortgage lenders to submit advance notification of delinquent mortgage loans that could potentially result in foreclosure activity leading to the collection of a third-party guarantee/insurance benefit. This standard can be used by mortgage lenders to file claims with both government agencies and private mortgage insurers. This standard was developed by HUD in conjunction with the mortgage data standards work groups and the X12 Insurance Subcommittee.

Mortgage Record Change - Transaction Set 266 can be used by mortgage lenders to inform mortgage insurers of mortgage loan record changes. It provides the format to allow all notifications involving the sale of mortgages and updates to mortgage portfolios as a result of mortgage loan activities, such as mortgage assumptions, and transfers. For insurance organizations other than property and casualty companies, this standard will also allow notification of termination or reinstatement of mortgage insurance. This transaction set was developed by HUD in conjunction with the mortgage data standards work groups and the X12 Insurance Subcommittee.

Application for Mortgage Insurance Benefits - Transaction Set 260 can be used by mortgage lenders to file claims with both government agencies and private mortgage insurers in the event that defaults or foreclosure activity allow for the collection of a third-party guaranteed insurance benefit. The information in this format will allow mortgage insurance claim payments to be requested similarly whether they be to an investor, insurer, or guarantor. This transaction set
was developed by HUD in conjunction with the mortgage data standards work groups and the X12 Insurance Subcommittee.

**Hazard Insurance Invoice** - The Consolidated Service Invoice/Statement - Transaction Set 811 can be used by hazard insurance companies to invoice hazard insurance renewals.

**Hazard Insurance Payment** - The Payment Order/Remittance Advice, Transaction Set 820, can be used for (1) making a payment; (2) sending a remittance; or (3) making a payment and sending a remittance advice related to hazard insurance renewal payments.

**Real Estate Inspection Request** - Transaction Set 206 establishes the data composite used by mortgage lenders, insurance companies or others to initiate, modify, or cancel a site inspection by field service organization, home inspection company, insurance vendor or other industry participant.

**Real Estate Inspection Result** - Transaction Set 207 establishes the data composite that can be used among field service organizations, home inspection companies, insurance inspection vendors and other industry participants to report the results of site inspections.

**Secondary Marketing:**

**Secondary Mortgage Market Loan Delivery** - Transaction Set 202 can be used to report mortgage loan information (i.e., borrower property, underwriting information, etc.) among mortgage lenders, mortgage service vendors and secondary mortgage market organizations.

**Secondary Mortgage Market Investor Report** - Transaction Set 203 can be used for the transfer and reporting of mortgage servicing information between mortgage servicers, mortgage service bureaus and secondary mortgage market organizations.

**Mortgage Note** - Transaction Set 205 establishes the format that is used by mortgage originators, settlement agents, warehouse lenders, document custodians, secondary mortgage market entities and other industry participants to exchange the data comprising the mortgage note and mortgage characteristics.
APPENDIX D: MORTGAGE MARKETPLACE ROLES

**ORIGINATION** is the creation of mortgage loans secured by real estate. In the origination phase, loan originators (loan officers, mortgage brokers and real estate agents) meet with home buyers to complete loan applications which detail information on the borrower's employment, income, assets and liabilities, and credit condition, in addition to information on the real estate being purchased or refinanced.

**PROCESSING** is the gathering of supporting loan documentation such as credit reports, bank deposit verifications, employment verifications, W-2s, past tax returns, and appraisal reports. These documents are passed on, along with the completed loan application, to underwriting for evaluation.

**APPRAISAL** is an opinion or estimate of the value of a property by one qualified to estimate the value of real property.

**CREDIT REPORTING** is an evaluation of a person's capacity (or history) of debt repayment reported by a credit agency.

**UNDERWRITING** is the evaluation of supporting loan documentation and the ultimate approval or denial of the loan. Certain standard underwriting criteria must be met to ensure that the borrower qualifies for the loan, is able to repay the loan, and that the loan is salable in the secondary mortgage market.

**HAZARD INSURERS** provide insurance that protects against certain risks and losses incurred from fire, storms, or vandalism.

**TITLE COMPANY/INSURERS** provide services that include title examination to real estate and/or the issuance of title insurance. Title insurance is an insurance policy that protects the holder from loss sustained by defects in the title. Services also include title reports: a document indicating the current state of the title, and title searches: an examination of public records to determine ownership and encumbrances affecting real property.

**MORTGAGE INSURERS** provide a policy that guarantees repayment of a mortgage loan in the event of death or, possibly, disability of the mortgagor. It also provides protection for the lender in the event of default, usually covering up to 25% of the amount borrowed.

**CLOSING** is the execution of mortgage documents and the disbursal of mortgage funds. Closed loans are held in inventory until they are sold to investors.

**SHIPPING & DELIVERY** is the physical packaging and transfer of loan documents to an investor, according to specific requirements of the loan sale.

**SERVICING** or loan administration is the collection of mortgage payments from borrowers and the remittance of funds to investors. Servicing mortgage bankers maintain escrow's for the pay-
ment of real estate taxes and property insurance, as well as perform collections on delinquent loans.

MARKETING is the buying and selling of mortgage loans. Loans are sold, singularly or in pools, directly to investors or through middlemen (conduits, brokers, and investment bankers). Mortgage bankers sometimes buy loans when they need to meet certain loan volume requirements to consummate a loan pool sale. Marketing is one of the riskiest activities that mortgage bankers engage in because of constantly changing interest rates.

LENDERS make funds available to borrowers and are both depository and non-depository institutions. Depository institutions include savings and loans (S&L's), commercial banks, mutual savings banks and credit unions and primarily participate in the primary market. Non-depository institutions include mortgage companies, insurance companies, pension funds and individual investors and primarily participate in the secondary market, except mortgage brokers and mortgage bankers who are active in both the primary market and secondary market.

WHOLESALERS buy (hold) loans for institutions not large enough to warehouse their loans to cumulate a pool large enough to sell to an investor.

WAREHOUSING is the funding of mortgage loans in inventory. An outside finance source (called a warehouse line) is obtained, usually from a commercial bank. The warehouse line is short-term financing that is continually being lent and repaid, similar to a revolving credit account.
APPENDIX E: THE AGENCIES AND THE SECONDARY MARKET

AGENCIES

Special attention is given here to describe the roles of the agencies because they represent the driving force behind the secondary market and can account for the increased level of standardization and automation in the mortgage marketplace.

Ginnie Mae - Government National Mortgage Association (GNMA)

Creation. Ginnie Mae was created by Congress in 1968 in conformance to Title III of the National Housing Act, 12 U.S.C. 1716, et seq.

Mission. Through secondary market mechanisms, Ginnie Mae supplies and stimulates mortgage credit that supports the government's housing objectives by assisting that segment of the housing market for which conventional financing is not readily available.

Functions. Ginnie Mae guarantees the timely payment of principal and interest for pass-through mortgage-backed securities representing interests in mortgages insured or guaranteed by FHA, VA, and the Farmers Home Administration. The securities are issued by lenders that are HUD approved mortgagees.

Operations. Under various special assistance programs, Ginnie Mae purchases below-market rate loans and sells the loans to investors at a discount. Ginnie Mae no longer issues new commitments under the special assistance programs but is continuing to purchase mortgages for which commitments were previously issued.

Financing. Special assistance purchase programs are financed by Treasury borrowings, interest received on portfolio holdings, and commitment fees. The securities guaranty program is financed by application and guaranty fees paid by the issuers of the securities.

Organization. Ginnie Mae is a wholly-owned governmental corporation within HUD. The president of Ginnie Mae, a Presidential appointee, acts under the general policy direction of the Secretary of HUD. The corporation operates from an office in Washington, D.C., and it has no branch offices.
Fannie Mae - Federal National Mortgage Association (FNMA)

Creation. Fannie Mae was created by Congress in 1938 as a wholly-owned government corporation. In 1954, it became a mixed ownership entity, owned partly by private shareholders and partly by the Federal government. In 1968, in conformance to Title III of the National Housing Act, 12 U.S.C. 1716, et seq., it was partitioned into Ginnie Mae and Fannie Mae, with Fannie Mae owned by private shareholders.

Mission. Fannie Mae is a major part of the secondary market for residential mortgages, providing additional liquidity to the mortgage market and thereby improving the distribution of investment capital available for financing the construction and sale of housing. Initially, it provided a secondary market for FHA and VA mortgage loans only, but it was authorized in 1970 to purchase conventional mortgage loans.

Functions. Fannie Mae purchases single-family and multifamily FHA, VA, and conventional mortgages. It functions as a long-term investor in residential mortgages and conducts a mortgage-backed securities program for conventional and seasoned FHA and VA mortgages.

Operations. Fannie Mae provides mandatory delivery commitments for fixed-rate, graduated payment, and growing equity first mortgage FHA and VA loans, FHA adjustable-rate first mortgages, conventional fixed-rate and rate-capped adjustable-rate first mortgages, and conventional, FHA, and VA second mortgages. Rate-lock standby commitments are available, and they may be converted to one-month mandatory delivery commitments for FHA and VA fixed-rate first mortgages, FHA and VA graduated payment first mortgages, conventional fixed-rate first mortgages, and conventional rate-capped adjustable-rate first mortgages.

Financing. Fannie Mae's purchase activities are financed principally by the cash flows from its mortgage portfolio and a large volume of issuance's of debentures and short-term discount notes. Its stock is publicly traded. In the past, Fannie Mae required sellers of loans to purchase a certain amount of its stock. Although this requirement has been eliminated, some servicers are still required to retain a set amount of Fannie Mae stock. Fannie Mae sells conventional
and seasoned FHA and VA mortgage pass-through securities. Also, a portion of Fannie Mae's earnings are generated from commitment fees from its mortgage purchase programs and guaranty fees from its mortgage-backed securities operations.

**Organization.** Fannie Mae's headquarters are in Washington, D.C. It operates from five regional offices located in Atlanta, Chicago, Dallas, Los Angeles, and Philadelphia.

**Freddie Mac - Federal Home Loan Mortgage Corporation (FHLMC)**

**Creation.** Freddie Mac was created by Congress in 1970 in conformance to Title III of the Emergency Home Finance Act of 1970, 12 U.S.C. 1451, et seq.

**Mission.** Freddie Mac enhances the liquidity of mortgage investments and increases the availability of funds for mortgage lending by developing and maintaining a nationwide secondary market for conventional residential mortgages.

**Functions.** Freddie Mac links mortgage lenders and capital markets through its purchase and sales functions. It purchases conventional single-family (one- to four-unit) fixed rate and adjustable-rate loans, FHA, and VA fixed rate loans, multifamily loans, and conventional second mortgage loans. Freddie Mac buys principally from savings and loan institutions, mortgage bankers, commercial banks, and HUD-approved mortgagees.

**Operations.** Freddie Mac purchases single-family, multifamily, and second mortgage loans under mandatory and optional delivery programs that are offered daily.

**Financing.** Freddie Mac uses a mix of financing alternatives to accomplish its objectives and finances most of its mortgage purchases through Participation Certificate (PC) sales. Another type of mortgage-backed security, the Guaranteed Mortgage Certificates, have been sold periodically. The corporation can also finance its operations through the issuance of debt obligations such as long-term debentures and short-term discount notes, PC reverse repurchase agreements, and lines of credit obtained from commercial banks. Since 1983, Freddie Mac has also issued CMOs periodically, which are debt obligations secured by mortgages.

**Organization.** Freddie Mac is a Congressionally-chartered corporation that is taxed as a private entity and has a three-member board of directors appointed by the President of the
United States. These directors serve also as the Federal Home Loan Bank Board, which supervises the operations of the 12 Federal Home Loan Banks and all federally chartered savings institutions. Originally capitalized at $100 million through subscriptions of non-voting common stock purchased by the Federal Home Loan Banks, Freddie Mac issued preferred stock in 1984, which may be held and traded by federally-chartered savings institutions.

SECONDARY MARKET

As shown in Figure 4, in the secondary market system, the borrower obtains a loan from a mortgage originator. This includes mortgage companies, banks, and thrifts that originate loans they intend to sell. The mortgage originator packages the loan with other loans and then either sells the package as a whole or keeps the package and sells securities that are backed by the loans in the package. If the originator is not large enough to package its own mortgages, it will sell the loans to wholesaler.

APPENDIX E, FIGURE 1: MORTGAGE LOAN DELIVERY SYSTEM: SECONDARY MARKET

There are two sources of buyers (investors) for this secondary market. The first is private investors such as commercial banks, savings and loans, pension plans, trust funds, and other investors who were looking for low risk, long term returns on their investments. The second group of investors, relatively new in the investment business, is the investment "pools" or "poolers" who are looking for more security in their investments. This results in two primary investors in the secondary market: (1) the pure portfolio purchasers who are looking for the initial investments with an attractive return, and (2) the "poolers" who are looking for the longer term, more stable return.

Not all mortgage bankers are involved in each activity of the mortgage lending process. In fact, in the past decade, mortgage bankers have taken on a high degree of specialization. It is not unusual to find mortgage bankers that only originate loans (correspondents), only service
loans (wholesalers and sub-servicers), or only purchase existing loans to form securities (conduits). All of these specialties have an equally important niche in the real estate finance industry.

Mortgage bankers profit from fees collected from originating, selling, and servicing mortgage loans. Origination and marketing are traditionally break-even operations in residential lending because of the high costs and risks involved in these activities. Servicing profits are the predominant reason mortgage bankers are in business. Such profits are attributable to high-volume efficiencies of scale.
APPENDIX F: COMPETITIVE ADVANTAGE SURVEY

The following survey was completed by the 13 industry participants. The survey was conducted over the telephone to maintain consistent interpretation of questions.

How does your firm compete? (Check those that apply) *Note: Some participants selected multiple categories.

5. Low-cost producer in the mortgage banking industry. Does your firm compete effectively by attempting to offer standard products or services because they are at the lowest cost compared to your competitors.

9. Unique mortgage banking product or service differentiation. Does your firm compete effectively by attempting to offer unique products or services compared to your competitors.

3. Cost focus in target segment of the mortgage industry. Does your firm compete effectively by attempting to offer specific products or services to a specific segment of the industry because they are at the lowest cost compared to your competitors.

12. Differentiation focus in target segment of the mortgage industry. Does your firm compete effectively by attempting to offer unique products or services to a target market in the industry compared to your competitors.

4a POTENTIAL ENTRANTS TO YOUR MARKETS

1.) Do economies of scale exist in your electronic products and services that would preclude potential entrants?

2.) Are your electronic products and services differentiated enough (brand identification and customer loyalty) to preclude potential entrants?

3.) Are proprietary electronic product technologies employed that preclude (potential) competitors from the market?

4.) Does a learning or experience curve exist for a proprietary process that precludes (potential) competitors from the market?

5.) Do governmental policies and regulations limit or foreclose entry to (potential) competitors?

4b EXISTING COMPETITORS IN THE INDUSTRY

1.) Do numerous or equally balanced competitors exist offering the same electronic products and services as your firm?

2.) Are there high fixed or research and development costs to develop your electronic products and services?

3.) Are your electronic products or services perceived as a commodity?

4.) Is there risk of over-capacity for your electronic product or service high?

5.) Do diverse competitors view the market for your electronic products and services as both a primary market and outlet for excess capacity?

6.) Do competitors sacrifice profitability to gain market share of your electronic products and services?
### 4c SUBSTITUTE PRODUCTS

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### 4d BUYERS

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### 4e SUPPLIERS

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REFERENCES


