

The State of Technology Use in the U.S. Mortgage Industry

by Jeff Lebowitz

It has become a broadly accepted axiom that automation is essential to a well run mortgage operation. Despite the persuasiveness of the idea, not all mortgage lenders in the U.S. have automated the most basic of operational functions. There remain large gaps between general perceptions and industry actions.

LEVELS OF AUTOMATION

The servicing function is pervasively automated. According to MORTECH 96, 98% of servicers have automated the basic servicing functions. Service bureaus began offering technology services targeted at servicers more than 20 years ago. This is the first function to be automated, and we would expect universal automation among servicers.

Front end process automation is another matter altogether. In 1996, 82.7% of mortgage companies reported having automated loan production; and, only 49.6% have automated their secondary marketing operations.

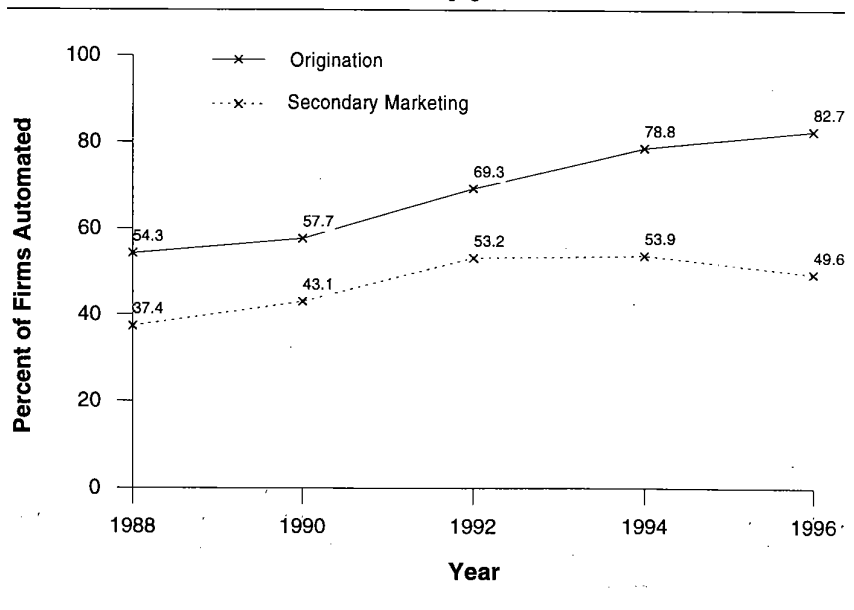
There has been a measurable decline in the rate of firms automating front-end functions. The average annual growth rate of firms having automated origination has declined from 6.5% (1988-1996) to just 1.95% (1994-

96). A decline in the rate of growth in new entrants is normal as the technology and the industry mature. If the growth of origination system use continues as occurred in 1994-1996, however, the penetration rate of origination automation will not equal that of servicing automation until the year 2004.

The decline in the proportion of lenders that have automated secondary marketing was an

unexpected result. Since 1994, the percentage of the industry with automated secondary marketing operations has declined by an average of 2.2% annually. Less than half of the industry is automated, and the growth rate in secondary marketing technology has turned negative. The reduction in the proportion of firms automating secondary marketing occurs while more than 90% of lenders actively sell new production into the secondary market. Why

Figure 1. All Firms Yet to Automate Basic Mortgage Functions



Source: MORTECH

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has the decline in automation levels of such a critical business function occurred?

DIFFERENCES IN OPINIONS ABOUT TECHNOLOGY

In our research into mortgage industry trends, we long ago learned to be wary of generalizations and to be cautious about relying too heavily on our personal experience.

The truth is that only a relatively small minority of lenders are convinced of the strategic value of technology investing. According to MORTECH 96, 22.8% of lenders see technology as being strategic to their businesses. The great majority (71.1%) consider technology merely to be a complement to their day-to-day operations.

Table 1. Lenders Assessment of the Importance of Technology

| <i>View of Technology</i> | <i>% of Lenders</i> |
|---------------------------|---------------------|
| Strategic to the Business | 22.8% |
| Tactical Support | 6.2 |
| Operational Day-to-Day | 71.1 |

Source: MORTECH 96 © SSP/RES Research

If seven out of 10 mortgage lenders are not convinced that technology is determinant of their position in the market place, it is likely that technology will not be incorporated in their plans to allocate business resources. This, in part, may explain why the proportion of lenders investing in marketing decision support technology has declined.

SUPPLIERS OF SUBSTITUTE SYSTEMS

Another explanation for the decline in secondary marketing automation may be that lenders have found an alternative source of information needed to manage their pipelines and inventory of loans to be sold—the auto-

mated underwriting system (software tools containing a statistical model or rules that define the characteristics of an acceptable mortgage applicant).

By some measures, automated underwriting systems have taken the industry by storm. One-fourth of MORTECH 96 respondents indicate that they have implemented an automated underwriting system. Another 27.4% of respondents are either budgeted for or planning to implement an automated underwriting system. At this rate, more firms will be using automated underwriting technology than those that use conventional secondary marketing systems.

This is a remarkable change in the operational methods used by lenders. Given that Freddie Mac's Loan Prospector™ made its commercial debut in February 1995, the adoption rate of automated underwriting systems has been nothing short of fantastic.

Table 2. Mortgage Lenders' Use of Automated Underwriting Systems

| <i>Status of AU</i> | <i>% of Lenders</i> |
|---------------------------|---------------------|
| Implemented or Prototyped | 25.1% |
| Budgeted | 7.2 |
| Planned | 20.2 |
| Studied | 25.0 |
| Not Planned | 22.5 |

Source: MORTECH 96 © SSP/RES Research

More than 70% of automated underwriting systems in use are those from government-sponsored mortgage enterprises (GSEs), Freddie Mac and Fannie Mae. GSE systems are designed to displace secondary marketing systems but ultimately will incorporate most of the secondary marketing logic of determining which loans are acceptable to the

secondary market and for which investor's purchase commitment. While MORTECH 96 did not pose the question directly to respondents, it is conceivable that use of GSE automated underwriting systems has obviated many lenders' perceived need to invest in secondary marketing technology.

Displacing secondary marketing systems is likely to be an unintended effect of GSE automated underwriting technology. But, for lenders who are originating predominately conforming product and who are selling most of their current production, closer logical and operational ties to the agencies is a natural occurrence.

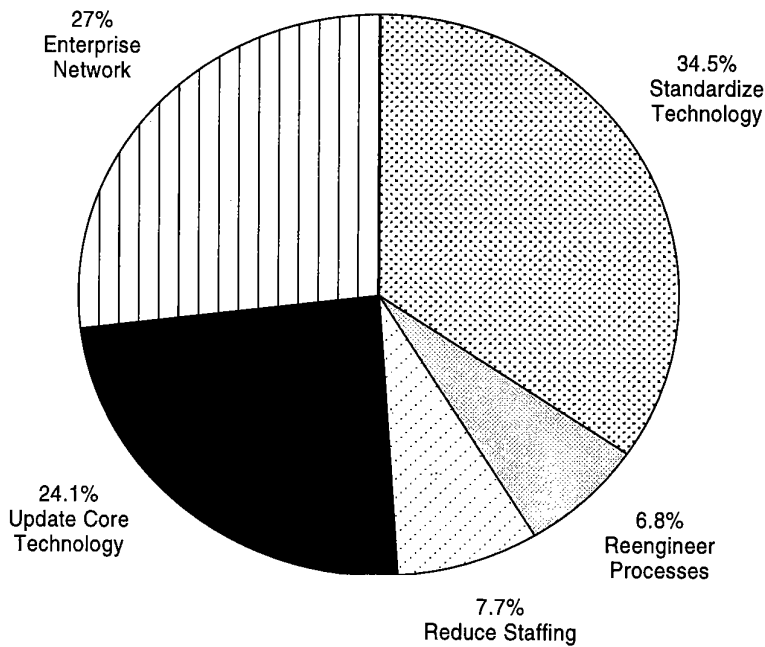
PERCEIVED BENEFITS FROM TECHNOLOGY USE

A key question is, "What do lenders expect to obtain from their investment in technology?" MORTECH 96 surveyed lenders' technology objectives for the next two years. Here, again, there were some surprising results.

The primary technology objective for the greatest proportion of lenders (34.5%) was to standardize the technology used throughout their companies. From MORTECH 96, we also know that almost one-half of lenders use core systems obtained from multiple systems vendors. Use of multiple vendors affords lenders the opportunity of selecting the best technology for each area of their business. Buying systems this way, however, creates operational complexity resulting from differing user interfaces, dissimilar data definitions and often different operating systems.

Operational complexity, in turn, creates additional expenses for user training, added documentation, and increased staff and time for data and systems maintenance. The large segment of lenders that want to standardize technology are, in a sense, consolidating rather than increasing their use of technology.

Figure 2. Lenders Consolidate Technology Operations



Source: MORTECH 96

IS TECHNOLOGY STRATEGIC?

Deciding if technology (automation) is strategic is a complex issue. The potential importance of technology in running a mortgage company is not at issue here. Certainly, automated processes may improve the breadth and depth of information available to better management and portfolio decisions. Automation has been proved to reduce cycle times in originating a loan. Customer service is improved through better access to histories of account activities. Cross-selling is made more effective through behavioral modeling. Marginal unit production costs may be reduced by combining auto-

mated systems and personnel to make labor more productive. There is an ever-expanding catalog of the uses and benefits of automation. So why is there any question about the strategic value of technology?

These are critical issues, however. In some cases, technology investment can actually reduce profitability and destroy corporate value. If the level of investment made in technology is high relative to the level of total equity invested in the business, the "capital intensity" (assets divided by revenues) of the business will rise. Should the growth of revenues decline or turn negative, companies will not be able to

spread (amortize) this higher level of investment over the level of production it planned. The new capacity to process business simply would not be fully utilized.

Financial Risks in Technology Investment

Should this situation occur, higher potential labor productivity will not offset the increased investment in technology. The amount of capital employed per worker will rise, thereby decreasing the returns on the company's wage bill. Under these conditions, the operating options available to management will diminish. In all probability, management would determine that their only solution to the problem is to increase the volume of loans processed through the more capital intensive operating configuration. In the face of declining growth and smaller incremental mortgage volume available in the market, this means shifting market share away from other market competitors. In order to increase volume in the short run, the first action of management will be to reduce prices (rates). In this scenario, the amount of invested capital rises, prices are cut, and return on revenues and return on investment (ROI) are reduced. In this way corporate value (net shareholder worth) would be destroyed.

We know that the U.S. mortgage industry is intensely cyclical. Volumes and revenues have been difficult to forecast. As a result, U.S. lenders traditionally have tried to minimize the amount of fixed capital employed in their businesses. There is great pressure to invest in technology and the investment intensity of the business has increased. With the increase in fixed capital in the mortgage business, potential responses to changes in loan volumes have become fewer. Consistent volume increases are required to cover higher fixed capital charges. Also, operational downsizing to accommodate cyclical down turns in the business is made more difficult with higher fixed costs.

Efficiency May Decrease

There is another problem that may occur when investment in technology is increased. If the implementation of technology is done poorly, the firm may become less efficient, rather than more so. In our research, MORTECH 96, we have discovered that 34.5% of mortgage companies have set technology standardization as their primary technology objective. We also know from our research that almost half of lenders buy components of their core banking system from multiple vendors. These data imply that lenders are having difficulty in managing the diversity in their bases of technology. Whether systems components are incompatible, or if they are not integrated, the cost of managing, maintaining and operating technology increases. Data has to be passed from function to function by re-entering the data. Increased time and labor is consumed maintaining the dissimilar systems. Costs to train users increase. User and process documentation becomes more voluminous and complex. Under the weight of these operational burdens, returns on the capital invested in technology may be reduced below management expectations.

We have detected one other trend that would be counter-productive to technology use in the mortgage industry. Our research implies that, on average, origination systems turn over every three years. Such a short systems life expectancy suggests that technology investments may not be fully amortized when changes are being made. If this is true, and if the investments have not been expensed, firms converting to new systems will have to write off the remaining book value of the asset. Certainly these are instances when investment in technology inhibits achievement of business objectives.

Our general interpretation is that much of the industry is going through a temporary adjustment period, as technology becomes more broadly used. There is reason to be more

positive about the future. Mortgage technology vendors are beginning to introduce "open systems" technology platforms, where information from various software applications may be freely exchanged. As these new systems make their way into common use, lenders will be able to eliminate many of the technology management problems that they have experienced. Systems integration will become less problematic, productivity will increase, and systems turnover rates will decline. Systems management costs then will decline and potential returns on technology investment are likely to rise.

The industry still will be left to contend with a cyclical origination market and with industry fragmentation (excess capacity). Little can be done about the former, and capacity consolidation through mergers and acquisitions may alleviate some of the effects of the latter. So, investment in technology will have significant risks for U.S. companies.

AN INDIRECT ANSWER TO THE QUESTION

We are still left with the question of whether technology is strategic. At this point in time, we only can back into an answer.

If technology allows competitors to have better control over the information in their business, to know their customers better and to provide better levels of service, not investing in technology indeed would be strategic, but a strategic error.

It seems to us that assuming a parity strategy—keeping pace with the competitors' use of technology—is the only rational response lenders can make, given the cyclical nature of loan production, the fragmented structure of the industry and fundamentally changing technology. Properly devising a parity strategy, however, requires keeping close tabs on technology developments and understanding well the rate and nature of

technology use among peers. That means researching the competitive situation and integrating technology planning into business planning.

TECHNOLOGY DEFINES STRUCTURE

The elegance of technology by itself will neither win market share nor cause greater profitability. Rather, the general state of technology plays a role in defining the structure of the industry.

In a paper world, little capital is required to run a business. As a result, it takes little effort to fold up shop and leave the business. Under these conditions, firms are small and the industry fragmented. There is little economy of scale, and the fundamental focus of competing is on price (yield).

The introduction of batch data processing by service bureaus translates into a higher level of operational efficiency in the mortgage industry. Particularly in servicing, more work and better control is obtainable for a fraction of the unit cost of purely paper processing. The costs of developing improved servicing technology are spread over a large number of technology users. Larger customers pay more of the costs but are rewarded with lower unit processing costs. By their nature, however, service bureaus provide a standard service to all their customers. Moreover, essentially all mortgage firms now have access to automated servicing support. Little competitive advantage is gained. The fundamental fragmentation of the mortgage industry remains largely similar to what existed before service bureaus brought their technology to the fore.

In recent years, in-house systems have become more prevalent. Larger competitors have asserted their independence from the standard offerings of service bureaus. Having brought automation in-house, large firms have become capable of determining the basis for competing with new products, providing cus-

tomized levels of customer service, and charging differentiated service pricing.

Larger volumes of business more directly translate into economies of scale with in-house systems. Full control is exercised over the nature and timing of operational change. The firms capable of investing and managing the newer technologies have the opportunity to increase the cohesion and effectiveness of their entire enterprise. They can turn their capabilities to providing a higher level of service to borrowers, bankers, and investors.

The higher levels of capital investment employed by large firms, however, increase their dependency on increased processing volumes. Increasing volumes are necessary to realize economies of scale and to recapture their investment. The origination volumes in the U.S. mortgage market have declined from peak levels realized in 1994. In the search for increasing returns on technology investments, large firms have entered a phase of acquiring their competitors. With the new technology profile of the industry, the search for volume will change the landscape of competition forever.

TECHNOLOGIES TO WATCH

Now and in the near future, mortgage company managers have a wide choice of emerging technologies to add to their portfolios of appli-

cations. Loan production, decision support and work design strategies will be amply supported by developments in information technologies.

Of the five key technologies, three (Call Centers/Direct Banking, PC-Based Banking and Internet Banking) pertain to implementing new methods of communication between the mortgage company and borrowers. A fourth (Client Server Computing) permits new forms of distributing information and flexibly linking employees into webs of business functions. All represent a new form of organization, the networked company.

THE NETWORKED COMPANY

With the commercial development of the Internet, it is quickly becoming feasible for all computer hardware and software to become network-enabled. Both consumers and businesses will use computers to conduct everything from business to entertainment over the network.

What is a networked corporation? The term refers to a company that does most of its business using a network, either local or wide area, to connect employees, customers and suppliers. There is a major difference between networking inside the company and companies connecting offices or transacting electronic commerce. Today most mortgage

companies have an internal network connecting employees. According to MORTECH, more than six in 10 companies use a local area network to process loan documentation. In the next five years, these companies will shift their investment attention toward network technology for transacting business electronically.

Electronic commerce will become the fundamental method of conducting business. Electronic commerce is defined by the ability to send an inquiry on product availability, price and other terms over a network. The inquiry is followed by a quote from the provider, an order with electronic verification and money transfer methods. Shipping logistics occur on the network and ongoing customer service occurs online.

Internet Will Become Primary

As the industry turns to electronic commerce, the Internet will become the primary network, with other sub-networks tied in. In a networked world of commerce, whole industries will restructure or even disappear. Any intermediary in a transaction or channel of distribution is vulnerable.

The trouble with most mortgage companies is that they are not yet sure how to adapt to a vision of an industry unified by communication networks. How do they reconfigure their conventional business applications? What effect will such a structure have on their organizations? Where will they obtain the new sets of skills required in a radically different business environment? How should work flows be redesigned to accommodate essentially paperless transactions? What is the best way to ensure adequate data security? To make the necessary technological and operational changes, companies will look for help from outside experts, even to set up a Web server.

Consulting and other professional services are key to the industry's adopting network-centric

Table 3. New Technologies to Watch

| <i>Technology</i> | <i>Application</i> |
|-----------------------------|--|
| Call Centers/Direct Banking | Direct marketing, service, cross selling |
| Data Warehousing | Risk management, target marketing |
| PC-Based Banking | Alternative product delivery system |
| Client Server Computing | Distributed computing environment |
| Internet Banking | Non-proprietary product delivery system |

computing. Training, systems integration, re-engineering and customer-care help desks are prerequisites. A new corporate infrastructure has to be built.

As the industry moves toward electronic commerce, mortgage company managers will be forced to decide which are the core competencies necessary to stay in business. Everything else could be outsourced to operational specialists, such as contract closers and underwriters. A good deal of everyday work can be done on the network. There will be integrators to tie the pieces together.

The Virtual Corporation

The aerospace industry has always worked this way. For specific programs, a general contractor brings together all the specialists required for design, manufacturing, quality control and customer management. Independent work agents sell their skills to the general contractor with the highest bid. Ad hoc configurations of firms and people sell their services and complete their assignments over the net.

This economic system has been referred to as the virtual corporation. High-tech firms in the U.S., such as Microsoft, MCI and Texas Instruments have implemented this model of work. Other industries, such as mortgage, will borrow organizational ideas from these technology leaders.

The initial focus of the networked company is on transacting business between individuals in an enterprise and between enterprises. Once this is accomplished, corporations will use network computing to conduct business with consumers. It could be that personal computers and networking software will be given away to facilitate doing business with consumers.

A very interesting application of networking technology is the "intranet". An intranet is an internal corporate network that carries Internet-developed applications that employ

technologies derived from the World Wide Web.

Initially, companies saw the Internet and World Wide Web as a way to communicate externally, with customers, prospects and the general public. They discovered that the same things that make the Internet and the World Wide Web a useful communications medium could be applied inside their companies.

Once Internet technology is implemented, the basic intranet capability is in place. No new architecture is required. It becomes a simple matter of adapting to corporate requirements. With the basics installed, internal data flows freely. Everything from product guidelines, to pricing and even the company phone book becomes readily available. With an intranet implemented, corporate staff gets ready access to the world, inside and out.

Avoid Process Duplication

The important thing for companies to keep in mind is that they will not be adding another form of communications that duplicates existing processes. Electronic information on an intranet should be replacing paper processes. The intranet symbolizes movement to a new way of conducting business. This is a time for management truly to recast how work is done within the company. Implementing networked-based systems opens the opportunity to reengineer operations.

Network strategies should be formulated centrally and with management's understanding of the importance of the changes to come. Basic work and networking rules have to be established to ensure that the pieces operate well together. Local implementation of applications and systems within the strategy works well if the rules are obeyed. New ways of applying technology accelerate the pace of change. Anticipating fundamental change and planning for these changes requires an increased emphasis on planning.

FINDING THE RIGHT TECHNOLOGY KEY

The greatest risk in not planning for technology change arises from not keeping up with the competition. Rule #1 is to remain at least technologically neutral. It is critical to anticipate the level of technology being employed by direct competitors. Highly profitable companies operate with an up-to-date technology infrastructure. Being too aggressive and investing in unproven technology often results in a cash drain and lowered profitability. The management trick is to build a balanced technology portfolio and find the key that fits.

Scanning available and emerging technology plays an important role in ordering management's investment plans and the infrastructure of the firm. Scanning has three primary objectives:

- Matching applicable technologies to the business strategy
- Comparing available technologies to the current technology portfolio
- Establishing acquisition and implementation priorities

Underlying technology scanning is the discipline of applying strategic business planning techniques to information management and technology selection. Business pressures require technology managers to actively add value—build and maintain competitive advantage and profitability through information technology. Links are necessarily forged between business and planning processes.

Initiating the scanning process assumes a well documented strategy for the firm's collection of businesses. The strategy defines the desired future state for the business, its market and profit objectives, and the strategic actions planned to achieve each objective. Scanning

generally assumes that a firm is divided into defined business units. Planned strategic moves and management actions for each business determine the technologies subject to scanning and analysis. The technologies included in the scanning exercise, in turn, provide a composite profile of the desired infrastructure of each business and the resultant technology portfolio of the firm.

Rapid changes in available technology force technology managers to build a business context for making investment decisions. In-house technology suppliers are put in competition with vendors, out-sourcers, facility managers, consultants and systems integrators for funding. The wide array of implementation alternatives requires a rational process for identifying and weighing the importance of relevant technologies and the way they are acquired.

The scanning process contributes a number of "abilities" to the planning process of technology management:

- Capability
- Feasibility
- Profitability

The management and movement of information that define the business' processes and transactions require a platform of capabilities that advance the aims of management. The first layer of scanning provides an estimate of which technologies inherently support the plans and objectives of the business. With the wide assortment of technologies continually being brought to market, a rational qualitative process can determine which technology (new and employed) has the capability of serving the company.

The scanning process goes through a series of iterations that compare the firm's current technology portfolio with that which is coming to market (emerging) and that which is used by relevant competitors. The scan is used to establish the appropriate technology set, independently of source. While it is important to track forms of innovative technology, there is nothing in the scanning process that assigns greater weight to new or novel technologies. Rather, the outcome of the scanning process is to map capability with the requirements of a firm's business strategy. Alignment is the crucial principle behind the scanning process.

Once a hypothetical technology set is created, individual technology selection is conditioned by the feasibility for the firm to implement the ideal portfolio. Implicit in the technology scan is judging the commercial availability and maturity of each technology. Also, the organization has to assess its technical, methodological, financial, risk assumption and cultural ability to absorb the technologies picked up by the scan.

The ultimate test of applicability comes in determining the contribution to profit that a reconstituted technology portfolio makes to the business. A planning level cost-benefits analysis may reveal whether new technology investment exceeds the rate of return hurdles established for the business. A detailed economic analysis, however, is the province of an ongoing capital budgeting process and generally exceeds the scope of a technology scan. Until the technologies are considered under a project proposal that includes application and scale requirements, the data necessary for a reliable cost-benefits analysis is not available. Even then, judgments of the revenue improvements and cost reduction that underpin such an analysis are often speculative and difficult to document.

An effective technology scan comes through an arduous process. The definition of the firm's business needs to be clearly defined to provide a context for the work. The business strategy should be well documented for input to the alignment analysis. Internal and external information sources have to be scoured for complete sets of implemented and possible technologies to be included in the scan. Numerous internal and external (experts, vendors, competitors) interviews should be conducted to build a useful consensus regarding the applicability of candidate technologies and the metric used to evaluate alternative technologies. Accounting systems have to be examined and operated on to collect relevant budget and expense data. These represent significant time and manpower costs to establish a scanning process.

The scanning process is an important tool for integrating technology and business decisions. Once internalized in the organization, the process becomes easier, more productive and less costly as start up is absorbed over repeated use. As in any planning process, top management's sponsorship and commitment paves the way for an effective program.

Technology Planning

- *Planning mechanism*—manage technology as a portfolio of assets
- *Technology priorities*—keyed to status of businesses
- *Technology alignment*—link to constituent objectives
- *Framework*—join to market strategies