

Residential Real Estate in the Age of Information Technology

by Isaac Megboluge

INTRODUCTION

The story of residential real estate in the age of information technology is that of automation. Automation has not taken the housing finance industry like a storm, perhaps due to the characteristic conservative reputation of the banking industry. Automation has been long overdue in the residential real estate industry. Buying a home has traditionally generated an enormous flow of paper. Several pieces of information are captured on dozens of separate forms, often involving numerous professional practitioners and consuming great amounts of time. Technology is quickly changing that.

Some industry players remain uncomfortable with the pace of change, although this industry has been much slower than others in adopting technology. In fact, some predecessors to the most advanced applications being rolled out in mortgage finance today have been around for years. For example, credit scoring, which is perhaps the most controversial

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innovation gaining widespread use in housing finance, has been in use for nearly 40 years in the commercial credit market. Perhaps overdue for technological change, the residential real estate industry, and its large portfolio of component services, is now one of the fastest changing industries in the U.S. economy.

These changes offer significant benefits, as well as serious challenges, to the industry. Institutions that understand and strategically utilize technology will be winners. Borrowers also stand to gain in important ways. The broad outlook is that new technologies will offer access to credit to a wider spectrum of households than are currently being served, while saving lending institutions time and money.

TECHNOLOGIES

Now more than ever, technological advances incorporate much more than the increasingly sophisticated software applications run on ever more powerful computer systems. Computer hardware and software—ever faster, more compact, better integrated and more portable—paired with advanced telecommunications, decision models and rich databases are changing the way businesses and individuals communicate, operate, transact and manage. An information-based industry, mortgage finance has only recently begun to utilize the full power of new technologies to collect, organize, digitize and analyze

information. In many respects, the mortgage finance industry is still taking its trademark cautious and conservative approach to introducing new technology. However, recent adoption of several key technologies is serving as a catalyst, rapidly accelerating the pace of change and extensively rewriting the rules of how things get done.

From a product standpoint, there are several specific technologies that are overhauling the home buying and mortgage lending process:

1. Computer hardware
2. Software
3. Electronic data interchange (EDI)—rapidly augmenting the sharing of information between computers
4. Models (knowledge-based systems)
5. Databases
6. Multimedia tools (voice/video/graphics)
7. Internet. No discussion about information technology would be complete without reference to the Internet. Indeed, the Internet is playing an increasingly major role in the sharing of data and technology tools used in the residential real estate industry. The Internet is the perfect medium for consumers to research and learn about every step in the home buying process.

IMPACT ON RESIDENTIAL REAL ESTATE

How have these technologies affected the functioning of the residential real estate market?

In addition to the pace of change, the scope of change is a reality with which the industry must contend. Technological change is affecting nearly every part of the residential real estate industry.

Real Estate Brokerage

Real estate brokers match buyers and sellers of homes. Brokers provide advice, information, market insight, and general guidance in the home buying and home selling process. Let's consider the ways in which technology is changing these roles:

1. The Multiple Listing Service (MLS) gives buyers quick access to all local properties on the market and includes significant structural information. The World Wide Web is already beginning to reduce the reliance on personal brokerage services. One trade publication estimates that more than 4,000 Web sites list for-sale properties. Many of these sites are marketing tools for Realtors, allowing a potential buyer to prescreen properties and narrow the search before engaging a broker. So far, the Internet has not eliminated the need for a broker, since Realtors are rarely willing to put complete property data on the Web. While offering the ability to conduct geographical searches, usually the only address most Web sites offer is that of the brokerage office.
2. The ability to digitize photography may lead to a 3-D MLS on the Internet and in brokerage offices. A virtual reality tour and inspection of houses for sale may not be that far away. Services may also arise that enable home sellers to place their house directly on the Internet in full color 3-D.

3. In a pragmatic way, mobile communications and computing have made agents more efficient and productive. Fast electronic transfer of information and documents has reduced the costs of consummating the deal.

Mortgage Finance

Most home transactions are financed with a mortgage. Obtaining a mortgage involves numerous steps. Once a broker get the buyer and seller to agree on a price, the buyer must obtain financing, therein initiating a series of events. The buyer searches for a lender and fills out a loan application form. The lender then obtains an electronic copy of the borrower's credit history report. An appraisal and home inspection are conducted. If the lender requires mortgage insurance, the insurer makes an underwriting decision. The lender, of course, makes its own underwriting decision. Once approved, the loan is either held in portfolio or sold to the secondary market.

Technology has impacted each of these processes.

Loan application forms have been fairly standard for some time. Both the application and inspection forms have computer versions that can be displayed and filled out on screen. Fannie Mae's Desktop Originator allows lenders to make applications, qualify a borrower and lock in a mortgage rate in just minutes. The information that is collected online can then be stored in electronic databases. Once the data resides in the database, it can be exchanged with any computer around the world, facilitating the compilation of information, which leads to several efficiency gains in the market in terms of time savings and avoidance of duplication of production costs.

Credit history reports contain a lot of information on a borrower's personal finances. Statistical methodologies known as "credit scoring" can index the credit risk of each

borrower, roughly capturing their ability and willingness to remain current on their financial obligations. Credit reports can be obtained electronically and stored in databases. Credit scores are now a standard component of mortgage loan underwriting.

Home appraisals attempt to derive a fair market value of a house. Growing databases of property addresses, their transaction prices and structural characteristics can enable the use of statistical methodologies as a means of eliminating these on-site appraisals. Automated appraisal can simply do the appraisal using a much wider array of information. Freddie Mac and Fannie Mae are aggressively moving to automated appraisals.

Mortgage underwriting encompasses the previous three areas. Just as credit reports can be "scored," the entire mortgage application—including information from the credit report, the property appraisal and the loan application—can be "mortgage scored." Only the worst loans get rejected, and everyone is measured against the same standard. Freddie Mac's Loan Prospector, Fannie Mae's Desktop Underwriter and other systems are rapidly taking the previously decentralized underwriting decision out of the hands of the loan officer. For example, Freddie Mac's Loan Prospector predicts degree of risk for a borrower or loan. It draws conclusions using a rules-based system that conforms with Freddie Mac's underwriting guidelines. By cutting the loan-processing time and reducing paperwork, loan closings are shortened to just five-to-10 days from an average of 30-to-45 days. Both Fannie Mae and Freddie Mac expect the automated system to speed up the loan-approval process for routine, problem-free loans, allowing underwriters to spend more time on difficult loan applications.

Once mortgage loans have been originated, they can become **tradable securities**. The same information that was used to underwrite the loan can also be used to value the

loan as a long-term bond. The days of the mortgage industry as a lender with a mortgage pool system will slowly give way to underwriting, pricing and funding each loan as if it were a single security. All the data on the loan, the borrower and the property can be used to simultaneously solve the major mortgage industry decision problems, including those of underwriting, pricing and funding. The same data can be used to optimally allocate the risk of the loans, based on investors preferences.

OPPORTUNITIES

Through these innovations, technology has the potential to provide at least five key benefits to the mortgage finance industry.

1. Lower closing and servicing costs, and faster processing times

Automation will speed processing times, thereby reducing the costs of originating a mortgage. This means that closing costs less. In fact, Fannie Mae recently set a goal of trimming \$1,000 off the cost of originating a loan. By all estimates, the industry is already more than half way there and may even exceed this goal.

Automation has also benefited property appraisals with advantages still being pursued. While current software enables lenders to capture application information electronically and underwrite loans in just minutes, it still typically takes two or three weeks and hundreds of dollars to conduct a full and complete property appraisal.

Automated appraisals are already commonplace for many lenders. Freddie Mac, for example, uses automated appraisals to fast track approvals for low LTV mortgages to high-credit-quality borrowers. This lowers mortgage origination costs. Right now those costs get folded into mortgage interest rates; when servicing costs come down, so will those rates. As advanced statistical methods help improve

credit quality and address troubled loans, automation will also lower default and delinquency-related losses.

2. More robust credit-risk assessment, customized products and greater objectivity

Computers can systematically assess the importance of hundreds of pieces of information on tens of thousands of past loans and relate the performance of those loans to information collected at the underwriting stage. Traditionally, individual underwriters have played this role based on their experiential knowledge, which in some cases, works quite well. Computers, however, have a much greater capacity to sort out good versus bad credit risks than do human underwriters, provided the data upon which the models are based is valid.

In addition, automating underwriting by using computer-generated credit scores and other statistically derived measures of risk allows lenders to accept more applications while reducing their exposure to losses.

- *Better measures of risk translate into more customized mortgage products.* Increasing the awareness of the relative importance of various compensation facts improves the ability to develop products specifically for niche markets.
- *Better measures of risk also translate into greater objectivity.* Computers can ensure consistency in underwriting decisions both across applications by a single underwriter and across a set of underwriters within a single institution. If the information needed to underwrite is entered correctly and fairly, an automated underwriting system will treat similar borrowers the same. That is, their protected class status is irrelevant to a computer.
- *Better measures of risk translate into flexible assessment methods.* Currently,

the industry has difficulty assessing the creditworthiness of an applicant who does not have an established credit history, has an irregular track record of repayment of debt, is self-employed or changes job frequently. Improved measures of risk will better enable lenders to assess the creditworthiness of an applicant with a nontraditional credit or employment history.

- *Better measures of risk translate into more accurate performance predictors.* These measures will enable lenders to better assess the value of loans they intend to buy or sell and assign loans to risk pools that more accurately reflect their potential performance. This final point is particularly important, since lenders can better determine the extent to which enhanced servicing might be necessary for certain loans at the time of origination.

3. Greater awareness of product options and cost

Automation will help potential home buyers find a match between their home buying plans and the growing menu of mortgage options available to finance the purchase of their homes. Automated systems can help borrowers assess the pluses and minuses of different types and terms of mortgage loans.

Finding the right match for a borrower can often mean the difference between achieving the dream of homeownership and letting it slip from his or her grasp. Automated applications can more reliably and consistently examine all options for potential borrowers.

4. Enhanced consumer education opportunities

Automation will help housing specialists counsel and educate potential home buyers and owners. Computer-based, interactive, multimedia educational programs can be excellent education aids for pre- and post-

purchase counseling purposes. Automated processes combined with high-powered laptop computers will greatly enhance the ability of lenders and nonprofits to reach prospective customers in nontraditional service locations such as homes, schools, community centers and religious institutions.

5. Faster, more standardized and more meaningful market analyses

Because technology enables us to collect huge amounts of information, from various sources, in relatively short periods of time, automation can help financial institutions evaluate their lending performance, relative to their marketing goals so as to better target underserved households.

Lender, regulators and community organizations will be able to examine in some detail the demographic, financial and physical characteristics of neighborhoods and compare the lending performance of institutions operating in various types of communities both within and across metropolitan areas.

RISKS AND CHALLENGES

These benefits are substantial. There are, of course, challenges associated with automation, and these risks should be recognized.

Currently, the most controversial aspect of mortgage finance automation is credit scoring. "Generic" credit scores are indexes based on borrower repayment histories for consumer debt. Mortgage scores (also referred to as credit mortgage scores) are more sophisticated indexes based on detailed mortgage loan application and performance data.

Credit scoring systems that rely heavily on consumer debt repayment history rather than on mortgage loan repayment history can produce misleading credit scores. Why? Because borrowers may perform differently with consumer debt than they would with a

home loan. Moreover, credit scores based on analyses that under-represent certain borrower groups may lack their full potential predictive power.

In looking at the impact of technology on the underwriting process, there are two general areas of concern relating to validity and neutrality.

Validity

Automation carries with it a presumption of validity that may be inappropriate in some instances. Automated underwriting systems are only as valid as (a) borrower information entered into the system for analysis and (b) the models that are used to assess that information. Credit bureau reports are noted for the number and types of errors they contain.

Moreover, credit scoring, in particular, does not generally take into account nontraditional measures of creditworthiness such as timely rent payments, loan repayments to friends and relatives, utility payments and loans from non-traditional sources such as finance companies.

Neutrality

"Automation" implies neutrality. But human decision-making remains part of the underwriting process with most automated systems. Loans that fall into the gray area are not rejected but are referred to human underwriters for further review and consideration.

This function of human underwriters reintroduces the possibility of subjectivity into the underwriting process. Moreover, if information is not entered into the system consistently for all borrower groups, an automated system can produce biased and invalid results. Since coaching of borrowers can still occur even within an automated environment, biases may remain in the underwriting process.

Indeed, the negative consequences of one loan officer manually processing loans improperly are much less than the damage that could be caused by an automated system run amuck. We must keep in mind that, by and large, great care is taken to use technology in a way that benefits consumers and keeps discrimination from creeping into the process. No industry leader would rush headlong into automating functions without first fully understanding the implications for borrowers and business partners.

IMPACT ON UNDERSERVED HOUSEHOLDS AND MARKETS

There is some concern that automation will be used to weed out low-income borrowers and avoid underserved market areas. If used properly, technology will help the industry reach out to underserved borrowers and markets, educate more people, qualify more applicants, get a better understanding of nontraditional credit and employment histories, and get people over the hurdle into homeownership.

Thus, despite some concern about the prospects for affordable lending, automation will expand, not restrict access to mortgage credit. Access to affordable mortgage credit will be enhanced by allowing lenders to (1) lower costs and (2) better target credit. Already, the use of technology has directly helped reduce origination and servicing costs. Lower costs translate into more borrowers who can afford to own, improve and refinance a home. Technology also can and will help lenders better target credit to underserved markets such as low- and moderate-income borrowers, rural areas, distressed neighborhoods, minorities and immigrants.

Information technology combined with social science lets lenders find areas where mortgage supply is running lower than demand. These often represent business opportunities, especially if the reasons that an

area is underserved can be deduced. Although economic models still do an imperfect job of identifying underserved areas, they do a good enough job to help lenders identify possible areas where traditional lenders are undersupplying mortgage credit.

CONCLUDING REMARKS

Technology presents us with many challenges. How expansive the revolution will be for the residential real estate industry has yet to be seen.

The potential of knowledge-based systems to raise the quality of human decision-making is almost unlimited. While the industry has primarily focused on deploying these systems in the area of underwriting, there are other knowledge-intensive parts of the mortgage process that can and eventually will benefit. One such area is servicing. Servicing offers many opportunities to reduce cost and boost profits. For example, customer satisfaction levels are generally increased when knowledge-based systems are put in production. The reason is that putting data on-line requires an extensive effort to scrub the data—making sure that it is complete and accurate. Routines are built into the system that prevent the entry of invalid data. The result is reduction in faulty decisions due to incomplete or inaccurate data. Such systems can also reduce collection costs by allowing servicers to apply the best credit-loss mitigation strategies to different types of accounts. Sloppy or chronic late payers can be distinguished from accounts that are likely to turn seriously delinquent, allowing servicers to strategically target resources to reduce credit losses.

The value that is added to the decision-making process and the market efficiencies that accompany such innovations raise legitimate concerns about the fallout from an extensive industry restructuring.

Several analysts are predicting considerable downsizing as the industry moves into the 21st century, both in terms of lower transactions

costs and fewer service providers. They estimate that real estate transactions will involve between four and five participants in the 21st century—down from the 16 or more that are required today. While it is possible that the need for some functions will be eliminated, many jobs streamlined out through restructuring will be highly cyclical. The mortgage industry, for instance, hires a lot of people during refinance booms only to lay them off when interest rates rise and refinancing slows. In the place of cyclical jobs, automation will bring higher skilled jobs in statistical modeling, software and hardware engineering, and specialists who know how to use information technology to their advantage in all the activities that go into buying and financing a home.

Another outlook made possible by technology in real estate is a picture of what community lending will look like in the not too distant future. Buyers interested in financing a home will have access to and benefit from a wide range of automated services. When they look for a home to buy, they will plug into an automated multiple-listing service that will display the location of homes for sale in the areas that they are interested in. Accompanying each listing will be pictures, facts about the homes and information on the neighborhoods in which they are located. When home buyers begin to consider how to finance their homes, they will work with a counselor using an automated financial system to calculate how much they can afford and want to spend. They will be able to experiment with different mortgage instruments and terms to see how these affect their purchasing power. They may also access educational software that teaches potential buyers what it takes to buy and maintain a home as well as how to manage their finances.

When they are ready to apply for a loan, they will go to a counselor who will have on-line quotes from multiple lenders. Based on these quotes, applicants will select a mortgage originator to work with. Loan application information will be entered directly into a computer.

Underwriting, verifications and appraisals will be completed in seconds, and a decision to accept or refer the loan will be made. If the loan is referred, precise reasons for the referral will be generated automatically. Loan officers will work with clients on the spot to see if terms can be readjusted to get the loan accepted. If not, specialized loan officers will spend time advising applicants about what they need to do to shore up their applications and will give them a referral to a nonprofit counselor. The counselor will work with interested parties to get them over the hurdle the next time they apply. The whole origination and underwriting process will be completed promptly, fairly and at lower cost.

The loan application information captured in electronic form will be relayed to researchers who will use it and loan performance information to gain a better understanding of mortgage credit risk. That information will be instrumental in easing and automating underwriting for loans once thought too risky. It will also be instrumental in identifying and targeting underserved markets.

A larger share of applicants than ever before will get approved for loans. Once the loans are approved, automation will be used to close loans quickly and cut closing costs. Property insurance rating and pricing will be automated, title insurance costs will come down, and documents will be transferred electronically. Once in a home, applicants will have financial planning software that helps keep them on track and in their homes.

Consolidation of mortgage servicing in the industry is ongoing. This is a direct outcome of availability of technology. It reflects the realization of huge economies of scale inherent in mortgage servicing. The point-of-sale technologies are making it possible for super brokers to flourish. The widespread use of various mortgage technologies is causing dramatic realignment of various functions in the mortgage lending process.