The future of finance: Coming technologies

Executive Summary - Real world issues have often driven the financial sector into a leadership position for the adoption of emerging technologies. Today’s challenges -- deregulation, mergers, higher customer expectations, demands for efficiency and security -- suggest that business analytics, virtual teaming and single sign-on will soon join wireless and natural language understanding used by the cutting edge of the Finance industry.

You are the chief operating officer of a progressive financial firm a few years from now. In a business planning session, one of your employees uses a simulation to demonstrate your firm’s potential effectiveness against a cluster of your smaller competitors. These competitors may be working with companies in many countries to create a dynamic partnership. Business analytics suggest potential new investment products that your company can develop and bring to market quickly that can be used to counter this threat. To create these new investment products, you will need to acquire one of those competitors an employment firm that helps its clients manage their finances as they transition from one job to another — a non-logical choice. Happily, representatives from your accounting and IT departments explain that the cost of the merger is mitigated by the fact that your IT systems are compatible. In fact, some of the capabilities of the new post-merger firm will allow you to reengineer processes within the human resources department, yielding significant efficiency gains and cost savings.

How this happens
The financial sector has always had an appetite for advanced IT. Popular use of ATMs predated home computers by years, and today, we see strong moves by innovative firms into wireless, natural language and business analytics. Why? The financial industry’s key product is information, whose flow is often impeded only by the need for signatures and documents. Your competitors also know this. They often have both the money and the risk tolerance needed to take a chance on new technologies.

Over the long term, work in artificial intelligence, agent technology and visualization may combine with experimental economics and valuation of intellectual capital to create new wealth or disrupt the industry in unpredictable ways. In the medium term, however, current trends and issues suggest important contributions can be made by specific emerging technologies.

The challenges
Financial services firms are faced with unprecedented challenges created by: Deregulation and mergers; more sophisticated, demanding customers; and pressure to work more efficiently. Let’s explore each of these more closely.
Deregulation has created a climate of increased competition and changing business structures.

- New competitors have emerged from both different geographies and other industry sectors -- such as insurance -- challenging the value delivered to customers and the costs.
- There are more opportunities for mergers, and they must offer a return on investment through greater reach and economies of scale.

Customers have better access to information and new expectations.

- The Internet, cable news, mailing lists and newsgroups are just a few examples of how regular investors are provided with information that was previously unavailable to them.
- As service industries have moved to availability through a variety of communications and support 24x7, customer expectations have hit new highs.
- Customers at lower tiers have become interested in wealth management services as well. The astute use of technology can make this a profitable business.

New technologies and business models have raised the bar on efficiency.

- The proliferation of networks has reduced the need for human handling and created new opportunities for financial services firms to reengineer processes.
- Online banking has facilitated data capture and shifted work to customers.

The capabilities

By performing an analysis of these issues and trends, there are five capabilities that appear to be needed as the finance industry goes forward: Three that can be pivotal to financial firms’ future success -- flexibility, efficiency, and innovation; and two that appeal to the customer -- convenience and experience.

It is logical to add security to this list. While the financial sector has always been more attentive to security issues than many industries -- both to protect assets and to protect clients, today, business executives are exquisitely aware that there are vulnerabilities in the current infrastructure and new ones stemming from increased use of Web sites, wireless technology and online identities.

For each of these capabilities, there are specific technologies, or clusters of technologies, that can potentially make a difference in the medium term.

Flexibility -- Companies that are locked in to one way of doing business and slow to change are particularly vulnerable as jurisdictional and geographic barriers become more flexible or, in some cases, begin to fall altogether. Companies that are less hierarchical and have infrastructures that allow them to quickly change and grow can gain an advantage in this new environment.

How can companies become more flexible? One of the most difficult tasks will be transforming the organization to take full advantage of talent through virtual teaming, decision support and other tools of knowledge management. Because of the social and cultural
changes that these technologies require, smaller companies may have an advantage here, particularly if they can be part of the leading edge in dynamic partnering. Adherence to industry standards, the use of open source software, XML and architecting for rapid deployment may provide more dependable returns for larger firms looking to become more flexible.

**Efficiency** -- Mergers are one way of increasing a company’s efficiency. One promise of mergers is the reduced costs realized from finding and eliminating redundancies and taking advantage of economies of scale.

Traditional approaches to reengineering and scaling the organization lead the way here, but a number of technologies can make the difference. Workflow analysis and support tools can help to identify process problems and reveal what work is really analogous, despite department-specific, nonstandard terms. These tools can help organize work, based on people’s actual activity patterns, rather than on a theoretical practice model from headquarters. Efficiencies can also be found by using tools for rapid deployment and by architecting efficiency… for example, by including Storage Area Networks). Although concerns about security are likely to delay widespread adoption of grid computing by the financial sector, the value of sharing resources and putting idle resources to work will ultimately be compelling.

**Innovation** -- History shows that enormous and profitable markets can be created by finding new ways of assessing risk or determining value. While novel ideas may have a better chance in a less hierarchical organization, with virtual teaming and decision support, large organizations may have the benefit of using business analytics, simulation, visualization and experimental economics to generate and test ideas. More data, more powerful systems and deeper algorithms can help provide the competitive advantages that financial firms seek.

**Convenience** -- More and more, customers want to interact on their own terms. Portals that allow greater personalization and link to realtime messaging are of more value than generic sites that only announce new products or provide limited account information. Wireless access to changing data, such as stock quotes, is already a customer expectation; access to experts and alerts is on its way. Home networking offers enormous opportunities for understanding and managing expenses and risk, and the range of options will increase as higher bandwidths become more available. This will provide a wealth of contextual data that can help focus responses and reduce requirements for explicit data entry.

**Experience** -- The customer’s “experience” of your financial institution is created from the sum total of many things, from the ATM machine’s interface, to the complexity of the account paperwork, to an employee’s tone of voice. The experience design goes beyond the role of IT, but emerging technologies related to context and personalization are key. Content management and profiling can use -- or even create -- an experience that is less frustrating and more effectively targeted toward the customer’s needs, interests and current entry device of choice. The use of modular data, such as XML, can facilitate lifestyle and event transactions. Consider this non-obvious connection: Your customer has an opportunity to change their insurance choices and carrier within a site devoted to wedding planning. Applications related to electronic identities, including single sign-on, can help market to the engaged
couple, as well as aid in authenticating and authorizing transactions. There are also tools, such as collaborative filtering, that can identify and nurture “virtual communities” that may build confidence and knowledge (which are often prerequisites to buying financial products). Here again, decision support and simulation -- which can be effective education tools -- can play a role.

**Security** -- Privacy, safety, confidentiality and protection are important across every aspect of business. Unfortunately, today there is no single technology that can encompass all of these aspects to achieve a high level of security. Security is systemic, comprised of layers, rules, actions and specific technologies that are both mixed into, and bolted onto, the core systems. Still, single sign-on can be more than a convenience. It can enhance security by reducing the complexity for the user and encouraging security-conscious user actions, such as good password management. Biometrics can speed authentication and provide an extra measure of security. Ultimately, autonomic computing -- whose premise is to help protect the system at every level and identify new threats -- may help set the standard for security. The financial sector is likely to be the most demanding customer for this type of technology.

**The results?**
Your clients spend a lot more time thinking about home improvements, helping their children with their homework and paying their bills than they do about financial products. But, when they need you -- to get a loan to pay for contractors, to save for college, to automatically track budgets, estimate taxes or suggest investment options -- you appear on their favorite Web site with a tailored offering. You make it easy for them to compare choices and even easier to finish the documentation they need to transact business with you, even if they are calling from a cell phone in the middle of the night as they drive back from visiting a potential college with their oldest daughter. They look to you, not just as a financial firm, but as a trusted advisor.

**Other sites of interest**

**Autonomic computing**
http://www.ibm.com/services/insights/etr_autonomic2.html
http://www.ibm.com/services/insights/etr_autonomic.html

**Biometrics**
http://www.biometrics.org/

**Collaborative filtering**
http://www.ibm.com/services/insights/etr_collaborative.html

**Experimental economics**
http://www.people.virginia.edu/~cah2k/y2k.htm
The future of finance

Grid computing
http://www.ibm.com/services/insights/etr_grid.html

Home networking

Open source software
http://www.opensource.org/

Personalization
http://www.ibm.com/services/insights/etr_personalization.html

Portals
http://www.portalking.com/

Single sign-on
http://www.ibm.com/services/insights/etr_affective.html

Storage Area Networks

Virtual teaming
http://www.marshall.usc.edu/ceo/vt/

Wealth management
http://www.ibm.com/services/insights/ibv_wealthmgmt.html

Wireless

XML
http://xml.com/
http://www.ibm.com/services/insights/etr_xml.html

About this publication

Executive Tek Report is a monthly publication intended as a heads-up on emerging technologies and business ideas. All the technological initiatives covered in Executive Tek Report have been extensively analyzed using a proprietary IBM methodology. This involves not only rating the technologies based on their functions and maturity, but also doing quantitative analysis of the social, user and business factors that are just as important to its
ultimate adoption. From these data, the timing and importance of emerging technologies are determined. Barriers to adoption and hidden value are often revealed, and what is learned is viewed within the context of five technical themes that are driving change:

**Knowledge Management**: Capturing a company's collective expertise wherever it resides -- databases on paper, in people's heads -- and distributing it so it can produce big payoffs.

**Pervasive Computing**: Combining communications technologies and an array of computing devices (including PDAs, laptops, pagers and servers) to allow users continual access to the data, communications and information services.

**Realtime**: "A sense of ultracompressed time and foreshortened horizons, [a result of technology] compressing to zero the time it takes to get and use information, to learn, to make decisions, to initiate action, to deploy resources, to innovate" (Regis McKenna, *Real Time*, Harvard Business School Publishing, 1997.)

**Ease-of-Use**: Using user-centric design to make the experience with IT intuitive, less painful and possibly fun.

**Deep Computing**: Using unprecedented processing power, advanced software and sophisticated algorithms to solve complex problems, and derive knowledge from vast amounts of data.

This analysis is used to form the explanations, projections and discussions in each *Executive Tek Report* issue so that you not only find out what technologies are emerging, but how and why they'll make a difference to your business. If you would like to explore how IBM can help you take advantage of these new concepts and ideas, please contact us at insights@us.ibm.com. To browse through other resources for business executives, visit ibm.com/services/insights

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