

FINANCIAL ENTERPRISE WEBSITES: A COMPARISON OF COMPONENTS AND TECHNOLOGIES

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ABSTRACT: This paper details the components and technologies used by current financial enterprise websites. E-business is highly competitive. As such, financial enterprises that have successful websites exhibit growth where it counts – the bottom line. One way to compete is to know the competition and what makes the competitor so successful.

INTRODUCTION

As the internet continues to expand into more homes, customers are doing more business on the internet than ever before. Making a business available to the online customer is essential for continued growth and success. In order to remain competitive in this growing market, financial enterprises are making great efforts to upgrade their websites to reflect the desires of their customers and at the same time incorporate the latest technology to provide the utmost in functionality and quality. A savvy website can attract millions of new customers that would otherwise never set foot inside their traditional brick-and-mortar bank resulting in great financial gain as recently discovered by ING Direct who was able to attract over 60,000 new checking accounts in just over two months which resulted in more than \$2.2 billion in new deposits (Pasha 2007).

Incorporation of acquired companies and new technologies, security, overall design, and ease of use are just a few of the reasons creating the perfect financial website can be difficult. A customer frustrated with or confused by a website will ultimately take their e-business elsewhere. The goal then should be a website that is intuitive, fast, secure, and takes advantage of technologies which allow customers to perform all of their banking needs without ever having to physically set foot in a bank.

The question then is what makes certain financial websites so successful? We seek to answer this question based upon research into a cross-section of financial websites selected based on current financial rankings as well as familiarity by the authors. They include, in alphabetical order, AmTrust, Bank of America, Capital One, Chase, Citibank, Guaranty Bank, ING Direct, Schwab, Wachovia, and Wells Fargo. We will present the current financial rankings, a top-level

comparison, a feature comparison, an overall website ranking of these ten financial institutions by the authors based upon these comparisons, and offer conclusions based upon the overall research.

CURRENT RANKINGS

When researching financial enterprise websites, we determined that a general cross-section would be sufficient; however, we sought to include those of many of the most successful financial institutions as ranked by Forbes Magazine (DeCarlo, 2007), Fortune Magazine (Fortune 2007), TheBanker (TheBanker 2007), and NetValley (NetValley 2006) as shown in Table 1. The rankings of the parent companies are based upon different formulas based mainly upon sales, market values, assets, profits, returns, and capital. NetValley ranked banks based upon assets alone. Likewise, the Fortune Global 500 is based only upon revenues.

Bank Name	Parent Company	Forbes Global 2000	Fortune Global 500	Fortune US 500	The Banker	NetValley
Citibank	Citigroup	1	14	8	2	3
Bank of America	Bank of America Corp.	2	21	9	1	1
JPMorgan Chase	JP Morgan Chase & Co.	3	31	9	1	1
ING Direct	ING Group N.V.	10	13	NR	NR	24
Wells Fargo	Wells Fargo & Co.	34	126	41	5	5
Wachovia	Wachovia Corp.	35	131	46	4	4
Capital One	Capital One Financial Corp.	192	492	154	11	44
Charles Schwab	Charles Schwab	480	NR	389	NR	NR
Guaranty Bank	Temple-Inland Inc.	840	NR	414	NR	NR
AmTrust Bank	Ohio Savings Securities, Inc.	NR	NR	NR	NR	64

NR – Not Rated

Table 1. Rankings of Banks (2006 – 2007)

Also considered was the ranking of the top ten e-banks by Personal Finance Magazine (Kiplinger's, 2005) which yielded results quite different from the

above (see Table 2). This report based its findings on rankings by Watchfire's GomezPro Scorecard, sold to Keynote in 2005 (Berkowitz, 2005). Areas of consideration by GomezPro were transfer of funds to other banks, receiving bills online, low-balance e-mail alerts, receiving web-only statements, and stopping payment on checks.

Rank	Bank Name	Website
1	Wells Fargo	wellsfargo.com
2	Citibank	citibank.com
3	Bank of America	bankofamerica.com
4	E-Trade Financial	bakus.etrade.com
5	Huntington	huntington.com
6	First National	firstnational.com
6	HSBC	hsbc.com
6	US Bank	Usbank.com
9	JPMorgan Chase	chase.com
9	Wachovia	wachovia.com

Table 2. Kiplinger's Top 10 E-Banks (2005)

TOP-LEVEL COMPARISON

Our comparison of the financial institute websites begins with a top-level comparison and then a more specific feature comparison. On the top-level, we compare default and personal homepage components, technology, security, and features.

Homepage Components:

Default Homepage:

The default homepage is the most important page of the website as it is what attracts customers in the first place. Therefore, the overall look and usefulness of the homepage are incredibly important factors.

- The bulk of the homepage should *fit into the initial window* so that a customer may find what they are looking for as quickly as possible.
- It should look *clean* with little clutter. However, a stark homepage is boring and unattractive, therefore, it is important to find a balance (see Figure 1).



Figure 1. Homepage Cleanliness

- There should be *clearly defined sections*.
- The *use of color* should be limited to a few contrasting, yet complimentary hues.
- The *login area* should be placed where the returning customer would first look. Based upon the Western style of reading from left to right, it is logical to place the login area on the left side of the homepage.
- For convenience, a customer should be given the *choice of login destinations* in order to diminish the number of page loads and subsequently the time it takes to get to a desired page.
- *Tabs* should be placed near the top of the webpage that link to the different areas of interest to the customer, such as personal banking, small business, commercial business, and information about the bank.
- *Advertising*, although important in order to present customers with the highlights of the website, should not detract from the main links of the webpage due to placement or size.

Overall, of the financial websites we researched, the *Wells Fargo* default homepage was the best example of a well-designed, well-balanced, useful default homepage.

Personal Homepage:

The second most important page of an ecommerce website is the customer's *personal homepage*. The reason for this is that once customers open an account, they rarely revisit the default homepage except to log in. Therefore, it becomes a bank's primary contact with customers once they open accounts and subsequently has influence over whether customers choose to increase their financial portfolio with the bank or take their business elsewhere. Here the overall look is important in order to cut down on confusion.

- The *main content* of the page should fit in the initial window.
- The page should be *uncluttered* and *symmetrical*.
- The *customer's real name* should appear somewhere on the page, preferably near the top in order to personalize the page.
- *Tabs* should be near the top of the page and be clear, useful, and allow customers to quickly navigate through the WebPages.
- All *accounts* should appear clearly separated from each other with links to a more detailed page.

- In the instance of credit card accounts, a clear *link to payment options* is preferable since paying online is a highly desirable feature.
- No link should lead to a *dead-end page* (one with no links back to the original site).
- A link should be provided that allows a customer to see new account options and *open a new account* easily without having to return to the default homepage.
- The *message center* should be easy to find and should alert customers on the homepage when they have a new message.
- The *logout button* should be placed in the upper right-hand corner and should contrast in color to the rest of the webpage in order to make it easy to find as did Bank of America, Capital One, Chase, and Wachovia.

Overall, of the financial websites we researched, the *Capital One* personal homepage was the best example of well-designed, well-balanced, useful personal homepage.

Technology Components:

Login Times vs. Technology Used:

The technology utilized by the financial institutions we studied varied greatly as did the login times. We use the term login time to refer to the time it took for the personal homepage to appear once the initial login button was clicked entering the userID (and, in most cases, the password). As shown in Table 3, the sites incorporating ASP.NET technology had significantly faster login times.

Bank Website	Technology Used	Average Login Times (sec.)
amtrust.com	HTM, ASP, ASP.NET, CFM	7
bankofamerica.com	JSP, CFML, CGI, PHP	8
capitalone.com	PHP, ASP.NET	3
chase.com	JSP, ASP.NET, HTML	5
citibank.com	JSP, CGI	4
guarantybank.com	ASP.NET	2
ingdirect.com	ASP	10
schwab.com	JAVA, Non-JAVA/Barista, C/CGI	4
wachovia.com	ASP.NET	1
wellsfargo.com	CGI	6

Table 3. Technology Used by Financial Websites

AmTrust, Bank of America, and ING Direct had the longest logins because they required customers to complete an additional login step which sent them to a second screen where a sitekey picture was verified and the password was entered. In the case of ING Direct, the user was required to manually enter the password through a number keypad with the mouse or type the letters corresponding to the numbers on the keyboard.

Although requiring additional steps increases security, it complicates the login process and potentially frustrates the customer to the point of not wanting to use the site anymore, therefore if a second step is to be required, it should be made as painless as possible.

Integration of Technology:

In relation to the technology used, it is desirable to move seamlessly from page to page, as well as enable users to freely move money from one account to another. In many cases, when financial institutions are sold and absorbed into parent companies, the integration process results in diverse technologies being utilized for the various components such as banking, lines and loans, credit cards, insurance, and investments. It is important that once incorporated, the added sites should contain links back to the bank's default homepage. Banks that contained *dead-end links* were:

- AmTrust – investment side and mortgage side
- Bank of America – investment side
- Citibank – investment side
- Chase – student loans
- Guaranty Bank – insurance side

In contrast, the following websites provided *seamless navigation*:

- *Capital One* and *Wells Fargo* contained homepage links on every single page
- *Schwab* and *ING Direct* were easily navigated since all of the pages were contained within a master page which contained tabs to all areas of the website.
- *Wachovia* not only incorporated the use of a master page, but provided additional links at the top and left to improve navigation.

Money Transfer Capabilities:

For customer convenience, it is advantageous for banks that offer investment accounts to also provide an easy means to transfer money between their banking and brokerage accounts (see Table 4). Requiring customers to call customer service or mail in requests to transfer money is simply not acceptable in this day and age. If a bank is going to offer a full-service online banking experience, they must allow customers to manage their money themselves if they so desire. *Schwab's* site is a good example of seamless money management. It is possible to keep money in the investment side and transfer it to a checking account whenever needed. But the *Chase's* site does not provide this kind of feature

online. The obvious advantage to this is that the customer's money is earning much higher interest while in the investment side. The downside is, of course, that brokerage accounts are not FDIC insured.

	AmTrust	Bank of America	Capital One	Chase	Citibank	Guaranty Bank	ING Direct	Schwab	Wachovia	Wells Fargo
Credit Card side	-	X	X	X	X	X	-	X	X	X
Credit link in-site	-	X	X	X	X	X	-	X	X	X
Lines & Loans side	X	X	X	X	X	X	X	X	X	X
Lines & Loans link in-site	-	X	X	-	X	X	X	X	X	X
Insurance side	X	X	-	X	-	X	-	-	X	X
Insurance link in-site	X	-	-	X	-	X	-	-	X	X
Investment side	X	X	X	X	X	X	X	X	X	X
Investment link in-site	-	X	X	-	X	X	-	X	X	X
Easy transfers between banking and brokerage accounts	-	X	-	-	X	-	X	X	-	X

X – Site contains this feature

Table 4. Technology Links

Security Components:

With the rise in identity theft in today's society, security should be the number one priority of any financial institution. Even so, it was surprising that many of the sites researched did not utilize every security measure available. We are not claiming that the low scoring sites are insecure; however, many features that are available to them are not being utilized, such as foreign computer sitekey recognition, additional login steps, privacy measures such as encoding the user ID and account numbers, and session timeouts.

Sitekeys and Additional Login Steps:

Foreign computer sitekey recognition entails recognizing that a user has logged on from a different computer and subsequently requiring an additional login step, usually in the form of a question to which the user must provide the answer stored in the database. Bank of America, Capital One, Guaranty Bank, and Chase all utilize this extra level of security. Those banks usually will ask online customers to answer security questions or activation code before they can login when they use a public computer. The banks that provided an extra login step at every login were Bank of America and ING Direct. They both employed the use of a sitekey picture in addition to a password to ensure security.

Encoding UserIDs, Passwords, and Account Numbers:

Both Bank of America and ING Direct encode the userID as well as the password. This is something more financial institutions should implement to keep casual onlookers from knowing a customer's userID. In addition to this, the account numbers should be encoded on every screen. It was found that both *Schwab* and *Wachovia* had windows which displayed a customer's entire account number.

Session Timeouts:

Additional security in the form of session timeouts is another measure which should be implemented by more financial institutions. Although it is annoying to be kicked off every ten minutes as do the Bank of America and ING Direct sites, it is better to place some sort of limit upon sessions as far as security is concerned. Consider the following scenario:

A businessman decides to check his bank balance before he heads out for the day. He is distracted by a phone call and an email request and forgets that he left the window open. He leaves for the day without shutting down his computer. An unscrupulous night worker sees the computer on, finds the open banking window, and transfers funds out of the account to an unnamed account.

Is this scenario likely? Probably not, but the point is made. Session timeouts should be less than twenty minutes to avoid untoward activity in the case of abandoned sessions. *AmTrust*, *Bank of America*, *Chase*, *ING Direct*, *Capital One*, and *Guaranty Bank* were the only banks researched that provided session timeouts of less than twenty minutes.

Session Timeout Warning:

In the addition of session timeouts to a site, it is important also to warn the user that they are about to be logged off. Of the sites that provided session timeouts, *AmTrust*, *ING Direct*, *Schwab*, and *Wachovia* all failed to provide any type of warning. The poorest performance came from the *Schwab* site which not only logged the customer out without warning, it failed to elegantly redirect the user to a new login page resulting in a failure of the entire window (Windows Internet Explorer 7).

Feature Comparison:

Over the years some standard features have come to be included in most financial websites, such as placing a summary of all accounts held at that financial institution on the customer's homepage and allowing customers to change address, email and password information, set account alerts, elect to receive their statements online, pay bills, order checks, request copies of checks, and stop

payments on checks online. It is the additional features that vary from bank to bank that not only attract customers, but keep them (see Table 5).

Feature	AmTrust	Bank of America	Capital One	Chase	Citibank	Guaranty Bank	ING Direct	Schwab	Wachovia	Wells Fargo
Add users	-	X	X	X	-	-	-	-	-	X
Allow external transfers	X	X	X	X	X	-	X	X	X	-
Autopay credit card setup online	-	X	-	X	X	-	-	X	-	X
Change preferences	X	X	X	-	X	X	X	-	-	X
External transfers free	-	-	X	-	X	-	X	X	-	-
Mobile banking	-	X	-	X	X	-	-	-	X	X
Nickname accounts	X	X	X	X	-	X	-	X	X	X
Open new acct. logged in	-	X	X	X	X	-	X	X	X	X
Select default accounts	-	X	-	-	-	-	-	X	-	-
Session timeout warning	-	X	X	X	-	X	-	-	-	-
Set login destination	-	-	X	-	-	X	-	X	X	X
Unlink accounts	-	X	X	X	X	-	-	-	-	X
View page in Spanish	-	X	-	-	-	-	-	-	X	X
Overall Score (of 12)	3	10	9	7	7	4	4	7	6	9

X – Site contains this feature

Table 5. Additional Feature Comparison

It is important to remember that a financial institution’s website is first and foremost about convenience. The more features that are offered, the more likely a customer is to transfer his or her portfolio to the bank exclusively. The following account-related features are desirable for that very reason:

- adding users
- changing preferences
- allowing customers to view the website in Spanish
- nicknaming accounts
- selecting default accounts
- warning customers of impending session timeouts (discussed earlier)
- setting login destinations

Although allowing the *addition of users* to the account may complicate concurrency issues, it allows for a more detailed usage log in the event of a

questionable transaction. Also, being able to *change preferences*, *choose the viewing language*, and *nickname accounts* can give customers a feeling of familiarity and make them feel more comfortable with the site. Lastly, allowing customers to *select default accounts* and *set login destinations* saves them time when accessing their most frequented pages.

External Transfers:

Allowing external transfers is a convenience that not only makes life easier for the customers; it also makes it easier for them to transfer money into the bank. All of the banks we researched allowed funds to be transferred between accounts held at their institution, however, not all of them allowed funds to be transferred online between their accounts and outside institutions (although Wachovia limited the selection of outside banks to a select few). Neither Guaranty Bank nor Wells Fargo provided this convenience. Along the same lines, several of the banks that allowed linking of external accounts did not allow them to be edited or removed. Of the banks that allowed external transfers, all of them allowed in-bound transfers at no charge; however, AmTrust, Bank of America, and Wachovia charged fees for out-bound transfers (see Table 6). Unfortunately, it was difficult finding these disclosures on some of the websites (see Table 6).

Bank Name	Fee Disclosure Finding Ease	Inter-Institution Transfers			
		Inbound		Outbound	
		3 Day	Next Day	3 Day	Next Day
AmTrust	difficult	Free	Free	\$1.50	\$8.95
Bank of America	medium	Free	Free	\$3.00	\$10.00
Capital One	medium	Free	Free	Free	Free
Chase	easy	Free	Free	\$3.00/Free	\$3.00/Free
Citibank	easy	Free	Free	Free	Free
Guaranty Bank	*	*	*	*	*
ING Direct	easy	Free	Free	Free	Free
Schwab	difficult	Free	Free	Free	Free
Wachovia	easy	Free	Free	\$3.00	\$10.00
Wells Fargo	*	*	*	*	*

* – Bank does not offer this feature

Table 6. External Transfer Fees

Automatic Payments:

Auto-payment of credit cards is another point of convenience. Although all of the banks researched for this paper offered some form of bill payment service,

only few of them, such as Chase and Bank of America, allowed customers to set up an automatic monthly payment with the choice of minimum balance or statement balance online for the credit card held by the bank itself.

Open New Accounts Online:

The ability to open and fund new accounts online is a convenience that not only benefits the customer, but the bank as well. Surprisingly, neither AmTrust nor Guaranty Bank allowed customers to open new accounts online once they had logged in. They only allowed customers to apply for new accounts from their default homepage. It is certainly to a bank’s advantage to allow customers to apply for new accounts from anywhere on their website.

Mobile Banking:

A current trend in customer convenience is allowing customers to access their accounts from their mobile phones (Sraeel, 2007). The greatest challenge to mobile banking is, of course, security. However, in order to be competitive in the future of banking, it is imperative that banks face the challenge head-on in a proactive manner before the want-it-now generation takes their business elsewhere.

OVERALL RANKING

Combining the scores given for homepage, technology, and security components and additional features produced an overall ranking for the websites researched (see Table 7). The top website is clearly *Bank of America*, although *Capital One* and *Wells Fargo* are close behind. All three offer attractive and functional homepages and many additional features. The latter two both lost points in the security features category, but were strong in the Personal Homepage and Default Homepage categories, respectively.

Rank	Bank Name	Overall Score	Default Homepage	Personal Homepage	Security Features	Website Features
1	Bank of America	33	9	9	5	10
2	Capital One	30	7	10	4	9
3	Wells Fargo	29	10	7	3	9
4	Citibank	23	8	7	1	7
5	Chase	22	4	7	4	7
5	Schwab	22	7	7	1	7
7	Wachovia	21	6	8	1	6
7	ING Direct	21	5	8	4	4
9	Guaranty Bsnk	20	7	6	3	4

10	AmTrust	19	5	6	5	3
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Table 7. Overall Ranking

CONCLUSION

It is interesting to note that two of the top-ranked banks financially, Citibank and Chase, did not receive top rankings here. Citibank lost points mainly in the security features area, however, Chase could definitely use some sprucing up its default homepage.

When the goal is to lure as many customers to a website as possible, it is imperative that the target be as attractive and functional as a spider's web: equally distributed, pretty to view, technically sound, and catches the customer's attention. In the competitive and growing world of virtual banking, the lure of an attractive and functional website can mean the difference between vulnerability to mergers due to loss of revenue or continued growth and stability. As the competition increases, it will prove imperative that financial enterprises step up and improve their websites if they hope to continue to attract new customers as well as keep the ones they already have.

REFERENCES

- Berkowitz, D. (2005). Keynote Acquires GomezPro Business Unit from Watchfire, [Keynote Systems](#), Dec 6, 2005.
- DeCarlo, S. (2007). The World's 2,000 Largest Public Companies, [Forbes.com](#), Mar 29, 2007.
- Fortune (2007). Fortune 500: Our annual ranking of America's largest corporations, [CNNMoney.com](#).
- Kiplinger's (2005). The Top 10 Online Banks, [MSN Money: Kiplinger's Personal Finance Magazine](#), July 2005.
- NetValley (2006). Online Banking: Top 100 Banks. [NetValley](#).
- Pasha, S. (2007). ING offers interest on online checking. [CNNMoney.com](#), Feb 15, 2007.
- Sraeel, H.(2007). Mobile Banking 2.0: Was There a First Wave? [Bank Technology News](#), Nov 1, 2007.
- TheBanker (2007). Ranking: Top 200 US Banks. [TheBanker](#).