e-Finance: Strategy, Architecture and Semiotic

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Abstract

In a few short years the Internet has gone from an inter-linked set of documents to a space which is a facilitator of front to back shopping experiences. Both the retail and the service sectors have moved their shop fronts to the web and there is one service sector, which is certainly growing in evidence, the financial sector. Recently a number of retail banks, investment banks, stockbrokers, insurance agents and mortgage brokers have sprung on to the net offering a range of products and services in a variety of forms. Some of these will be successful business ventures and some will not.

Financial services are now being offered globally by well known UK institutions, which are profiting from a strong brand name and an existing, trusted, customer base. However new startups, with aggressive strategies and new technologies, and re-branded spin-offs are being equally successful. In this paper we examine the reasons for this success in the context of what we consider to be the three absolutely essential element of an e-commerce initiative: business strategy, architecture and technology and semiotic.

We share the belief that good e-finance (and indeed e-commerce) initiatives are designed around the customer and in particular are focussed on the experiences that the customer has during, and after "shopping". The business strategy and technology thus support the underlying social semiotic of the e-finance experience. Certainly e-anything would be impossible without some understanding of the way in which customers can be encouraged to trust, shop and return to web sites. And all e-initiatives benefit from incurring in customers high switching costs. This all rests in a basic understanding of the communication that takes place between the customer and the website, and appropriate application of customer relations management (CRM). The tool that we have chosen to facilitate this understanding is semiotic.

Semiotic, the study of signs and meaning making is presented as an encompassing framework within which to view the e-finance experience, and we suggested that design and strategic decisions can be made by considering the basic semiotic assumptions. Drawing on our Shared Meanings Design Framework (SMDF) (Polovina, French, Vile 1999) we show, by use of examples of a variety of e-finance front ends, how valuable a semiotic analysis could be when considering the strategic, technical and client facing aspects of an e-finance experience. Finally we will offer a number of, what we consider to be, theoretically well founded and empirically supported guidelines for design of e-finance experiences.

There is no denying we have come a long way in e-commerce, even in the last few years. And there is similarly no denying that there is still a long way to go. Recent predictions however (IDC 2000) predict massive growth in e-commerce over the next three years. Potentially becoming a one trillion-dollar market with 900 million people connected. Everyone, from SME to high street bank wants to get in on the action and draw in some of this business. And why not, potentially low on overheads and without many requirements for illiquid assets (such as buildings), a small investment can reap very large rewards as we have recently seen with companies such as freeserve for example. Yet leveraging the current market tendency to favour high-risk technology stocks in order to make a quick buck is not the corner of the market that existing commerce and finance companies want to enter. Rather they are interested in expanding customer base and providing services that will encourage customers not only to stay but also to recommend their friends.

Ways in to the global marketplace

Financial institutions have traditionally relied on notions of trust and loyalty to keep their customer base (Valdez 1997). This is particularly true in the high street bank, indeed how many of us have stayed with the same bank since we opened our first account at 16? A number of e-finance initiates have been aimed mainly at the provision of on line services to existing customers in an attempt to keep them loyal. However the convenience of on-line services can lure customers away from their banks, building societies and insurance companies. This was clearly shown with the successes of Direct Line and First Direct, telephone services which were (and still are) available for long periods during the day, fully functional and convenient. It is not a very big step from this sort of venture to a fully-fledged e-finance site.

There are three ways that e-finance initiatives seem to have emerged. First , through the expansion of existing channels, in which high street banks such as Lloydstsb (www.lloydstsb.co.uk) , building societies offering a multitude of services such the Halifax (www.halifax.co.uk) , stockbrokers such as charles schwab (www.schwab-worldwide.com) and investment banks like Barclayscapital (www.barcap.com) have attempted to provide access to and information about existing services through a web interface. Secondly there are spin offs from existing companies that attempt to tap in to the new market place such as egg, an offshoot from the prudential (www.egg.co.uk) which combines financial services and banking. Finally there are entirely new entities, who with aggressive strategies attempt to capture business from established markets, a good example of this is e-trade which provides on line share dealing services and real time quotes at low cost (www.etrade.co.uk). another excellent example, recently launched is the street (www.thestreet.co.uk) which acts as a metamediary, a portal to a myriad of financial services, mortgages, share shop, banking, loans etc.

This sounds fantastic, but it is not all-good news as the recent growth in Internet usage has compounded the reliability problems and lack of robustness that has beset the Internet since its inception. The average user still gets frustrated waiting for graphics intensive pages to download or for a login to be authorised by a slow back end system. In fact, unless the promise of faster network and faster connection from home and office is realised, the predicted growth in Internet usage may grind the whole global network to gridlock. Other problems are the lack of one set of standards, even for accessibility and information overload in which (when you can find what you want) validity and reliability of internet based information is questionable. E-finance

sites, which are governed by FSA regulations with an established customer base can hopefully avoid this problem, but need to use conventional advertising techniques to be found in the first place.

The Internet is changing business, the way we do business and the very nature if business. At one level it can give competitive edge (Chesher and Kaura 1998) , certainly a year or so ago this was one reason to get in the game early. At another level it can change the business processes and directly impact business strategy. Nowadays, outside of organisations e-commerce generally applies to a web based, customer-facing site, inside the company it can refer to any number of integrated, automated systems used for communication and co-ordination of business. In reality a full e-commerce initiative needs both. And in the world of finance, in which rules and regulations govern the way in which business can be done, seemless integration of front end and back end is essential. Thus we find our three main ingredients in an e-finance initiative: Business direction; supporting technology; and a well-designed interface. That is: Strategy, Architecture and Semiotics.

Strategy

The Gartner group (www.gartner.com) predict that 75% of e-commerce projects will fail because of a lack of understanding of the technology and a desire to rush onto the web circumventing usual; business methods. The Internet certainly does expand and advance in leaps and bounds but the recommendation is not to jump on the bandwagon without careful planning and integration with existing business.   In e-finance, where customer loyalty and service are extremely important a failed e-finance initiative will almost certainly damage reputations.

Still, it is clear that there are a good number of reasons for a financial institution to consider some sort of e-finance venture. Initially, there may be the need to extend the service, availability and reliability for the existing customers.   If successful this should generate even stronger customer loyalty and may even encourage new customers. Which is of course the second reason to enter into this arena. There are cost savings to be made, since with automation, staff numbers may be reduced (some companies however have seen staff numbers increase in order to cope with the growth in the number of users requiring support). With the growth of the Internet as a sales, communication and transaction space business to business and business to client interactions are happening much faster, as a result customer expectations are changing. (Chesher and Kaura 1998). It is important for a forward thinking company (in any sector) to take their business to the web, but initial set up is costly and with everything that has the potential of high reward, there are additionally high risks.

E-commerce strategy can be divided in to business and technology strategy. The technology cannot be considered independently of the business, as almost all of the initial outlay and a large proportion of the risk are dependent on appropriate management of technology. Specific architecture questions will be addressed in the next section, however at the top level there are three choices: Integration with existing systems, extend existing systems or replace existing systems. It is absolutely essential that there is a seamless front to back solution whichever route is chosen, and that there is as much automation as possible. There are a number of on-line financial services which consist of a telephone service wrapped up in a few Internet pages. These

attempts at e-finance are doomed to failure because of the overhead of supporting a telephone service and the potential of human error in transaction processing and data entry. The user only sees the front end, but imagine her disappointment after navigating ten pages to find that she must phone a telephone number anyway.

There are similarly three ways in to the global market place, integration with existing services; extension of existing services or replacement of those services. There are some good examples of e-finance sites, which essentially provide an on-line version of existing services. The Halifax (www.halifax.co.uk) provides access to loans and mortgages for new and existing customers on its website, as do the many other sites that provide Internet versions of high street banks of building societies. In some cases financial institutions have provided services to customers that are not available through any other medium along side the "webising" of existing services. Barclays Capital (www.barcap.com) now provide a sterling index service and the facility to view supporting static data, this service competes for business with other indices, but is purely a web based product. And then there are the e-finance institutions, which exist only virtually. These are split into those which are spin-offs from existing companies (www.egg.co.uk) and those which have been created independently, explicitly with the intention of capitalising on the e-finance market (www.etrade.co.uk). These businesses have only been made possible by the rise of the Internet and their business model is inextricably tied to it.

Strategically then , business embracing the internet for e-finance have to choose between two extremes of a continuum one end of which would be extending the existing business and technology models, and the other end of which would be the creation of a new entity altogether. Considering the per capita value of a large number of virtual companies (few of which have yet to actually make a profit) it would seem that the high gain end of the spectrum is the creation of a new entity altogether. Of course high gain is almost always associated with high risk and high street banks will always have their established business to fall back on when and if the e-finance bubble bursts.

Architecture

It is clear that without supporting technology e-finance would be impossible. There have been a number of new requirements for this technology, which extend beyond the traditional client-Sever model. Despite common conceptions e-commerce is not at all about a pretty web page, e-commerce solutions stretch from the Internet through the webserver to middle and back office and beyond. It would not be uncommon for a single transaction to require access to a number of company databases and an external credit card validation system. Additionally such transactions must be secure, and must perform correctly, committing or rolling back under the right conditions. E-anything systems are required to be available all the time, and need to be extensible without bringing the entire operation to a halt. Finally it is clear that usage scenarios are not always accurate, and sites may become popular beyond their capabilities. In this case it may be that additional hardware is required to support demand. E-finance sites must therefore be scalable and support load balancing.

More appropriate now, than two tiers architectural models are three and four tier models in which the presentation, business and data layers are clearly separated and encapsulated. The key to this, whichever technologies are chosen, is to treat each layer as a black box with its own functionality. Presentation layers (the web server and the browser) should display information and provide a user interface, Business layers, should encapsulate the business logic, security and support distributed transactions. The data layer should provide access to the required data. There are currently in the market place two main approaches to this, the Microsoft solutions which uses COM, IIS, SAL Server and MTS and the Unix solution which provides CGI, Unix based web servers, CORBA, Java and non-proprietary database integration. Each has its own merits and each has an equal share of the market. Whichever is chosen it is essential to maintain the three-tier nature of the solution.

One thing that is often neglected in any e-business is the supporting data. In e-finance more than in any other business the quality of data provided to the customer and the timeliness and accuracy of that data is paramount. Customers make investment or purchasing decisions based upon the data that they are presented and incorrect or out of date data can have disastrous consequences. There are great costs in acquiring the data, development and maintenance in delivering this data to the customer, but great benefits too. As a core aspect of this the database architecture and supporting infrastructure is central to the overall e-commerce architecture. Perhaps even more valuable than the front end itself, data forms but one part of the e-finance experience.

Semiotic

Even though the web page or site is not the whole of e-finance, it is certainly important from a number of perspectives. The web site is the only way the user has to develop an impression of the company that she is dealing with. The nature of the whole e-finance experience is mediated through the few web pages that the user sees. If it is a positive experience she will probably willingly return. If it is a negative experience she will almost certainly never come back again. The e-tailors spiral
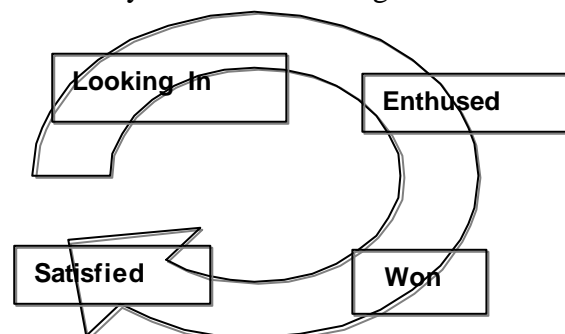
(Birch et al. 1999) below, shows the phases that an e-finance customer will go through in their journey towards becoming a regular customer. At any point they can jump off, and the e-finance strategist has only one way of communicating with the customer, one way and in some cases one chance To get it right. The key to successful e-commerce is the returning customer, and the key to encouraging them to return is the generation of sticking costs, provision of a positive e-commerce experience, generation of rust and perhaps a community of practice and of course clear, honest communication. In fact client maintenance is becoming a growing area of interest, the first to market may gain initially in customer base, but if the service is not there, if the customer cannot find their way around the website, and cannot get what they want in the promised time, and if the advice given is not good., then they wont return. This is

good customer relationship management, and what's more it is good semiotics. Customers experiences are shaped by the front-to-back design of the site. They are encouraged to make-meanings, they engage in semiotics. Once this is understood there is the question of how we can design the appropriate experience on this basis.

Since the web has an undefined audience, traditional methods of analysis and interface design are no longer appropriate. In fact design of e-commerce sites is more like creating a film or other mass media for an ill defined audience than creating a well specified user interface for a well defined set of stakeholders. Thus tools used for analysing mass media would be more appropriate, semiotics is one such tool.

Semiotics is the discipline of everything that can be taken to mean. That is it is the "science of signs". More specifically it is the discipline which connects meaning, meaning making, communication and culture through an understanding of acts of signification. There are a variety of semiotic discourses and traditions, most noticeably that of Peirce (1931-1935)and Saussure (1974) and there have been attempts to apply a semiotic framework in the field of IT (French , Polovina and Vile (1999); Pollard and Vile (1998); Anderson (1992)). It is difficult to know which approach to take or which view would best serve the area under discussion, and this is certainly not the place to discuss the merits of each viewpoint. Nevertheless, there are a number of basic assumptions which are common to the semiotic point of view, which can guide the following discussion (I hope that this list will not attract too much criticism from the semiotic community as it is an attempt at consolidation a number of viewpoints into a comprehensible set of principles).

1. Communication, meaning-making and culture are linked through a belief in a shared understanding of signs.
2. Any semiotic element (sign or text) has at least two planes, an expression plane and a content plane.
3. Each semiotic element may be read in any number ways other than that intended by the author.
4. Texts and signs cannot be contextually neutral and offer statements at a level of power and solidarity, and ideology.
5. Signs are not static, their meaning and their place in meaning making changes for individuals through time.

Paying proper attention to these assumptions can lead to e-finance and e-commerce sites that take account of culture, communication and the myriad of meanings which can be made for a single simple sign system. Taking this one step further it is possible to use semiotics as a basis for analysis and design and work developing this in to a coherent framework (SMDF) has already begun (French , Polovina, Vile (1999)). SMDF provides a soft methodology for analysis and design of customer centred, meaning rich websites.

Central to the SMDF framework, are principles of social semiotics (Hodge and Kress 1988). The following social semiotic phenomena can be sought in the analysis of any text or sign system:

- *Semiosic determination* - focuses on the semiosic (expression) plane, sign types, logonomic systems (set or rules for determining meaning).
- *Mimetic anchorage* - The meanings and messages of the text/ signs
- *Ideological conten*t - The versions of reality implied by texts
- *Analytic anchorage* - The place of the analyst in the reading and interpretation of the text
- *Homology* - synergy and correspondence between message and text (as in icons) etc.
- *Redundancy and absence* - Are messages repeated at different levels, in different codes and media etc. Are there specific absences.
- *Contradictions* - opposing messages?

An excellent example of the (albeit ad hoc) application of semiotic principles to design of the whole e-finance experience can be found in e-trade (www.etrade.com) which has a number of features that engender trust and encourage returning clients. For example on the first page of the etrade site, we are presented with the icon of the stock market, a graph of a timeseries, the changing prices of stock over time. Better than a logo, this has the effect of supporting the customers' belief that they are in a place dedicated to trading and in which they can do business. One may wonder if there would be an increase in trading if the graphs displayed on the front page always went up?

(timeseries graph on etrade front page)

Secondly e-trade have developed a community of practice by providing an area in which customers can share share-tips and communicate ideas about when, how and where to trade. Clearly this community as a semiotic entity makes meaning which relies on e-trade. Once trust has been developed, etrade will become the website of choice for trading.

Taking the criteria for social semiotic analysis we have the following:

- **Semiosic determination** - Strong (Picture of a rising stockmarket ticker)
- **Mimetic anchorage** - Strong (simple and clear messages)
- **Ideological content** - Strong - (all are empowered to buy, using a familiar medium, development of communities of practice)
- **Homology** - Strong (we can facilitate your growth)
- **Redundancy and absence** - High (many links point to the same place)
- **Contradictions** - None (need to trust this site, we are entrusting them away our money)

Other sites have not been quite as successful in providing a semiotically rich experience for customers. In fact, one of the authors witnessed an incident in which someone bought 4000 (penny, thankfully) shares by clicking the wrong button on a well known stockbrokers website.

We may ask what it is from a semiotic perspective that makes an e-finance initiative successful. Analysis of a number of successful sites has lead to the following rules of thumb:

- STRONG Semiosic determination
- STRONG Mimetic anchorage
- HIGH Ideological content
- STRONG Homology
- MINIMUM Redundancy and absence
- NO Contradictions

This equates to trust and security, inclusivity and solidarity, clarity of message, consistent and stable navigational metaphor, and an integrated front to back system.

Semiotic, and semiotic design give a perspective from which to view the entire e-finance experience. Clearly architecture or strategy alone will not encourage customers, but by the same token a non functional semiotically rich website will not encourage customers to return. For example a number of on-line financial services require the use of the telephone at some stage in the transaction, this takes the control away from the client, and introduces a variable which inserts a breach in to the e-finance experience. And it is the experience which is the most important factor.

In conclusion

e-finance is joining the list of other e-s' which are becoming commonplace on the Internet, and in our homes and on our desktops. As a relative latecomer it has the benefit of building on the successes and mistakes of others e-businesses. We would like to suggest that taking a semiotic perspective on the design of an e-finance experience would be of positive benefit, but that this must be supported by the technology and business strategy. Semiotics provides a theoretical perspective supported by a thriving community of practice that can add weight to the ad hoc understanding of the e-finance customer experience. Currently e-finance strategy seems to be business lead, but there is clearly a sense in which the customer, who after all is always right, should become the focus of strategic and design decisions. Semiotics can provide a framework for that refocus. The difficulty is in identifying just who the customer is.

References

Anderson P. (1992)) A Theory of Computer Semiotics. Cambridge University Press.

Chesher, M. and Kaura, R. (1998) Electronic Commerce and Business Communications. Springer.

Peirce, C. S. (1931-1935) Collected papers. Edited by Hartshorne, C. and Weiss, P. Harvard university Press.

Polovina, S., French , T and Vile A. (1999) Semiotics for E-commerce: Shared Meanings and Generative Futures. Proceedings of Business Information Technology 99 conference. ISBN 0905304306. Ray Hackney (ed).

Birch A, Gerbert P, Schneider D (1999) The Age of E-Tail. Capstone.

Hodge R & Kress G.(1988) Social Semiotics. Polity Press

Pollard and Vile (1998) Power structures on the Internet, Patterns of Social Control in newsgroups. Paper presented at the annual conference of the Semiotic Society of America , Toronto. (1998).

Saussure (1974) A course in general Linguistics. Fontana.

Valdez (1997) Introduction to Global Financial Markets. Wiley

Websites
Gartner Group reports.
http://gartner5.gartnerweb.com/public/static/aboutgg/pressrel/pr012600c.html:

Egg: www.egg.co.uk

Etrade: www.etrade.co.uk

SMDF: www.smdf.org