

WEB TECHNOLOGIES AND VALUE INNOVATION IN THE ITALIAN RETAIL BANKING INDUSTRY

Francesco Virili, Andrea Carignani

Università Cattolica del S. Cuore – Dipartimento di Scienze dell'economia e della gestione aziendale
Via Necchi, 5, 20123 Milano (Italy)
Tel.: +39-02-7234 2427, Fax: 7234 3793
francesco.virili@acm.org, acar@mi.unicatt.it

ABSTRACT

Interpreting the outcome of a recent survey on Internet banking in Europe, [CARIGNANI et al., 2000], we point the attention to the adoption of Web technologies in Italian retail banks. Four patterns are emerging: minimal (just a presence on the WWW); tactical (Web as a distribution channel); functional (adoption of Web-based information systems); strategic (a definite strategy centered on Web technologies). While minimal and tactical adoptions are widely diffused, functional and strategic approaches are still very rare. The functional approach is mainly challenged by the underlying complexity of banking information systems and by the still immature technology. On the other side, the adoption of a Web-centred definite strategy is made difficult by unstable market conditions, together with very fast innovation. We refer to the framework introduced by Kim and Mauborgne to overcome the limits of conventional strategic approaches. Our analysis is centred on their concept of value innovation, which is pursued by shifting the focus away from existing markets, to point the attention to the creation of new market spaces. To this aim, the actors should overcome the limits of industry-wide competition, which are classified in six dimensions. The application of the Kim-Mauborgne framework may suggest concrete actions to the Italian retail banks; some exemplifications are given here. Finally the relationships between value innovation and the different degrees of Web technology adoption are explored, concluding that some of the most interesting opportunities are disclosed at the intersection of value and technology innovation actions: the degree of interaction and integration with partners and even competitors that is required by most value innovation actions may be enabled by the adoption of Web information systems. That is: the less diffused forms of adoption of Web technologies have the highest potential of generating profitable growth. Unfortunately, they are also the most difficult to achieve.

1. INTRODUCTION

A presence in the World Wide Web is becoming one of the normal means of building a corporate brand, image and visibility, like appearing in the yellow pages or producing brochures and presentations. Obviously, the Italian retail banking industry makes no exception from this point of view, and in the last few years all the institutions operating in the national market have adopted a corporate Web site. Together with a Web presence, many Italian banks recently started offering Internet banking services, like account management, money transfers or trading on line. A recent survey conducted by CeTIF (Centro per le

Tecnologie Informatiche e Finanziarie) and published by the Italian banking journal *Aziendabanca* [CARIGNANI et al., 2000] draws a first picture of the Internet banking patterns adopted by the main Italian banks in comparison with European competitors¹. According to the surveys' results, the Italian e-banking market is still at an embryonic phase, with the 71% of the sample having less than 30,000 active e-customers, but there are diffused expectations of growth: in the year 2000 on-line trading is estimated to cover around 12% of the total number of transactions (but only 4% in volume); in 2002 it is expected to reach the 20% of the total transactions. Half of the operators declared that they were using Internet banking with a defensive strategy (mainly as an additional offer for the existing customers and not as a way to gain market share); 41% used a different brand for Internet banking, and 35% started a separate company. The 50% of the sample is active in e-commerce through partnerships in other industries, especially with IT companies: the majority of the investments are targeted to conquer a position in the new payment systems evolving market; the 29% has a proprietary Internet mall. Very few banks are planning to move towards Web-based applications for back office activities.

Interpreting the survey outcomes, we may distinguish four different categories of Web technologies adoption:

- Minimal: World Wide Web presence
- Tactical: using the Web as a distribution channel
- Functional: a Web based information system supporting the whole banking activity
- Strategic: a definite strategy centred on Web technologies is clearly formulated

In Italy, all the country-wide operators have a Web presence; the majority are adopting a tactical approach based on Internet banking, with a small but fast growing volume of activity. In contrast, functional and strategic approaches are almost absent.

There are actually strong reasons that make Web Information Systems (WISs) for banking more challenging than in other industries: as stated, for instance, in [Dennis 1998], WISs are not just Web pages, they are inheriting the complexity of the underlying business environment: "*WISs should use the same disciplined system development principles, hard nosed business value assessments, and user-centered approaches that are required to build successful non WISs*" (from [Dennis 1998], page 113). Given the very high information content both in the services and in the processes of the banking industry (see. e.g. [Porter and Millar 1998]), the complexity of the underlying information systems has typically grown in years, together with the richness of the product/services line. Many Italian banks currently use information systems which are a result of an incremental evolution and stratification over time with very different layers of hardware and software [Teixeira 1990] In these conditions, the integration of Web based functions could be challenging, where the total replacement of the old systems would require an extensive development effort, high costs, long time and sizeable resources. A wider adoption of WISs in Italian banks might be enabled by the diffusion of standardized, modular packages based on Web technologies for the banking industry. For an overview of technical and organizational issues connected with WIS development and adoption, refer to [Isakowitz et al., 1998].

If underlying complexity and immature technology are slowing the adoption of WISs in Italian banks, market turbulence and too fast innovation are the main obstacles for the formulation of a clear strategic approach to Web technologies: according to the surveys' results, the Italian banks are actively investing in Internet banking and e-commerce, with the short-term goal of defending their customer base, and generating more customer value without losing interesting new opportunities given by the advent of new payment systems. This classical strategic approach, based on market and competitors monitoring, may be inappropriate in today's turbulent environment, where entirely new market spaces could be created in very

¹ All the figures cited below are referred to the Italian sample only. The whole sample was composed by 41 financial institutions in Italy, Germany, France, Spain and Switzerland. The Italian sample composition was of 14 banks and 3 non-bank financial institutions. The research outcomes were presented also in [Carignani 2000].

short time. To this extent the classical Porter's static framework, where market conditions are assumed to be static, might be integrated with Kim and Mauborgne's dynamic analysis, centred on the concept of value innovation, which is introduced below in section 2. In section 3, through illustrative cases, concrete ways to achieve value innovation are investigated. The key concept is looking beyond the boundaries of traditional competition, in six different dimensions. The analysis is put forward in section 4, figuring out some exemplificative strategic actions that the Italian banks could perform to produce value innovation in each in each of the six dimensions above. Our conclusions are finally offered in section 5, identifying the relationships between value innovation and different degrees of Web technology adoption and the strategic implications for the Italian retail banking industry.

2. VALUE INNOVATION: CREATING NEW MARKET SPACE

In summary, according to the results of the CeTIF survey, the Italian banking industry is still at an early stage of adoption of Web technologies, mainly at the tactical level. The question is: how can Italian banks leverage Web technologies at a strategic level? Is it possible to formulate a strategy centred on Web technologies? Our analysis is mainly based on the framework introduced by [Kim and Mauborgne 1997] and furtherly developed in [Kim and Mauborgne 1999a] and [Kim and Mauborgne 1999b]. The authors investigated, along an almost ten years period, several companies, in more than thirty industries, with sustained high growth in both revenues and profits, with the aim of discovering the common underlying factors of high profitable growth. The target companies were compared with their less successful competitors, building strategic, organizational and performance profiles, but no systematic corporate or industry characteristic was found to be determinant. Only with an analysis of implicit and explicit strategic thinking the winning factor was finally evidenced: *"Less successful companies were racing to beat the competition; highly successful companies did not use competition as their strategic reference. Rather than building advantages over their competitors, companies with high profitable growth aimed to make competition irrelevant by providing buyers with a quantum leap in value. We have come to call their way of strategic thinking value innovation."* ([Kim and Mauborgne 1999a], page 42). The link between innovation and value creation is the real breakthrough for high performance. Value creation is often achievable only on an incremental scale if not accompanied by substantial innovation. The same for innovation alone, which has to be targeted to value creation to release its benefits. There are many examples of new technologies that were not initially accepted by the market: the authors cite the case of Ampex, which innovated video recording technology in the 50s without market success, where JVC and Sony could leverage this innovation to produce consumer value and create new mass markets. The relationships among value creation, value innovation and technology innovation are depicted in figure 1.

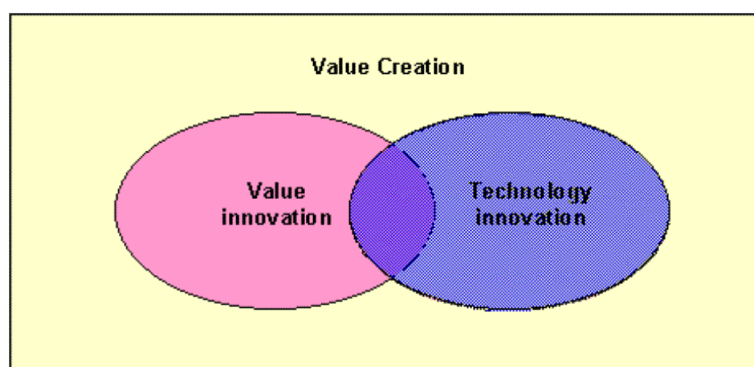


Figure 1: Relationships among value creation, value innovation and technology innovation (From [Kim and Mauborgne 1999a], page 45).

Notice how value innovation can be pursued also by non-technological forms of innovation, like creative ways of using existing technology and resources. In the following section, several examples are given of

value innovation actions that are not necessarily based on the introduction of new technologies, and are depicted on the left side of figure 1. On the right side, pure technology innovation actions are represented, that have a limited, incremental effect on value creation (e.g. the use of new technology to gain production efficiency, or for the introduction of marginally new product features). Value and technology innovation are not totally overlapping: the overlapping zone, in the middle of figure 1, represents the value innovation actions that are based on the introduction of new technology. In section 5, our attention is pointed to this particular zone where we delineate interesting opportunities for the Italian banks for the creation of new market spaces.

According to the view evidenced here, market conditions - and even market dimensions - are not purely determined by external factors, as from the classical approaches to strategic management, like e.g. [Rumelt et al., 1991]. The actors don't compete just for market share, they can create new markets achieving sustained profitable growth. Environmental instability and the possibility to actively influence the market is mainly a result of the high degree of innovation and turbulence of certain markets, and it should be taken into account in research models. In [Chakravarthy 1997], for example, the so called "Infocom" industry (information and communication providers, processing and support) is analysed, evidencing the limits of classical Porter's framework assuming stable competitors, suppliers and buyers. After a review of some recent studies on the subject, the author proposes a framework based on three main points: continuous strategy redefinition, strategy definition process broadly shared within the firm, focus on distinctive competences. Such a "going with the flow" approach has several common points with value innovation, but it doesn't give detailed and viable options for practical use, as we are going to do in the following sections.

3. THE SIX DIMENSIONS OF VALUE INNOVATION

How to achieve value innovation? In [Kim and Mauborgne 1999b] a useful framework is presented, which is summarized in Table 1. The authors suggest how to "*systematically pursue value innovation by looking across the conventionally defined boundaries of competition*". A classification of what they call the "boundaries of competition" is in the first column of Table 1; the following columns show the actions taken to create value in the classical strategic approach, ("head to head competition") and in the value innovation approach ("creating new market space"). Some examples, chosen from the numerous cases analysed by the authors, may help to visualize the six dimensions of value innovation.

Home Depot is a North-American company which has revolutionized the do-it yourself market *looking across two different industries*: in the past people interested in home improvements could hire contractors, at an expensive rate, or buy tools and materials from a hardware store and do the work himself. Both the solutions had weak points: the first was expensive and the second was difficult for inexperienced people. The management of Home Depot analysed the relative merits of each substitute industry and created a new type of store, offering free specialised consultancy by trained sales assistants and even lower prices than conventional hardware stores.

Ralph Lauren has created a new market in clothing, *looking across the two strategic groups* of high price haute couture and higher volume, lower priced classical clothes. They proposed a paradoxical "fashion with no fashion" market, combining exclusive designer name, luxury materials and stores, with the comfort and easier fit of their "Polo", high priced but informal line.

Gaining information from the three categories of buyers groups (purchasers, users and influencers) there are often some opportunities for value innovation: Philips Lighting Company, for example, could open an entirely new market *shifting the focus from purchasers to influencers* in the industrial lighting business. Influencers (mainly CFOs, public relation and communication people) had a different cost perception than purchasers (corporate purchasing managers): the new elements to take into account together with price and lifetime were disposal and environmental costs. Consequently a new product, named Alto, was introduced. Alto was a new, environmentally friendly bulb, that could reduce the overall costs and even benefit to the customer's image gaining positive press. The so called value bundling, a quite trendy expressions currently on the media [Schwartz 2000], is one of the ways of *looking across complementary product and service*

offerings beyond the industry bounds, which is the fourth dimension of value innovation. It is more difficult to achieve in traditional bricks and mortar industry than in e-commerce, given the higher degree of flexibility allowed when coupling immaterial contents from diverse sources.

The Conventional Boundaries of Competition	HEAD-TO-HEAD COMPETITION	CREATING NEW MARKET SPACE	OPPORTUNITIES FOR ITALIAN RETAIL BANKS (exemplificative)
Industry ➔	focuses on rivals within its industry	looks across substitute industries	WAP applications and smartcards to achieve micro-payments as a cash substitute
Strategic group ➔	focuses on competitive position within strategic group	looks across strategic groups within its industry	re-defining boundaries between savers and investors: (e.g. Unicredito RISKVAR index and Investor)
Buyer group ➔	focuses on better serving the buyer group	redefines the buyers group of the industry	pointing the attention to the family members as influencers: family portals and communities (e.g. BNL e-family.it)
Scope of product and service offerings ➔	focuses on maximizing the value of product and service offerings within the bounds of its industry	looks across complementary product and service offerings that go beyond the bounds of its industry	integrated offers: e.g. digital signature certification for e-commerce, mortgages and housing services
Functional-emotional orientation of an industry ➔	focuses on improving price-performance in line with the functional-emotional orientation of its industry	rethinks the functional-emotional orientation of its industry	defining specific product offerings with new emotional impact, like accounts with privileged rights for sport or concert tickets, etc.
Time ➔	focuses on adapting to external trends as they occur	participates in shaping external trends over time	accepting the challenge of Internet price comparisons (navigators) with specific product offerings

Table 1: The six boundaries of competition; actions required to create new market spaces and opportunities for the Italian retail banks (Adapted from [Kim and Mauborgne 1999b], page 92).

The experiences of Barnes and Nobles and The Wall Street Journal Interactive Edition are well known: the first regenerated the book market in the 80s creating a new environment with comfortable reading rooms, coffee bars, knowledgeable assistants, higher selection, and better prices, offering the customer a full set of pleasant side-experiences; the second succeeded where others had failed: it could attract a critical mass of paying subscribers with a carefully designed bundle of news, sister publications, personalised views, stock tracking and technical info, and a special Tech Center, consolidating all high-tech coverage in one place. What generates value innovation here is crossing the industry boundaries, focusing on the buyer's utility.

The Swatch and the Body Shop cases are two well known examples of *functional-emotional redefinition* within the wrist watches and the cosmetics industries. The first transformed the watch into a trendy, emotionally reach, fashion object, generating a totally new demand; the second brought cosmetics from the emotional to the functional sphere, redefining ingredients, packaging, cost and image of this product class.

Finally, Cisco and Microsoft are too well known examples of *shaping external trends over time*, respectively in the telecommunications hardware and Internet software industries. They anticipated the times, building on their initial assets a dominant position.

4. LEVERAGING WEB TECHNOLOGIES FOR VALUE INNOVATION

In the last column of Table 1 we figured out some opportunities for the Italian banking industry in the six dimensions of value innovation, often given or amplified by the strategic use of Web technologies.

In Italy the credit and debit card penetration is often lower than in other European countries as France, UK, and Germany (ABI/Banca d'Italia, 2000) and the role of cash for payments is still very strong. An analysis of

the reasons why Italian consumers are so concerned with cash (mainly trust, costs and practical reasons) could give useful insights for designing new, no cost and high security methods to open wide and entirely new markets for micro-payments systems. Web technologies, especially WAP applications, could be leveraged to this aim. The Italian wireless telecommunications market is interesting from this point of view, with the highest penetration of mobile telephones in Europe after Scandinavia. In the next future it is estimated to grow from around 40% in 2000 to over 50% for 2003 (cf. [Morgan Stanley Dean Witter 1999], page 43).

The two strategic groups of "savers", (customers who trust the bank mainly to save their money, with low knowledge and low propensity to risk), and "investors", (with higher return expectations, risk propensity and technical knowledge), are traditionally addressed by the banks with separate instruments and products. Stock exchange or other risky investments have peculiar characteristics which make them inappropriate for the typical "saver": constant monitoring, high quality information and timely decisions are of vital importance. Usually Italian banks address only educated customers to these products, offering locally advice at request (by the branches or by telephone) and expecting them to actively monitor the market themselves. Web technologies can help to design new banking products aimed to redefine the concept of saving and investment. The easy reach of Web, especially if combined with the use of wireless devices and push technologies, offers to the saver the opportunity to take easily calculated risks and improve profitability, being timely informed and having the opportunity to confirm or schedule transaction in an easy, semi-automatic and costless way. Pre-defined, monitored portfolios may be offered to unacquainted customers and a constant support may be achieved. A first example in this direction is the risk index "KILOVAR", developed by Tradinglab, a trading company owned by the Italian major bank Unicredito Italiano. Technically KILOVAR is a measure of Value at Risk (VaR) for one trading day, given an underlying confidence value, which is probably around 95%. VaR is an instrument widely used for risk management in banks (cf. [Dowd 1998] for an extensive treatment of VaR). KILOVAR is just a simplified VaR for common people: the users just have to know that the index expresses the maximum possible loss in one trading day when investing 1000 Euros on the target share or portfolio, and it may assume values between 0 and 1000. KILOVAR is a smart way to give the user a simple instrument to select portfolios taking into account the underlying volatility without even knowing what volatility is. Approaches like this, together with specific products and services (e.g. Investor, which is a contract sold in an innovative box package like a software), constant large scale assistance enabled by Web technologies can contribute to redefine the boundaries between savers and investors.

An intriguing use of Web technologies could unleash the power of strong (and usually neglected) influencers in everyone's life: the family components. One way is in the careful design of family portals, coordinated and owned by banks, with intriguing graphical and multimedia contents, like entertainment sections and school aids for children, time management, house keeping hints, suggestions for shows and food, network games, chats and so on. With such a strong and regular connections to the families, there would be many indirect ways not only for marketing and promotion, but also to get feed-back and ideas for existing or potentially new products and services. A very nice example is the experimental, freshly launched family portal by Banca Nazionale del Lavoro (www.e-family.it). Partnerships with IT and content providers or merchants are a key aspect of such fully integrated offers, and in several cases a tight integration with the partner's information systems would be required. Here the adoption of a Web-based Information Systems might play a strategic role, as we'll see in section 5. Web technologies could be further leveraged for the creation of communities around the customers common interests or events of life: for example young new families may share interests about babies, education, etc. The strategic role of customer communities is discussed among the others, by [Grover and Ramanlal 1999]. Digital signature certification services may be used to build value around the basic financial product offerings: a strategic analysis of the opportunities for Italian banks in this field is in [Virili and Cantoni 2000].

As an example in the field of cross-industry complements one may conceive a new type of mortgage loan offering targeted to young families for the purchase of a new house; the main product would be enriched with a whole offer of complementary services: furniture and design experts, privileged access to selected operators in the market of housing services, personalized housing insurance profiles, garden design and

maintenance services. Web technologies may play a role here: the bank's Web site might help to inform the customer about the range of active and available services; at a different level,

Giving an emotional impact to a financial product, which has basically a functional orientation, is not so uncommon: the classical example is that of credit cards, which are often personalized and targeted to different categories of customers, giving people the possibility to be associated with a higher or lower financial standing. The possibility to be recognized as members of a higher standing category is one of the justifications for a higher price. Similar mechanisms could be introduced in other financial products, such as a bank account with privileged access to concert or sport tickets or other kind of restricted access privileges. The diffusion of e-commerce could be here a good opportunity for banks to associate a similar emotional profile to digital signatures: a kind of 'silver' or 'golden' digital signatures could give access to credit and/or debt cards payments without the security issues usually associated with the transmission/storing of the card identification numbers. In this field visionary (and powerful enough) banks could anticipate times and really participate in shaping the future of e-commerce payments. A first example is again given by the Banca Nazionale del Lavoro, which guarantees its customers e-payments through its digital certificate "multiCERTIFY", which is legally binding according to the Italian legislation (cf. [Virili and Cantoni 2000]).

Another external trend which may challenge financial operators in the future is the advent of facilitating agents, also called "navigators", which can accomplish not only information retrieval but also price and performances comparison across the market. In the USA financial management software like Quicken or Microsoft Money had already 10 millions users in 1997, as reported by [Evans and Wurster, 1997]: an important feature is that the user is allowed to accomplish *rich* exchanges with the customers bank, integrating the bank's account data with personal planning data. This richness was later accompanied by the power of extended *reach*: the current versions of Quicken and Money are able to connect with several banks and compare their product offers. The introduction of navigators could represent a serious threat, lowering prices and margins in the whole industry, and the banks could act with a defensive strategy, refusing to give access to their products listings. In facts *"The banking industry collectively committed to common strategies to fend off the threat from new navigators such as Quicken and Microsoft Money. But, one by one, individual banks found that they had more to gain from participating in the common information standard that these navigators were creating"* (!) (from [Evans and Wurster, 1999], page 88). The only way to keep a direct contact with the customers may be achieving a more ample customer reach and product offerings range: *"That may mean entering into joint ventures with competitors² to achieve critical mass. It may mean navigating to other companies products and services"* (from [Evans and Wurster, 1999], pages 88-89). The definition of a common playground with competitors, joining efforts to integrate product offerings or to build common infrastructures, is a complex issue which goes beyond the scope of this analysis, but it will probably offer several occasions of value innovation for the financial institution that will be able to shape this trend earning a prominent position in the dynamically evolving market spaces.

5. CONCLUSIONS

Looking back at the scheme of Kim and Mauborgne and revised in figure 2, we could try to summarize the main points investigated until now.

² Joint ventures among competitors actually represent a very complex and delicate issue; nevertheless they are appearing in different fields, both in business to consumer and in business to business. For example, two of the major recording companies, Universal Music and BMG, joined their efforts and built a common Web-based e-commerce site and catalogue (GetMusic.com), to offer the consumer a wide selection without sharing their margins with third parts; on the other side, an historical business to business joint venture among fierce competitors is Covisint (www.covisint.com), the common Internet exchange by Ford, General Motors, DaimlerChrysler and Renault-Nissan. Covisint will link the four automotive companies with suppliers enabling common functionalities like procurement, supply chain and product development, with astonishing effects on productivity: according to Goldman Sachs and Morgan Stanley Dean Witter, global estimated savings should be around \$ 2-3000 for a \$19,000 vehicle (!).

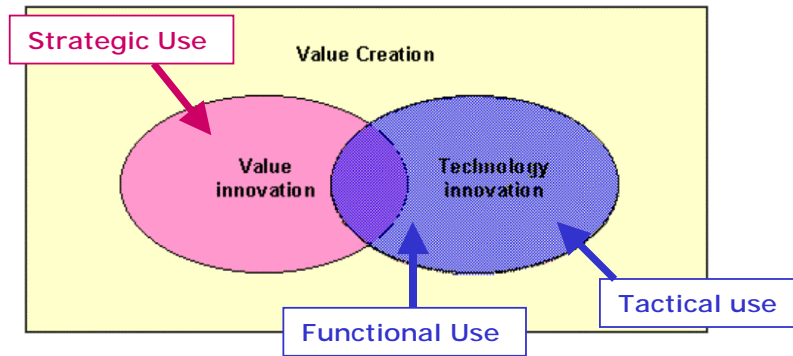


Figure 2: Value innovation and Web technologies adoption patterns.

The tactical use of Web, with the development of classical e-banking activities, may be positioned in the right side of the technology innovation area: investments in this field, if not accompanied by value innovation strategies, are necessary not to lose market share, but they are presumably not generating new significant market spaces. At the current growth rate, an estimate of the aggregate margins generated by the whole Italian Internet trading market in 2002 is around 50 millions Euro, a quite ridiculous amount even for a single bank.

On the other side the functional adoption of Web technologies could be located between the dark and the overlapping area: the adoption of a Web Information System may well be regarded as a significant technological innovation, and it is possible (but not guaranteed) to leverage it for value innovation.

The strategic use of the World Wide Web, with value innovation actions similar to those described in section 4, could be positioned on the value innovation area. In the overlapping zone the value innovation actions enabled by the adoption of WISs and other new technologies (like WAP applications for cash substitution, e-payments, integrated family portals or e-communities services) are located. Some of the most interesting opportunities for Italian banks are just in this area.

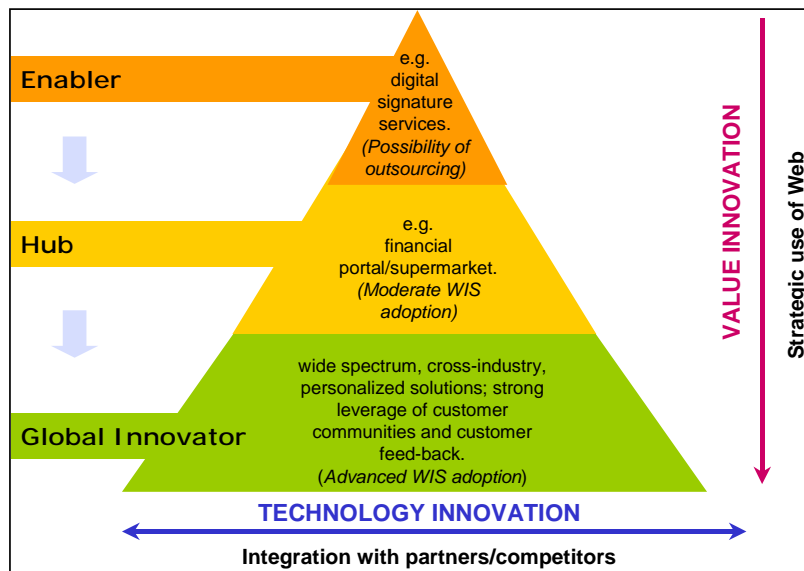


Figure 3: The potential role of Italian retail banks in the “Web arena”: value innovation enabled by technology

In figure 3 we explore this area by individuating some potential roles of Italian retail banks in the “Web arena” and classifying them in terms of technology innovation and value innovation. Three roles are identified: the *enablers* are situated at the top level, with low degrees of adoption of new technologies and low value innovation; the services which may enable or facilitate transactions in other industries are located

here, like e.g. digital signatures or new payment systems for e-commerce. For this role it's not necessary to reinvent the back-office implementing Web Information Systems, given the low level of integration with third parts required; rather outsourcing of technology services is generally one of the viable options. A second role is that of *hub*: Italian banks may have an active role in e-commerce offering Web portals/supermarkets with a wide selection of products and services under the bank's brand. Here a tighter integration with third parts would require a higher degree of internal adoption of web technologies. The third potential role is much more unexplored: we call it *global innovator*; the highest value innovation actions in the six dimensions explored above, that require a very high integration with third parts and even competitors (together with an advanced internal adoption of WISs), are classified here.

Global innovators generate market space using new technologies (e.g. the amplified customer reach of all the available channels) as a mean of capturing more information from and about customers, in order to design new products and services to fulfil their needs in creative ways. This process may require a tight collaboration with other firms, to different degrees, ranging from simple product bundles to the formation of virtual organizations for specific projects. To this aim, WISs can unleash their full potential when interconnected to realize a tight integration with partners and even competitors, finalized to the generation of a global product/service offering. Patterns already present in other industries, like the deconstruction of the value chain (cf. the Covisint case in note 2) and the creation of a value network³, are enabled and pushed by Web technologies [CARIGNANI, 1998]. On the other side, as we mentioned above, the adoption of WISs is not without pain. Is it worth the effort? The answer to this question would be a perfect starting point for further research.

REFERENCES

- Abi/Banca D'Italia (2000). *Rilevazione dello stato di automazione del sistema creditizio*, May 2000 (in Italian)
- Carignani, A. (2000). Lo stato dell'arte della banca diretta in Italia e in Europa: I risultati di una ricerca CeTIF-AziendaBanca. In *Proceedings of the CeTIF International Conference "I servizi finanziari virtuali: l'evoluzione del ruolo del cliente in uno scenario multicanale"* Università Cattolica del S.C., Milan (Italy), June 2000 (in Italian).
- Carignani, A. (1998). A Framework for analyzing technological and organizational evolution in banking industry: from virtual banking to value network. In *Proceedings of IF98* Frankfurt, 1998.
- Carignani, A., Terraciano, C., Bigi, A. and C. Frigerio (2000). Internet banking in Europa. *AziendaBanca*, June 2000 (in Italian).
- Chakravarthy, B. (1997). A new strategy framework for coping with turbulence. *Sloan Management Review*, Winter 1997.
- Dowd, K. (1998). *Beyond Value at Risk: the new science of risk management*. Wiley, Chichester.
- Grover, V. and Ramanlal P. (1999). Six myths of information and markets: information technology networks, electronic commerce, and the battle for consumer surplus. *MIS Quarterly*, December 1999.
- Dennis, A.R. (1998). Lessons from three years of Web development. *Communications of the ACM*, July 1998, 112-113.
- Evans, P.B. and T.S. Wurster (1999). Getting real about virtual commerce. *Harvard Business Review*, November-December 1999, 85-94.

³ According to Ernst&Young (1997) Value networks are formed when banks and other financial services providers collaborate to offer their customers comprehensive financial services and products.

- Evans, P.B. and T.S. Wurster (1997). Strategy and the new economics of information. *Harvard Business Review*, September-October 1997, 71-82.
- Isakovitz, T., Bieber, M. and F. Vitali Eds. (1998). Web Information Systems. *Communications of the ACM*, July 1998 (special issue), 78-118.
- Kim, W.C. and R. Mauborgne (1997). Value innovation: the strategic logic of high growth. *Harvard Business Review*, January-February 1997, 102-112.
- Kim, W.C. and R. Mauborgne (1999a). Strategy, value innovation and the knowledge economy. *Sloan Management Review*, Spring 1999, 41-54.
- Kim, W.C. and R. Mauborgne (1999b). Creating new market space. *Harvard Business Review*, January-February 1999, 83-93.
- Morgan Stanley Dean Witter (1999). The global telecommunications primer. *Morgan Stanley Dean Witter Research*, <http://www.msdc.com/techresearch/>, June 1999.
- Rumelt, R.P., Schnedel, D. and D.J. Teece (1991). Strategic Management and Economics. *Strategic Management Journal*, vol. 12, Winter 1991, 5-29.
- Porter, M.E. and V.E. Millar (1985). How information gives you competitive advantages. *Harvard Business Review*, July-August 1985.
- Schwartz, E.I. (2000). Value of a bundle. *Business 2.0*, April 01, 2000. (www.business2.com).
- Teixeira, D. B. and T. D. Steiner. (1990). *Technology in Banking: Creating Value and Destroying Profits*, Homewood, IL: Dow-Jones Irwin.
- Virili, F. and F. Cantoni (2000). The Italian legislation on digital signatures and the role of Italian banks as Certificate Authorities: a strategic analysis. In *Proceedings of ECIS 2000*, Vienna, 2000.