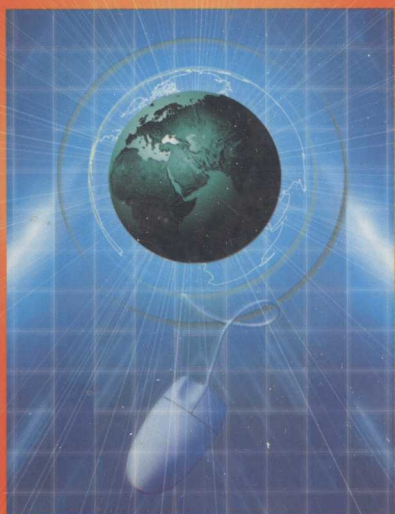


e-Finance



THE
ELECTRONIC
REVOLUTION

ERIK BANKS



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e-Finance

The Electronic Revolution

Erik Banks



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E.B.
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1

The Arrival of e-Commerce

e-COMMERCE IN THE INTERNET AGE

Electronic commerce, digital money, online trading, and web banking—we hear these terms on the evening news and read about them in the daily newspapers. They are elements of 21st century business that have changed the way we conduct our business and lead our lives. Though the issue is complex, we propose that electronic banking, trading and finance—key elements of the broader electronic commerce (or e-commerce) sector—have been made possible by a unique confluence of technology, creativity and capital. Technology, as outlined in the Appendix, has enabled business to be conducted in a fast, efficient and secure way; creativity has allowed entrepreneurs, start-ups, and seasoned companies to break ‘old economy’ paradigms—those based on traditional manufacturing and industrial production models—to deliver business solutions through new, exciting, and often radically different structures; and capital, the lubricant of every micro- and macro-economy, has provided the financial wherewithal to put these technical and human wheels in motion. These three elements, working together in a deregulating environment, have started to reshape the global economic and financial landscape. As a result, the retail and institutional financial services industry is in the midst of a dramatic transformation that is affecting all participants—providers, users, regulators and investors—in a very meaningful fashion. Electronic finance (e-finance) represents a new frontier in the creation, delivery and use of financial services.

The development and expansion of computer/communication networks—fuelled by enabling technologies such as integrated circuits (ICs), personal computers (PCs) and broadband connections—has led some observers to draw parallels between the 21st century digital revolution and the 18th/19th century Industrial Revolution—which changed the social and economic

landscape of England, and then the world, so dramatically. As a result of networking, new efficiencies have been achieved, new methods of working and playing have been introduced, and new methods of organizing life and work have evolved—fundamental changes that are, in many ways, as radical and transformational as those witnessed during the Industrial Revolution. From the creation of packet-switched networks in 1969, to e-mail in 1971, the web in 1991, browsers in 1993, and popular online services in 1995, the Internet (and associated private networks, intranets and extranets) has changed the way millions of people lead their personal and professional lives. As the price of communication and computing power declines, the presence and influence of networks expands even further—indeed, the steady decline in the price of information access and transmission has been, and continues to be, central to the success of the Internet. Technical innovation has deep and lasting impact when it is affordable—the Internet, and its users, have benefited from increasingly inexpensive technology. Consider that the price of computer processing power has fallen by an average of 35% per year over the past three decades, while the cost of sending information over copper, coax, fiber or wireless has dropped by orders of magnitude—according to the Federal Reserve, the cost of sending 1 trillion bits (characters) of information over the network has declined from \$150,000 in 1970 to only \$0.12 in 2000, while a 20 page document can today be e-mailed for only 1 cent. Because computing and communicating power is cheap, it is available and accessible to a broad audience—this increases the connective and productive power of the network and helps transform entire aspects of financial, economic and social behavior.

Penetration and acceptance of the Internet and associated networks have been very rapid. It took 38 years for the radio to achieve widespread mass use, 13 years for the television, and 16 years for the PC—but only four years for the Internet (once it was opened to the general public). Further expansion of the Internet is expected as PC and wireless use continue to grow. The number of computers in operation globally increased from 237MM in 1995 to 428MM in 2000, and researchers expect nearly 800MM to be in use by 2005. Various forecasts already predict that Europe will be home to the largest number of computers by 2005 (260MM), followed by the US (230MM), Asia (190MM), Latin America (56MM) and Middle East/Africa (30MM). Wireless users, many of whom will access the web through their wireless devices in the future, will double to over 1B by 2004. As a result of these trends, Internet growth and activity is set to expand further over the coming years. During the mid- to late 1990s Internet traffic doubled every 100 days, and continues to accelerate; in 1995 there were approximately 39MM Internet users, by 2000 that figure had increased to 350MM and by 2005 is expected to reach over 750MM. While the US currently accounts for more than 40% of all Internet access, future growth will come from various other regions—by 2005 the US will feature

230MM Internet users, Europe 260MM, and Asia 190MM. Network hosts increased from the 'original 4' created in late 1969 to 160,000 at the end of 1989 and over 100MM at the end of 2000—and are expected to reach 1B by 2005. The number of web sites rose from a mere 130 in mid-1993 to 650,000 at the end of 1996 and 9.6MM at the end of 1999. The number of distinct web pages reached 1.5B at the end of 1999, reflecting a two-year growth rate of approximately 1.9MM pages per day; IDC, a research firm, estimates that the Internet will feature over 8B web pages by 2002. With such impressive growth and penetration rates—in such a short period of time—and with such bright future prospects, it is little wonder that many businesses, including those represented by the financial industry, have sought to take advantage of the Internet to deliver products and services.

The growing reach and influence of the Internet, fuelled by cheaper and more powerful PCs, and faster and more robust communication links, has helped spawn new ways of doing business. While technology has been an important enabler and facilitator, it has not been the sole force responsible for reshaping commerce. In order to create new business platforms, technology has been supplemented by the creative forces of businesses and entrepreneurs who have been willing to think differently, and sometimes radically, in the design and application of business methods. Prior to the mid-1990s business models were generally confined to standard 'value chains'—links in the production/service process, from logistics, to resource acquisition, design, production/manufacturing, inventory control, processing, shipping, and corporate infrastructure. By taking advantage of the commercial possibilities of the Internet these 'value chains' were—and continue to be—challenged, disassembled and reordered. With the Internet it has become possible—at least in theory—to provide small and large customers with electronic access to a broad range of information, goods and services at a cheaper price and with greater efficiency and transparency. Businesses have been able to use the Internet to reach a larger, and more geographically diverse, set of customers at very little incremental cost. In addition, they have been able to leverage technology to scale their businesses very quickly. Such is the basis of the broad field of e-commerce; as we shall note throughout this text, many of the advantages gained through this construct apply equally in the e-finance world. It is worth stressing that e-commerce is not strictly about selling goods and services through the web—though this is a part of the proposition—but about using technology to fundamentally change business processes in order to achieve speed, efficiency, innovation and customer value.

A University of Texas survey indicates that in 1996 US e-commerce accounted for \$2B of a total gross domestic product (GDP) base of \$7.6T—less than 0.03% of GDP. By 2002 US e-commerce is expected to account for \$750B to \$1T of a \$10.1T economy, or 7.5–10% of GDP, and to grow even further from there. Though the US has led the way in e-commerce—

accounting for 67% of all business-to-business e-commerce revenues and 76% of business-to-consumer e-commerce revenues in 1999—nations around the world are already increasing their participation and narrowing the gap. Foreign e-commerce will be an important component of global output in the coming years; indeed, IDC predicts that by 2004 62% of e-commerce transactions will come from outside the US, with Western Europe and Japan accounting for the largest portions (35% and 16% of the total, respectively). Various research firms predict that global e-commerce will reach between \$1.5T and \$3T by mid-decade, with more than 90% coming from the business-to-business sector. Projecting future e-commerce revenues is a decidedly tricky task; analysts often include different sectors of the market in their definitions and typically employ different inputs to arrive at revenue growth rates (i.e. how rapidly the Internet expands, how quickly ‘old economy’ companies adapt their strategies, how alternate models and concepts are developed and introduced, how new technologies impact communication and distribution, and so on). Though the range of estimated future e-commerce revenues is quite large, it is clear that the sector will be a significant contributor to global output over the short- and medium-term.

e-Commerce firms operating in the ‘new economy’—as it has come to be known—are redefining many of the business tenets long held ‘sacred’ by companies. The new economy and its successful e-commerce firms are characterized by dynamic value migration, real-time execution and fulfillment, ‘webs’ of alliances and partnerships, distributed work processes, and personalized, interactive customer relationships. Successful ventures are those which are capable of managing partnerships, alliances and other relationships in a flexible manner, dealing with rapid change effectively, and maintaining the highest standards of management and technical competency. Achieving commercial success on the Internet is not simple. Since many of these concepts are new or alien to well-established firms, the task of redefining and migrating business to the Internet has been, and will continue to be, doubly hard. To understand the issues and challenges involved in creating Internet platforms we explore, in this chapter, various conceptual and practical issues related to the development of e-commerce and e-finance sectors and models.

e-COMMERCE SECTORS AND MODELS

Though the field of e-commerce has only existed since the mid-1990s, it has already developed a taxonomy which helps classify and identify the functions performed by different participants in the market. For instance, it is by now well established that e-commerce is divided into three broad sectors—‘business-to-consumer’ (B2C), ‘business-to-business’ (B2B) and infrastructure. Two additional fields which offer future e-commerce potential include

‘consumer-to-consumer’ (C2C, sometimes also known as peer-to-peer (P2P)) and ‘exchange-to-exchange’ (E2E).

In B2C, businesses supply information, goods and services to individuals; individuals can purchase these goods and services directly from the B2C platform. This is the most established segment of e-commerce (though not necessarily the most profitable) and focuses heavily on access, content, traffic and consumer branding. Representative platforms in this segment, familiar to many Internet users, include Amazon, eBay, E*Trade, and so on. In the B2B sector businesses supply information, goods and services to other businesses and develop business-related exchanges to serve other businesses. Representative corporate platforms include the transaction-enabled sites of firms such as Intel, American Express, Microsoft, Ford, General Electric, Daimler Chrysler, IBM, Oracle and others; institutional buyers can transact directly with these platforms. B2B business exchanges bring together companies from identical industries (so-called vertical exchanges) or different industries (horizontal exchanges) and allow them to buy and sell goods and services in a moderated setting. Exchanges may be supplier-led, buyer-led or intermediated. Depending on the structure of the exchange, transactions can occur on the basis of auctions (sellers offer goods/services which buyers bid on), reverse auctions (buyers provide sellers with bids for specified goods/services), or matching services (brokers link buyers with sellers). In its simplest form, a buyer interested in purchasing a bulk shipment of auto parts (or Treasury bonds or any other exchangeable good) accesses the relevant electronic exchange, posts a price or lifts a seller’s offer, and has the order filled; attendant fulfillment services related to payment and shipping (or transfer) are typically arranged and concluded within the exchange as well. Regardless of the structure, exchanges require an appropriate balance of buyers and sellers in order to function properly; a bias in either direction can cause the business model to fail, as supply or demand forces will act to skew prices. Vertical exchanges exist in numerous sectors, including manufacturing, utilities, construction, health care, and financial services, among others; examples include Covisint (auto parts), E2Open (electronic parts), Pantellos (energy), Transora (packaged goods) and Quadrem (mining/metals) (along with a range of financial exchanges that we discuss at length in Chapter 4). Horizontal exchanges have been created to provide distribution channels for capital equipment, excess inventory, and contract manufacturing across a range of industries; representative exchanges include Onvia and Freemarkets. E2E, a relatively new concept, is intended to promote business between, and within, exchanges. C2C, a small but emerging sector, is designed to let consumers deal directly with one another through mechanisms such as electronic auctions.

In the e-commerce infrastructure sector, technology and consulting ventures supply web ventures with the ‘nuts and bolts’ needed to develop and conduct Internet-based business. These companies provide consulting ser-

vices, web/content enabling packages (including payment, inventory, shipping and other fulfillment services), software products, web design, wireless and broadband capabilities, security architecture, network transportation/equipment services, and support and maintenance; infrastructure services are available to both start-up ventures and established companies. As established firms, in particular, develop e-commerce strategies and alter their business structures, existing infrastructure architecture often needs to be redesigned and reimplemented; this can be a wrenching, expensive and time-consuming exercise, particularly when legacy technology and processing platforms are well entrenched. Infrastructure companies readily assist such companies in the conversion process. Examples of companies in the infrastructure sector include Vento, VerticalNet, Ariba, Oracle, Vignette, Commerce One, Cisco, Akamai, SAP, Inktomi, Geo Interactive, XoR, Clarus, and Digex, among others. It is worth noting that while some researchers view infrastructure companies that allow businesses to serve other businesses as B2B companies (and adjust their definitions and metrics accordingly), others define them to be separate providers of infrastructure and measure according to that definition. The categorization of e-commerce ventures into the three broad sectors described above is, of course, applicable across industries; as we shall note in greater detail later in the chapter, the financial sector features its own B2C, B2B and infrastructure providers.

Many businesses have found e-commerce to be a logical, if challenging, way of conducting and expanding business. For companies entering the e-commerce arena the value proposition—or gains to be derived—must be clear. For example, a company can use the web to reduce costs, manage supplier relationships, access and service customers, expand distribution, deliver information, streamline logistics, manage inventories and pipelines, create ‘upstream’ (trading partner) and ‘downstream’ (distributor) links, and so on. The value proposition for the customer must also be obvious—there must be a clear and compelling reason for an individual or institutional customer to use the Internet for business. Most often the enhanced value proposition relates to lower costs, greater returns, more transparent pricing, enhanced liquidity, broader selection, more rapid and convenient processing, more efficient fulfillment, and so on. Technology and marketplace dynamics change so rapidly that companies that strive to be effective and relevant constantly search for new value chain opportunities that can enhance the value proposition for themselves and their customers.

Companies entering the Internet business arena must possess a committed management view that is applied in a rigorous and disciplined manner. The e-commerce strategy must be driven from the top down and become part of everyday corporate culture—this means management must be committed to establishing a presence, being visible, offering value and convenience, and partnering/outsourcing as necessary. More than a few firms have pursued

e-commerce strategies in an informal or ad-hoc fashion, leading to wasted time and resources and ineffective results. Achieving a sustainable competitive advantage is very difficult under the best of circumstances, and is virtually impossible when the approach is not properly planned, guided and driven. In practice, many companies and ventures have chosen to implement their e-commerce strategies in small steps. Commencing first with internal tactical applications, such as 'webizing' corporate functions (including human resource management, internal policies, business expenses and financial reporting), some have then moved to experimenting with the business model—primarily by targeting 'non business critical' functions with less downside risk. From there they challenge corporate standards and redesign business processes. In the final stage they may completely transform entire aspects of their business, with a view towards creating significant improvements in the value chain.

Developing an effective e-commerce platform requires the definition of a mission statement and identification of a robust business model. The business model must identify the component of the value chain that is being restructured and enhanced, and quantify the relative costs and benefits of doing so. As indicated above, the successful model provides tangible benefits to all parties involved. For established companies the development of a business model cannot, of course, be done in isolation; existing operations must be considered as part of a process that ensures the business 'scope' of the traditional and e-commerce platforms is clearly understood. Creating web-based sales, distribution, procurement or support channels can lead to 'channel conflict'—conflict that can arise when separate parts of an organization offer similar products/services through different channels, leading to 'cannibalization' of business. Avoiding or minimizing channel conflict by developing appropriate strategies is, as noted below, of paramount importance. The scalability of a business model is also critical. There is little lasting value in implementing an idea that has a very small audience or market; the potential audience for a product or service must be large enough to justify the time, investment and expense of developing it. Just as the business model must be scalable so, too, must the underlying technical architecture supporting the model—technology must be able to deliver what the business model promises. A governance process, which manages and oversees the e-commerce platform, is crucial; such a process cannot, however, be bureaucratic in nature.

There is no single 'correct' definition of the e-commerce business models that are shaping the web; many ventures and platforms cross boundaries, and analysts and researchers periodically classify them in different ways. Despite these differences, certain broad classifications can be described. At a macro level Internet players can be divided into groups focused on access, content/context and enabling. Access platforms provide users with physical connections/entry points to the Internet and related support services; this

group includes Internet service providers (ISPs), telecom providers, web hosts and middleware companies, such as America Online (AOL), Freeserve, Microsoft Network (MSN), T-Online, Tiscali/World Online, Wanadoo, and Terra Lycos. Content/context platforms provide users with information, products and services in an informational or interactive setting; this group includes electronic retailers ('e-tailers'), brokers, agents, dealers, advertisers, infomediaries, e-marketplaces and exchanges, such as Amazon, Yahoo, E*Trade, AskJeeves, LastMinute, GoTo, eBay, and QXL. Enablers facilitate the transmission of information and transactions and act as trusted, independent third parties for web commerce; this group includes clearinghouses, guarantors and security providers, such as Bottomline/Checkpoint, Guardent and Verisign. Within these three groups platforms may operate as B2C ventures, B2B ventures or providers of infrastructure. In certain cases, they may span multiple functions (acting as access and content providers, for instance).

Within the content/context subgroups we may consider more granular models. One approach divides these platforms into five different categories: vanity sites (those for personal, non-profit or altruistic ventures); informational sites (those for investor relations and product/service information); advertising sites (those for third-party promotion); subscription sites (those with specialized content and access); and storefront sites (those where users can purchase products/services and related fulfillment and support). A second approach divides business models into four slightly different categories: infomediary sites (those which collect and analyze web information/preferences in order to assist in targeted marketing); advertising sites (those which provide general, personalized or specialized access to information); merchant/'e-tailer' sites (those which provide users with products/services through virtual/'pure play' entities (i.e. no underlying physical store/outlet), catalog-driven entities, or physical store extensions (so-called 'bricks and clicks' or 'surf and turf'))); and broker sites (those which provide users with broking or agenting services). A third approach classifies business models in a more detailed fashion: e-shop/storefront sites (those which provide advertising, goods selection and payment capabilities, primarily at the consumer level); e-mall sites (those which extend the e-shop concept by providing advertising, goods selection and payment capabilities across a wide number of e-shops (based on a single theme or a range of themes)); marketplace sites (those which provide information, analysis and aggregation across a large number of associated web platforms); e-procurement/exchange sites (those which provide tendering/procurement facilities for goods and services, targeted especially at large companies or public/government authorities); e-auction sites (those which provide bidding facilities for goods and services, along with contract and payment capabilities); information management/infomediary sites (those which supply information and provide data management collation, analysis and search services); value chain service provider sites (those which provide

niche components of the value chain, such as product creation, payment or shipping); and value chain integrator/portal sites (those which provide aggregate components of the value chain, such as information dissemination, resource acquisition/purchasing and design/manufacturing). In addition to these structures the B2B sector is sometimes defined to include additional models such as virtual/affinity communities (sites where users with common interests/themes unite), buyer/aggregators (sites where individual buyers are brought together in a consolidated fashion to obtain better prices), extranet business communities (sites where extensive private networks provide links to common interests), and so on. Naturally, various other classifications of models exist, but these are common representations. Within the e-finance world, most platforms can be classified according to one of these definitions. For instance, firms such as Bank of America and Barclays operate corporate storefronts, E-Loan and InsWeb are active as marketplaces, Citibank and American Express are broad integrator/portal sites, Financewise and finweb act as financial infomediaries, CheckFree functions as a value chain service provider, Atrix and BondBook operate as exchanges, and so on; we shall discuss these at greater length below.

e-COMMERCE IMPLEMENTATION

As indicated above, B2B and B2C e-commerce platforms often evolve through various stages. They can commence as informational sites, then introduce customer interactivity, become transaction-enabled, and then offer real-time personalized services. Indeed, many of the financial platforms discussed in this book have gone—and are going—through such evolutionary phases; some have started as infomediary sites and emerged as corporate storefronts or broad-based interactive integrator/portal sites. Others have confined themselves to a particular state, believing they can add greatest value in that form. For most companies, the e-commerce process starts with product and market transformation, which involves reinventing products/services and redefining the value proposition. For a smaller group of successful ventures it moves into a business process transformation, where new business models are created, partnerships/alliances are formed and outsourcing is undertaken. For a very select few, it culminates in a broader industry transformation, where traditional industry boundaries are redrawn and competitors are redefined. Exchanges are often created in stages as well. In the first phase, institutional buyers and sellers come together using a common web platform. Once established, the exchange expands in scope to include additional third-party/infrastructure services, including vendor certification, payment mechanisms, logistics, financing and customer support. Advanced exchanges then move into a product development/marketing phase that focuses on workflow man-

agement, optimization and fulfillment. For a select group of extremely well-developed exchanges a fourth phase focused on leading-edge business and product innovation (that becomes synonymous with industry leadership) is also possible. The essence of successful e-commerce involves rethinking and challenging value propositions—by understanding and anticipating customer needs—and then migrating business from a commoditized service, to a value-added service, to a truly unique, premium service. Defining a business model, such as one of those outlined above, forces a firm to consider attendant revenue, cost, design, technology, security and management issues. It also allows a firm to crystallize its core competencies. A business model must focus on the e-commerce business the venture is capable of pursuing in future years—it should not be seen as an opportunity to ‘spread out’ across an entire spectrum of businesses.

The revenue and cost dimensions of the e-commerce model must be thoroughly understood, stressed and monitored. It is worth noting that some of the services offered through the models described above appear to be ‘free’ to users, in the same way television and radio are ‘free’. While the user may gain the benefit of some Internet service without ‘paying’ for it, the service provider actually attempts to generate direct or indirect revenues through alternate means—for example, by creating marketing or advertising services, developing customer information profiles for marketers, or collecting transaction/subscription fees. The e-commerce revenue paradigm is particularly complex because the web has altered established concepts of pricing. Contrary to traditional business models, for instance, the web allows for free products/services, differential pricing for the same goods, and so on. Understanding what customers are willing to pay for a particular product or service is central to unraveling the complexity surrounding revenue generation. Since the Internet is a relatively new medium it is still somewhat unclear what features like news headlines, e-mail, stock quotes, trade execution, investment advice, portfolio management, bill paying, front-to-back processing/fulfillment, and so on, are really worth to the average customer; services that can be ‘bundled’ or ‘unbundled’ add further to the complexity of the pricing function. Revenue generation within B2B exchanges is also a complicated issue. While some exchanges have been developed to bring suppliers and buyers together in order to help them ‘strike deals’ (and take fees), business reality is far more complex—creating a sustainable revenue flow depends very highly on the relationships between exchange participants (buyers, sellers, intermediaries), the degree to which the underlying market served by the exchange is fragmented or concentrated, the relative balance of buying and selling that occurs within the exchange, and so on; for instance, charging buyers and sellers a fee for simply bringing them together in a more efficient fulfillment setting may not necessarily be acceptable to buyers or sellers who have had a long history of dealing with each other outside the exchange

structure. These pricing complexities are likely to be an ongoing challenge for all participants, particularly as competition gives rise to new ways of reconstructing the value chain and doing business. Different models obviously seek to create revenues in different ways. e-Storefronts/malls attempt to make money from product/service sales margins and advertising fees, infomediary models from advertising, subscription, partnership, and referral/transfer fees, B2B storefronts and exchanges through product/service sales margins, auction, advertising and procurement fees, and so on. As one might imagine, costs also form an essential element of any e-commerce business model. Costs of technology, development, inventory, outsourcing, fulfillment, human resources, and so on, vary from model to model; they must be justified and managed on behalf of those providing capital. New ventures, in particular, are sensitive to ‘burn rates’—the speed at which funds supplied by venture capitalists and other investors are spent; if burn rates are too high, suggesting costs are moving ahead of budget, investors may take pre-emptive actions to protect their investments.

The nature of the business model generally indicates the most appropriate type of web platform design needed to perform stated tasks. A basic informational model with relatively static information is unlikely to need frequent updates or carry any sensitive user information, and therefore requires only modest technical maintenance and security once it is operational. Conversely, an informational model which relies heavily on dynamic information, such as a portal offering streaming headlines and stock quotes, requires more intricate technical construction and maintenance. A dedicated corporate storefront that offers fully interactive, transaction-enabled services demands extensive technical design that is sensitive to both security and performance—this ensures that appropriate safeguards exist to protect customer information and that transaction execution and fulfillment can be accomplished accurately and efficiently.

Technical architecture follows from design, and focuses on both the external platform that is being offered to customers and the internal platform required to deliver services and integrate legacy systems. Legacy systems are an important part of the process, as it is common for mature companies to have well-established technology focused on inventory control, payments, billing, cash management, accounting, reporting, and marketing. These operations must generally be integrated with new Internet applications, and infrastructure companies specializing in this type of work often facilitate the process. For instance, if a bank is offering customers the ability to access account balance information that resides on a legacy mainframe database, it must design and implement architecture that provides a seamless link between what the customer sees on the web and the information that resides in the mainframe database. In certain instances the incremental expense of converting or merging legacy systems into a new, integrated platform is justifica-