

e-business Models: Integrating Learning from Strategy Development Experiences and Empirical Research

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Introduction

Although “e-business” is a relatively new concept, there already exists a substantial base of experience in designing and implementing e-business initiatives and measuring their impact. As firms seek to go beyond the initial and often imitated online store examples to the less obvious areas of their business that could be transformed with e-business technologies, there is a need for benchmarking the existing base of e-business experiences. In a joint project with IBM Global Services, we are performing such a task by surveying e-business initiatives that have been deployed long enough to observe and analyze their impact. The objective of this survey is to break down an industry or function specific initiative into its e-business components or “building blocks” that may also be observed in initiatives in other industries and functional departments. The identification, description, and organization of these building blocks make it convenient to reuse them in new initiatives. For example, a building block extracted from a customer service initiative in a retail firm could also be reused in a supplier focused initiative in a manufacturing firm.

We choose to use *building blocks* as the unit for modeling a firm’s e-business initiatives instead of its *business model*, a term used, often inconsistently, in the context of formulating and analyzing e-business strategies. There are two reasons for this choice. First, a business model – however defined – is invariably linked with its situational context: the firm and its industry. This makes it difficult to reapply an observed business model to another firm or industry without first isolating it from its context. Second, a business model is often defined to apply to the whole firm (or strategic business unit) instead of specific e-business initiatives undertaken by the firm. This makes business model a less reusable concept because most incumbent firms would prefer to develop new e-business initiatives aligned with their existing business model rather than experiment with new business models.

In this paper, we describe our e-business modeling framework and the role of building blocks within it. We then describe a set of building blocks based on the e-business initiatives analyzed so far¹. Finally, we explain the method by which these building blocks are being incorporated into new e-business initiatives developed by IBM e-business strategy and design consultants for their clients².

An e-business Modeling Framework

We model a firm’s business in a strategic knowledge representation framework called *Strategic Capability Network* (SCN). This framework represents the basic components needed to analyze or formulate a firm’s business strategy. This is especially suited for e-business strategy because its primary objective is to link a firm’s resources such as network and computing technology to its ultimate business value, such as customer satisfaction and revenue from new customers.

The SCN framework represents the value propositions, capabilities and resources of a firm and the influence relationships among them. *Value propositions* are the statements of benefits that are delivered by the firm to its external constituencies, such as customers (e.g., lower prices, wider product choices, faster delivery) and also to its internal constituencies, such as employees and shareholders (e.g., faster expense reimbursements, shorter time to market, growth in market share).

The value propositions offered by a firm are generated by a set of internal *capabilities* of the firm. A capability is the ability of a firm to perform a certain function that is described in terms of the outcome as opposed to the method of operation. A relationship exists between two capabilities when one capability produces an outcome that aids (or hinders) the performance of the other. For example, the capability to gather market data helps the capability to design new products. There can be various degrees of influencing relationships. It may be impossible to perform a capability without the outcome from another. Alternatively, it may be possible to perform the capability, but at a different level of effectiveness. Relationships do not necessarily have to be of an enhancing or positive in nature. An outcome of a capability may reduce the effectiveness of another. For example, the capability to obtain the lowest price by frequently switching suppliers will diminish the capability to build close relationships with suppliers.

¹ Due to the rapidly evolving nature of the e-business initiatives, this remains an ongoing survey that has no completion date. The set of building blocks undergo periodic revisions to remain updated with new business ideas and technologies.

² See Tulsie, et al, “A Proven Methodology for Developing a Portfolio of e-business Initiatives,” SMS Conference, 2000 (available at <http://www.research.ibm.com/strategy>)

Capabilities and their relationships to other capabilities may be drawn in the form of a network where the nodes represent capabilities and the links represent the relationships. These links must have the attributes of direction and strength, to represent the directionality of the relationship and the degree of support (or conflict).

Capabilities in turn, depend on more tangible assets or *resources* of the firm, including skills, e.g., direct sales force product design, software development; and technologies, such as sales databases, mobile connectivity, and data mining software. Our definition of resources is distinct from that given in the resource-based view of the firm³. Resources represent the tangible (people, policies, capital, technology, etc.) and intangible (brands, etc.) assets of the firm. Usually, resources have a finite capacity to support a firm’s activities. They are the points at which a firm directs its investments. Acquiring more capacity usually involves additional costs to the firm. Resources, in our framework, ground the cost structure of the entire Strategic Capability Network. Usage based cost drivers that link resources to capabilities allow for computation of the relative costs of capabilities and by extension, value propositions.

Identifying value propositions, capabilities, resources and the supporting relationships between them results in the creation of a network of interrelated business capabilities supporting the firm’s value propositions and supported by the firm’s resources. This network model of the firm allows for the visual depiction of strategic features such as strategic alignment, synergy, network effects, and leverage of core capabilities.

In the context of an SCN model of a firm, an e-business *building block* is a collection of capabilities that a firm develops through the deployment of e-business technologies, especially those made popular and cost effective through the growing use of the Internet. Figure 1 shows the internal components of a building block. The building block enables a firm to offer a set of value propositions to its external partners as well as to itself. These value propositions are the direct outcomes of the capabilities contained in the building block. For example, the capability of “direct access to company knowledge-bases through the web” offers the value propositions “around the clock access to current and detailed information” to an external recipient and “reduced load on call center personnel” to the firm.

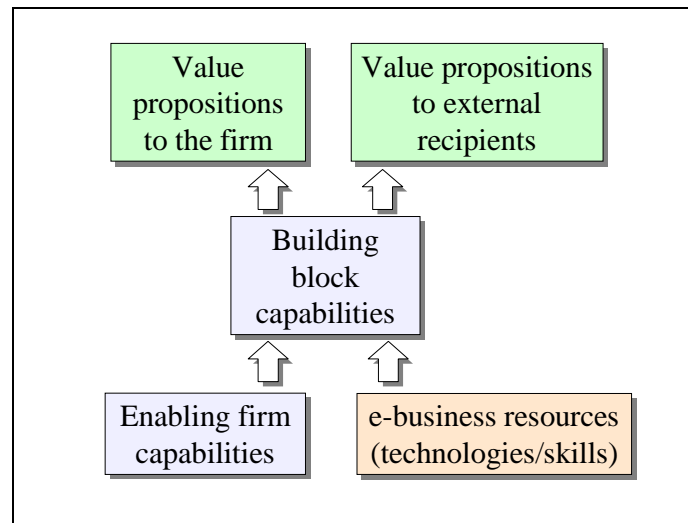


Figure 1: Internal Structure of an e-business Building Block

Although the capabilities in a building block may be developed through the acquisition and use of e-business technologies, they also require the additional support of other capabilities that must already exist in the firm or else be developed during the initiative. In the example above, the online access capability requires not only web searching and publishing technologies, but also the capability to develop the content within the knowledge-base and the process for keeping it updated.

As shown in Figure 2, the value propositions a building block offers to a firm can be used to support or enhance

³ Margaret A. Peteraf, “The Cornerstones of Competitive Advantage: A Resource-Based View,” *Strategic Management Journal*, 14(3), pp. 179-191, 1993.

other capabilities that exist in the firm. These, in turn support other value propositions. Continuing the above example, the value proposition “reduced load on call center personnel” could be used to support the firm’s customer service capability by freeing the service representatives from answering routine questions, leading to the enhancement of its value proposition of being responsive to difficult customer problems. Another initiative may employ the same building block in the context of supplier management or sales force management. As a result, the value propositions ultimately supported by a building block may depend on the existing firm capabilities that are influenced by it and therefore, vary from firm to firm. Figure 2 shows the representation of e-business initiatives as building blocks situated in the context of the firm. The context serves as an enabler for the successful operation of the building block, which in turn influences the context by enhancing value propositions specific to the context.

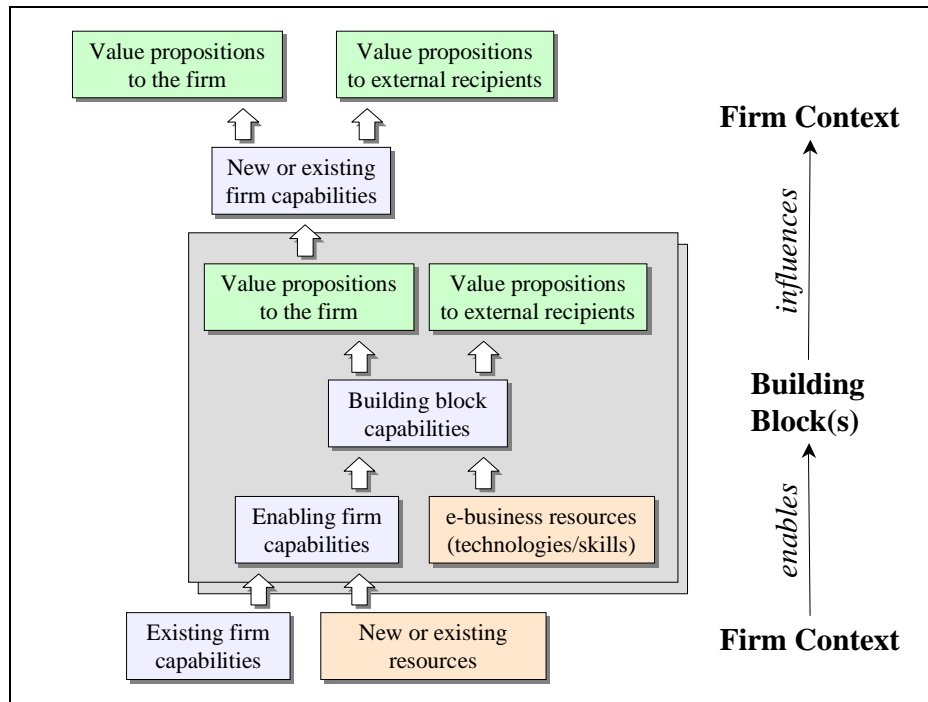


Figure 2: Representation of an Initiative as a Set of Building Blocks Situated in a Firm’s Context

e-business Building Blocks

Figure 3 depicts the high-level process for transforming e-business initiatives into a reusable building block repository. The initiatives are gathered from consulting engagements performed by IBM e-business strategy consultants, as well as surveys and secondary case studies. They are then analyzed in the SCN framework, which decomposes the initiative into value propositions, capabilities and resources. The e-business building blocks are then identified and categorized into a repository database.

Due to the rapid evolution of e-businesses we view this building block identification and extraction process as a continual task. In this section, we describe the current contents of this repository. Based on the analysis of over 600 e-business initiatives (as of October, 2000) implemented by companies around the globe and in diverse industries, we have identified the following building blocks.

1. Online information exchange
2. Electronic execution and delivery of services
3. Customized (or personalized) services
4. Resource pooling
5. Business intelligence
6. Online collaboration
7. Offering aggregation

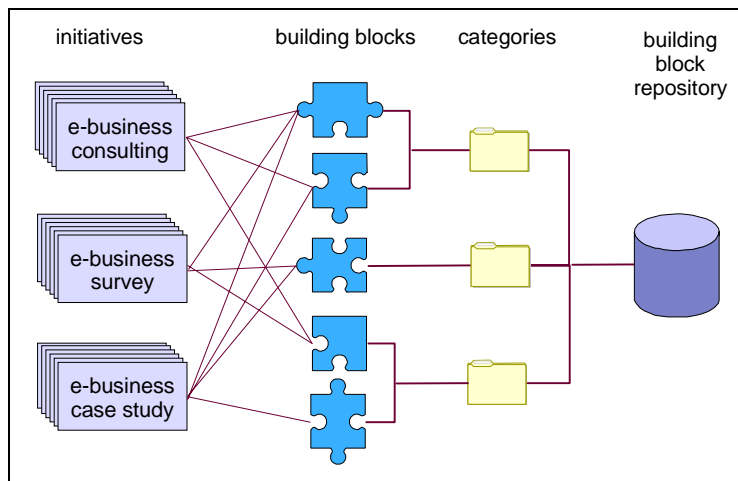


Figure 3: Developing a Building Block Repository from e-business Experiences

Online Information Exchange

The most common building block used in e-business initiatives is the online exchange of information between two parties. Firms can upload selected information on Web servers and specify who can access this information. In many cases, the information is presented in response to some information provided by the viewer. The server may also need to perform computations or analyses in order to determine the information to be presented. These activities have been made cost effective by the universal adoption of Web protocols and free HTML browsers, and the availability of cheap data storage and communication bandwidth. Table 1 shows the structure of this building block.

Table 1: Online Information Exchange

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Increased breadth, diversity, depth of information • Increased frequency of information updates • Increased availability of information • Increased places where accessible • Improved means of searching • Improved flexibility of analysis • Improved means of interpretation • Better matched to user needs • More interactivity • Simple access to complex analysis through easy to use interface 	<ul style="list-style-type: none"> • Reduces overall load on staff supporting the recipient • Provides data on the usage of the information by the recipient • Electronic storage, manipulation, and delivery of data results in lower incidence of errors • Cheaper channel for dissemination of information • More frequent information updates can be made 	<ul style="list-style-type: none"> • Ability to reproduce information items at close to zero cost • Ability to store information items in electronic form • Ability to capture information about physical artifacts • Interface to legacy systems that store desired information • Translate into Web browser based presentation formats • Management of additional content providers • Ability to design easy to use & friendly user interfaces • Transaction security and privacy • Gather and analyze user profiles • Mining of usage data for patterns to better understand the user

This building block has been applied to a wide variety of contexts, resulting in equally various benefits. In simplest form, the service might comprise only direct but restricted access to the service firm's internal databases. Examples of such information are prices, inventory levels, order status, and product usage instructions. The processing element

constitutes the structuring of searchable indices, the organization of the content, and the translation of incoming search requests into answers. In most cases, these simple, low added-value inquiry tasks consume the bulk of a service representative's time. By offloading these tasks to an automated service facility, the service representatives are better able to address the more complicated tasks and exceptions, increasing the added value of their role.

When applied in the context of customer service, this building block helps customers serve themselves, such as being able to track the status of an order. News organizations use this building block to get valuable information on the stories being read by various demographic groups. In the context of suppliers, the sharing of demand and inventory data could lead to a more streamlined supply chain with more inventory turns but fewer stock-outs.

Electronic execution and delivery of services

The delivery or exchange of information, as described in the previous building block, is often considered a service. Indeed, practically all services are accompanied by some exchange of information between the served and serving parties. However, we observe many instances where the basic exchange of information is accompanied by value added activities and information processing done by the serving party (beyond basic receipt of the information). The addition of value added capabilities or processing to the basic exchange of information results in a new type of building block.

Notice that we are not requiring that business models employing this building block must have explicit charges for the value added work. Often this processing is done for an explicit fee (see examples below), but in many other cases, it is subsumed into some related charges, such as the costs of customer support service, typically absorbed as a cost of sales. In still other cases, the costs might be born by even less closely associated revenue streams, such as electronic/email fax services that are paid for by advertising.

The firm providing the service delivers it to the receiving organization with little or no manual intervention. Because we are limited to electronic delivery, only those services that can be delivered through information flows are handled by this building block. As in other building blocks, the direct input of information and direct access to the returned information offloads these tasks from human resources. This is beneficial to both parties when the service request or query can be unambiguously expressed and the returned information can be easily interpreted. It is also effective in situations where the served party is not entirely certain what they want but are willing to search for themselves or even interested in learning.

Properly applied, this building block can provide not only a lower cost service alternative but also a more effective service for the customers, suppliers, or other business partners served since typically much larger volumes of data can be delivered through electronic links than can be expressed by people on phones. In addition, the service delivery can be more easily interrupted and resumed as suits the needs of the requester and the service can be customized by the requester to his/her individual needs.

A fortunate byproduct for the server may come in increased switching costs as the served community gains familiarity with the service facility. In more sophisticated forms, the serving firm enables automated workflow interfaces with the external parties. This may help the firm to lock in its external relationships by reducing the cost of doing business and further increasing the switching costs. Historically, EDI linkages for logistics, ordering and payment had this characteristic. Relative to EDI based systems, industry standardization and a public shared network infrastructure promise to offer similar functionality at far lower cost, while decreasing the systems integration component of switching costs.

From the perspective of the served firms, this building block opens up the possibility of outsourcing non-strategic processes while using e-business technologies to maintain the tight integration required due the volume or frequency of data that need to be exchanged. This ability opens up new outsourcing options for business processes that require the degree of integration that previously could only be possible within one company⁴.

⁴ John Hagel III and Marc Singer, "Unbundling the Corporation," *The McKinsey Quarterly*, 2000 Number 3 <http://www.mckinseyquarterly.com/pdf/unco00.pdf>

Table 2: Electronic execution and delivery of services

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Increased information detail • Lower transaction costs for routine, high volume transactions • Reduced transaction time • Faster access • Broader service availability (time and place) • Service better customized to recipient wants and needs • Better accommodation of service timing (suspend/resume) 	<ul style="list-style-type: none"> • Reduces overall load on staff supporting the recipient • Off loads mundane support tasks • Allows staff to focus on more complex tasks • Allows staff to focus on exceptions instead of routine tasks • Provides expanded data for analysis of support improvements • Attracts more clients through: • Better quality of support • Wider variety of information • Reduces rework due to lower incidence of errors • Learning effects and process integration increases partner switching costs • Better management of uncertainty or variability in partner relationship and processes • Provides basis for collecting valuable usage information • Increased learning to the firm • Better economics for increased service availability 	<ul style="list-style-type: none"> • Production of content in forms directly usable by served community • Development of searching facilities for content access • Development of service for delivery through information • Generate and present personalized/customized information • Secured and private information transmission/ transactions • Design of new (automated) business processes that can be integrated with external business systems (interoperable) • Promotion of integration benefits to business partners • Provide training and consultations to business partners

An application of this building block appears in electronic payment systems offered as a service to web sites. Here the service provider provides specially secured transmission of the information, maintains electronic connection to banking systems, insures against risk of non-payment, logs detailed information about individual payment transactions, provides summary reporting of payments, and a variety of additional services. These services may be done for a fixed fee per transaction, for a percentage of the payments, or for a fixed fee per period of time. In addition, the payment provider may provide the services to set up the necessary connections to their payment systems.

A very different application arises with online surveying services. Here the service provider maintains a set of survey subjects and web based systems to collect data from them. They typically provide survey design expertise to translate the issues of interest from the client to a well-formed survey instrument. People are involved in the service provision, but the process can be administered entirely through electronic means, that is, through simple exchange of e-mails or more sophisticated electronic collaboration. Next, the survey subjects are contacted, electronically, and their answers are gathered electronically. Finally, people analyze the survey results and deliver them back to the client electronically.

Instead of maintaining connections to banks, the connections are maintained with a subject pool. Rather than secured processing with non-repudiation, we have survey design, administration, analysis, and delivery. The underlying abstraction remains the same: receipt, processing, and delivery of a service where all the elements can be represented as information.

Customized (or personalized) services

The online delivery of services makes it cost effective to customize the service to fit the preferences of the recipient. This is because online interactions generally yield more data because of the greater ability to monitor the activities of the service recipient when compared to traditional channels of interaction. This data can be analyzed to infer the preferences of the recipient and deliver the service accordingly. Preferences could also be explicitly solicited from the recipient. The importance of preserving the privacy of individuals presents a challenge to this activity. The firm is more likely to receive permission to monitor recipient activities if the benefits to the recipient are clearly demonstrated. Table 3 describes the structure of this building block.

Table 3: Customized (or personalized) services

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Reduced transaction time and cost • Information organized according to preference • Alerts and reminders for specific events • Recommendations and promotions tailored to recipient's interests • No need to provide the same data on multiple occasions 	<ul style="list-style-type: none"> • Access to recipient wants and needs (at the level of individuals rather than segments) • More targeted promotions and cross-sells (for customers) • Increased switching costs for partner • Increased likelihood of repeat transactions • Simultaneously cater to diverse segments • Offer differentiated pricing 	<ul style="list-style-type: none"> • Ability to serve custom web pages • Develop friendly, non-intrusive user interface for requesting preference info • Monitor user actions and identify user preferences • Predict user behavior (from past actions) • Data mining of past transactions • Provide recommendations (through collaborative filtering) • Maintain privacy of collected information

Customization is predominantly used in the context of delivering value to customers, however, examples of applications to suppliers, channel partners and other segments also exist. Online portals offer personalized information presentation, which is not only a convenience to the visitors but also to advertisers, who are given a more clearly defined promotion target. Personalization in the context of e-commerce creates the possibility of cross-selling and increases the chances of repeat buying and loyalty. In return, the customer is provided a streamlined transaction process. When extended to suppliers and other business partners, personalization helps to reduce the transaction costs for these recipients by supporting their specific business rules and processes. The greater degree of electronic integration required between these businesses helps to foster longer-term relationships.

Resource pooling

Through resource pooling, an enterprise can centralize its redundant operations and achieve better resource utilization, economies of scale and better sharing of information across the enterprise. Prior to the popularity of e-business technologies, decentralization of activities and services was seen as the way for a geographically distributed company to maintain the agility and flexibility of a smaller, single branch company. However, decentralization made it difficult and expensive to share information, coordinate, and collaborate between the distributed units of the company. e-business communication technologies have made it possible to combine the cost and coordination advantages of centralization with the agility and localization advantages of decentralization. Table 4 describes the structure of this building block.

Table 4: Resource Pooling

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Single point of contact within the firm • Better quality of service due to centralized expertise • More reliable service • Better quality of service due to aggregation of information across firm 	<ul style="list-style-type: none"> • Lower costs of operations through resource sharing • Free up resources to focus on more specific tasks • Better sharing of information • Better management of knowledge through centralization • Better coordinated interaction among related departments • Better collaboration among related departments • Free up wasted resource or increase utilization • Ability to outsource generalized (but non-strategic) tasks • Consolidation of demand (lower variability, better forecasting) • Better quality of service through aggregation of experience • Growth into new geographies • Personalization of services can be maintained despite centralization • Better flexibility in upgrading service because of easier (centralized) deployment • Better (usage-based) financial terms if service is outsourced 	<ul style="list-style-type: none"> • Development of network based coordination systems • Development of standardized templates, work practices • Delineation of generalizable tasks from specialized tasks • Provide incentives to employees to share and reuse knowledge • Centralize domain expertise • Deliver services (information) to remote users • Gather input from remote sources • Consolidating diverse multiple demands into integrated overall demand • Recognition of demand trends across firm • Design of interfaces for remote users • Maintain local specialization of services

Resource pooling is evident in many initiatives such as knowledge management and centralized procurement. As knowledge becomes an increasingly competitive asset, especially in service industries, companies are looking for ways to capture this asset from its tacit storage within the experience of its personnel to the explicit management and storage in information systems. In addition to making knowledge assets less dependent on employee turnover, knowledge management also promotes better reuse across the corporation, making it more coordinated and agile. e-business technologies enable companies to efficiently capture, organize, and disseminate knowledge within the organization, as well as to monitor its use.

Large, multi-division companies spend billions of dollars a year on the procurement of materials that do not go into their finished goods, but instead are needed for maintenance, repair, and operations (MRO). Being not as strategic as the procurement of raw material, MRO procurement had been distributed across the multiple divisions in a fragmented manner, leaving it up to the local management to source this material as they saw fit. e-business allows a company to consolidate its various MRO procurement processes into a centralized one, while maintaining the local customizations. The benefits from this consolidation go to all parties: the employee requesting the material, the firm, as well as the suppliers.

An example where the resources of multiple firms are pooled together, is electronic marketplaces, where the demands of buyers and the supply of sellers are pooled together to provide a more efficient pricing mechanism. In addition, many e-marketplaces also provide other services such as product inspections, order tracking, and financial transactions processing. The adoption of these services by the marketplace participants instead of obtaining them from different and incompatible sources serves to streamline the buying and selling transactions in the market.

Business intelligence

This building block comprises the collection, synthesis/integration and analysis of data to identify useful patterns in past events that enable the identification of areas for process improvement or prediction of likely future events. The combination of cheaper computing power and the ability to collect and communicate larger amounts of data from remote sources leads to improved analyses, intelligence, and decision making by a firm. In some cases, the data collection portion relies on only the data that a firm currently gathers in the normal conduct of business and that it has on hand from external sources. At the other extreme, the data collection can be a carefully designed and instrumented system developed from a prior theory of events or agent behavior. The synthesis/integration process involves the association of the various portions of data into a coherent whole. The analytical process, like the gathering processes, might span a range of simple to complex techniques. At one extreme, we observe simple statistical analyses and at the other, complex inductive pattern recognition. As was true for electronic service delivery, once this building block is set-up, its ongoing operation can be fully automated.

Table 5: Business intelligence

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Proactive identification of needs based on a more comprehensive integration of facts • Communication better targeted to interests (less noise) • Communication better directed to knowledge level (more understandable) 	<ul style="list-style-type: none"> • Less wasted effort on low probability opportunities (weak associations) • Better opportunity selections • Better returns on selected opportunities • Better relationship with BI target (customer, supplier, etc) • Better information for distribution within the firm • Less ambiguity in decision support and coordination within the firm • Better information for sharing with partner 	<ul style="list-style-type: none"> • Data gathering • Data synthesis/integration • Analysis (data mining, filtering, searching) technologies • Identification/classification of targets (customer, supplier, etc) by profiles

The business intelligence building block most commonly appears in web site surfing analysis. Web sites gather and analyze the click to's and click through's of users, the time spent on sites, the domain that the user comes from and departs to, and the degree to which a given user repeats this behavior in follow up visits. All of these data can be synthesized and analyzed over time to compose both a complete picture of the expected behavior of any given individual and a view of the various types of users and the numbers of each type. This information in turn allows for the proactive and dynamic composition of content for an individual user based on his/her past behavior and the behavior of other users that exhibit similar behavior. In addition, the information also allows for the overall analysis of the more and less successful areas of the site. Other common examples appear in general marketing and sales, forecasting, cross-selling and up-selling, credit checking, security, warranty claims, and many others⁵.

Online collaboration

As one of its original and popular applications, the Internet makes it possible for an interest group to collaborate without having to be present in the same place or at the same time. It is also possible for an individual to concurrently participate in multiple subjects of collaboration. The firm plays a passive role in hosting the collaboration site and usually holds a stake in the topic of interest or the community participating in the collaboration.

⁵ Michael J.A. Berry and Gordon Linoff, *Data Mining Techniques*, Wiley, 1997.

Table 6: Online collaboration

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • Communicate with peers who share a specific interest • Access to a wider set of viewpoints • Comments can be made and heard in public (as opposed to private complaints) • Flexibility in time and location of collaboration • Catch up on past or missed discussions • Pace of discussion can be set by each participant • Reduced intimidation factor 	<ul style="list-style-type: none"> • Stay in touch with the sentiments of a community (wants & needs, concerns, preferences) • Leverage community ideas into new product development • Live test bed for marketers • Early detection of dissatisfaction in community • Allow community to help each other • Increase word-of-mouth promotions • Develop deeper relationship with community 	<ul style="list-style-type: none"> • Develop structure and organization for knowledge storage • Knowledge search and retrieval techniques • Incentives for contributing information • Information refinement • Monitor usage and collect feedback • Ensure that collaboration stays on topic (or original goal) • Maintain privacy • Manage rights to information

Online collaboration can be applied to a wide variety of contexts. Usenet, Web chat areas, online clubs, instant messaging are all instances of sharing information among peers. Even when geographically separated, a sense of community can be created around an interest area. For niche interests, where a critical mass of community members does not exist in a specific geography, online communities provide the only solution. Businesses have also fostered information sharing through online communities of sales people, programmers, and consultants for example. Collaboration helps particularly in disseminating knowledge from experts to novices in a manner that is impossible to replicate through formal training. Firms that trade with each other can collaborate online to streamline areas such as product design, production planning, and problem troubleshooting. For example, an electronic equipment designer and its manufacturing partner have implemented online collaboration to realize faster detection and resolution of design problems, improved on-time delivery, and faster time to market for the designer. The manufacturing firm also benefits from faster resolution of problems leading to better plant utilization as well as increased customer loyalty.

Offering aggregation

The Internet makes it easier for a firm to aggregate offerings such as information, products, and services that are complementary to each other. The firm need not produce all the offerings. It is now cost effective to integrate the catalogs, inventory, and ordering systems of a number of producers to create a virtual aggregation of offerings. At the same time, the Internet makes it possible to market to a larger segment of the population, with more varied wants and needs. This increases the necessity for aggregating a wider range of offerings. Table 7 describes the structure of this building block.

Table 7: Offering aggregation

Value Propositions to Recipients	Value Proposition to the Firm	Required Capabilities
<ul style="list-style-type: none"> • One-stop convenience • Large selection to choose from • Comparison between alternative choices • Access to hard to find offerings (or those not carried locally) • Personalization (recommendations, catalog layout, sale) • Access to detailed information about offering 	<ul style="list-style-type: none"> • Greater share of a customer's purchasing budget • Market to a larger market (new market segments) • Ability to promote offerings complementary to that being considered by customer • Better probability of satisfying customer (through larger selection) • Reduced need to produce the offering or carry the inventory 	<ul style="list-style-type: none"> • Electronic linkage with suppliers (for product, inventory, and order information) • Ability to detect and cater to customer preferences • Ability to offer recommendations and product comparison guides • Cross-selling capabilities • Logistics management (receiving, shipping) • Supplier selection and management • Product selection (determine what to carry) • Online catalogs and transaction processing systems

Internet portals make use of this building block by collecting together a wide variety of information, services, and products – all produced by other vendors. These vendors gain a wider audience than they could get on their own, while the portals organize the offerings in a manner that attracts and retains the audience.

Firms can offer a set of products and services that are needed by a customer for a specific event or activity, such as home or car purchases and travel. This customer event explicitly influences the marketing, sale, and service offered by the firm. The degree to which the products and services need to be interlinked during the event determines the value of the bundled offering. Internet standards offer a low-cost means for implementing linkages that require the exchange of information between the linked offerings.

Offering a wide selection of products allows a company to gain more of the customer's business (or share of wallet). This outcome depends on the successful prediction of the types of products and services that might interest a customer or market segment. Such product selection capabilities are not new. Physical retailers have developed them, where it is even more important to be accurate in the predictions because of the need to hold physical inventories. The Internet helps in two ways. First, it reduces the cost of prediction errors. The actual cost of the over-forecasted inventory as well as the opportunity cost of under-forecasted inventory is both greatly reduced (to zero for purely virtual retailers). Second, the richer interaction channel offered by the Internet increases the accuracy of the predictions. The customers' interests and preferences can be captured even when a sale is not made. Personalization and recommendation technologies can be used to elicit more information about the customer who can justify the cost of his time because of the value of the convenience and advice offered in return. The accuracy also comes from statistical advantage of the larger number of customers who provide the data that can be mined for predictive purposes. In addition, the global market of potential customers makes it justifiable to carry items that have very little demand in more localized markets.

The wide variety of offerings increases the probability that a customer will find a satisfactory product during a visit. It also increases the chance of repeat visits and purchases. As a result, there is an opportunity for developing a relationship with the customers, which could be the basis for expanding to related product categories (from books, to music, to videos...). The knowledge about customer preferences can also be used to influence supplier relationships.

Developing e-business Initiatives from Building Blocks

The e-business building block repository helps to determine the e-business initiatives that a firm could undertake. In order to do so, the appropriate building blocks must be selected from the repository on the basis of the knowledge of the firm's strategic objectives as well as its existing internal capabilities. The strategic objectives of the firm must first be converted into value propositions to targeted external parties and the firm through a strategy formulation process. The repository may then be queried for the building blocks that offer such value propositions. The set of

building blocks identified through this process must be evaluated for compatibility with the firm. First, the capabilities necessary to support the building block should exist within the firm. If they do not, the cost and time required to develop them must be evaluated. A building block must also be compatible with a firm in other respects. The external value propositions offered directly by the building block must be consistent with the other value propositions offered by the firm. For our earlier example, online information access may not be very useful when the primary value proposition to the customer is focused around personal consultations. Consistency must also exist between the capabilities enhanced by the building block and those that support the building block. This requirement helps to constrain the number of building blocks that are applicable to a particular firm.

A firm may also query the repository to determine which building blocks can make use of its existing capabilities and resources, particularly those it considers to be better at than the competition. The building blocks returned by the query must fulfill the requirement that the offered value propositions are consistent with the firm's strategy and its existing value propositions. The repository may also be browsed by industry, geography, or functional area in order to select building blocks of interest

No matter what the approach, the selected building blocks have behind them, the supporting body of case studies and surveys, which indicate the variety of contextual information that may be relevant to the firm. Examples of such information include the industries where a building block has been used, the impact on the organization structure, governance issues, the time and cost of implementation, and the realized benefits in terms of revenue or cost savings.

Conclusion

In this paper, we have described the development, content, and usage of a repository of reusable e-business components or building blocks. The sources for this knowledge base are the e-business initiatives within companies. We have modeled these building blocks to be reusable across industries as well as functional areas with a firm. This enables the application of proven e-business techniques to those industries, functional areas or business processes that have not yet benefited from it.

The building blocks are modeled in terms of value propositions delivered and capabilities required. This makes it possible to hypothesize the ultimate value propositions of a potential initiative designed from one or more building blocks. The required capabilities for the building blocks lead to the identification of specific capabilities that the firm must possess or else build or buy.