

Point of view

E-business: linking available services and entrepreneurs' needs

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Abstract

Traditionally, entrepreneurs and small businesses have faced difficulties when competing with entrenched firms for customers and expanding into global markets. The World Wide Web (WWW) is one approach to overcoming obstacles by giving organizations a direct connection to potential customers and suppliers on a global level. However, complex technology, security, and reliability present significant challenges to the entrepreneur or small business owner about to enter the e-business arena. Difficulties are especially notable when the business operates in a non-Web-related field or when it has relatively few individuals with IT (information technology)/Web experience. Facing these challenges alone by hiring or developing an in-house technology staff and building a support infrastructure is costly and may be risky. An alternative, contracting for Web-based services from an application service provider (ASP), effectively reduces cost and risk while preserving the competitive advantage of the entrepreneurial firm. This paper describes the use of the ASP concept to allow an entrepreneurial firm to compete effectively in the global market.

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Introduction

Traditionally entrepreneurs and small businesses have faced difficulties when competing with entrenched firms for customers and expanding into global markets. Entrepreneurs have encountered problems with name recognition and may find it difficult to design and implement a marketing strategy aimed at a broad audience. Similarly, the entrepreneur may encounter additional problems in providing support services, answering customer questions, supplying information, or processing orders in broader markets. Furthermore, there are numerous potential difficulties linking information systems to potential buyer systems in an evolving electronic business environment. In this paper, we review the issues of entering e-business for the entrepreneur and suggest ways to minimize the risk and need for expertise.

The Internet, the World Wide Web, and e-business

We begin our discussion by looking at the history of the Internet, the World Wide Web, and their use in e-business. In order to chart the beginnings of e-business, one should first consider the origins of the Internet. A pioneering system, known as ARPAnet, was created over 30 years ago by the United States Department of Defense. ARPAnet made it possible for academic and government computer mainframes to communicate more efficiently. The system was a success and gained popularity within the government and academic fields. In 1972, electronic mail was introduced and soon became the network's most popular application. From this point, the technology evolved slowly for the next decade. In the mid-eighties, as desktop operating systems began to surface, the Internet began to take shape. By 1990, ARPAnet ceased to exist, and Tim Berners-Lee developed the first World Wide Web software. With the advent of the World Wide Web, the Internet opened up to commercial traffic, and commercial dial-up services were marketed. The move into commercial applications marked the real beginning of the e-business economy.

What is e-business? The American Institute of Certified Public Accountants (2004) defines e-business as "Current and evolving technological processes that allow the accessing, updating, and communicating of information in a purely digital format, which can be used more efficiently and effectively, thereby creating a competitive advantage". The Federally operated Electronic Commerce Acquisition Program Management Office (ECAPMO) (1994) defines e-business as, "The paperless exchange of business information

using electronic data interchange (EDI), e-mail, electronic bulletin boards, electronic funds transfer (EFT), and similar technologies”.

By 1993, over 100 countries had an online presence, and commercial users outnumbered academic users for the first time in the history of the technology. With advertisers underwriting costs for “dot coms”, e-commerce became attractive to business. By the late nineties, virtually every major company, organization, government, and news service had a presence on the Web. At the same time, companies such as Amazon.com took the Web to its next logical step, actually performing business on the Web (PricewaterhouseCoopers, 2001).

Adding technology to “traditional” business settings is prevalent and continuing to increase. Research by John Berryman of the global accounting firm, PricewaterhouseCoopers, confirms that many companies have already adopted efficiency-driven technologies. In fact, their findings show that 92 percent of companies have adopted e-mail, 71 percent have their own Web sites, and 59 percent make use of internal Web sites or Intranets. The findings also indicate that by the end of 2004, a majority of these same organizations will be using interactive technologies and enhanced business practices to add new, deeper dimensions to their relationships with customers, suppliers, and business partners. In the process, they will be taking part in a trend that is becoming a strategic priority for a growing number of firms: becoming an e-business (PricewaterhouseCoopers, 2001).

Business strategy and technology implementation

To be successful in making a transition to e-business, entrepreneurs will need to think strategically. Moreover, as Stevenson and Gumpert (1985) have pointed out, the strategic questions asked by entrepreneurs differ from approaches by more traditional managers. For entrepreneurs, the strategic questions are, first, “What is the opportunity and how do I capitalize on it? Next is “What resources do I need”, and “How do I gain control over these resources?” Finally, the entrepreneur considers issues of “What structure is best?” In our examination, we will consider e-business from these perspectives and will take the position that e-business does indeed represent an opportunity, but one which requires the entrepreneur to consider carefully how to capitalize on what is available. We consider several options for gaining and controlling needed resources and examine implications for structure, especially between the existing entrepreneurial business and the e-business.

Note that recent discussion of entrepreneurial strategy has also pointed to the need for the entrepreneur to give emphasis to the “twin strategies” of cost control and differentiation (Chaganti *et al.*, 2002). From this perspective, the entrepreneur must consider whether the design of an e-business strategy can be done in a way which contributes to cost control, and we will consider issues related to these needs. While we will show how entrepreneurs can gain access to the “nuts and bolts” of e-business hardware and software in cost effective ways, it is important to recognize that the entrepreneurial firm must be willing to put funds toward human resources, and especially compensation and training, as Chandler (2000) has recently shown. Moreover, the e-business, if adopted, should serve to differentiate the entrepreneur’s product or service and not simply to provide a “copycat” which imitates what is offered by competitors. To some extent, the vision to develop the new ideas may need to be decoupled from the everyday management of the business, a process which Keeley and Roure (1990) have shown is a possibility for the entrepreneur, but not an activity which comes naturally to many entrepreneurial executives (see also McCarthy’s (2003) recent distinction between pragmatic and charismatic entrepreneurs and the need for learning, especially by the charismatics). In effect, the entrepreneur will need to “let go” of the idea generation function and trust someone else to do the development of what, in this case, would be the strategic differentiation offered by the e-business. It is important to note that our recommendations are made during a period of dynamic change and growth, where both great opportunities and great challenges are present.

Although technology is pervasive in business today, many companies continue to view the planning, funding, and measurement of IT efforts as separate or only semi-related to the creation and planning of business strategy. It is becoming increasingly important to align business strategy with technology integration strategy to obtain the full benefits of investments in software and hardware. Business strategy and technology implementation must move together in lock-step fashion because firms with solid business IT integration are better positioned to adopt and develop innovative practices that confer a competitive advantage. Companies integrating their business strategy and information technology planning efforts are more likely to invest in innovation and growth activities, adopt new technology earlier, and fuel business growth through IT enabled advances (Paper *et al.*, 2003). To capture the rewards stemming from the integration of business strategy and technology,

business experts advise entrepreneurs to redefine the role of technology in their corporate structure and to seek IT providers with strong business and operational skills. The IT provider should serve as a consultant, providing expert advice on how to make the most of the technology acquired by the firm. Furthermore, entrepreneurs and other decision makers should extend the use of strategic measurement into IT to capture results in terms of value to the business rather than return on investment. This approach becomes extremely critical because investments in technology are often substantial, and the benefits may be difficult to measure (*PR Newswire*, 2003).

Statistics show that current users of the Internet amount to approximately 151 million, whereas by 2005, users are expected to number about 231 million (PricewaterhouseCoopers, 2001). According to Michael Dell (1999) in a speech to the Detroit Economic Club, "The Internet is bringing about the demise of many traditional business models and creating tremendous changes". How can the small business take advantage of the potential offered by technology while avoiding the risks envisioned by Dell? For many, the answer may come from knowing how to obtain services in ways that do not require enormous capital outlays and acquisition of technical personnel. As we have noted, e-business applications primarily consist of systems that interact with customers. These systems provide virtual storefronts that incorporate product catalogs, ordering and payment systems, and other customer support information. They can be set up in a variety of ways. For instance, some businesses may choose to develop these systems in-house, others may purchase commercial off-the-shelf (COTS) software, while others may employ the application service provider (ASP) concept – leasing the software from a provider. Of the e-business software deployment methods listed above, developing the systems in-house is the most expensive and time consuming (O'Connor, 2001). This technique would be advisable only when the entrepreneurial firm derives its competitive advantage from software development skills. In this instance, the entrepreneur is presumably developing a unique system that is not available commercially. Nevertheless, an infrastructure ASP could be beneficial to this type of business by providing the necessary hardware. Furthermore, firms utilizing ASP hardware for e-business applications may also consider outsourcing internal systems such as accounting and office automation. As we will detail, for many entrepreneurs utilizing the ASP will be the most effective and efficient choice. Our subsequent

discussion will highlight entrepreneurial use of the ASP.

ASPs

The Internet has enabled a new business model for delivering IT to companies and their customers. The combination of near-universal access provided by the Internet and the falling cost of telecommunications has made the physical location of computer servers nearly irrelevant to their users. As a result, an organization can choose to lease access to computers and software across networks rather than purchasing and housing such systems themselves. This opportunity has sparked the fast growing new industry of ASPs. "An application service provider (ASP) is a company that offers individuals or enterprises access over the Internet to applications and related services that would otherwise have to be located on their own personal or enterprise computers" (whatis.com, 2001). For the entrepreneur, the ASP offers the potential to employ a sophisticated IT architecture with nominal lead time, minimal in-house IT expertise, and low costs. "By hosting their customers' infrastructure and applications, Application Service Providers (ASPs) are helping a growing number of businesses focus on their core competencies – instead of on technology" (Microsoft Tech Net, 2001). Since ASPs operate an IT infrastructure that is used by many client companies, significant economies of scale accrue, allowing the ASP to provide a high quality, extremely reliable service at a lower cost than can be achieved by firms acting on their own (Walsh, 2003).

There are many important support features that should be considered when choosing an ASP. Ideally, an ASP should have system redundancy to improve uptime; as well as support hours that extend beyond customary business hours. A dedicated help desk system is vital to handling the basic support burden; while chat-based support provides help for customers in real-time. Also, an ASP should offer training agreements and options designed to fit their specific customer base. Each ASP user has unique needs, therefore, customization options are vitally important, and an ASP should have feedback mechanisms to facilitate communication. The service provided by an ASP must remain flexible and responsive to the changing needs of its customers (Caton, 2004).

The development of a Web presence requires sophisticated technology and a supporting infrastructure. For example, an e-business today is expected to be available in real time and with consistent reliability. Such reliability requires not

only modern computing technology but also multi-tier backup systems, security, and support personnel (Tapscoff, 1995). Large corporations often have technology and competencies in these areas, but they are not usually components within small businesses or entrepreneurial firms. Additionally, information technology (IT) personnel tend to demand high salaries, often prohibitive for small businesses. Consequently, rather than incur the costs and risks of developing a Web site, we suggest that entrepreneurs can use an ASP, an organization that provides services and infrastructures for e-business.

ASPs can be categorized as an outsourcing business activity which is "described by the phrase 'buy' not build" (Lexicon, 2001). From an ASP perspective, "buy" refers to a "pay-as-you-go" or "rental" payment plan. Consequently, it is more cost efficient for many small companies to outsource their IT requirements rather than to develop them on site. Outsourcing allows companies to provide desired Web technologies while maintaining focus on their core competencies. Outsourcing itself is by no means a new phenomenon. More than half (54 percent) of the companies surveyed by *Purchasing Magazine* reported outsourcing manufacturing processes or services during the past two to three years. Additionally, customer satisfaction is typically high, with 82 percent of buyers reporting that they are generally satisfied with the performance of their outsourcing partners (Porter, 1999). Thus, while small businesses may not have had experience in dealing with ASPs, many will have had a successful "track record" of outsourcing in other areas to draw upon.

Three major categories of ASPs

Capacity service providers

These companies host Web sites used for e-business or e-commerce. They provide data centers and network connections, and they supply bandwidth. Primary organizations in this arena include Internet service providers (ISPs) and telephone companies. Since capacity service providers furnish just an infrastructure, the small business obtaining this type of service will still require considerable technical expertise to bring an e-business online.

Internet business service providers

Most of these companies offer instant rent-and-use applications – sometimes at a very low cost or free of charge. These programs, which run exclusively over the Internet, are "turnkey" solutions for small businesses and support a full range of customer facing systems, including catalogs, shopping carts, and payment options.

True application service providers

This category of ASPs is the most comprehensive, providing both customer facing systems as well as systems supporting an organization's internal business processes. These companies host, manage, and support a wide array of applications, including major enterprise resource planning (ERP), customer relationship management (CRM) packages as well as payroll and accounting software. One subset of true ASPs consists of independent software vendors hosting their own products; another subset consists of third-party outsourcers. In most instances, these ASPs handle applications from major enterprise vendors.

ASP business advantages

The major advantage of any ASP is the cost benefit. Proprietary software – software that is customized to meet specifications – and off-the-shelf software can be expensive. An example of the cost benefit of the ASP model is demonstrated by the Investment Banking Firm, Putnam Lovell Securities (O'Connor, 2001). Putnam outsources most of its external business applications and has saved several hundred thousand dollars. To build the system that Putnam currently uses would cost \$500,000 in capital expenditures and another \$150,000 in annual expenses. However, Putnam is paying a flat fee of only \$70,000 per year. O'Connor (2001) points out that is "less than half the annual cost of what it would take to build and manage the applications in-house, with no initial capital expenses". ASPs base their success on their technological expertise. Their personnel know how to update applications, provide help desk support, create interfaces, run data centers, and ensure access. By offering the same services to many companies, ASPs are able to take advantage of economies of scale, thereby allowing lower costs to be passed on to consumers. Note that while the Putnam example involves a large firm, ASPs also provide cost advantages to small businesses. In fact, small to medium enterprises do not enjoy the same economies of scale for internal operations; therefore, they are more likely to experience cost savings by outsourcing to an ASP (Turban *et al.*, 2002).

In addition to cost benefits, other advantages exist when businesses utilize ASPs. As Terdiman (2001) asserts, "ASP applications tend to get optimized because the providers use templates based on industry. This allows all users to take advantage of best practices". Also, rapid deployment is an advantage of ASPs. In-house development of IT systems can be very time consuming. Infrastructure must be developed and configured, and systems administrators hired and trained. Moreover, software must be continually

upgraded. A significant "benefit is that when it's time to upgrade, Putnam Lovell doesn't need to do anything by way of buying new hardware or reprogramming – an upgrade comes automatically from the ASP" (O'Connor, 2001).

Another benefit of the ASP approach is the reduced lead time and added flexibility of the IT services provided by the ASP. When a business makes a decision to use a new IT product, there is significant lead time required to design, build or acquire, and deploy the system. Such lead efforts are expensive, risky, and delay the use of the system by the firm. In an ASP model, many applications may be already supported by the ASP and can be added to the company's portfolio at the flip of a switch. In cases where the ASP does not have the application deployed or where the ASP may be involved with customization, the process is still hastened by the ASP's experience with deployment.

Furthermore, an ASP facilitates the adoption of new technologies and customer interfaces to the system without straining the entrepreneur's resources. For example, M-commerce is beginning to take hold with a wide range of user interfaces including PDAs, cell phones, and new hybrid devices. Such innovative devices can require the redesigning of customer facing systems in order to recognize the device being used and to adapt the display accordingly. The ASP can introduce such technology as it emerges and automatically add the support to the entrepreneur's system. Of course, this may provide a new opportunity for the entrepreneur to redesign product or service offerings.

ASP infrastructure advantages

E-business requires an extensive infrastructure that must be designed and maintained properly to ensure reliable performance, particularly as customer expectation of reliable, on-demand access becomes the norm. This infrastructure consists of an Internet connection, internal networks, computer hardware, and power and data backup systems. Failure of any of these systems takes the e-business off line. Managing these systems effectively can be a complex and expensive task, but entrepreneurs can benefit from the ASPs' economies of scale (Oz, 2002).

The connection to an Internet service provider (ISP) is a high bandwidth network connection through which the customer communicates with the e-business system. One advantage of using an ASP is that it provides high capacity lines to multiple major ISPs. Should one ISP go offline, traffic is automatically routed to an alternate ISP. Such a scheme is cost prohibitive for small businesses to deploy on an individual basis, usually

limiting them to a single ISP. Other components of the infrastructure include internal connections—the routers, switches, and networks that provide the Internet link (Oz, 2002). The ASP provides internal links and connections as well as real-time technology support staff. Therefore, the entrepreneur needs a minimum staff to handle problems associated with the Web site.

Moreover, the ASP guarantees battery backup systems that typically provide 24 hours of power if electrical systems fail. When battery backup systems are depleted, diesel generators are engaged. The diesel generators supply a week's worth of power before consuming diesel reserves. Entrepreneurs typically are limited to short-term battery backup systems designed to deliver a safe shutdown during power loss. Finally, data backup provides storage of e-business information, such as customer orders, which would be restored in the event of a system failure. ASPs supply automated systems to all member organizations. Although entrepreneurs can backup data, the discipline of making backups regularly – including moving data offsite – can be difficult to maintain on a regular basis.

The ASP also offers clients scalability. If an entrepreneur's business is in a high growth phase, the infrastructure of the ASP can readily scale to meet demand. In most cases, the entrepreneur will be just one client among many businesses leasing services from the ASP's extensively shared infrastructure. Huge growth rates in the entrepreneur's business would likely translate into only modest growth rates in the ASP's business. Furthermore, the ASP's experience with both monitoring demand and increasing supply will allow them to expand as needed. Note that if an entrepreneur is using a significant amount of the ASP's capacity, then rapid growth could become an issue that the entrepreneur should address with the ASP.

Supply chain advantages

Creating an online presence gives the entrepreneur access to previously unavailable supply partners. Estimates show that the worldwide business-to-business (B2B) market will grow from \$919 billion in 2001 to about \$6 trillion by 2005. An organization can use the Internet to integrate seamlessly with its supply chain partners and exchange customer orders, sensitive business documents, and even cash in real-time. Approvals for purchases and other complex business processes can be managed more efficiently using software addressing workflow and business process management issues. Coordinated production planning and control among the supply chain partners enables better demand management.

More importantly, unwanted inventory is not shipped across the supply chain. This improved communication leads to significant cost savings and improved transactional efficiency (Mahadevan, 2003).

Additionally, highly integrated supply chain management and accompanying logistics services have now become the basis of competition in the increasingly electronic and Web-driven marketplace. By reaching trading partners electronically, organizations are able to implement more effectively targeted marketing and relationship building strategies with lower costs and overhead. For example, e-commerce applications offer new opportunities for suppliers such as global presence, improved competitiveness, shortened supply chains, substantial cost savings, novel business opportunities, and new products and services (Ratnasingam and Phan, 2003).

ASP disadvantages

Disadvantages also exist when using ASPs. Problems may arise because a company that uses outsourcing typically experiences a loss of control. When an application is not performed in-house, management may not be informed about problems that are occurring. In addition, management generally is unaware whether internal security and controls are being maintained properly within the ASP (Issues relating to information security will be discussed in the next section). Since data physically resides with the ASP vendor, it is critical that security measures are current. According to Korostoff (2001), "The most common question I hear from IT managers considering an ASP is simply: Will adopting this model cause any perceptible performance decline for my end users? Ultimately, IT managers will use application service providers only if users can't tell the difference between an application hosted across the country and one down the hall".

Entrepreneurs can experience the greatest cost savings when they outsource both their internal and customer-facing IT to an ASP. In fact, they may not even need an IT department or an in-house server. However, increased dependence on the ASP makes changing service providers more difficult. If the entrepreneur relies on the ASP primarily for technology outsourcing and retains control of e-commerce strategy, then service level agreements (SLAs) can be written to define ASP performance. As entrepreneurs rely increasingly on ASPs for e-commerce advice and strategy, it may be appropriate to create profit-sharing contracts that align the interests of the ASP and the entrepreneur (Kishore *et al.*, 2003).

SLAs

ASPs assure clients of satisfactory experiences with such issues as security through SLAs. SLAs are used to guarantee end-to-end service while controlling only a portion of the infrastructure between the site and its users. SLAs outline the specific quality and performance levels expected from the service provider. The ASP Consortium (2001) states that, "A service level agreement (SLA) defines the responsibilities of a service provider and the users of that service. It also identifies and defines the services provided as well as the supported products, measurement criteria, reporting criteria, and quality standards for the service". There are four kinds of SLAs: network, hosting, application, and customer care/help desk. A firm employing several service providers may need all four types of SLAs to guarantee satisfactory service.

Currently, service level agreements are offered in packages designed to meet customer needs. SLAs address issues such as uptime, response time to critical issues, disaster recovery, storage utilization, maximum allowable service outages, payment terms, termination conditions, installation timetables, and legal issues, such as warranties (ASP Consortium, 2001). While service level agreements are sometimes cumbersome, users should remember the importance of SLAs to a company's mission-critical applications. Additionally, small business managers should familiarize themselves with a variety of SLAs (see www.allaboutasp.org) and enter into a contract only when they are assured that reliability will exceed projected in-house performance.

Information security

If a small company decides to develop an e-business through an ASP, there are other issues the entrepreneur must consider, such as information security. As the use of automated information exchange among individuals and businesses continues to grow, the need for information security and controls will continue to increase as well. "The 'millionaires' club' – the number of companies spending more than \$1 million annually on security – has become significantly less exclusive over the last three years. In fact, since 1998 club membership has grown by a remarkable 188 percent" (Briney, 2000). As Halpern (2000) explains, "Employee voice mail, email, Internet access, portable computers, and remote-access capabilities are increasingly prevalent. Although these technologies provide employees with personal and corporate benefits,

their use also increases the opportunity for libel, harassment, copyright violation, breaches of corporate confidentiality, theft of sensitive information, and myriad other dangers". Electronic technology has created numerous security issues. Companies have been forced to focus on prevention and detection of security breaches. For the entrepreneurial firm, the key will be to obtain sound advice – either from the ASP or from related organizations which specialize in security issues – on the best ways to deal with the threats which we detail below.

Security threats can originate from external sources, such as hackers, and/or from internal sources, such as disgruntled employees. The most prevalent breaches in security are caused by individuals external to the firm and include the following:

- viruses/Trojans/worms;
- denial of service;
- activities related to active program scripting/mobile code (ActiveX, Java, JavaScript, VBS); and
- attacks related to buffer overflows, to insecure passwords, to Internet Protocol (IP) spoofing (stealing passwords online) and to other protocol weaknesses (Beekman and Rathswohl, 2003).

To alleviate these problems, various controls must be employed, such as:

- passwords;
- firewalls;
- encryption;
- server segregation;
- application-specific controls;
- authentication servers;
- dedicated circuits; and
- authentication tokens (Briney, 2000).

Again, the ASP is typically in a better position to employ experts that can design and maintain security systems at its data center. Security personnel are highly specialized and typically command salaries that might be prohibitive to the typical entrepreneur.

The two most significant security mechanisms that apply in the use of ASPs are firewalls and DMZs or demilitarized zones. A firewall is hardware and/or software to prevent unauthorized network access. Thus, items not meeting prescribed criteria are not allowed to pass through the firewall. There are two major types of firewalls. One is a packet filter which reads and evaluates each packet entering or leaving the network for authorization. It is a fairly effective tool and is invisible to users, but it is difficult to configure and susceptible to IP spoofing (Avolio and Blask, 2001).

The second type of firewall is a proxy server or application gateway and is considered the most secure type of firewall (Avolio and Blask, 2001). The proxy server intercepts all messages entering and leaving the network and decides if the communication should be forwarded to the primary server (Wald, 2001). "Probably the most important thing to recognize about a firewall is that it implements an access control policy. If you don't have a good idea of what kind of access you want to allow or to deny, a firewall really won't help you" (Curtin, 2000). Another type of mechanism used to maintain network protection is the demilitarized zone or DMZ. A DMZ is a safe area between an internal and external corporate network that has been isolated by a firewall or secured router (Compuware Corporation, 2001).

Outsiders are not the only ones causing havoc to companies around the world; insiders are also a common threat. Indeed, research indicates that internal breaches are more prevalent than external ones (Dean, 2001). Common internal security breaches include:

- installation of unauthorized software or hardware;
- infection of company equipment via viruses;
- use of company resources for illegal activities; and
- theft, sabotage, or destruction of computing equipment or information (Briney, 2000).

For this reason, the entrepreneur still must be conscious of security even though the ASP mitigates many threats.

One way for a company to solve internal problems is by creating policies and procedures that should be communicated to stakeholders (Cutler, 2000). Moreover, the support of top management is essential to a good IT security policy. Company officials should make certain that employees are educated and trained in security awareness. Then, the next step is to make certain that security systems are enforced and that the entire company is involved in corporate security. Either the ASP or another firm should be used to provide guidance to the entrepreneur on these issues.

In addition, a detection approach must also be employed. As *TopTech* (2001) points out, "No system can ever be one hundred percent secure. As a result, most companies have adopted a dual approach to information security management by combining prevention and detection techniques". Intrusion detection systems assess network vulnerability by testing normal security holes to verify that they have been plugged and to monitor configuration files, passwords, and other critical areas (ProWatch Secure, 2001).

Company officials must understand that information security is multifaceted and is critical in modern business. Consequently, disaster recovery is a topic that should be considered when using electronic technology (Schneier, 2000). In addition to information security and controls, officials of small businesses should determine that the ASP has an up-to-date disaster recovery system. "The primary objective of disaster recovery planning is to protect the organization in the event that all or part of its operations and/or computer services are rendered unusable" (Wold, 2000). Most ASPs have disaster recovery plans in place. Thus, the entrepreneur should make sure that this issue is covered in the service level agreement.

Traffic coverage/search engines

After the entrepreneur secures an ASP that meets the organization's standards, it is reasonable to expect the Web site to be up and running within two weeks (Oz, 2002). The entrepreneur should then focus on traffic coverage. Traffic coverage refers to bringing potential customers to the Web site and includes procedures such as adding the site to business cards and other advertising. Moreover, the firm can receive additional exposure by offering its products and Web link on heavily trafficked sites. Such activities will provide customers with easy access to the company's products.

Another issue to consider in the traffic coverage area is the search engine. Search engines represent a form of low-cost or free advertising. Also, the interested entrepreneur can visit the Web to locate companies that offer directory listings and advertising on their respective sites. Specifically, these types of strategic linkages between companies that market complementary goods provide excellent opportunities that otherwise would not be available to many small businesses.

The variety of sites available to entrepreneurs may seem daunting. Consequently, this represents another opportunity to outsource. Google, the online search engine, has capitalized on its competency and expertise in keyword matching. Google prebuys advertising space in an array of sites – large and small – and based on the content of the page, chooses the ads it will run in real time. For example, when space is purchased in an online newspaper, the ads included are related to the featured article. Google will manage this type of placement for its customers and provide the best matches they can offer (Myelene, 2003).

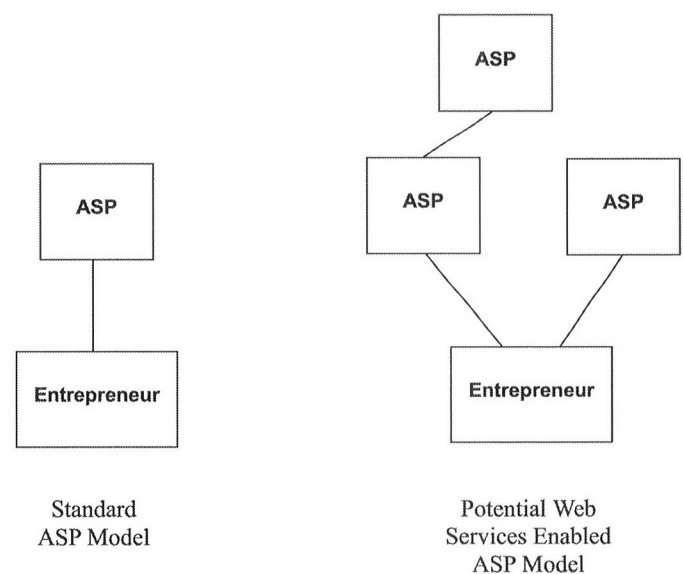
The next wave: Web services

Web services include a collection of new technologies such as simple open access protocol (SOAP) and extensible markup language (XML), which are providing the Web with greater flexibility, intelligence, and distribution of work than ever before. Although these are new technologies and their effects have not yet been fully realized, entrepreneurs should search for Web-based opportunities and capitalize on them. Web services greatly enhance the ability of computers to communicate and coordinate activities across organizational lines without human intervention. The business benefit of this technology is the potential for virtual organizations, where a unified Web storefront is actually supported by many individual businesses. A centralized ASP would link and integrate customers with a variety of specialized service providers, thus harnessing greater economies of scale than previously available. The possible new connections for ASPs using Web services is shown in Figure 1.

As Figure 1 shows, Web services will help the entrepreneur select products from multiple providers. These ASPs will, in turn, outsource some of their offerings to one or more other companies. This type of outsourcing and intermediation has already begun on the Web, creating new forms of collaboration and business linking.

In addition to providing more flexible and efficient ASP models, Web services may enable entrepreneurs to create new organizational structures and innovative new business ventures.

Figure 1 Standard and potential Web services enabled ASP models



For example, customers shopping on Amazon.com may actually buy products from a variety of stores that operate under the Amazon umbrella. This design allows the parent organization to focus on inter-organizational Web protocol and transactions while the individual firms concentrate on their core competencies. Typically, transaction and coordination costs are a barrier to extensive virtualization of firms, but Web services offer the promise of well-integrated information systems that greatly reduce such costs. ASPs, which are experts in Web services, may then be facilitators of entrepreneurial partners.

In terms of supply-chain management, emerging XML/SOAP standardization may increase access to supply partners, thus creating more competitive environments. Previously, interfaces between systems and across organizations were not always compatible and produced a situation requiring a proprietary solution. Now, however, XML/SOAP standards define the interface between legacy and new systems opening up the flow of information across organizational lines (Kong *et al.*, 2004). More importantly, the increase in information available to the purchaser empowers value-oriented entrepreneurs to continuously seek the best price or performance from suppliers.

Summary and conclusion

In conclusion, entrepreneurs should consider the following statistics. According to the International Data Corporation, "e-commerce related revenue driven by small business is expected to grow from \$21 billion in 1999 to over \$110 billion by the end of 2004" (Dean, 2001). Dean (2001) also points out that although approximately 20 million small and home-based businesses are not online today, projections indicate that four out of five of these companies will have Web sites by 2005. It is imperative, therefore, that small businesses seriously consider the importance and impact of becoming a part of the electronic commerce arena.

Yet, entry into e-commerce need not be cost prohibitive for the small business. Many small, entrepreneurial businesses will not have in-house competencies to develop sophisticated e-commerce capabilities. Moreover, from a business perspective, doing so – even if feasible – could be counterproductive for the business, in that it could divert scarce resources away from the organization's key competencies. ASPs allow entrepreneurs to outsource their e-business software, infrastructure, and security requirements rather than taking on the burden of deploying complex and expensive systems. ASPs also can

provide numerous benefits, such as lower costs and a higher quality of service than an entrepreneur could afford acting independently. The ASP, therefore, can be an integral partner to the entrepreneur in launching an e-commerce site by reducing costs, shortening lead-time, and decreasing risks. In sum, as automation and computer networks continue to evolve, ASPs will likely become the norm for small, entrepreneurial businesses, making their use in the e-commerce infrastructure as prevalent as a basic utility.

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