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Small Business in the Electronic Marketplace: A Blueprint for Survival

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The digital economy made possible by the World Wide Web is growing at an astounding rate. At the forefront of this economy are digital products, often loosely defined as information-based products that can be digitalized and delivered via electronic networks. Digital products can be assembled, customized, and packaged in almost an infinite number of ways to meet changing customer demands for instant delivery. Software programs, newspapers, and compact disks can now be delivered electronically over the Internet. Purchasing airline tickets and managing securities transactions are common online activities. More and more industries—banking and insurance, education, and health care, to name a few—are also beginning to use the Internet to change the way they do business. Over time, the sale and transmission of goods and services electronically likely will be the largest and most visible driver of the new digital economy. How can small digital companies survive in such an economy?

Big Challenges for Small Business

Economists have long recognized the importance of small business in the economy. The active existence of numerous small business firms, each exercising a reasonable degree of independence, is considered basic to the maintenance of a competitive market. In addition, small companies are the essential mechanism by which millions enter the economic and social mainstream of society: 47 percent of U.S. firms employ fewer than ten workers.

A big digital product market offers innumerable business opportunities for small companies. At the same time, it presents particular challenges to emerging businesses. For one, there are investment expenses: *the cost structure of technology* requires enormous investments in the infrastructure to make it possible to process information efficiently, handle heavy traffic, and deliver satisfactory performance. Once the infrastructure is established, the cost of offering more products decreases, and the company can take advantage of economies of scale. Many consumers associate prestige with size, assuming that large business is synonymous with efficiency and economy. Therefore, the more a company grows, the easier it is to win consumer confidence and lure business away from smaller firms that lack established identities.

Small businesses in the electronic marketplace also face the two-sided problem of *asymmetric information*. In a traditional business environment, vendors and

customers develop basic trust through eye contact, conversation, and handshakes—that is, the kind of interpersonal interactions that do not exist in the electronic market. With the global, but insecure, Internet being the primary carrier of electronic commerce transactions, misrepresentation of information remains a concern for both consumers and merchants. Web sites can be counterfeited, identities can be forged, and the nature of transactions can be altered. Where asymmetric information exists, the authentication and legitimacy of business entities and the integrity of business transactions are called into question.

The other side of this problem concerns information about product quality. Online markets offer an abundance of product information, but too many choices and too much information make it difficult for consumers to tell which vendors offer quality products. One possible consequence is that online consumers may only transact with well-established brand names to mitigate the asymmetric information and minimize their risks.

Without the advantage of a strong brand name or the resources to establish a widely recognized online business that can handle heavy traffic from around the world, small businesses may have a hard time acquiring the online trust enjoyed by their larger counterparts. Consumers may wonder whether the company is a legitimate business, whether it will deliver the purchased products, whether they can return a poor quality product, or, as in the case of software, whether this company's products are compatible with other products. Such distrust inevitably prohibits the growth of small online players and prevents competition in the electronic marketplace, which, in turn, hinders the innovation that leads to technological change and productivity growth.

Will the cost structure of technology and asymmetric information lead to an online world of natural monopolies? How can small businesses build a trustworthy reputation, develop innovative contents, and compete with well-established brand names in the digital economy?

A Middleman Approach: Digital Intermediaries and Trusted Third Parties

In the digital economy, information technologies and open standards make specialization and cooperation possible and help reduce transaction costs among collaborators. Unlike business giants that have many product lines, such as Microsoft and IBM, small digital companies may have only a few employees and concentrate on a specialized digital product (e.g., accounting software or education programs for specific age groups). In order for these small companies to compete effectively, they will have to develop core competencies and collaborate with each other to construct innovative content tailored to the consumer's unique taste. In addition, they will need an infrastructure that facilitates collaboration and customization.

Digital intermediaries can provide one cornerstone for such an infrastructure. Serving as "middlemen" between small companies and customers, digital intermediaries contract with numerous small digital companies to procure content of different types, with provision for bundling content from different sources. In this way, they can customize and integrate digital products from a wide selection of small companies, helping customers obtain a made-to-order product. Such flexibility in customization and bundling is the reverse of the bundling concept widely practiced now by large companies, wherein products are pre-bundled and customers have very little choice regarding content. Digital intermediaries can facilitate the collaboration and customization that can greatly improve small

companies' quality of product or service, as well as their efficiency, giving them a competitive edge in the electronic marketplace.

By offering a digital company's products through their services, intermediaries vouch for the reputation and product quality of that company. The company is therefore spared the expense for extensive marketing in order to build brand reputation. This saves important resources for product development and innovation. In order to ensure quality to consumers, digital intermediaries must enforce rules on participating companies. These companies must conform to quality rules agreed upon by both parties in order to continue using the services of the intermediaries, who are, in effect, "renting a reputation" to the companies. As long-term players in the electronic marketplace, intermediaries have a strong incentive to build and maintain their reputations.

To help customers find trustworthy digital intermediaries and help digital intermediaries find better content providers, *trusted third parties* (TTPs) provide authentication and product quality evaluation. In an environment where identities can be easily forged, authenticating becomes a paramount concern for business transactions. Certification authorities (CAs) authenticate the identity of each trading party in a transaction by issuing digital certificates based on technological mechanisms such as public key cryptography and digital signatures. By digitally signing a certificate, a CA vouches for the identity of the public key holder. These trusted third parties trace the history of certificate holders to make certain they cannot change their online identity, and, even if they do, the certificate will state that fact. TTPs tie the management team, key employees, and other critical company information to the certificate and keep track of the companies' activities, informing users of any significant changes. This level of authentication provides extra protection for consumers and endorses businesses that carry certificates.

How will all these interactions occur? Interactions between customers and intermediaries will be mediated by an extensive set of directory and catalog services and mobile agent-based systems, which are key elements in integrating content and customizing products. Directories, with information on what is available, at what location, and what is included in the content, allow intermediaries to procure and assemble content. Catalogs give customers the flexibility to look up and choose the type of products they wish to purchase. Further, the catalogs will provide a vast array of choices that may include various combinations of information components. Success will depend on an adaptive system that can rapidly update catalogs to reflect individual customer preferences, make products available on-demand, and facilitate agents' communications with one another to ensure fast dissemination and synchronization of information regarding demand and supply.

Public Policy Issues

We are still at the beginning of an economic revolution. The development of new information technologies provides precious opportunities for small digital business. But these businesses face many challenges in this new competitive setting. Digital intermediaries and trusted third parties may help small businesses overcome some of the online obstacles, but this framework also raises several questions about the implications of strong authentication, the pricing mechanisms for product bundles customized to individual preferences, and the development of technology standards. These issues are of paramount importance to the growth of the digital economy and should be addressed in the near future by both researchers and policy makers.

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