A Virtual Community:
A Strategic Initiative and Competitive Advantage for Small Businesses Engaged in E-Commerce

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ABSTRACT

E-Commerce small businesses have an opportunity to build "sticky" relationships with their customers through effective management of information systems focused on building a virtual community in support of their business activities. This paper describes the required MIS building blocks for a customer-centric online community. Online communication processes, information architectures, and network infrastructures needed to build a successful virtual community are discussed. Finally, there is evaluation of the cost-effectiveness of information system (IS) products and services that are currently available for building a virtual community including several all-in-one web-based solutions.

INTRODUCTION

The phrase "virtual community" has entered the lexicon of our world today. It implies some sense of closeness, intimacy, and connection As the pace of change is increasing and technology and information overload is becoming an issue, the time available to nurture relationships in the "real" world is becoming threatened (Baker and Ward, 2002). At the same time, our need for "answers" and quick access to solutions is growing exponentially. This is a perfect match for the small business owner who is engaged in E-Commerce. Small businesses can provide their customers with opportunities to build relationships, to find answers and solutions, and gain a sense of community deriving from the relationship between individual customers and the small business.

This paper identifies e-business solutions that small business owners can use to develop their virtual communities on the Internet. A virtual community is "an electronic meeting place where a group of people gather to exchange ideas on a regular basis" (Powers, 1997). Such communities "allow broad communities of interest (e.g., customers) to coalesce around specific products and services" (Nambisan, 2002).

A virtual community represents more than just the activities involved in e-commerce or shopping online. Visiting a site and seeking information about a product may be the "portal" into involvement in a virtual community supported by that e-commerce retailer. Buttons and links to chat rooms, to internet groups, and/or to similar retailers selling similar products, are all part of the experience.

A well-designed technical infrastructure provides a strong foundation to ensure flexibility, scalability, and adaptability to meet the changing user requirements of a virtual community and address inherent economic fluctuations in the marketplace. Managing the IS resources, (including hardware, software, data, procedures, and support personnel), is a difficult task in a virtual community because they are subject to over and underutilization based on market changes that are difficult to predict and control.

In his book "How to Program a Virtual Community", Powers (1997) defined five building blocks for a virtual community: inhabitants, places to see, things to do, a government, and an economy. Online member are inhabitants; often called avatars (or embodiments). A virtual community may have different places, locations, spaces, rooms, chat rooms, or even theme parks for its online members to visit.   A community may also have different objects, props, and activities for online members, encouraging interaction among members who may be present at the same time.

The "governance" in a community includes support and trust in a democratic environment with commands and control, as well as rules and regulations that govern the cyber interaction. This includes monitoring online activities, managing the resources, and gathering the utilization and visitation statistics that are needed to make the optimal decisions to facilitate future growth. Lastly, the economy is the exchange of things of value, from local and foreign currencies, objects, and games, to banners, promotions, memberships, and events. The online community must have some kind of economic exchange in order to maintain itself in the cyber space.

ONLINE COMMUNICATION PROCESSES

Technologies mirror the modern society based on its democracy, civil structure, culture, and education (Barber, 2001). However, today people expect "open systems" that have flexible and dynamic links within and outside their communities. The following sections discuss four different communication architectures: one-to-one, one-to-many, many-to-many, and peer-to-peer. Understanding the different nuances of these approaches to communication will help businesses to design their virtual community effectively.

One-to-One Communication

One-to-one communication in a virtual community is the digital interaction between a host and a member, or more commonly, between two members. This kind of relationship is direct, simple, and easy to understand and manage. A virtual community with many of these linkages will have a lot of individually driven communications and is often described as a private or closed system. It is a one-way communication at a specific instance of time. The host or members have direct control in this one-way, vertical or horizontal communication. This is an isolated and non-interactive relationship in a computer-mediated environment and is probably not the best approach to building a virtual community.

One-to-Many Communication

The one-to-many architecture allows the host to distribute information effectively to all members in a group. This is usually a closed system, as members have to register to receive information or be on a mailing list obtained by the host site. A one-to-many virtual community is nearly always a vertical communication process. If the customers would like to send in feedback, a many-to-one communication process begins. Thus, one-to-many communications can be viewed either as a one-way or a two-way communication process. This method is highly

centralized and often minimally interactive and the host has maximum power in controlling information within the group. However, it does provide a cost-effective way to communicate with members of a community.

Many-to-Many Communication

The many-to-many communications architecture may better solve the problem of market fragmentation as it integrates many groups together at one place through common interests and linkages. Kozinets (1999) suggests that effective virtual communities are like "electronic tribes" structured around member interests. "Communities of commerce", a phrase originated in 1995, are the Internet-based communication channels for suppliers and customers (Bressler & Grantham, 2000). A many-to-many communication structure is an ideal way for the online members to interact with others and an innovative design that accelerates communication velocity at low cost.   For a large, fragmented, and unorganized group of vendors who are seeking to reach buyers in the same market, communities of commerce provide a "many-to-many" communication structure for them to meet electronically on the Internet. While the communities of commerce evolve, clusters of communicating groups are formed on the Internet, albeit with some limitations based on cultural and language differences. In this interactive many-to-many community, members have to learn how to manage communication effectively to gain market recognition and other members' support.

Peer-to-Peer Communication

The latest design in virtual communities is a totally market-driven, peer-to-peer (P2P) communication network. According to the TechEncyclopedia (2001), a P2P network is "a communication network that allows all desktop and laptop computers in the network to act as servers and share their files with all other users on the network". This P2P community is an open and yet dynamic electronic exchange network, totally controlled by its members. It is a multiple version of the one-to-many network, and the expansion of the many-to-many network. A peer-to-peer communication network tends to lack security, privacy, and trust. Members have less protection in cyber space than in the real space because there are no rules or regulations and no consensual authority that monitors the activity. This type of self-governing is a concept very much in its infancy and complicated by multiple cultural frameworks or orientations easily engaged in a struggle to dominate.

Molitor (2001) describes five forces that are transforming this electronic communication: optical transmission, satellite communication, wireless and mobile communication, broadband digital technologies, and Internet resources. As we progress beyond the 21st century, virtual communities will enter a new digital age with revolutionary changes in real space markets and online environments.

INFORMATION ARCHITECTURE

Well-designed information architecture integrates the five building blocks of MIS. These are finance (including accounting), human resources, information services, manufacturing, (including product development), and marketing. With respect to the architectural design, front-end and back-end information design are discussed. User interfaces and data flow are also addressed. It is important that a system or business analyst defines user requirements and functional specifications in this stage.

Front-End Information Design

The front-end information design focus is like home decorating and interior design for a house, placing various objects in an environment based on anticipated human behavior. The front-end information design provides the first layer of user interface for members in a virtual community. Front-end web interfaces include web content management, graphical user interfaces (GUI), and multimedia presentations. Designing how members will interact online involves designing and writing the web site content. Based on the "Activity theory" described by Chaudhury, Mallick, and Rao (2001), a virtual community has the

following elements: actors, tools, objects, processes, and outcomes. When developing web content, managers must address each of these elements.

At the graphical user interface (GUI) level, managers should work with their web designers to develop interactive features and tools based on user requirements with a goal of increasing site stickiness (the time spent that leads to loyalty). Well-designed GUI pages create a special mood or emotional feeling in the cyber space at a particular time. Hence, understanding online members' psychological behavior, attitudes, and personality will help to create the right emotional appeal at the GUI level.

For business and news related web sites, very often there are some multimedia presentations or audio-video files for download. The use of streaming media creates more excitement and higher stickiness than static forms of communication (Bressler & Grantham, 2000). However, this multimedia approach does rely on the users' bandwidth capacity. Additionally, member loyalty does not necessarily lead to higher profitability (Bughin & Zeisser, 2001).

Back-End Information Design

The back-end information design is like drawing the plans for a house and preparing for construction. The key is to determine how the front-end and back-end elements will interact and communicate with each other. Managers have to design how information will flow in and out of the website, and to or from the server and desktop computers. Basically, there are three types of management systems to take care of the back-end information: customer relationship management, value chain management, and knowledge management. A customer relationship management (CRM) process deals with external information from customers or members. Through the virtual community based on a customer relationship management strategy, the organization can track customers' or members' online activities and search for new marketing promotional strategies for future campaigns. According to the Object Management Group (2001), the value chain is a "set of activities an organization performs to create and distribute its goods and services, including direct activities, such as procurement and production, and indirect activities, such as human resources and finance". When an organization can link the activities in its value chain in a cheaper and more efficient way, it will gain a competitive edge in the market. Knowledge management is an internal business process that positions an organization to store, retrieve, study, and learn from historical data. For example, NVST.com, established in 1995, is a virtual community for investors, entrepreneurs, and professional service providers to meet and do business online (Tudor, 1999). There are two databases: one is a contact database with free subscription and the other is an investment opportunity database with a fee-based subscription. Managers can easily do data mining studies and study the differences in online user demographics. New insights from the KM system will help to improve the front-end information design for the virtual community

NETWORK INFRASTRUCTURE

Railsback (2001) says that the right mix of databases, application servers, data-mining tools, and customer relationship management solutions will be the foundation for a solid business infrastructure. For a small business virtual community, the infrastructure will be a little different depending on whether the online community is a business-to-business (B2B) or a business-to-consumer (B2C) network selling products or services.

Requirements for the Network Infrastructure

It is crucial for a small business trying to build a virtual community to have a reliable ISP as small businesses usually have limited resources to maintain their computing network in-house. A well-planned network infrastructure must be open, flexible, scaleable, robust, reliable, and secure. In the article "Wish: An entrepreneur's dream", McClelland (2000) suggests that content providers, payment providers, and consumers together create an efficient e-commerce environment on the Internet. There really is a synergy in that the virtual community transcends its component parts.

In terms of the software and hardware components of a virtual community, Powers (1997) suggests three software components and a four-step process. The three software components are: (1) the server and database, (2) the client browser, and (3) the network connection. The four steps of building a virtual community are finding the right machine, launching a server, using the client, and editing the online settings. A small business may need to work with an IT analyst to define specific user requirements to reach the ultimate marketing goals

E-Business and Customer Databases

A virtual community requires a virtual office with robust and reliable functionalities in the areas of Finance, Human Resources, Information Systems, Manufacturing, and Marketing functions. The traditional business relationship is about vendors targeting customers in a segment. Today, this is reversed as a virtual community customer seeks the most ideal vendor (Poynder, 1999). A virtual community interacts in an e-commerce area with a unique focus that integrates content and communication, and provides access and convenience to a broad range of products and services. After many dot-bomb failures offering free content sites, the future trend will be to have broad and popular content sites that gain online exposure and generate revenue (Goldberg, 2001).

Web-Based Applications

Web-based applications must provide accurate and secure online and offline communication between all web pages in the virtual community and the application servers. A virtual community needs web-based for content management, online payment, and Internet security to develop member's interests, drive online revenue streams, and develop online trust.

There are both free and paid content management tools. For a small business, MSN community seems to be a good choice as the host can choose to keep the community as an open or closed system with calendar, chat, message, and many other web features, all at no cost on the Internet. Similarly, eProject is a free online project management application service provider (ASP) that members can use to check schedules, post information, and exchange files with other members. Online payments have become very popular as the number of experienced online users increases. PayPal, a pay-per-use model that small businesses can use to minimize risks and costs, is the world's largest online payment or e-cash provider. Internet security tools include anti-virus software and firewalls.

Internet collaboration takes hard work, the right tools, patience, and the ability to develop web design from scratch (Sherman, 2001). Online communities can also build in a 3D collaboration application (Miller, 2000). Although remote teams can collaborate and communicate in an open ISO standard, members may require accelerator video cards and intensive resources to implement a 3D collaboration.

All-In-One Solutions

The author compared online product and service information for small businesses offered by the following vendors: SAP, Oracle, PeopleSoft, JD Edwards, Baan, IBM, Microsoft, and HP. The comparison focused on the availability of small business enterprise (SME) solutions, free trials, prices, support, customer relationship management solutions, value chain management solutions, and knowledge management solutions.

Oracle appears to have the best small business center e-commerce suite with a total network infrastructure (http://www.OracleSmallBusiness.com). It is an Application Service Provider (ASP) solution designed for small businesses and is simple and responsive. Navigation is user friendly, unlike other vendors that have poorly designed web sites with many pop-up windows or broken links. The monthly fee for the Oracle e-Suite is about US$99 (or Canadian $160). This is an affordable choice for a total e-business solution that offers 24/7 support and is optimal for the organization seeking an all-in-one web-based small business solution.

CONCLUSIONS

A virtual community is an electronic meeting place where individual members buy and sell products and exchange ideas and messages, thus facilitating relationships based on common interests. Members use that community as a platform to search for other sites and begin new relationships. Customer-centric virtual communities provide competitive products, services, and experiences for all members anywhere, at anytime. Managing information systems in a virtual community is like managing the incoming and outgoing data flows from a web site. It consists of five fundamental functions: finance, human resources, information systems, manufacturing, and marketing. The five building blocks for a virtual community are actors, places, objects, a government, and an outcome. These elements make a virtual community very attractive, interesting, informative, and interactive. Online members are motivated to make repeat visits and expand upon their transactions with the small business and its extension through the virtual community.

A peer-to-peer network provides open and dynamic access to all parties. The information architecture of a virtual community must integrate the front-end and back-end and be robust and reliable with well-defined user requirements and system applications. A mix of databases and web-based applications, such as web content management software, online payment applications, and Internet security tools, enhances a web site's functionality in a virtual community. From a small business owner's point of view, Oracle has an effective all-in-one Small Business e-Suite integrating online and offline business functions together in an ASP solution. Small business owners can manage internal operations and external relationships with customers and suppliers via this product.

Managing information in a virtual community requires hard work, patience, commitment, and creativity. Small businesses should evaluate how web design and web content can be translated into an online environment that mirrors the real space environment. Understanding how a virtual community can satisfy the currently unfulfilled market needs will certainly create many new online opportunities for small businesses to generate revenue and gain a positive experience in the cyber world in the future.

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