

# **Portal Combat: An Empirical Study of Competition in the Web Portal Industry**

Appeared in the *Journal of Information Technology Management*. Vol. 11, No. 1-2, 2000, pp. 13-24.

John M. Gallagher  
Assistant Professor of Information Systems  
Wallace E. Carroll School of Management  
Boston College  
Chestnut Hill, MA 02467  
john.gallagher@bc.edu  
Tel: 617-552-2519

Charles E. Downing  
Associate Professor of Information Systems  
Operations Management and Information Systems Department  
College of Business  
Northern Illinois University  
DeKalb, IL 60115  
cdowning@niu.edu

# **Portal Combat: An Empirical Study of Competition in the Web Portal Industry**

*forthcoming in the Journal of Information Technology Management*

## **ABSTRACT**

What determines a market leader when business models and technologies can be easily imitated? This work examines this question within the context of the market for free, consumer-oriented Web portals. Factors considered include the length of time a service has been offered, the brand-related make-effects of various leading players, and product features that create virtual community and other switching costs. This analysis demonstrates that there are strong make-related premiums among leading portal players, suggesting that brand value may be a critically important asset for industry players. The study also offers qualified support for the first-mover hypothesis, the benefits of chat and gaming features, and notes a lack of significant benefit from leadership in various technology-based service innovations.

## **KEYWORDS**

Electronic Commerce, Strategy, Make Effect, First-Mover Advantage, Virtual Communities, Switching Costs

## INTRODUCTION

Creating and sustaining a competitive advantage is challenging for most firms, however this challenge may be particularly difficult for businesses offering services over the World Wide Web. At mid-year 2000, there were less than fifteen publicly traded US 'dot-com' firms that were turning a profit. Those few sector-dominating firms were beginning to emerge from their respective packs of competitors. Many of these firms, such as eBay, Yahoo, InfoSpace, and Monster.com, are what can be referred to as 'bits-based' businesses [24], firms that hold no inventory and provide products and services that are entirely digital. Identifying the determinants of market leadership among technology dependent firms remains an ongoing challenge despite extensive research into the strategic value of information systems [e.g. 3; 4; 7; 18; 23]. Examining the factors associated with market leadership among Internet rivals is particularly interesting, given that firms use identical technology based on open standards to interface with the customer, and given that one's competition is typically just 'a click away'. While Internet firms use technology almost exclusively to interact with their customer base, resource-based theory suggests that technology alone can not yield sustainable competitive advantage [4; 23]. The question remains then – how are firms able to dominate their market and capture the broadest customer base when competitors can easily match a firm's feature innovation?

This research examines previous literature as it relates to IS strategy, market entry, brand value, and Internet features in an attempt to assess those factors at work in online competition. Using the Web portal industry as a context, accepted techniques from prior IS research used to examine

competition in software markets are applied to measuring and assessing online competitors. Results of this study provide insights of interest to practitioners in Internet and related industries as well as to firms considering developing, partnering with, or investing in such information services. Researchers in the area of information systems, marketing, economics, and strategy should also find these insights valuable, as the study provides an empirical exploration into an emerging context that has thus far attracted little quantitative research.

## **CONTEXT – THE WEB PORTAL INDUSTRY**

Examining competition among Web portal firms provides an interesting research context for several reasons. These include immense interest in the Internet, the enormous market valuations placed on Web portals<sup>1</sup>, the difficulties in crafting a sustainable business in an environment where consumers increasingly demand free services<sup>2</sup>, the likelihood that portals represent a first step in the evolution of free information services delivered over public networks, and the fact that many portal features are beginning to appear in other online enterprises.

In the context of this study, the term "Web Portals" refers to the category of firms that have evolved from early roots as World Wide Web search engines, but may now include features such as calendar management, chat, free e-mail, games, and shopping, among others. During the time of this study, the market consisting of free web portal services was dominated by four firms – Excite, InfoSeek, Lycos, and Yahoo. These firms controlled the majority of both advertising dollars (the primary revenue stream for these firms) as well as visitor traffic to free, general-interest portals. At the end of 1998, these four firms had a combined market capitalization

exceeding \$50 billion. The growing importance of this industry within the United States economy has been acknowledged by the Fall 1999 inclusion of Yahoo as one of the securities making up the S&P 500 index.

In examining market leadership we chose to focus this analysis on factors associated with *market reach*. In this study, market reach refers to the percentage of the Internet population visiting a particular portal during a given period. This was done for the following reasons: 1) Market reach is the most cited measure used for discussing competition in the web portal industry and as such, is the primary indicator used in assessing market leadership. 2) This method is also consistent with the traditional market share approach used in examining competition in software markets [2]. Market reach is similar to the share measure, but allows for the fact that a user may visit more than one service in a given period<sup>3</sup>.

## **INFLUENCING MARKET DOMINANCE**

It would be impossible to conduct a study that examined all potential factors associated with market dominance. Noting this, we have chosen to focus on four areas that have received attention in the research and practitioner literature, but have yet to be empirically explored in the context of e-commerce firms. These factors include early mover advantages, brand-related make effects, virtual communities, and non-community features that create switching costs. A description of each, along with the reasons (theoretical and practical) for considering these factors follow below.

## Early Mover Advantages

It has been suggested that the venture capitalist axiom "*speed is God, time is the Devil*" has never been more applicable than to the context of Internet competition [10]. For example, Amazon.com launched in July 1995; 22 months ahead of leading book chain Barnes & Noble. At Q1 2000, first-mover Amazon was selling more than four and a half times as many books online with a total sales volume nearly eight times larger than Barnes & Noble. Similarly, prior to 1996 Charles Schwab and Fidelity competed as near equal peers with respect to their share of the discount brokerage business. Schwab launched its Internet trading operation in May 1996; Fidelity followed eight months later. By 1999, Schwab was the leader in online trading volume; Fidelity – despite having more competitive rates – was in fifth place.

Strategic management researchers have long been concerned with whether or not moving first in an industry offers a firm an advantage over rivals that follow. However, there is significant controversy regarding the pros and cons of moving first (for an excellent summary, see [33]). Moving first can allow a firm to gain early market share, establish a reputation as an industry pioneer, define standards, develop relationships with suppliers and distributors, and begin generating revenues to foster future growth. However, those firms that do move first incur risk as market pioneers. It can be expensive to develop a pioneering product (the first product or service in a category) and to generate consumer awareness with a constituency unfamiliar with the offering [32]. Expenses may involve not only creating product and firm recognition, but also generating awareness of the new product or service and providing consumer education. And

while pioneers are vulnerable to the risks and missteps of moving early, followers may take less time to deploy rival products and require fewer funds to copy the innovation [22]. Because computing power continues to increase exponentially relative to cost, information-based industries may be particularly vulnerable to investment asymmetries between first and subsequent movers (that is to say, first movers may spend more than later movers).

Several cases have claimed the value of the first-mover advantage in the development of information systems (for an overview see [26]). In studies of why dominant firms fail, Christensen [3] advises a pioneering role, suggesting that firms experiment with innovations and take a stake in industry innovators in order to avoid being shut out of later competition. Early theories of Internet strategy have emphasized the value of moving early [6; 15]. However, to our knowledge there has been no empirical research regarding early mover advantages in involving Internet businesses. Moving early may not yield sustainable advantages in industries where switching costs are low or non-existent and where customers can readily shift their business from supplier to supplier [30]. Low switching costs and distribution advantages helped Microsoft match Netscape's dominant lead in the Web software market, despite the latter's considerable head start [5]. In order to shed light on this conflicting theory, this work investigates the role of moving early.

### **Brand Value (Make Effect)**

Early Internet strategists have suggested that brand loyalty may be weaker for online firms [17]. For example, a recent study examined the high rate of customer churn (customer turnover) in the

fee-based online service industry [27], suggesting that consumers may lack brand loyalty.

Loyalty among some online firms may decrease as product comparisons can be made with very little effort on the part of consumers, and as deep-pocketed newcomers secure virtual distribution through bundling agreements. In the portal industry, such agreements include licensing virtual real estate under a browser's search button, or bundling a service with an Internet service provider [5].

Despite suggestions of weakening consumer loyalty, it has also been argued that a strong brand may be a vital asset to online firms [10]. A strong brand provides Internet businesses with benefits in three critical areas: 1) brands lower customer search costs, 2) brands proxy quality, and 3) brands inspire trust. Brand-related make effects (premiums associated with a given provider) have been considered in earlier studies of IS markets such as spreadsheets [2] and online services [35]. If dominant brands exist in the portal industry, then a significant make effect for a given service should be evident after adjusting for features offered and the time the service has been available.

### **Stickiness (Switching Costs)**

Recent popular Internet business literature has referred to the strategy of creating 'stickiness' [29]. The idea behind stickiness is that firms should create ties between the service and the consumer in order to encourage repeat visits to a web site. IS and strategy researchers know this concept as switching costs. Shapiro and Varian [30] emphasize the importance of establishing switching costs in industries where customers may otherwise sample nearly identical offerings

from competitors. Seybold [29] suggests that the more information that a customer ‘leaves behind’, the greater the likelihood that he or she will return to that service.

[ --- Place Table 1 About Here --- ]

Sources of switching costs for Internet firms include e-mail, calendar, and web hosting services (also known as homesteading). As Table 1 illustrates, many firms have placed high valuations on successful Internet services that attempt to establish switching costs. Customers of these services are reluctant to switch providers given that a change of service involves time, effort, and the potential of lost contact with those unaware of one’s new address or URL. These sorts of switching costs may be particularly important in preventing the earlier cited penchant for customer churn in the online services industry [27]. As such, one would assume that firms that offer features to create and leverage switching costs would be able to maintain and grow market presence over time.

## **Virtual Communities**

In their book *NetGain*, Hagel and Armstrong [15] suggest that virtual communities are a potential source of substantive value for Internet operations. They encourage firms to grow and cultivate services such as chat or gaming that bring consumers together in some sort of online dialog. The value of virtual communities is derived from network externalities (popularly referred to as Metcalfe’s Law). When network externalities are present, the value of a particular product or service increases as its installed base of users expands [9]. Given that each new

member of a virtual community brings the ability to interact with other users, the value of a virtual community has the potential to increase exponentially with each adopter.

Metcalfe's Law can also fuel awareness of a firm's offerings. Firms that move early in information-based Internet businesses can leverage Metcalfe-fueled techniques such as viral marketing [10] – using the firm's growing customer base as a low-cost means to promote and establish a new enterprise [16]. Blue Mountain Arts, Hotmail, and ICQ are all examples of leading Internet destinations that have each leveraged this strategy to create a multimillion-customer installed base. However, virtual communities benefit from Metcalfe's law beyond mere promotion because users generally see larger communities as more valuable than smaller ones. For example, gamers are attracted to places where there are the most competitors, collectors are attracted to auctions with the most buyers and sellers, and chat users are attracted to destinations where there are likely a critical mass of like-minded individuals. Failure to quickly attract a critical mass of virtual community users may doom an otherwise high-quality offering. For example, Apple's eWorld online service was widely regarded as superior to AOL, however the service remained a virtual ghost town as users were attracted to AOL's larger communities [35].

[ --- Place Table 2 About Here --- ]

The substantial valuations placed on virtual communities (Table 2) suggest that Internet firms see benefit to securing virtual communities, with many compelled to play 'catch up' and match the efforts of their rivals. Parthasarathy and Bhattacharjee [27] and Wang et al. [35] offer

evidence of the existence of positive network externalities in the subscription-based online services industry, however the impact of network externalities in free information industries remains largely unstudied. If virtual communities do generate growth in a service's subscriber base, then it is assumed that firms that have established virtual community features such as chat and multi-player games will generate benefits that positively impact the firm's market position vs. competitors that do not offer such features.

## **MODELING PORTAL COMBAT**

The traditional approach used in the IS literature when comparing the market leadership of one product relative to others in its class has been to examine market share [2; 11]. The concept of market share is less applicable in the context of Web portals since consumers may patronize more than one portal during a given time period. Given this non-exclusivity, market penetration is best measured by market reach, or the percentage of the overall customer population using a particular service. Using this construct, aggregate reach percentages among the leading players may exceed 100 percent, yet still reflect a firm's relative market position compared with its rivals.

The approach to constructing the general model is otherwise similar to the studies cited above. In order to enable the exploration of the factors that we are interested in, four additional characteristics are needed in addition to market reach: 1) the length of time a service has been operational, 2) an indication of the services make or brand, 3) the consideration of features that foster virtual community, and 4) the consideration of non-community features that establish

customer switching costs. A fifth characteristic is also considered – features that neither provide switching costs nor virtual community but that may enhance the utility of the service. While not the focus of this study, these later factors are included as control variables. The general model is presented as follows:

$$R_{it} = f(A_{it}, M_{it}, C_{it}, S_{it}, F_{it}) \quad \text{where:} \quad (1)$$

$R_{it}$  = market reach,  $A_{it}$  = age, or time since service launch,  $M_{it}$  = make effect, indicating the brand of a service,  $C_{it}$  = features that establish virtual communities,  $S_{it}$  = features that create customer switching costs, and  $F_{it}$  = other features that may enhance the utility of the service, for product  $i$  during time period  $t$ .

## **DATA**

A single data set consisting of 88 total observations ( $n = 88$ ) was prepared for this study. The data set reflects a cross-sectional time series across 22 months from March 1997 to December 1998. This study restricts its investigation to leading pure-play portals in the Web portal industry. These ‘Big Four’ are made up of Excite, InfoSeek, Lycos, and Yahoo. All firms considered during this period were publicly traded companies whose primary product offering is a consumer Internet portal. Not considered in the study are fee-based services such as AOL and CompuServe or fee/free hybrids such as MSN. Also excluded from the study are vertical or niche portals as well as firms such as AltaVista or Inktomi that provided OEM services to leading players during the time of the study.

The dependent variable REACH represents the percentage of the Internet population that visited a particular Internet domain in a given month. These data were obtained from industry research organization MediaMetrix. Measuring Internet audiences is the primary business of MediaMetrix. The firm uses proprietary software to regularly collect data from a representative sample of over 40,000 individuals.

The AGE variable reflects the number of months a portal has been in operation, with the first month expressed as month zero. As in earlier studies [2] it is included to quantify the length of time a competitor has operated and to moderate this against the percentage scale of a firm's relative market share. The make effect of a given portal brand was represented by a one-zero indicator variable for three of the four portals, Excite, Lycos, and Yahoo (the fourth, Infoseek, was eliminated to avoid auto-correlation among the residuals that would have resulted from including indicators for all four portals [25]). For precedent on the use of one-zero indicators for measuring make-effect of players in IT industries see [2].

Unfortunately, due to the lack of empirical research in this industry, clear constructs for virtual community, switching cost, and other feature variables do not exist. As such, data were selected via a content analysis of trade press reports, press releases, and industry resources such as searchenginewatch.com. The variety of sources consulted allowed for cross-checking and corroboration among multiple sources and, we believe, for a highly consistent and reliable data set. In the rare case where a discrepancy was noted among sources, the portal firm was contacted for clarification. The use of such industry and company-supplied sources to acquire

time-reflected data is similar to that used in [28], among others. As was noted in earlier studies, it is common for features to overlap multiple inputs in the theoretical model. For example, Brynjolfsson and Kemerer [2] found that the significance of standards features may proxy network externalities, but such features also increase overall product quality. Interpretation of significant features where a variable may impact multiple constructs (such as virtual community or switching cost) will be saved for the discussion and interpretation. A description of all variables considered in the empirical test model is presented in Table 3.

[ --- Place Table 3 About Here --- ]

It is acknowledged that availability of a feature does not indicate use. One of the goals of this study is to explore competition among free Internet services using established techniques employed by previous studies of priced IS products (e.g. [2; 11; 12; 28], among others). For this reason features are measured by one-zero indicators of availability. The Internet may eventually offer us more robust monitoring tools to improve upon this approach. However, the data used in this paper may already offer a more reflective representation of overall product use than the previous approach of using sales-based market share data, given that the later may reflect products that have been acquired but never used.

## **RESULTS SUMMARY**

Multiple regression is one of the most common empirical techniques used in the development of econometric models of IS industries [2; 11; 12; 28]. A series of regressions was performed to

fully explore the presented propositions and the impact of the various variables considered. These results are presented in Table 4. The four models in the Table, (a), (b), (c), and (d), indicate the examined factors and positive feature variables that are significant at or above the 90% confidence interval. Multicollinearity was tested for in each model using both the VIF and Belsley-Kuh-Welsch diagnostics [1], and in each model these results indicated that the independent variables were not significantly confounded with each other.

[ --- Place Table 4 About Here --- ]

Model (a) represents a refined regression considering all possible variables in the data set. The results of this regression clearly suggest that the make effect for given brands is quite strong. Among the three make indicators considered, Yahoo enjoyed the greatest leadership-associated brand premium, with the Yahoo brand carrying a nearly 23 percent market penetration advantage over its rivals. While Excite enjoys a brand premium of roughly 4 percent, the Lycos brand, *ceteris paribus*, seems to carry slightly negative make effect in the model. This finding is consistent with criticisms of the Lycos brand in the business press [34].

Also interesting in the results for Model (a) is the fact that none of the feature variables except GAMES exhibited a significant positive relationship to market penetration. The significance of multi-player online gaming can be cautiously interpreted as supporting the influence of both network externalities and switching costs. To the extent that consumers visit a web site to engage in multi-player games, the user is participating in a virtual community. The impact of virtual communities is difficult to separate from the added influence of switching costs, as a

user's network of fellow players represents a lost resource if one switches to a rival service. The benefits of online gaming have been suggested in the popular business press [13], and by the Fall 1999 acquisition of the Gamesville network by Lycos. At the time of the acquisition Gamesville not only claimed 2.2 million active users, the service held users for a longer amount of time (roughly four hours on average) than any other Internet site. While these results suggest the benefits of virtual communities and services that offer switching costs with respect to market reach, future studies might also examine the length of time per visit since this can be key for determining how much advertising and cross-promotion a site can do per visitor.

Since this is an exploratory study, several additional analyses were performed to investigate the influence of additional factors studied and to examine the robustness of results. In order to explore further the impact of brand-related make effects, Model (b) was created eliminating all feature variables except AGE. A firm's age may proxy a user's time/brand related quality perception [31] in addition to indicating a firm's market entry relative to peers. Model (b) shows that even without considering features, the original assertions regarding make effect hold. All non-feature related variables considered in the analysis register as significant, along with a continued strong dominance by the Yahoo brand and directionally similar significant results for the other two brands.

The positive significance of the AGE variable in Model (b) suggests limited support for the first-mover hypothesis – that is, firms offering services longer than rivals enjoy market reach leadership. Model (c) further explores this finding by including only the AGE variable in the regression. The adjusted r-squared value of Model (c) indicates that the AGE variable alone

explains roughly 20 percent of the variability of the data. Although there may be some overlapping influences among early mover and make effects that are impossible to split out of the AGE measurement, the positive significance of this variable is interpreted as offering qualified support for the importance of first mover and make effects.

Given the rapid rate of innovation in the Internet industry in general and the portal industry in particular, it is interesting to note the impact of the feature indicators on market penetration. The final Model (d), considers the positive benefits of just the feature variables. Such one-zero indicator constructs have proven significant in past analyses of IT markets [2; 11; 12; 28], however the analysis here shows a decidedly smaller explanatory power of the model considering the benefits of the feature variables when compared to the other models. The positive impact of the GAMES and CHAT variable suggest the influence of virtual community and switching costs (through the potential loss of online companions for service switchers), however their combined power describes less than twelve percent of the variability in the data. Other variables considered in the study do not appear to yield market-reach related benefits. This suggests that the bulk of the performance of firms examined is explained by make and age variables, with features yielding very little effect.

## **INTERPRETATION AND CONCLUSION**

Interest in the Web portal industry is clearly evidenced by the dramatic growth of Internet use, the rising profitability of this sector of an industry otherwise void of profits, and the enormous market valuations placed on leading players. Yahoo alone held a market capitalization at the

conclusion of this study that was larger than that of any major U.S. television network. This growing and powerful industry has thus far received no quantitative empirical attention among IS researchers. It is hoped that the research presented here has shed light on the factors that have led to the growth and dominance of leading portals, and the competitive factors at work in the industry.

The study provides strong support that brand-related make effects were at work in the portal industry during the time period examined. For practitioners, this result suggests that establishing a strong brand early in an industry's development may be a critical mechanism for attracting consumers and sustaining growth. Early practitioner writings dismissed the value of brands among e-commerce firms, suggesting that only the value of services will determine a firm's dominance [7]. However, this study has shown not only that brand appears to be important, but that it may be more important than feature innovation in attracting customers in situations where competitors are closely matched. This might also be seen as justification for spending heavily on advertising and other marketing expenses early in a firm's development (however, as many dot-coms are learning, marketing alone will *not* make up for a poor business model with bleak revenue prospects).

These results are also interesting for researchers given the conflicting earlier research on the importance of brand-related make effects. Make effects were not recognized as significant by Brynjolfsson and Kemerer [2] in their study of the spreadsheet market. However, Wang et al. [35] found support for make-related effects in their study of the online services market. One possible explanation for the discrepancy in earlier studies and the significance of make effects

here is that the portal industry, like that examined in [35], is at a relatively early stage of development<sup>4</sup>. This suggests a moderating impact of industry maturity on the influence of make effect – in other words, brand may be more important at earlier stages than at later stages.

This study also offers limited support for first mover advantages among portal players. This is particularly important given the controversy discussed earlier regarding the benefits vs. risks of moving first [33]. The findings of this study are consistent with those demonstrating that later entrants should plan on achieving less share than the pioneering firms if they enter with a parity product [32]. However, caution is advised when interpreting the influence of first-mover effects – the age of a firm did not appear as strongly significant as brand-related make effects and it is possible that some unmeasured interaction between brand value and the age of the firm exists.

The study also demonstrates the positive benefits associated with features that create virtual communities and switching costs – specifically games and chat. The significance of games is consistent with suggestions that online games are among the most popular Internet activities and that games attract users for visits of the longest duration [19]. The relationship between market reach and games and chat may also be a result of so called 'viral marketing', or the propensity of a feature to be promoted by the firm's customers [10]. Individuals inclined toward multi-player games and online chat may encourage friends and colleagues to join a service so that they can interact online. Such features would expand reach as their popularity increases. These results could be used by cash-strapped firms for justifying investment expenses in these features and in estimating the value of potential merger and acquisition partners that leverage similar assets.

[ --- Place Table 5 About Here --- ]

The lack of significant benefit from the other feature variables examined provides an equally interesting result. The resource-based theory of business strategy [4; 23] offers a possible explanation as to why most features did not offer market penetration benefits. Internet firms interface with customers using similar technologies based on open standards, so virtually any innovation introduced by one firm can be imitated by competitors. These innovations therefore do not represent resources that are sufficiently rare or unique enough to yield a sustainable advantage. Although innovations that create switching costs and virtual communities have the potential to yield growth-related benefits to the firm, if these features are rapidly matched by competitors then the benefit to the initial innovator may be nullified. Also, by examining rapid innovation among online competitors, this study offers quantitative insight into the notion of 'Internet Time' suggested by Cusumano and Yoffie [5]. Internet Time refers to an environment in which competitors innovate and make matching product introductions at accelerated rates. Table 5 demonstrates such a hypercompetitive environment present in the portal industry by depicting the time for second-movers to match the innovations of the lead innovator for those features considered in this study. The average matching time for a given service was roughly 2.5 months. The innovations examined may not yield sustainable market penetration advantages due to the competitive intensity in the industry and the ability of closely matched rivals to duplicate a given innovation. However, the accelerated rate of feature-for-feature matching among competitors suggests that responsive innovation may be a competitive necessity among participants. Considering this result, resource-constrained firms may elect not to pioneer innovations that can be developed easily; instead if a firm feels it can be a fast-follower, then it

might allocate critical resources such as cash and staff only after a rival has made an initial move.

As with all empirical work, certain limitations of this study must be acknowledged. *First*, while the approach and methodology used in this work is consistent with that used in similar investigations, it is recognized that this study is limited by the coarseness of the data used, the subset of available variables, and the possible influence of examined variables across multiple features. *Second*, the time-series of observations used in our study can be a possible limitation. Markets may go through developmental stages that have not been adequately expressed by theory or captured using existing modeling techniques. Even if this is the case, the study makes an important contribution as an analysis of early-stage competition. *Third*, the results and interpretations may be subject to particular contexts, each subject to its own random evolution patterns [21], complicating generalizability to other industry settings. Despite these limitations, we are confident that this work provides important implications for both researchers and managers.

While this research has sought to examine and develop theory within the context of the Internet portal industry, this work has also raised a number of opportunities for future research. Additional work in this area should examine whether these results are consistent over time. As cited above, the role and impact of make effects relative to industry maturity and the impact of make effects over time is worthy of further exploration. While competitors seem to exhibit a responsiveness to rival innovations, research should also examine whether or not sustaining innovations are required. Among firms that sell products and services, future work might

consider whether moving into new markets has the same impact as employing new services. For example, Evans and Wurster [8] suggest that CDNow's narrowly defined offerings led to the firm's loss of market leadership in the music business. Related questions include; under what conditions is such responsiveness necessary? And what are the common characteristics that appear to be most critical for those moves necessitating a response? The scope of future analyses may also be broadened to include a cross-functional study comparing fee-based online services such as AOL, CompuServe, and MSN with the portals, as well as one that looks exclusively at leading fee-based services. Finally, the industry has recently seen several mergers and acquisitions. Many of these are aimed at acquiring users – this can be thought of as an attempt to purchase market reach. The impact and effectiveness of these acquisitions remains unknown, particularly with respect to the amount of time spent on a site; this should provide an interesting context for additional study.

<b>Date</b>	<b>Service</b>	<b>Features</b>	<b>Purchaser</b>	<b># of Users</b>	<b>Deal \$</b>
Jun-00	AnyDay.com	Calendar	Palm	3 million	\$80 million
Jan-99	GeoCities	Page hosting	Yahoo	3.5 million	\$3.56 billion
Aug-98	WhoWhere	E-Mail, Page Hosting	Lycos	10.6 million	\$133 million
Feb-98	Tripod	Page hosting	Lycos	1 million	\$58 million
Jan-98	HotMail	E-Mail	Microsoft	9 million	\$400 million
Oct-97	Four11 / Rocketmail	E-Mail	Yahoo	1 million	\$92 million

**Table 1: Recent Deals to Acquire Switching Cost Services**

<b>Date</b>	<b>Service</b>	<b>Purchaser</b>	<b># of Users</b>	<b>Deal \$</b>
Jun-00	eGroups	Yahoo	17 million	\$428 million
Nov-99	Gamesville	Lycos	2.2 million	\$207 million
Aug-98	PlanetAll	Amazon	1.5 million	\$87.9 million
Jun-98	Mirabilis/ICQ	AOL	11 million	\$287 million
Apr-98	WebChat	InfoSeek	2.7 million	\$6.7 million

**Table 2: Recent Virtual Community Acquisition Deals**

<b>Var. Name</b>	<b>Description</b>
<b>REACH</b>	Percentage of the Internet population accessing a portal in a given month
<b>AGE</b>	Age of web site in months, calculated assuming T=0 as month in which the service was rolled out
<b>EXCITE</b>	one if observation represents Excite
<b>LYCOS</b>	one if observation represents Lycos
<b>YAHOO</b>	one if observation represents Yahoo
<b>AUCTION</b>	one if service offers auctions
<b>CALENDAR</b>	one if service offers a personal calendar service
<b>CHAT</b>	one if service offers online chat
<b>CLASSIFIEDS</b>	one if service offers online classified ads
<b>E-MAIL</b>	one if service offers free e-mail
<b>GAMES</b>	one if service offers multi-player games
<b>ISP</b>	one if the service has a co-marketing deal with an Internet service provider
<b>SHOP</b>	one if the firm offers a shopping site
<b>HOMESTEAD</b>	one if the firm offers free web page hosting (homesteading in industry speak)

**Table 3: Variable Names and Descriptions**

Variable	a) refined model		b) brands & age alone		c) age effects alone		d) features alone	
	Coef	T-stat	Coef	T-stat	Coef	T-stat	Coef	T-stat
<i>(Constant)</i>	0.164	45.486 ***	0.135	11.924 ***	0.041	1.011	0.167	7.604 ***
<i>AGE</i>			0.001	2.689 ***	0.006	4.698 ***		
<i>YAHOO</i>	0.226	41.834 ***	0.229	40.985 ***				
<i>EXCITE</i>	0.037	7.048 ***	0.050	8.359 ***				
<i>LYCOS</i>	-0.022	-4.127 ***	-0.013	-2.282 **				
<i>AUCTION</i>								
<i>CALENDAR</i>								
<i>CHAT</i>							0.065	2.479 **
<i>CLASSIFIEDS</i>								
<i>E-MAIL</i>								
<i>GAMES</i>	0.019	4.265 ***					0.044	1.807 *
<i>ISP</i>								
<i>SHOP</i>								
<i>HOMESTEAD</i>								
<i>Adj. R-sq.</i>	0.972		0.969		0.195		0.117	
<i>F</i>	768.547		683.061		22.073		6.764	

Significance: \* p < .10, \*\* p < .05, \*\*\* p < .01

**Table 4: Regression Results**

<b>Service</b>	<b>Response Time (in months)</b>
<i>AUCTIONS</i>	3
<i>CALENDAR</i>	4
<i>CHAT</i>	4
<i>CLASSIFIEDS</i>	1
<i>E-MAIL</i>	3
<i>GAMES</i>	2
<i>ISP</i>	3
<i>SHOP</i>	Less than 1
<i>HOMESTEAD</i>	2

**Table 5: Response Time for Second Mover Introducing Various Portal Services**

## Endnotes

---

<sup>1</sup> For evidence of increased interest in the Internet, see [20]. Regarding market valuations, the average price-to-earnings ratio of publicly traded Web portals fluctuated in a range from eight to over twenty times larger than average P/E for stocks on major US exchanges.

<sup>2</sup> User surveys suggest there are fewer customers willing to pay for services when free substitutes seem readily available (see [14]). The trend also reflects experiences of firms that have initially offered free content, but attempted to move to a fee-based model (e.g. Microsoft's Slate and Individual's NewsPage).

<sup>3</sup> This more accepted definition of market reach differs from the concept of reach offered by Evans and Wurster [8], which also includes the number of products a firm offers. Results related to this concept are discussed in this paper's conclusion.

<sup>4</sup> Spreadsheets were a relatively mature product during the timeframe examined by Brynjolfsson and Kemerer [2], however online services enjoyed a consistent period of growth during the time studied by Wang et al. [35]. A recent study [27] demonstrated that early adopters of online services tended to rely less on word-of-mouth from peers and more on external influencing factors (of which brand could be considered one). Since the web portal market grew tremendously in overall installed base during the course of this study, this study's findings of positive make-related effects are consistent with those of Wang et al. [35].

## REFERENCES:

1. Belsley, D., Kuh, E. and Welsch, E. *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*, John Wiley & Sons, New York, NY, 1980.
2. Brynjolfsson, E. and Kemerer, C.F. "Network Externalities in Microcomputer Software: An Econometric Analysis of the Spreadsheet Market," *Management Science* (42:12), 1996, pp. 1627-1647.
3. Christensen, C.M. *The Innovator's Dilemma*, Harvard Business School Press, Boston, Massachusetts, 1997.
4. Clemons, E.K. "Corporate Strategies for Information Technology: A Resource-Based Approach," *IEEE Computer*, 1991, pp. 23-32.
5. Cusumano, M.A. and Yoffie, D.B. *Competing on Internet Time: Lessons from Netscape and Its Battle with Microsoft*, The Free Press, Boston, 1998.
6. Downes, L. and Mui, C. *Unleashing the Killer App: Digital Strategies for Market Dominance*, Harvard Business School Press, Boston, 1998.
7. Dyson, E. *Release 2.0*, Broadway Books, New York, NY, 1997.
8. Evans, P. and Wurster, T.S. "Getting Real About Virtual Commerce," *Harvard Business Review* (77:6), 1999, pp. 85-96.
9. Farrell, J. and Saloner, G. "Standardization, Compatibility, and Innovation," *Rand Journal of Economics* (16:1), 1985, pp. 70-83.
10. Gallaughar, J. "Challenging the New Conventional Wisdom of Net Commerce Strategies," *Communications of the ACM* (42:7), 1999, pp. 27-29.
11. Gallaughar, J.M. and Wang, Y.-M. "Network Effects and the Impact of Free Goods: An Analysis of the Web Server Market," *International Journal of Electronic Commerce* (3:4), 1999, pp. 67-88.
12. Gandal, N. "Hedonic price indexes for spreadsheets and an empirical test for network externalities," *Rand Journal of Economics* (25:1), 1994, pp. 160-170.
13. Gunther, M. "The Newest Addiction," *Fortune* (140:3), 1999, pp. 122-124.
14. GVU Center "GVU WWW User Survey," (2000), 1998
15. Hagel, J. and Armstrong, A.G. *Net Gain*, Harvard Business School Press, Boston, Massachusetts, 1997.

16. Jurvetson, S. "Turning Customers into a Sales Force," *Business 2.0* (November), 1998, pp. 103-108.
17. Kalakota, R. and Whinston, A.B. *Frontiers of Electronic Commerce*, Addison-Wesley, Reading, Massachusetts, 1996.
18. Kettinger, W.J., Grover, V., Guha, S. and Segars, A.H. "Strategic Information Systems Revisited: A Study in Sustainability and Performance," *MIS Quarterly* (18:1), March 1994, pp. 31-58.
19. Lawrence, S. "Playing Around," *Iconocast*, Sept. 2, 1999
20. Leonard, D. "Is This the Next Tech Bubble?," *Fortune* (141:12), 2000, pp. 145-150.
21. Leydesdorff, L. and Besselaar, P.V.D. *Evolutionary Economics and Chaos Theory: New Directions in Technology Studies*, St. Martins Press, New York, 1994.
22. Mansfield, E., Schwartz, M. and Wagner, S. "Imitation Costs and Patents: An Empirical Study," *Economic Journal* (91:364), 1981, pp. 907-918.
23. Mata, F.J., Fuerst, W.L. and Barney, J.B. "Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis," *MIS Quarterly* (19:4), 1995, pp. 487-505.
24. Negroponte, N. *Being Digital*, Alfred A Knopf, New York, NY, 1995.
25. Neter, J., Wasserman, W. and Kutner, M.H. *Applied Linear Statistical Models*, Irwin, Reading, MA, 1990.
26. Newmann, S. *Strategic Information Systems: Competition Through Information Technologies*, Maxwell Macmillan International, New York, NY, 1994.
27. Parthasarathy, M. and Bhattacharjee, A. "Understanding post-adoption behavior in the context of online services," *Information Systems Research* (9:4), 1998, pp. 362-379.
28. Rao, H.R. and Lynch, B.D. "Hedonic price analysis of workstation attributes," *Communications of the ACM* (36:12), 1993, pp. 95-102.
29. Seybold, P.B. *Customers.com*, Times Business - Random House, New York, NY, 1998.
30. Shapiro, C. and Varian, H. *Information Rules*, Harvard Business School Press, Boston, 1998.
31. Szymanski, D.M., Troy, L.C. and Bharadwaj, S.G. "Order of Entry and Business Performance: An Empirical Synthesis and Reexamination," *Journal of Marketing* (59:4), 1995, pp. 17-33.

32. Urban, G.L., Carter, T., Gaskin, S. and Mucha, Z. "Market Share Rewards to Pioneering Brands: An Empirical Analysis and Strategic Implications," *Management Science* (32:6), 1986, pp. 645-659.
33. VanderWerf, P.A. and Mahon, J.F. "Meta-analysis of the impact of research methods on findings of first-mover advantage," *Management Science* (43:11), 1997, pp. 1510-1519.
34. Wallack, T. "Yahoo's GeoCities Buy Boosts CMGI," *Boston Herald*, January 29, 1999, 1999, pp. 33.
35. Wang, Y.-M., Gallaughar, J.M. and Vasudevan, S.P. "The Determinants of Network Growth: The Case of Commercial Online Information Services," *Proceedings of the the Seventeenth International Conference on Information Systems*, Cleveland, OH, 1996, pp. 235-248.