

December 2002

Horizontal Portal Strategies: Winners, Losers and Survivors

Sandra Sieber

IESE Business School, University of Navarra

Josep Valor

IESE Business School, University of Navarra

Follow this and additional works at: <http://aisel.aisnet.org/bled2002>

Recommended Citation

Sieber, Sandra and Valor, Josep, "Horizontal Portal Strategies: Winners, Losers and Survivors" (2002). *BLED 2002 Proceedings*. 24.
<http://aisel.aisnet.org/bled2002/24>

This material is brought to you by the BLED Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in BLED 2002 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Horizontal Portal Strategies: Winners, Losers and Survivors

Sandra Sieber

IESE Business School, University of Navarra,
Estonia
Sieber@iese.edu

Josep Valor

IESE Business School, University of Navarra,
Estonia
Valor@iese.edu

Abstract

The arrival of Internet offers both opportunities for incremental efficiency gains and complete industry redefinition presenting new value propositions and hence leading to the emergence of new businesses and industries. One particular case is that of the horizontal portal industry, with consistently the most visited sites on the Web. Nevertheless, and despite the ongoing concentration of the market, overall profitability remains low. In this paper we argue that, although the industry has a great potential for value creation, value appropriation in information-based businesses remains problematic. Still, interest in this industry is huge, which is understandable if one analyzes the industry within its online value network. As we show, horizontal portals constitute a critical link in this network, as it is both a way of organizing content, which seems to be the king of the future, and captures and canalizes the incoming traffic of the Internet Service Providers. Still, they face a number of hurdles to capture the value they generate and become profitable.

1. Introduction

New technologies, and the arrival of the Internet in particular, have shown to have a profound impact on today's businesses. As with almost all technological changes, the early and actually most obvious changes are of incremental nature, resulting in cost savings, as it gets cheaper to do things that we are already doing. Nevertheless, a second, more profound effect may be observed over time, as we discover that we can do completely new things with that technology, or that the technological change transforms the nature of the businesses, hence opening new value proposition opportunities (Christensen, 2000). The Internet is an enabling technology (Porter, 2001) that has allowed companies to affect both their demand and costs at the same time creating what Kim and Mauborgne (1997) call "value innovations". These changes are hard to forecast, and to analyze, as industries become reshaped, and markets therefore shift toward a new equilibrium. One of these markets is the horizontal portal market.

In addition, to forecast whether a business model is viable, one has to differentiate between value creation and value appropriation. Two years ago, it was believed that the disruptive nature of Internet technology changed the fundamentals of business. A new era of competition in which none of the old paradigms were valid was heralded. The collapse of the technology market and the high profile failures of many of the upstarting dotcoms, has shown us that the old business rules still apply. Hence, the new e-businesses had shown great value propositions on the value creation side, being it either through the reduction of transaction costs, search costs or enhanced customization opportunities (Cassiman and Sieber, 2002). Still, value appropriation appeared to be very problematic. Although new products and pricing mechanisms may help companies in appropriating the created value, recent reality has shown us that both increased rivalry and constant entrance of new competitors, as well as increased market transparency pose significant challenges to value appropriation by the firms.

In this paper we focus on a particular business activity that the Internet has allowed to emerge, horizontal portals. Up to this moment, the industry is still drifting, and the main players have adopted differing approaches in their competitive positioning. We will analyze their strategies introducing the online value chain (Valor and Hess, 2002), dividing the overall value systems into different steps that represent more or less profitable value propositions. We will show how value creation and value appropriation occur on each of the steps. This framework allows us to better understand the overall value propositions and value appropriation opportunities of the main players. We will focus on three main observed strategies: pure players, forward integrators, and backward integrators, analyzing their long-term feasibility.

2. The Horizontal Portal Industry

Early in the 1990's the first horizontal portals were born as simple search engines or directories, offering Internet users an efficient way to filter through the immense amount of information available on the Web. Over time, other services have been added to the search engines including email, chat, and other information services, as well as the possibility to customize the start-page of the portal, for example with MyYahoo!. Since then, portals have evolved into full-service hubs of electronic commerce, mail, online communities and customized news. They offer end-users a place to start their exploration of the Internet, linking them to Web sites according to their interests. Portals have consistently been the most visited sites on the Web. Since many Web-surfers arrive first to portal sites, these companies are in a very powerful position, giving them huge leverage over retailers and other firms that need to be on their sites. Nonetheless, with the exception of a few portals, such as Yahoo and AOL, these businesses are generally not profitable.

There are also two fundamental portal business models. One is the pure portal, such as Yahoo!, which is an advertising or broadcasting model. The pure portal attracts an audience by packaging and promoting content, and generates revenues by selling advertising (usually rectangular banners) and by selling "anchor-tenant" positions. The pure portal does not provide Internet access. Although this business model was heralded as a paradigm of the new economy, Yahoo, the biggest portal in the world, has suffered a crash in the stockmarket, reporting losses from previous gains (see Figure 1), and its strategic long-term feasibility has been recently put into questioning.

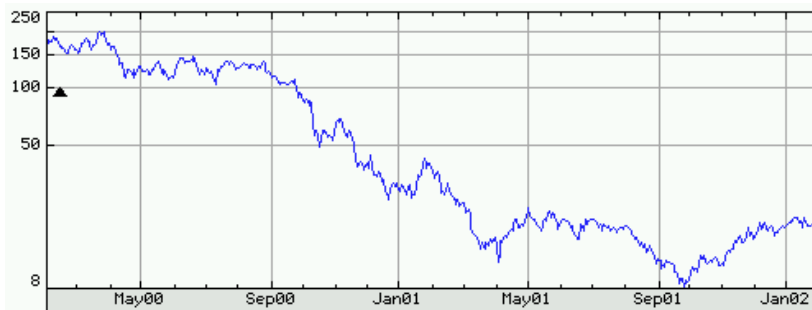


Figure 1: Yahoo! Stock Evolution, 2000-2001

The second business model is the online service provider (OSP), such as AOL, which combines the pure portal with Internet access, thus adding Internet access revenues (subscriptions or percentage of phone call charges) to advertising and tenant placement revenues. AOL, despite of having some problems after its merger with Time Warner, does better than Yahoo!, maintaining earnings and valuation (Figure 2).

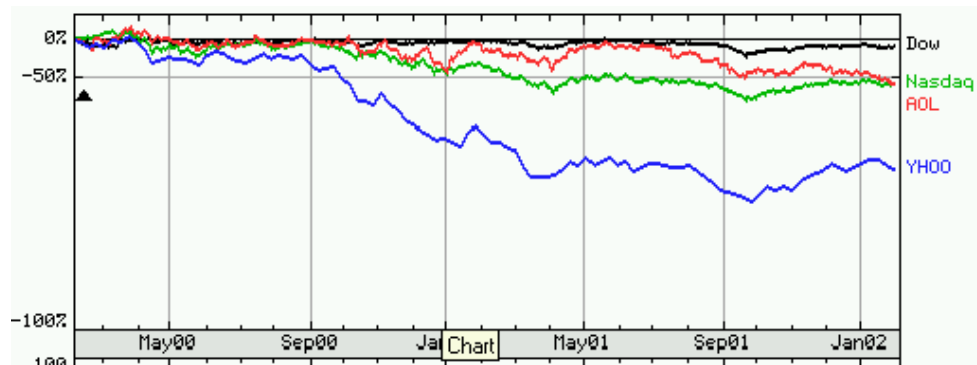


Figure 2: Comparison Stock Evolution: Yahoo! – AOL, 2000-2001.

A whole range of portals have either closed or repositioned their businesses. In this way, Disney, who was drawing over 13 million unique users a month, decided to close their flagship portal Go.com after having invested several billion dollars in its Internet division. Similarly, Excite@ Home prepares to cease operations after February 28, 2002.

The shakeout has begun and first tier portals (AOL, Yahoo!, MSN and Terra Lycos) are capturing 70% to 80% of the visits and the top 10% of portals derive 71% of the revenue (Rayport and Wirtz, 2001). Second-tier portals are fading, as there is simply too little left over for them to run profitable businesses. Still, the future does not seem too bright, and although scale is clearly important for success in the portal industry, other factors definitely influence their overall performance.

2.1 Value Creation and Value Appropriation in the Portal Industry

In this sense, on the value creation side, portals have considerably reduced the users' search costs, hence creating positive value (Brynjolfsson and Smith, 2000). In addition, their customization features, such as providing an email account, or giving the possibility to personalize the portal's homepage, increases the created value even further.

Nonetheless, value appropriation is difficult due to several reasons. First, rivalry among portals is intense with large, deep-pocketed firms competing in the general portal area and an increasing number of specialists entering vertical markets. Once companies have invested in building the necessary infrastructure, they compete aggressively to build the user-base to take advantage of low variable costs of serving new customers. Mobility barriers among rivals are low, implying that for every strategy that seems to be working, there are very few ways to keep the competition from copying the strategy almost instantly, i.e. personal home pages such as MyYahoo! The one asset that cannot be imitated is unique and exclusive content. The ability to build and maintain partnerships will be critical to firms'

success, as portals are becoming increasingly dependent upon third parties for much of their content, services, and technologies.

Second, despite efforts to increase customer loyalty through customization, switching costs for visitors to general portals are low. Unlike OSPs which charges monthly fees to subscribers (at least in the U.S.), pure portals such as Yahoo! have no contract to bind users to their site. In addition, as users become more experienced with the Internet, they may migrate to more sophisticated or focused portals, such as vertical portals. Also, low switching costs also limit e-commerce revenue growth since users that initially purchase by passing through the portal may bypass the portal and go directly to the e-tailer's site for future purchases, thus disintermediating the portal from the transaction process.

Third, technological changes often require new technological architecture within the portals. Because of low switching costs, it is critical to manage such changes well, as delays or interruption in service may lead users to move to competitive providers. Maintaining service is complicated by the fact that many portals depend on third parties for critical elements of their architecture. Firms are spending considerable amounts of money and resources to provide a variety of communications services (email, instant messaging, calendaring and chat rooms). They provide these and other basic communications services free of charge to users, but have not yet determined an effective means of generating revenues from them.

Finally, in efforts to differentiate themselves and increase customer loyalty, portals are investing millions, sometimes billions of dollars to obtain exclusive content. The battle for such content is. In principle, driving content prices up and availability down. However, as MacKie-Mason and Varian (1997) point out, a pricing information services problem exists, as the pricing-by-replication scheme breaks down, and completely new pricing schemes have to be developed (Cox, 1992), although there are still several problems remaining to be solved before such schemes can become widely used.

Once up and running, portals are global businesses. However unless they offer local content and language, they will struggle to transfer success in their home markets to foreign markets. Portals will also have to expand into devices beyond the PC, primarily to wireless devices. These devices require a different platform or version of the portals' service due to the lower resolution, functionality and memory of the non-PC devices.

2.2 Strategic Challenges for Value Appropriation

A portal's success depends on generating the maximum visitor traffic possible, hence overcoming perfect market transparency and lack of differentiation. This involves attracting new visitors to their site, keeping visitors at the site for as long as possible and convincing them to return (increase site "stickiness"), attracting users that are interesting for advertisers, deriving better demographic and behavioral information from users, and encouraging users to utilize the majority of the services and products offered by the portal.

Portals must continually enhance the customers' experience. If users cannot accomplish what they set out to do at a site, they will go somewhere else. The content must be: 1) updated frequently, 2) of local interest, 3) easily and quickly accessible, and 4) accessible on an increasing range of Internet-access devices. General portals are increasing their borders to the maximum so the user does not have to leave or be redirected to another web page. An important strategy for enhancing users' experience and achieving stickiness is to create a community feeling for the visitors, a goal made possible by the chat technology. In this sense, portals should pursue a systems competition rather than a component competition (Farrell, Monroe, and Saloner, 1997).

Advertising on the Internet still offers tremendous potential, as it currently accounts for less than one percent of all advertising spending (on- and off-line) worldwide. Most Internet advertising is concentrated among a few of the top Web properties (AOL and Yahoo! command 30% of the total in 1999); however, smaller sites are gaining advertising share (AOL and Yahoo! combined for 55% of the total in 1996). A growing source of revenue is coming from e-commerce. The interactive advertising element of e-commerce is made possible by web tracking software that traces the source of the purchase to the banner ad. While these commissions are still a relatively small percentage of a portal's total revenue, they are increasing rapidly.

Firms are spending considerable money and resources to establish and maintain their brands. Due to the increasing number of competitors, it has become increasingly difficult and expensive for portals to obtain quality television, radio, magazine, Internet and other advertising space. Firms are expanding their services to find new ways of differentiating. Many are expanding into the corporate market by providing enterprise portal services, similar for example to MyYahoo!, but focused on employees and their management of information at work. Such portals are attempting to expand beyond the provision of content to the provision of online solutions. As Lactovich and Smith (2001) reported in their study, investments in these types of initiatives seem to be increasingly important to reach a differentiation advantage.

Finally, because of the growing range of Internet devices being used, particularly wireless, portals are forced to partner with other companies to ensure a presence in all devices. For example, both AOL and Yahoo have signed multiyear contracts to provide content to Sprint PCS, a wireless operator in the U.S.

Nevertheless, and despite of all these challenges and continuing reports of losses, the horizontal portal industry remains of strategic importance to its main players. This is because, of its strategic importance to other complementary industries, for which it is necessary to analyze the competitive dynamics of horizontal portals within a wider network, including at least Internet access providers (IAPs) and Content providers. Therefore, to shed some light into the competitiveness of portals we will resort to the traditional value chain model, introducing the *online value network* in the next section of this paper.

3. The Online Value Network

The horizontal portal industry forms part of what Valor and Hess (2002) have called the online value network. As industry transformation has taken place especially in those industries in which information plays a key role, be it as content (such as the media industry), as communication of information (such as the telecommunication industry) or as the infrastructure for information (such as the computer and electronics industry), all involved industries are suffering fundamental changes, and are nowadays immersed in a process of industry convergence, during which industries with new competitive dynamics have emerged. Changing value propositions are being driven by the advances in information and communication technology, namely growth in the use of the Internet. The result of these changes is an interconnected, information-based economy that has created a new connection between the customer and products or services. We refer to the industries making up this connection as the *online value network* (Valor and Hess, 2002), shown in figure 3. It has to be focused on where the value is and who is capable of capturing the network. To identify this value, competitive factors, strategic approaches, and trends within each stage of the network, have to be analyzed, as well as those affecting the entire network. Of course profits need not be immediate, but they must be achievable within a realistic or survivable time frame, as many former dotcoms have learned. While we would hope to identify the factors that enable firms to not only capture but to sustain value, we have to acknowledge that in the volatile Internet environment, key factors can and do change.

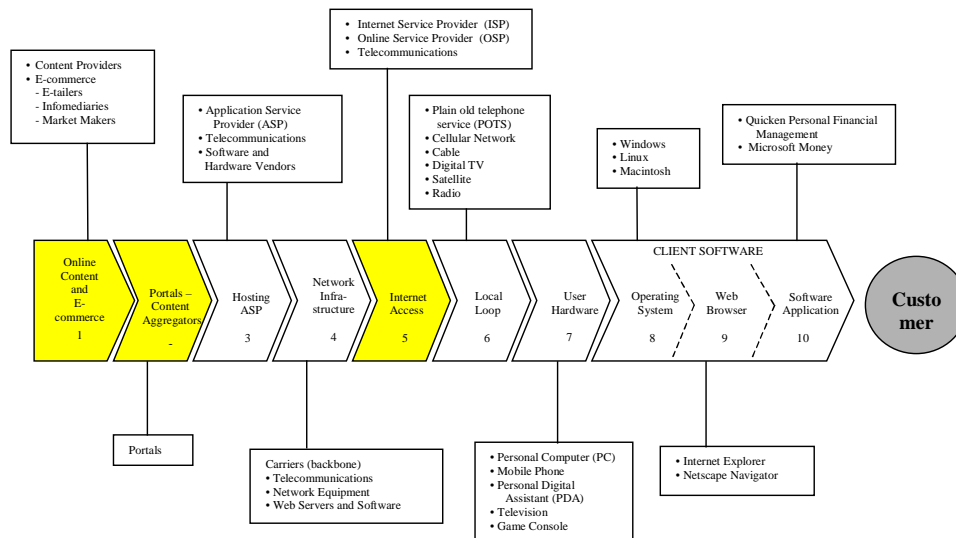


Figure 3: The Online Value Network (Valor and Hess, 2002)

In this way, the merger of America Online and Time Warner, completed in January 2001, aimed at becoming “the worlds first Internet-powered media and communications company-which will connect, inform and entertain people everywhere in innovative ways”¹ shows that the transformation of the traditional movie, media and telecommunication companies has just begun, and that industry convergence will be ongoing. AOL Time Warner provides content through a variety of companies of the publishing (Time Inc and Time Warner Trade Publishing), filmed entertainment (Warner Bros and New Line Cinema), music (Warner Music Group), and interactive video (AOL Time Warner Interactive Video) industries. These contents are aggregated through their interactive services and properties (America Online), and brought to the customer using their own Internet access provider (America Online), as well as their own networks (Turner Broadcasting, Home Box Office) and cable systems (Time Warner Cable). Thus, AOL Time Warner has opted for an integrated strategy, as it wants to be present in both the content, content aggregation, Internet access and telecommunication steps of the online value network.

4. Content Providers and e-Commerce

A full comprehension of horizontal portal strategies cannot be achieved without taking into account the strategies of content providers. The first stage in the value network consists of two different segments: 1) content providers, and 2) e-commerce companies. *Content providers* include individuals or companies that develop and/or distribute goods that can be digitized into bits (3), such as text, data, audio, and video. *E-commerce* includes those individuals or organizations that trade or facilitate trade over the Internet.

The content provider segment consists of a large and varied range of companies that produce and deliver information and entertainment products that can be digitized, such as news, music, and movies. The focus here is on two types of content providers: 1) originators - those who create the content, such as writers or musicians; and 2) packagers - those that traditionally have packaged and often delivered this content, such as movie producers, newspapers, or book publishers.

Content (digitizable goods) defies the basic economic law of scarcity because when it is sold, the seller still possesses it and can continue selling it - it never gets used up. Once a physical object is sold, on the other hand, the seller no longer owns it. Another unique factor of content is its cost structure. Producing information is costly (high fixed costs, normally sunk costs), while reproducing it is not (marginal costs of close to nothing), thus, profits increase rapidly as sales increase. In

¹ AOL Time Warner Press Release, January 11, 2001

addition, there are normally no capacity limits to the production of additional copies.

Despite the importance of high quality content, on the Internet a second, increasingly important content has emerged. This content, contained in chats, forums and discussion groups, is produced by their users, and therefore its production costs are insignificant. In addition, it creates network externalities, which in turn creates stickiness and hence fosters further production of more content that again will attract more traffic to the site.

Information can be distributed globally, immediately, and at a very low cost. The reduced cost of reproduction and distribution makes managing intellectual property critical. In the music industry, for example, musicians and record producers are battling to protect their property against rights to download music using MP3 and Web sites like Napster, Gnutella and Audiogallery. Content packagers that package unique content (such as books or music) are threatened with disintermediation as the changing cost and distribution factors enable originators to bypass them. As a result, access to exclusive content is critical to achieve differentiation and avoid disintermediation. Competition for such content is intense, causing prices, and therefore barriers to entry, to rise. On the other hand, information commodities such as CD phone books are not viable because competition tends to push the price to marginal cost, in this case essentially zero. As a result, giving information away on the Internet is no surprise.

As Evans and Wurster (1999) explain, the Internet blows up the traditional tradeoff between richness (detail) and reach (audience size). Companies can now provide instantaneous, detailed~ interactive, multimedia, customized information (richness) to global audiences (reach). This enables content companies to move from a broadcasting model, in which one message is sent out to a large audience, to a narrowcasting or pointcasting model, in which the content can be tailored to each individual. The Internet also creates an important shift in bargaining power from the seller to the buyer by allowing the user to actively control the process of communication. For example, users can selectively choose or personalize the information they want to receive.

4.1 Strategic Challengers for Content Providers and Its Consequences for Horizontal Portals

The originators of content can use the Internet to appropriate more of the value they create. For example, well-known authors such as Stephen King can now sell books online to readers to capture all of the profits, thereby disintermediating publishers, wholesalers and retailers. Many traditional intermediaries of original content have had to form exclusive partnerships or acquire the content originators.

For other packagers, for example newspapers, the uniqueness of their offering depends on the way in which they select and present the information. Since these

companies are not threatened with disintermediation by the originator, they stand to benefit much more from the changes brought on by the Internet. For these packagers, company image is critical because it carries the brand name and reputation that are important distinguishing factors for content in the Internet's crowded environment. A major threat to these packagers is the new online intermediaries because strong branding in the off-line world does not translate automatically into a strong branding position online. For example, on the Internet the largest financial information providers in the world today are not the Financial Times (FT), The Wall Street Journal (WSJ), Reuters, or Bloomberg, but rather AOL and Yahoo!, and therefore horizontal portals are putting a considerable threat on the positioning of these companies.

The Internet enables all content providers to increase profits through more effective price discrimination strategies. Because the Internet enhances a firm's ability to learn about individual customers, firms can more effectively identify customer groups and offer different prices to the different segments based on their level of demand. If groups are difficult to identify, a versioning strategy can be used. In this case, firms can offer different versions of the same product and customers can self-select the appropriate version based on their needs or level of interest. For example, charging more for earlier releases than for later releases of the same product, or charging more for full access than for limited access.

The increased ease of access to content through the diverse platforms (PCs, TVs, mobile phones, and PDAs) that the Internet enables is bringing the client closer to the primary source of the content. This phenomenon is moving the media companies to the extremes of the network: the content or the user. The companies that stay in the middle of these two extremes risk being disintermediated. These factors are accelerating consolidation in the media sector as packagers are acquiring content, for example the AOL-Time Warner merger. This process of concentration is also driven by the challenge of both generating content and managing distribution and technology in just one company.

5. Internet Service Providers and Internet Access Providers

ISPs (also called IAPs) are businesses that provide services to connect individuals and companies to the Internet. An extension of the ISP is the online service providers (OSP), such as America Online or Microsoft Network (MSN). The OSP provides an integrated offering by combining Internet access with a portal that includes exclusive and proprietary content. ISPs mainly generate revenue by charging user subscription fees.

Currently consumers have several ways to connect to the Internet (DSL, cable, wireless) though most still connect through "plain old telephone service- (POTS). This method involves: 1) dialing up to an ISP over a modem and sending data requests over the telephone line, 2) the ISP then sends the data request over another

telephone line to the appropriate server, 3) the server sends the requested data back to the ISP, and 4) the ISP sends the data to the individual requesting it.

Only a small percentage of ISPs are profitable due to a number of reasons. Barriers to entry are low because of the relatively inexpensive infrastructure required to start providing access. Acquiring users is expensive, requiring huge investments in advertising to build brand. Switching costs are low because there is little opportunity for pure ISPs to differentiate themselves aside from providing better service or higher speed access, making differentiating strategies difficult to sustain. The commodity status of access has led to a price war in the stage. Some firms have adopted an advertising revenue model, thereby providing free Internet access for consumers who are willing to provide personal information and permit a permanent space on their screens for advertising. Although free ISPs spend much less acquiring customers, the amount they generate in advertising revenue is still lower than the actual cost of operating the network.

Economies of scale enable the firm to purchase access at lower rates and, if part of their business model, to attract more advertisers. Economies of scope enable the firm to capture the maximum profit possible from each subscriber, but the success of bundling access with additional services depends on the quality of the customer base and the likelihood of that customer base wanting other services. For example, customers attracted to the free-ISP model may not be willing to pay for additional services and may not be attractive for advertisers.

Regulation is important in determining the revenue model ISPs can pursue (see Srinagesh, 1997). In the U.S. consumers pay a flat rate for local phone calls regardless of how many local calls they make. This is referred to as unmetered service. In Europe, however, local calls are metered, therefore, on top of a flat monthly rate, users are charged based on the total minutes of local calls made. As a result, ISPs in the U.S. generate revenue by charging a monthly access fee, usually around \$20, while in Europe ISPs provide free access and generate revenue by taking a percentage (from 5% to 25%) of the local calls made to access the Internet.

5.1 Strategic Challenges for ISPs and Its Consequences for Horizontal Portals

At a minimum, ISPs need to have the equipment and access to at least have a POP (Point-of -presence, the place where they realize the physical connection to the Internet) within their geographic market. In addition, larger ISPs often have their own high-speed networks; therefore they are less dependent on the telecom suppliers and can offer better service to their customers.

Competitive strategy in this stage of the value network primarily involves combining additional value added services to the basic service of Internet access. The goal is to differentiate the service, to create customer switching costs, and to offer more profitable services to both grow and profit from the installed base. This is exactly what AOL believed when it decided to acquire Time Warner. AOL is the

largest ISP worldwide. TimeWarner is the largest content provider. To sustain its competitive advantage, AOL felt it had to provide exclusive content.

Telecoms are creating their own ISPs, which greatly increases the level of competition. They are taking advantage of their brands and relationships with the customer. The access business can generate lots of additional traffic that passes through their networks. Although additional revenues from access alone may be small, it opens the door to new business areas that can generate new income sources, such as access to the Internet through mobile phones.

In addition to telephone firms and ISPs, cable and satellite companies are also competing in the race to deliver broadband service. Their technologies are able to create a broadband "last mile" to the home that can be used to attack the local telecom's narrowband local loop. Since AOL and other ISPs do not have automatic or guaranteed access to customers who use such broadband technologies to get onto the Internet, broadband may have the power to determine who wins and who loses in the Internet access industry.

The revenue structure of IAP's shows that consumers have not shown a willingness to pay for value-added services, such as email, as seventy percent of total income comes from consumer access subscription fees. The remaining 30% of revenues is generated by expanding into hosting for businesses that are migrating to the Web. Alternative sources of revenue will continue to increase in importance, leading ISPs to converge with other stages of the network. Primarily, ISPs are becoming OSPs - portals with Internet access.

6. Conclusions: Possible Future Avenues of Horizontal Portals

Horizontal portals are key players within the broader value network. Hence, and taking into account that the volatility of the Internet may provoke the appearance of new factors that may induce to new and dramatic shifts, some main conclusions may be drawn from the previous analysis.

1. Horizontal portals create value for many users, but they seem unable to appropriate any, this going to infrastructure and access providers, and content owners
2. The industry is subject to large economies of scale, prompting consolidation
3. An advertisement-based business model is unlikely to succeed given the low audiences of most portals and the lack of focus of horizontal mega portals. Click rates are low, and advertising opportunities are ample for advertisers
4. Portals need proprietary content to differentiate from their competitors. Of this, content provided by users in the forms of chats and clubs are the most effective as they costs only the fixed infrastructure and provide both network externalities and stickiness to the site

5. Pure-play Internet Access Providers have most if the same problems as portals, as they cannot differentiate their offer much, having to resort to compete in price. Bundling on the internet access with telephony or cable access seem the obvious strategy due to economies of scope to the provider and client
6. The bundling of IAP-portal-content provider may be the only possible strategy given the idiosyncrasies of each business that impede them to effectively compete in isolation in their step on the value chain

References

- Brynjolfsson, E., and M. Smith (2000). "Frictionless Commerce? A Comparison of Internet and Conventional Retailers" *Management Science*, 46(4).
- Cassiman, Bruno and Sandra Sieber (2002). "The Impact of Internet on Market Structure", *Economia Industrial*, forthcoming.
- Christensen, Clayton (2000). "Meeting the Challenge of Disruptive Change", *Harvard Business Review*, HBR March 2000
- Cox, Brad (1992). "What if there is a Silver Bullet and the Competition gets it First?", *Journal of Object-oriented Programming*, 10(6).
- Evans, Phillip, and Thomas S. Wurster (1999). *Blown to Bits : How the New Economics of Information Transforms Strategy*, Boston, MA, Harvard Business School Press
- Farrell, Joseph, Hunter K. Monroe, and Garth Saloner (1997). "The Vertical Organization of Industry: Systems Competition versus Component Competition". University of California at Berkeley.
- Kim, Chan and Renée Mauborgne (1997). "Value Innovation: The Strategic Logic of High Growth." *Harvard Business Review*, January-February.
- MacKie-Mason, Jeffrey K, and Hal R. Varian (1997). "Economic FAQs about the Internet", in *Internet Economics*, Knight, Lee W. and Josep P. Bailey (eds). Cambridge, MA, The MIT Press.
- Porter, Michael (2001) "Strategy and the Internet", *Harvard Business Review*, March. 63-78
- Rayport, Jeffrey F and Bernd W. Wirtz (2001). "Latest Developments in Electronic Business: Trends and Strategies in the New Economy", *Frankfurter Allgemeine Zeitung*, Thursday, March 22, p. 30.
- Srinagesh, Padmanabhan (1997) "Internet Cost Structures and Interconnection Agreements, in *Internet Economics*, Knight, Lee W. and Josep P. Bailey (eds). Cambridge, MA, The MIT Press.
- Valor, Josep and Mike Hess (2002). The Online Value Network, *Economía Industrial*, forthcoming.