

MIT SLOAN SCHOOL OF MANAGEMENT
15.020 COMPETITION IN TELECOMMUNICATIONS



phon.com

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Company Overview

Phone.com is the leading provider of software that enables the delivery of Internet based services to mass-market wireless telephones. Phone.com is currently the only company providing a full suite of products and services to enable network operators to provide customized Internet based data to its users.

Phone.com has positioned itself at the center of the wireless data revolution. The convergence of the Internet and the rapidly developing wireless world has led to a large demand for Phone.com's products.

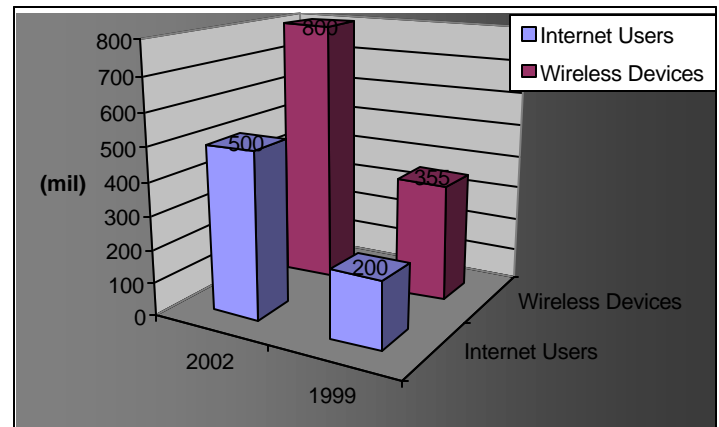
Phone.com has created a family of products which can, through WAP technology, enable the delivery of email, intranet and Internet information services to the screens of any network based wireless phone.

Founded in 1994, Phone.com has quickly become the leader in allowing the end user to surf without strings. Late 1995, their first product, the microbrowser for the wireless phone, was introduced. After this first commercial release, AT&T quickly launched a wireless data service called PocketNet, and soon after many other network carriers quickly followed suit. Phone.com is currently providing 31 network operators (globally) with server side software which enables the use of the wireless network for data services. All of the major wireless handset manufacturers (eg Ericsson, Motorola, Nokia, etc) are integrating the Phone.com microbrowser into their phones as well.

With a lock on providing software and services to both access points of the Internet data revolution through its current licensing deals and partnerships, Phone.com can be considered a monopoly. But, because Phone.com is positioned in a developing industry with huge upside potential, competition is quickly making its way into the marketplace.

Industry and Market Overview

The world is getting “connected” fast and in two ways: wireless connectivity and the Internet. The number of Internet users will reach half a billion by the year 2003, and an even higher growth rate can be expected in the wireless phone industry. Phone.com is in excellent position to take advantage of a market whose growth depends on the use of the Internet and the availability of wireless devices.



By the year 2005, wireless penetration will reach nearly 64%. US household penetration will have increased by nearly 50% in a period of 6 years! While this large increase in penetration will spur the growth of the wireless industry, a major driver will be the adoption of Internet-enabled wireless phones. Approximately 62% of all Internet users currently own wireless devices. In the future, nearly all Internet users will own wireless devices that will act as their portable personal portal to the Internet.

Wireless devices that will allow users this kind of access to information will soon be available. A projected 80 million low-end smart phones (phones with a microbrowser) will be in the marketplace by the year 2003.

Clearly, there will be a huge market for wireless data. The two drivers of the wireless data market, Internet usage and wireless usage, are rapidly growing. The convergence of the Internet using wireless technologies will have a lasting effect on society and provide a huge revenue creating opportunity for Phone.com.

Products and Services

Phone.com has the “UP” product family, an array of WAP based software for all involved parties in the wireless data industry.

- ❑ UP.Link Server Suite: provides network operators with a full software infrastructure to provide wireless Internet services to wireless subscribers
- ❑ UP.Applications: applications for enabling personal information management and email within an operator’s network
- ❑ UP.Browser: the “microbrowser” that turns the LCD screen of a wireless device into a window to the Internet. Currently, over 20 leading wireless phone manufacturers have licensed this free product.
- ❑ UP.Smart: brings PDA functionality to your digital mobile phone such a calendar, address book contacts, to-do list, etc.

- ❑ UP.SDK: a free software developers kit to allow more content and applications to be created.

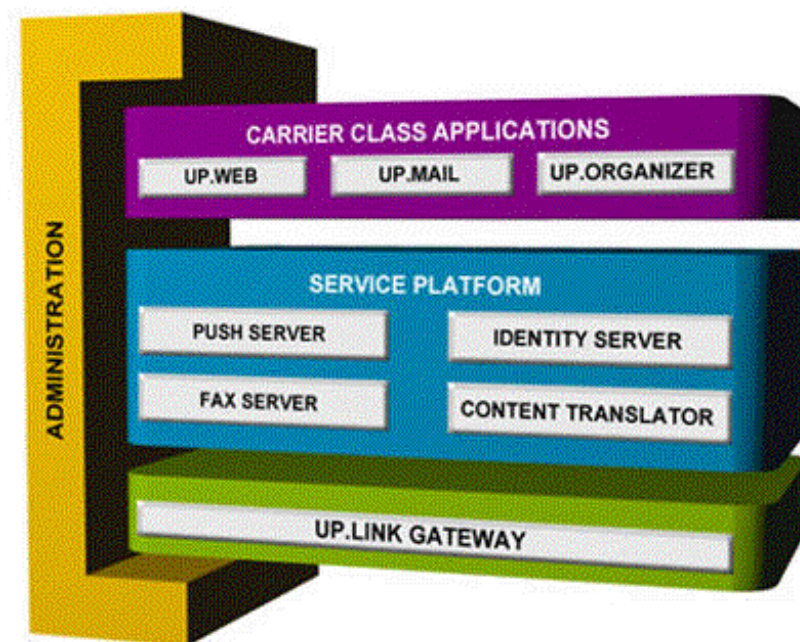
Phone.com provides maintenance, support, and consulting services to any party requiring assistance in integrating the Phone.com product into their own infrastructure or product. Commonly, Phone.com lends these services to wireless network operators using the server software, and to wireless phone manufacturers integrating the microbrowser.

A new exciting service that Phone.com is offering is called MyPhone. MyPhone offers a turnkey OEM mobile portal to wireless network operators. This web portal is an interface through the web to the display of each phone on a carrier's network. This provides users maximum ability to personalize info displayed on their phone. This service provides wireless network operators with the opportunity to rapidly offer end users unique data services through the operator's own branded web portal.

While services (consulting) revenue are important to Phone.com (generating nearly 30% of their revenue), the UP.Browser and UP.Link Server Suite are the products which engender the demand for their services.

The UP.Browser was Phone.com's first product, and it is certainly the most visible in terms of interacting with the end user. Because the microbrowser directly interacts with the end user, the microbrowser could be considered to be the most valuable product Phone.com has developed (which incidentally is given to phone manufacturers for free).

- ❑ UP.Browser provides users to access email, Calendar, Contact Lists, and To-Do Lists. Also provides web data from Reuter, DBC Financial, and ESPN.
- ❑ UP.Browser provides a Universal Inbox, used to integrate email and voicemail notifications, and web updates (eg stock quote alerts).



The UP.Link Server Suite provides wireless all network operators with a full service solution for Internet enabling their customers. This is a crucial product because it what connects the network operators to the user. Ultimately, if the network operator doesn't have server software or if it has compatibility issues with a certain type of microbrowser, the end user will not be reached.

- UP.Link Gateway provides the interface for the data to be translated to a wireless signal. It functions with virtually all widely used network protocols.
- The service platform provides
 - a. Content Translator: delivers HTML, HDML and WML content to microbrowser-enabled handsets.
 - b. The Push Server allows applications to alert subscribers with pertinent Web data anytime, anywhere.
 - c. The Fax Server allows users to print documents using the nearest fax machine, making every fax machine a remote printer for the wireless subscriber.
 - d. The Identity Server provides subscribers with a service tailored to their unique needs by storing bookmarks, home pages, cookies and other subscriber information for the subscribers' personal use.

Wireless Application Protocol (WAP)

Phone.com, in conjunction with Motorola, Nokia, and Ericsson, has created the wireless data industry through its involvement with WAP, the Wireless Applications Protocol. By coordinating major phone manufacturers, a widely adhered-to protocol for sending digital data was developed in 1997.

WAP is a technical specification for the way in which data is exchanged between a wireless network operator server's and a wireless phone. Through the WAP Forum, WML (Wireless Markup Language) was created to optimize the display of and interaction with web based content on wireless devices.

Phone.com's role in creating the WAP forum has significantly impacted the industry, and has given Phone.com an inside track in terms of technical expertise as well as access to all parties involved in the transmission of wireless data.

COMPETITIVE ANALYSIS

Because the industry in which Phone.com competes is so new and being developed as we speak, there are very few competitors yet to actually enter the market and pose some type of competition in Phone.com's main product space.

This will soon change. While a standard was needed for Phone.com to address the whole market, this standards development has put the technology out in the open, welcoming companies with technical expertise and strong financials to compete. Phone.com can expect competition from several formidable opponents in two product spaces.

Phone manufacturers are currently developing their own microbrowsers to be integrated into their wireless handsets. A possible incentive for this is to develop user loyalty through branding of the browser, which cannot be done now because Phone.com's microbrowser is virtually the same for all wireless phones. The phone manufacturers could also begin developing server side software, thereby getting rid of Phone.com (the "middle man").

Many software companies are partnering with phone manufacturers. Joint ventures such as Nokia and Spyglass, and Microsoft and Qualcomm have already been announced. Microsoft has made it clear that it shall enter the wireless data market. With deep pockets and programming expertise, Microsoft can develop either the microbrowser or the server software and steal the market away from Phone.com.

Competition In the Present

- Motorola: This phone manufacturer is currently developing its own microbrowser for integration into its phones. Unlike other phone manufacturers, Motorola is following through with the software development without the partnership with a software company. Motorola is certainly broad in its technical expertise, and may be able to leverage their experience from their other products to develop a competitive microbrowser.
- Microsoft and Ericsson Joint Venture: This newly announced joint venture demonstrates Microsoft's commitment to entering the wireless data market. Microsoft will be creating a microbrowser specifically for Ericsson that will allow Ericsson mobile phone users to surf the web as well as receive email. From the viewpoint of Ericsson, this joint venture will allow Ericsson to enjoy the branding of the Microsoft name on their browser as well as bring some needed technical expertise in the development of the software. Microsoft benefits by getting a foot in the door with one of the wireless phone makers in the world.
- Nokia and SpyGlass: SpyGlass, the maker of the Mosaic web browser, is teaming up with another marquis phone manufacturer. The structure of the venture is similar, as are the benefits, to the Microsoft and Ericsson joint venture.

- Aether Systems: This company has focused on partnering with financial companies such as Reuters and Morgan Stanley. Data provided from these companies can then be sent to PalmPilots. It is expected that the software provider will develop a platform for wireless phones based on WAP.

Predicted Behavior of Competition

Three main types of competitors will be analyzed: phone manufacturers (hardware), software developers, and joint ventures between software developers and the phone manufacturers. All three types of competitors will be considered as products that will compete with Phone.com's most valued products, the microbrowser and the network operator server software. The *effects* of developing or not developing these products will be displayed in the contents of the table below.

	Develop MicroBrowser?	Develop Server Software?
Phone Manufacturers	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Costs saving (no consulting fees to Phone.com) <input type="checkbox"/> Ability to differentiate their product through the browser (branding) <input type="checkbox"/> Potential control of the “personal portal” operating system and any revenue benefits <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Save in development costs of browser <input type="checkbox"/> No opportunity to generate revenue from e-commerce transactions 	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Generate revenues (through leveraging their current position as phone manufacturers) <input type="checkbox"/> Create more efficient gateway due to knowledge of transmission technology <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Creators of server software could leverage different browsers into usage
Software Developers	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Generate revenue off of future e-commerce transactions <input type="checkbox"/> Potential control of the “personal portal” operating system <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Miss out on rev. from e-commerce transactions in future 	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> If both the browser and server software is produced, and the server software is well received, then developers can leverage their browsers into phones <input type="checkbox"/> Generate revenue <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> No revenue from server side, no leverage for browser
Joint Venture of Phone Manufactures And Software Developers	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Synergies between wireless web and standard internet create value added for customer <input type="checkbox"/> Both companies receive revenue from future e-commerce, but divide costs <input type="checkbox"/> Potential control of the “personal portal” operating system and any revenue benefits <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Won't enjoy cost and efficiency savings if no joint venture <input type="checkbox"/> No revenues from future e-commerce 	<p>Yes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> If server software developed as well as browser, a powerful joint venture can lock industry on their platform, displacing Phone.com <p>No:</p> <ul style="list-style-type: none"> <input type="checkbox"/> They can partner with Phone.com or other software player (e.g. Siemens) that already has a software server on the market

A joint venture between a phone manufacturer and a software developer is the most effective manner into capture some of the browser market share from Phone.com, and therefore many of these alliances/joint ventures will result in stiff competition for Phone.com. The recent announcement by Microsoft and Ericsson is proof that this is the most effective manner to enter the wireless data market. Most definitely, Microsoft will be creating a browser for Ericsson phones in the hope that they can profit from e-commerce transactions that will occur over the phone. Also, Microsoft will look to create synergies between their "Mobile Explorer" and their PC products. Once again, we see the wireless revolution providing an avenue for more convergence of services.

Hardware manufacturers that do not partner with software developers will most likely create their own browser anyways. The investment required is nothing compared to the potential loss on future e-commerce transactions that will occur via their phones.

Software developers who do not partner with phone manufacturers will most likely not be able to enter the browser market successfully. There will be stiff competition not only from Phone.com but the other competitors which are better positioned through joint ventures.

Joint ventures will certainly be entering the server software arena in order to attempt to displace Phone.com. The server software is extremely significant due to the fact that it has a direct effect on what kind of information the browser receives. This is a key link which software giant Microsoft will seek to capture. Microsoft will attempt to use its joint partnership with phone manufacturers to leverage its way into this market. While Microsoft certainly has the technical ability to create a competitive server software compared to Phone.com, it will be unlikely that Phone.com will be displaced in this product space. Forrester Research notes that Microsoft will fail to capture this product space, and eventually end up attempting to bid for Phone.com.

Lone hardware manufacturers will most likely not have the technical expertise to enter the server software market, and lone software developers will most likely not be able to compete between Microsoft or Phone.com.

INDUSTRY EFFECTS OF COMPETITION

As of the past 6 months, there has been no other operating software server platform and micro browser as is currently available from Phone.com. Recently, as noted in previous sections of this report, the wireless data market is quickly heating up with new market entrants by new and existing software and hardware providers.

It is already evident that the WAP standard is the standard of choice for mobile and other wireless device offerings. This consensus and wide industry adoption is key to ensure widespread use and adoption by end-users. In the past, confusion over multiple standards has hindered adoption – this difficulty is no present in our case, wireless data has an enormous helping hand with the WAP Forum. With the WAP Forum's additional partnership with the W3 forum on Internet standards, even greater power to the develop of this industry.

Server software offerings

Since many of the network operators have already signed up with Phone.com on pre-paid multi-year contracts, new server offerings will not (and it's questionable if they ever will be) be a significant factor in pricing within this server space.

We can foresee that eventually, server software prices will drop due to increased competition. But, more pertinent is the fact that software prices don't tend to drop, but rather more features tend to be included at the same or slightly higher price level. Additionally, service and support will continue to rise as solutions become more complex.

Alternatively, Phone.com (as noted in the strategic recommendations below) may opt to offer discounted server software pricing for longer-term and exclusive contracts for network operators.

Browser software offerings

As more players enter the browser market (as Microsoft did with Netscape) in the hopes of controlling the "personal portal" and the operating system that they run on. Currently, the only available browser is the Phone.com UP.browser, and which is currently free from per user license fees. We predict that the browser will continue to be free, and can effectively be compared to the Microsoft and Netscape model, both of which are still free as well.

On a pure pricing economic level, there is no advantage for other players to enter the free browser market. But, once consideration for alternative revenue sources such as advertising and e-commerce are considered, the benefits could be enormous for any one company that controls the operating system on these "personal portals."

Network Externalities driving Other Applications

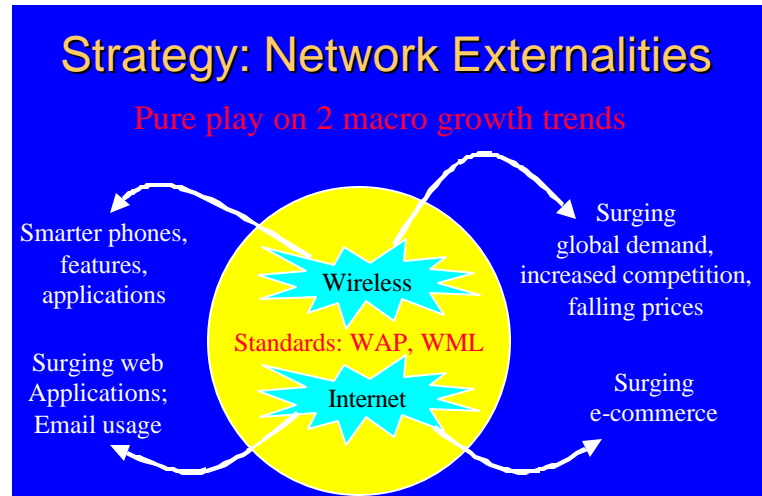
As more network operators, phones, and end-users have use of browsers and WML enabled websites, more applications will be developed to access this market, and vice versa. Each additional user, service, and provider, will become a network externality that will drive more of each into the network. Since the WAP is an open protocol, this effect will keep the prices low for each service, thereby benefiting all players, including end-users.

CURRENT STRATEGY

Pure Play on Macro Economic Growth Trends: Wireless and Internet

Phone.com is positioned at the convergence of wireless technology and the Internet, two large and rapidly surging growth markets.

As wireless voice service is quickly becoming a commodity, service providers view wireless data as a way to develop proprietary and open services, so as to curb competition based on price, and convert wireless telephones into Internet appliances or personal portals, as the Internet industry has dubbed them. This movement coincides with the tremendous popularity in both business and personal usage of the Internet, with specific applications to include email, travel, news, and location (geographic) based information such as directions and directories. Many market visionaries consider wireless data as the next “killer app”, that will in turn enhance the acceleration of both wireless and the Internet, and create greater and adjunct opportunities in global wireless e-commerce, online communities, etc.



- ❑ The Internet is driving the services that people and organizations have come to depend upon. As these Internet (and intranet) services further develop and become more useful, more users will use them, thereby creating a network externality that gives greater worth to the network.
- ❑ The wireless revolution is creating the hardware and connectivity infrastructure to untether users from their physical locations.

The growth in both trends, significantly drive the demand for one another. In total, all of these network externalities create a tremendous opportunity for Phone.com.

Setting the Standard – Harmonic Agreement

Standards are a necessity in creating “killer applications” that will be widely used, as was proved in the development of TCP/IP as a standard communications protocol on the Internet, and the browser and HTML to standardize the specification, display, and access to data stored on the Internet, the “network of networks” spread like wildfire as it was adopted by users all around the world to access and disseminate information.

As a founding member of the WAP Forum, Phone.com helped set the standard, and in effect created the wireless Internet industry. Phone.com was the sole non-partial member of the founding group along with Motorola, Ericsson, and Nokia. It would be debatable whether or not the currently successful adoption of the standard by so many in the industry would've been hindered were it not for Phone.com's involvement. The WAP Forum allowed for so many natural rivals in the wireless industry to come together and work on developing a strong, cohesive, and technically sound protocol that they would all adopt.

Along with Phone.com, the WAP Forum has also been strict to enforce adherence to the standard with the creation of the WAP certification program. As long as the industry adopts and accepts the standard, this will discourage proprietary additions that often occur when no certification authority exists. The WAP Forum is an end-run on a number of intractable problems associated with proprietary networks, subscribers devices and software.

Ensuring agreement and buy-in from all parties, phone.com benefits in several ways:

- ❑ Ensures Phone.com's software products are useable and interoperable on any of the major platforms (wireless carriers and equipment manufacturers of wireless devices)
- ❑ Ensures access to the latest developments in the WAP and WML standard
- ❑ Has a strong voiced input to further develop enhancements to the WAP and WML standards
- ❑ May learn of developments by others that are developing on the WAP and WML standards
- ❑ Seen as thought and technological leaders in the newly developing industry of wireless Internet, one that phone.com has effectively created
- ❑ All members of the WAP Forum, now amounting to over 100 of the most influential global wireless companies, have a vest interest to push the standard, thereby benefiting the industry and Phone.com.

Having a ubiquitous standard has the following benefits for phone.com as well as the industry:

- ❑ Faster acceptance by network operators since they no longer have to worry about buying into the wrong technology since the WAP standard encompasses all of them. Faster acceptance, means faster implementation of WAP servers and thus services, which in turn means more value to consumers using Internet enabled mobile devices.
- ❑ Faster acceptance by users since they may already be familiar with other phone WAP browsers, and/or have already heard of them, and thereby also creating user demand.

Ubiquitous and Complete Suite of Products

Phone.com's solution is positioned to be the ubiquitous standard for wireless Internet applications due to the fact that the software suite runs on all the major digital technical platforms of GSM, TDMA, CDMA, PDC, PCS, CDPD, iDEN, regardless of network operator.

Phone.com's product suite is a comprehensive solution that allows for the effective, rapid, scalable, and robust deployment of Internet services to enabled wireless devices. The product suite is designed with multiple components that allow the service provider to match features to customer requirements, as well as the management and integration of the Internet service with the carrier's existing services and management platform.

Phone.com's full turn-key solution provides a number of key benefits for network operators include the following:

- Opportunity to generate incremental revenues: Network operators can generate additional revenues by offering value-added Internet-based services. They can also charge for the increased data and voice airtime that these applications encourage.
- Ability to differentiate services and improve subscriber retention: Using Phone.com products and services, network operators can offer new Internet-based services to wireless subscribers. In addition, by enabling wireless subscribers to store personal contact information in their networks and to personalize the selection and presentation of Internet content such as stock quotes, sports scores and news, network operators can enhance subscriber retention.
- Opportunity to reduce operating costs: Using user and web-based administration can also be used by network operators to reduce operating costs. For example, network operators' call centers are burdened by high rates of calls from subscribers inquiring about billing, service availability, usage and other service-related matters. Phone.com's software platform enables network operators to leverage standards-based Internet technology to allow subscribers to make many of these inquiries using their wireless telephones without assistance by customer care representatives. By bypassing the call center infrastructure for these activities, network operators can reduce their operating costs.
- Ability to rapidly deploy a branded mobile Internet portal site: MyPhone is designed to allow network operators to rapidly deploy a customized and branded Internet portal for its wireless subscribers. By aggregating content and applications optimized for mobile users in a customized, branded portal service, network operators will be able to increase subscriber loyalty and generate new revenue opportunities. MyPhone's extensible architecture will facilitate new application development, allowing network operators to continue to deliver new and enhanced services to their subscribers.

First Mover Advantage

Phone.com leads the emerging wireless data software market with the only operable platform. In doing so, the firm has been able to create the following nearly insurmountable first-mover advantages:

- ❑ The company has clients including 31 global wireless carriers, and 25 (of the top global 40+) wireless manufacturers, all under multi-year pre-paid contracts of 12 to 36 months. As of June, 1999, there were over \$36.8m in unrecognized revenue.
- ❑ The company has signed up 25 phone manufacturers, 10 of which are the major Japanese manufacturers, or effectively a “clean-sweep” of the Japanese market. Eight of these manufacturers have already publicly announced phone models with the UP.browser embedded. A number of these models are already widely available in the world markets.
- ❑ There are 10,700 registered developers of the SDK (Reuters, ESPN, ABCNews, etc.).
- ❑ The company has worked out partnerships with a number of content providers such as MapQuest, Yahoo, Data Broadcast Company, Traffic Monitor, etc. These providers will provide data over UP.browsers directly or from the MyPhone webservice for each network operator.
- ❑ Seen as thought and technology leader in this newly emerging industry. Phone.com is able to define the movements in the industry by becoming the implemented standard and makes it more difficult for competitors to enter.
- ❑ Develop more comprehensive services to lock in network operators and clients. For instance, MyPhone will lock in network operators into the Phone.com services and servers.

The company’s first mover advantage positions phone.com to become the ubiquitous platform for wireless data service.

Attractive Pricing Economics

Phone.com’s pricing strategy is key to phone.com’s wide acceptance and depth of penetration with its contractual client base. The company has adopted the Internet server software model (e.g. Netscape) and applied it to the wireless communications industry. Phone.com sells the backend server software, maintenance support, and consulting services, but virtually gives away the WAP browser front-end. The free browser is an incentive for wireless manufacturers to embed the browser into today’s new cellular phone models without investment risk.

As the explosion of new wireless devices continues, and users of older wireless technology trade-up for newer technology (encouraged by Internet connectivity and useful applications), the browsers will proliferate, driving up the number of potential users of content providers, thereby driving sales of backend servers, maintenance contracts, and consulting services – exemplifying greater network externality effects.

Client contacts with wireless services providers are on a pre-paid multi-year contract, which ensures “lock-in” (sunk cost) of the carrier, and thus a higher cost of future switching. Once signed on to Phone.com, wireless service providers are unlikely to switch to another platform.

The product suite also includes a software development kit (SDK) that is widely distributed for no-cost to content providers and applications developers. As it was for the proliferation of the 3COM Palm Pilot, freelance software developers created freeware, shareware, and commercial-ware for practical uses of the platform, which in turn created more network demand for the product. The SDK will do the same for phone.com’s Internet enabled devices.

Strategic Acquisitions

In October of 1999, phone.com made its first acquisition since going public in June 1999. The company acquired APiON’s (of Belfast, Northern Ireland) wireless data software division in a stock trade valued at roughly US\$239 million.

APiON is a leading European WAP software supplier with commercial relationships for delivery of WAP software to ten (10) GSM wireless network operators including the giants, Swisscom and Sonera. APiON has particular expertise in GSM intelligent networks, wireless data and WAP technology.

APiON’s Irish facilities will form the basis of Phone.com’s first product development center outside of Silicon Valley and will also act as the support center for carrier deployments in Europe. The combined resources of Phone.com and APiON will enable the company to provide customers with greater technical expertise and support.

The benefits from the acquisition are many-fold:

- ❑ Further increases Phone.com’s strong technical and sales presence into Europe, one of the world’s fastest growing wireless market
- ❑ Obtains increased features for it’s own server suite that will be incorporated over time
- ❑ A skilled additional employee base to service the rapidly growing demands for services of the company
- ❑ Will help reduce operating expenses (current and future spending) by the consolidation of the company’s support facilities into the Irish facility, thereby reflecting a more solid base for cost management. Covering financial analysts have already revised their earnings estimates for the company to be 50% better

than before the acquisition (e.g. negative EPS of \$0.45 to negative \$0.25 for FY2000).

Strategic Partnerships

In addition to working with the infrastructure and device companies, Phone.com also works with a wide variety of Internet content and corporate application developers, which enhances the availability of interoperable software that in turn drives demand for both the corporate and personal users.

Partnerships with Content Providers

On November 22, 1999, Traffic Station, Inc (www.trafficstation.com), a national provider of Internet-based personalized traffic and transportation information, announced that it will use Phone.com's MyPhone service to deliver personalized traffic and transportation alerts and reports to Internet-enabled wireless phones. Traffic Station offers services in 14 major metropolitan areas with an additional 16 cities to be deployed by March, 2000. Other relationships include Microsoft, Zip2/Alta Vista, Infoseek/Go Network, Vicinity MapBlast!, Planet Direct, Motorola, GTE Wireless, DaimlerChrysler Services and SkyTel. Traffic Station's leadership has been recognized through its selection as Partner in the AZTech and iTravel Federal Model Deployment initiatives in Phoenix, Arizona and New York, New York.

On November 22, 1999, Data Broadcasting Corporation (Nasdaq:DBCC), a leading provider of real-time financial market data to traders and individual investors, formed a partnership with phone.com to supply eSignal's market quotes to the MyPhone for use by Internet enabled devices. The integration of eSignal's financial information into the MyPhone platform allows mobile device users to receive instant financial market data and market quotes.

On December 8, 1999, Weather.com, the Weather Channel Web site, announced plans to deliver timely weather, news and information to users of Internet-enabled mobile phones. Data from weather.com, the world's leading source of weather on the Web, will be delivered to mobile phone users through the MyPhone service.¹

The partnerships bring many benefits to Phone.com:

- Traffic Information: Allows Phone.com browser enabled phones to access a highly useful service, one that according to Jupiter Communications is requested by over 37% of users (39% for driving directions, and 37% for traffic updates)², the second and third highest ranked mobile Internet application services. In effect, it gives the subscriber more value.

¹ Yahoo! Finance, http://biz.yahoo.com/prnews/991208/ca_phone_c_1.html, "Weather.com and Phone.com to Deliver Weather Related Information To Internet-Enabled Mobile Phones," December 8, 1999

² Mobile Web Access, Jupiter Communications, July 1999

- ❑ DBC: Allows Phone.com browser enabled phones to access a highly useful service, one that according to Jupiter Communications is requested by over 12% of users³. In effect, it gives the subscriber more value.
- ❑ Offers the benefits of co-branding for both Traffic Station and DBC.
- ❑ Phone.com doesn't need to offer expend resources on providing this service itself, since it's not a core competency
- ❑ The more services phone.com can provide over MyPhone, the more valuable the whole phone.com network and suite of applications becomes for the end-user, phone manufacturer, and network operator

Partnerships with Software Developers

Phone.com has been busy partnering with software developers to create more mobile WAP enabled applications, which will create more user demand and network externality value for Phone.com and it's product line, the firm must continue to partner with corporate application developers.

On Dec 10, 99, Phone.com and Infowave announce a strategic partnership. Infowave is is a leading provider of wireless solutions for mobile access to Microsoft Exchange, Intranet and Internet information from portable device. Infowave customers can already access corporate information from a wide range of mobile devices and now will have added access from WAP enabled wireless phones.

Founded in 1984, Infowave develops, markets and sells specialized software solutions for wireless and printing computing and is headquartered in Vancouver, Canada. Infowave's Wireless Division builds mobile business solutions that use the power of wireless communications to extend the reach of enterprise computing. Infowave for Exchange and Infowave for the Net are advanced and secure wireless solutions for connecting mobile workers to key corporate information and applications. Symmetry(TM) provides interactive wireless access to Microsoft Outlook(TM) email, schedules, contacts and calendar from pagers and PCS phones.

“The Phone.com browser links people to their most important information such as email, calendar, contacts and other Intranet information. We see the corporate market as a perfect fit for WAP solutions,” says Phone.com's Director of Developer Marketing Kathy Simpson. According to Strategy Analytics, there will be 525 million WAP handsets shipped in the US and Europe between 1999 and 2003.⁴

³ Mobile Web Access, Jupiter Communications, July 1999

⁴ Yahoo! Finance, http://biz.yahoo.com/prnews/991210/infowave_a_1.html, Dec 10, 99, “Infowave Enters Phone.com Alliances Program”

Strategic Risks

An investment in Phone.com is attractive yet there are a number of risks:

- ❑ Limited operating history: Even though the firm has been around since 1994, the company has a limited operating history for its new focus of being a WAP software developer (since 1998 when the WAP Forum was founded). The risk would be entrance of more established players such as Microsoft or other big names within the telecommunications industry, each with large investment arsenals and able to gain quick market share with acquisitions.
- ❑ History of losses: Being the leader and first to market in this newly exploding (and highly visible) industry, the company has seen losses due to significant and rapid product development, sales and marketing, and administrative expenses.
- ❑ Long sales cycle: Since network operators would be investing in their future if they decide to go with Phone.com's server suite of applications, the sales cycle is very lengthy. Having said this, phone.com has already secured a majority of the market with 25 of the top 40 operators, but any new sales would be similarly long, though maybe shorter due to the fact that many of the world's biggest players have given the technology its "green light" and thus validation.
- ❑ New market: Market for products and services is new and undeveloped thus making demand for Phone.com's services less predictable and more difficult to plan.
- ❑ Dependency on a limited revenue stream: The company expects to rely on sales of one product family and has no other streams of revenue, though being the only player in this market, would be an enormous boon for the company, provided the lead is sustainable. The current appreciation in stock market values attributes to the public's appetite for this company.

The majority of revenues have come from annual support service fees paid by wireless telephone manufacturer. Future success will depend on new sales to the few number of worldwide operators (and quickly consolidating in number), new products lines and services, such as MyPhone.

STRATEGIC RECOMMENDATIONS

Our forward looking strategic recommendations for Phone.com addresses the following issues:

- ❑ Maintain first-mover lead (sustain monopoly)
- ❑ Stave off new market entrants
- ❑ Expand into other markets and products
- ❑ Expand into e-commerce and advertising software
- ❑ Enhance user and client affinity to the Phone.com brand and service
- ❑ Strategic pricing economics

Maintain First-Mover Lead (Sustain Monopoly)

Phone.com currently has a monopoly by the sheer fact that they are the only operational platform. With the proper focus, Phone.com can maintain this lead and lock-out potential threats from new market entrants.

Maintaining existing customers and gaining new customers

There is no doubt that Phone.com has already roped in the major network operators for at least the next 12 months, with many contracts extending to 36 months. The firm will maintain this majority and continue to gain new clients. Even though the sales cycle is long, new clients will be easier to influence since the major players are already on board, and thus the sales cycle may be reduced (the early buyers had longer sales cycles due to being the first to enter).

Some of the network operators are on a trial basis, and it will be Phone.com's responsibility to fully service and convince these operators of the values of staying with Phone.com – there is no foreseeable reason why these firms will not convert and commit to pre-paid multi-year contracts like those before them. The firm should continue to make it easy for network operators to trail the software and service with their own end-users. Once the end-users are hooked, there's no turning back from the Phone.com service.

As was the case in the acquisition of APiON, Phone.com can also continue to acquire new clients by acquiring other software developers, and thus in turn acquire their clients. Fortunately, this isn't an area that is being regulated by the FCC nor an anti-trust committee, but future conflicts can be foreseen. Therefore, it may be prudent to quickly acquire these clients however possible and as quickly as possible.

Adding features, products, partnerships to keep existing customers and gain new ones

To maintain and gain new clients, Phone.com must continue to develop new features to the existing product line, as well as produce new products that provide more end-to-end solutions for various types of clients, new and old.

- ❑ Even though Phone.com's products already cover end-to-end management and implementation, the firm can create specific versions for a wider audience, such as small businesses that may also want to enter and provide content and other services for mobile users.
- ❑ As Phone.com continues to develop partnerships with more content providers, more network value will be created as a member of the network. This is a model that is similar to the proprietary network model that AOL uses for their own content, and has kept other players from being to duplicate it's model just by the sheer quantity of available content.
- ❑ As an additional method to create more user demand and network externality value for Phone.com and it's product line, the firm must continue to partner with corporate application developers, such as the Dec 10 announcement with Infowave that is a leading provider of wireless solutions for mobile access to Microsoft Exchange, Intranet and Internet information from portable device.
- ❑ Phone.com should integrate software that fully utilizes new network operator features such as physical E911 localization using GSM and triangulation, to enhance functionality for the user and richness for developers. This will also help expand the proposed (see below) offerings in e-commerce and advertising.
- ❑ Phone.com should develop software that fully utilizes Motorola's new chip set announced on Nov 1, 99, that will enable new mobile phones to offer fast data services and work on any kind of wireless network. The new chip is the first that can power TDMA, CDMA, GSM or integrated digital enhanced network, or iDEN phones.⁵
- ❑ As the mobile data business segment grows from 800k users today to 9 million⁶ in 2003, or nearly 1/3 of all mobile data users, Phone.com should create a division specifically for targeting the servicing of corporate users looking to unwire themselves from their offices and homes. "The Phone.com browser links people to their most important information such as email, calendar, contacts and other Intranet information. We see the corporate market as a perfect fit for WAP solutions," says Phone.com's Director of Developer Marketing Kathy Simpson.

⁵ Total Telecom (www.totaltele.com), by Lisa Levenson at Bloomberg News, "Motorola Develops New Chip for All Phones"

⁶ Cahners In-Stat Group, quoted from WirelessToday@phillips.com, 09 Dec 1999

According to Strategy Analytics, there will be 525 million WAP handsets shipped in the US and Europe between 1999 and 2003.⁷

- Develop a line of e-commerce services such as an e-wallet, that are integrated into each UP.browser (which already includes encryption). Users will continue to depend on these services (keeping a budget and tracking spending), Phone.com will gain more customer loyalty, as well as a new revenue model that takes a percentage of each customer transaction.

Keep “perceived” switching costs high

Once network operators are committed to contracts and rollout the features to their subscribers, there will be almost no way of turning back, thus “lock in” and a higher switching cost to the network operator if they were to switch from Phone.com.

As Phone.com develops features that require a user to customize and thus depend (customer loyalty) on the service (e.g. like a MyYahoo start page), the users will continue to demand the service, and thus, network operations will again be compelled to stay with Phone.com.

Stave off New Market Entrants

Phone.com will need to continue to anticipate more entrants into this market space as they see the potential for growth. Phone.com should continue to heavily spend on R&D for new features as noted above. Additionally, the firm should continue to heavily market to network operators, phone manufacturers, and more importantly, the end-user.

Stave off new entrants mobile phone manufacturers

To keep phone manufacturers from entering the software server market, Phone.com should continue to market the benefits of an open architecture and the benefits of a lessened dependency on being locked into one firm for both the hardware and software. Telecom network operators have already seen the negative affects of depending upon a single vendor.

Stave off larger software players with lots of muscle, such as Microsoft

Phone.com should continue to develop software at a fast pace and allow Microsoft to help push the market. Microsoft isn't a player in the telecom space and they have little experience, but this disadvantage for Microsoft will not remain for long. Phone.com must hurry to lock-in more network operators.

⁷ Yahoo! Finance, http://biz.yahoo.com/prnews/991210/infowave_a_1.html, Dec 10, 99, “Infowave Enters Phone.com Alliances Program”

Expand into Other Markets

Phone.com should continue to expand into other regional markets such as Asia and Europe, especially since mobile penetration in most of these other markets is much higher than it is in the US.

For instance, expand MyPhone.com into Asia and Europe where MyYahoo isn't as popular as in the US, allows for more rapid growth potential from an untapped market.

Phone.com's Chairman and Chief Executive Alain Rossmann said that the company's largest opportunity over the next 18 months is in India and China, he said. "The demand for our technology goes beyond the developed world," Rossmann said. "We have demand for our technology everywhere around the world because the cell phones are so ubiquitous. Even where PCs don't exist, cell phones are there."⁸

Expand into e-Commerce and Advertising software tools

Once the market is locked in and a majority of users are using the browser, or at least have access to it, expand the suite of features to include e-commerce and advertising. For instance an e-wallet service that can be used to save credit card information for rapid purchases, big and small. Along side this, develop a new revenue model that takes a percentage of each transaction, similar to the Amazon.com zShops and eBay models. Or for advertising, a service that allows for opt-in broadcasts of selected advertisements.

A whole suite of software products and support services should be built around getting commerce players into the Phone.com network and use the UP.browser. Similar to content, the more sellers that Phone.com can sign up for this space, the more value it will create for the end-users and thus network operators.

Once E911 localization is available, e-commerce and advertising players will be to target geographically and "pull" clients to their physical establishments, another incentive (and revenue stream) and network externality.

Enhance User Affinity/Loyalty to the Phone.com Brand and Service

Pushing brand and brand loyalty will enhance "lock-in" by network operators as users demand Phone.com services and browsers due to its profile and rich features.

Focus on Brand Recognition by the Users

The Phone.com brand is currently being pushed with the UP.browser. Whenever the browser is launched, the Phone.com logo appears. Phone.com can add a "Phone.com authorized service" message on each of its services. This is similar to the early Netscape

⁸ Total Telecom (www.totaltele.com), by Lisa Levenson at Bloomberg News, "Phone.com May Make Purchases After Sprint Agreement," 12 August 1999

model where the firm was seen as the underdog against Microsoft and other corporate players.

User Dependency on Integrated Features

As has been noted above, as network operators use and rollout services that are customizable by their users, their users will increasingly depend on these services and will expect them to be available – more “lock-in” value. They will in effect become more loyal users.

Strategic Pricing Economics

To date, Phone.com has adopted the Internet model (as pioneered by Netscape) in freely distributing the browser, and well the back-end software servers and support. In going forward, we recommend the following:

- ❑ Maintain it's successful position as being able to commit network operators to pre-paid multi-year (12 to 36 months) contracts. These pre-paid contracts “lock-in” network operators, and once they roll-out the service and users begin to depend on the service, there is a less likelihood of the operator leaving for another firm.
- ❑ The firm should look into offering discounts for longer-term and exclusive contracts with network operations. Even though the initial price may be lower in the short-term, the non-monetary gain that Phone.com gets from a longer-term and highly visible revenue stream could potentially be greater.
- ❑ The firm should maintain the freely distributed UP.browser, especially since new entrants like Microsoft, Spyglass, and perhaps others will slowly creep into the market.
- ❑ Develop an additional middle-man revenue model that takes a percentage of each transaction this uses the UP.brower's e-commerce capability. This would be similar to the additional revenue models by Amazon.com's zShops or eBay's.
- ❑ The firm can also develop a combined middle-man fee percentage or a per advertising fee for opt-in ads delivered to UP.browser users.

In a Nut Shell: Overall, the firm should not compete with pricing, but rather focus on low pricing, exclusive multi-year contracts, more features that users depend upon creating user loyalty, and developing new models of revenue such as e-commerce and advertising.

WAP Forum Board Members

- Motorola
- Alcatel
- Nokia Mobile Phones
- CEGETEL/SFR (Societe Francaise du Radio Telephone)
- NTT DoCoMo
- DDI Corporation
- SBC Communications
- Ericsson Mobile Communications AB
- Sprint PCS
- IBM
- Telstra Corporation
- Matsushita Communication Industrial
- Phone.com



The image displays a collection of logos for the WAP Forum Board Members. The logos are arranged in a grid-like fashion on the right side of the slide. From top to bottom, the logos are: SBC (a stylized 'SBC' in a circle), Ericsson (the word 'ERICSSON' in a box with a graphic), Hewlett Packard (the 'hp' logo and 'HEWLETT PACKARD' text), Sprint (the 'Sprint' logo with a red arrow), Nokia (the 'NOKIA' logo with 'CONNECTING PEOPLE' below it), IBM (the 'IBM' logo with horizontal lines), NTT (the 'NTT' logo with a blue circle), Alcatel (the 'ALCATEL' logo with 'BUSINESS SYSTEMS' below it), and Telstra (the 'Telstra' logo with 'Making life easier' below it).

WAP Forum Network Operators

➤ AT&T Wireless Services	➤ SK Telecom	
➤ Mannesmann	➤ Deutsche Telecom	
➤ Bell Atlantic Mobile	➤ Mobilnet GmbH	
➤ Nextel Communications	➤ Sonera Corporation	
➤ BellSouth Cellular	➤ FarEasTone Telecommunications	
➤ Omnitel	➤ SWISSCOM LTD.	
➤ Bouygues Telecom	➤ Giesecke & Devrient	
➤ One 2 One	➤ Tokyo Digital Phone	
➤ Cable & Wireless	➤ Hongkong Telecom Mobile Services	
➤ Orange Communications	➤ Telecom Italia Mobile	
➤ Cellnet Communications	➤ IDO Corporation	
➤ Radiolinja	➤ Telenor Mobil Group	
➤ CoCoNet Global Interchange	➤ Japan Telecom	
➤ Rogers Cantel Mobile Communications	➤ TU-KA Cellular Tokyo	
➤ Connect Austria	➤ KPN	
	➤ Vodafone	
	➤ LG TeleCom	

WAP Forum – Equipment

- Acer Peripherals
- ORGA Kartensysteme GmbH
- Bosch Telecom
- Danmark A/S
- Philips Consumer Communications
- Bull CP8
- Pioneer
- CMG Telecommunications & Utilities
- Qualcomm
- De La Rue Card Systems
- RTS Wireless
- DENSO
- Samsung Electronics
- Gemplus
- Schlumberger Industries S.A.
- Hewlett-Packard
- Sema Group Telecom
- Hitachi
- Sharp
- ICO Global Communications
- Siemens AG
- Intel Corporation
- Sony International (Europe) GmbH
- LG Information & Communications
- Tecnomen Oy
- Logica Aldiscon
- Telital S.p.A.
- Lucent Technologies
- Toshiba
- Mitsubishi Wireless Communications
- Uniden
- NEC Technologies (UK)
- Unisys
- Nissan Communications Systems
- Nortel

APPENDIX IV – WAP FORUM SOFTWARE DEVELOPERS

WAP Forum - Software

<ul style="list-style-type: none"> > @MOTION > M.D. Communications > Advance Systems Limited > Merita Bank > Aether Systems > Microsoft > Agency.com > Mobile Services Group > APiON > Myalertcom > A U-System Mobile > Oracle Corporation > Baltimore Technologies > Peramon Technology > BEA Systems > ProxiNet > Bussan Systems Integration Company > Puma Technology > Certicom > RSA Data Security > Charles Schwab & Co. > Saraide > Converse Network Systems > Sendit A B > CCL > Scandinavian SoftlineTechnology > Spyglass 	   	<ul style="list-style-type: none"> > CTC (Itochu Techno-Science Corporation) > Symbian > CycleLogic > Systems Engineering Consultants > Dr. Materna GmbH > TANTAU Software > Digital Mobility > Tegic Communications > Diversinet > TWS Dolphin Telecommunications > Union Bank of Switzerland > Evolving Systems > UshaCommunications > Technology Fantastic Corporation > VTT Information Technology > Fujitsu Software Corporation > VeriSign > Geoworks Corporation > Visa International > Glenayre Technologies > WapIT > Lexacom > Wireless Knowledge > LPG Innovations > MapQuest.com 	    
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Phone.com Clients: Network Operators

 Bell Atlantic Mobile

 BELL SOUTH

 France Telecom

31 network operators, including the following companies

Name	Stage	Technology	Country
AT&T Wireless Services	Deployed in July 1996	CDPD	USA
Bell Atlantic Mobile	Deployed in September 1996	CDPD	USA
GTE Wireless	Deployed in May 1997	CDPD	USA
SFR/CEGETEL	Deployed in March 1999	GSM	France
DDI Corporation	Deployed in April 1999	CDMA	Japan
IDO Corporation	Deployed in April 1999	CDMA	Japan
Bell Mobility	Deployed in May 1999	CDMA	Canada
LG Telecom	Deployed in June 1999	CDMA	South Korea
Omnitel	Deployed in June 1999	GSM	Italy
Sprint PCS	Launched in Fall 1999	CDMA	USA
Mannesmann Mobilfunk (D2)	Launched in Fall 1999	GSM	Germany
Nextel Communications	Launched in Fall 1999	IDEN	USA
Southern LINC	Launched in Fall 1999	IDEN	USA
Shinsegi Telecom	Announced Commercial License	CDMA	Korea
US West	Announced Commercial License	CDMA	USA
Telstra Corporation	Announced Commercial License	GSM	Australia
Deutsche Telekom Mobilnet	Trial	GSM	Germany
France Telecom Mobile	Trial	GSM	France
Telecom Italia Mobile	Trial	GSM	Italy

 Sprint

 NEXTEL

 AT&T

 T

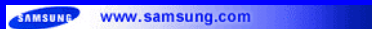
 Telstra[®]
Making life easier™

 USWEST
life's better here®

Phone.com Clients: Wireless Manufacturers

25 wireless telephone manufacturers have licensed UP.Browser, and the following manufacturers have publicly announced products that will include UP.Browser:

- Alcatel
- Nokia
- Bosch
- Panasonic (Matsushita)
- Casio
- Philips
- Hitachi
- Qualcomm
- Hyundai Electronics
- Sagem
- IGS
- Samsung Electronics
- Kyocera
- Sharp
- LG Information & Communications
- Siemens
- Mitsubishi
- Sony
- Motorola
- Toshiba
- NEC
- 3Com (Palm Computing division)
- Neopoint



Phone.com Clients: Application Developers

Approximately 10,700 registered developers including:

➤ 724 Solutions

➤ Lotus

➤ biztravel.com

➤ Mapquest.com

➤ BroadVision

➤ NewsAlert

➤ CableData

➤ Reuters

➤ Comverse Network Systems

➤ SmartServOnline

➤ Data Broadcasting Corporation

REUTERS

MAPQUEST

Lotus

➤ Sportsfeed.com

➤ eDispatch.com

➤ StockTips

➤ InfoSpace.com

➤ Vantive

➤ Internet Travel Network

➤ The Weather Underground

➤ KLELine

➤ Webraska Mobile Technologies

➤ Lightbridge

InfoSpace.com

DATA BROADCASTING CORPORATION

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