Talking to the 'Net – Voice Portals Come of Age

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Executive Summary

According to Cahners In-Stat Group, this is, finally, the year of wireless data. It is also the year of the voice portal, as the industry recognizes that voice remains the most efficient delivery mechanism for presenting information over a telephone. Call it "everything old is new again." Voice portals are companies that allow people to access data over the telephone. They use speech recognition technology to interpret requests for information, automatically find that information, and then use text to speech technology to convert the information into an audio format to be played back to the caller.

Voice portals are starting to pop up like mushrooms after a long rain. They offer callers the ability to get directions to the nearest restaurant or FedEx mailbox, let them listen to news, weather, the latest stock prices or sports scores, and even allow them play a quick game of blackjack or check their horoscope. Despite the seeming banality of some of these services, voice portals hold great promise and will offer users the ability to manage e-mail, voice mail, documents, personal schedules, and to make travel arrangements.

Voice portals are attracting the interest of a wide variety of players in the new economy, including software developers, server manufacturers, wireless carriers, systems integrators, service providers, and e-businesses.   Old-line businesses too are recognizing the striking potential of voice portals to give them access to potentially more customers than can be reached over today's Internet.

This study reviews the major players that are making an early mark in the voice portal space.   It explores the market potential created by voice portals and it offers a comprehensive breakdown of where the opportunities will be as well as what the pitfalls will be for companies that misstep or are not quick enough to execute in this space. The report contains a detailed explanation of the revenue opportunities that will be created by voice portals, which Cahners In-Stat Group projects will reach $1.6 billion by 2005, excluding revenue from reselling user information.

Introduction

According to Cahners In-Stat Group, this is, finally, the year of wireless data. It is also the year that many have come to realize that no one has figured out a clever way to present data to wireless users. How does one deliver data-intensive Internet and Intranet web pages, documents and spreadsheets, maps and directions, or even simple email to a device whose screen is at best slightly larger than the average business card, and often much smaller? While manufacturers talk of future smart devices with large bright screens that are able to support color and graphics and drop down menus, the reality is that the devices are not available now. When they are, they will be big, expensive, and power hungry. When will they be available, at a price point and form factor that anybody beside Techies and the early adopters will accept? Who knows, but certainly not before the next 18 to 24 months.

Enter voice. As carriers and developers grapple with the issue of how to deliver content to wireless users, primarily to cellular and PCS subscribers, there is a growing realization that voice remains an extremely efficient delivery mechanism for communicating information over phones. In recent months, several different companies have released voice-web portals that allow users to access specific information over their phones using only their voice to navigate through the site.

Voice portals allow people to access data over their telephones. They use speech recognition technology to interpret requests for information, automatically find that information, and then use text to speech technology to convert the information into an audio format to be played back to the caller.

Through these sites users can access a variety of information that is specifically designed to be relevant to their mobile activities. The services offered today are rather limited and basic, but their promise of voice as an easy method to access the wireless web are unmistakable.

New Drivers

Cheap Chips

Although voice recognition technology has been around for several years, historically its reality has not lived up to its promise. All of that is changing. The re-emergence of voice recognition technology has been driven by several factors. Chief among them is the rise of cheap computing power. Voice recognition is extremely computationally-intensive. To recognize an individual's voice requires a high degree of processing power, and as larger vocabularies are added to voice recognition systems, the processing demands increase. Falling chip prices and the rise of affordable computing mean that robust voice recognition systems can be built at a price that is affordable.

Maturing Technology

A second driver is simply that voice recognition technology has had more time to evolve. In its original form speech recognition was extremely poor. The vocabulary of systems, that is, the number of words recognized, was extremely limited. Moreover, most systems had to be trained by the user to recognize a caller's voice. Training typically involved repeating key words several times so that a system could record a user's voice patterns. These patterns would be matched to the user's voice on future calls. As speech recognition technology has developed, the number of words and the number of speech patterns recognized has grown, making the systems much more user-friendly.

Data

A third driver in the resurgence of speech recognition technology is the rise of wireless data. Previously, the demand for speech recognition was limited to automatic attendant functions and virtual assistant services. These had limited appeal and didn't find a wide number of buyers or subscribers. But as wireless data services began to appear as a reality on the horizon, voice recognition technology received a second look from several companies that saw in the technology a way to bridge the difficulties related to providing data information over what is essentially a voice-optimized medium.

Device Proliferation

Hand in hand with the recognition that speech is the most effective delivery mechanism for presenting information over wireless phones is the proliferation of multiple wireless handsets. The myriad form factors and types of wireless phones makes it extremely difficult to come up with a unified way of presenting data. Though solutions such as WAP have been advanced to deal with the problem, the elegance of voice as a solution is obvious, since it effectively deals with both data input and output issues, more elegantly than WAP-based solutions. Content does not need to be optimized for individual device form-factors, and content delivery is not limited by device design factors such as small screen size. Since phones do not need to be optimized to access voice portals – screen sizes don't need to be improved, additional memory or processing power does not need to be added to handsets – the installed base of users than can access information through the portals is much greater than the base of people using smartphones or other devices optimized for visual data access.

In-Vehicle Hands-Free

Another factor contributing to interest in voice recognition technology is the growing reliance on hands-free technology for wireless access for in-vehicle applications. Hands-free kit sales are up due to a growing legislative trend led by grass-roots campaigns, both nationally and internationally, to outlaw the use of wireless phones unless they are used in conjunction with a hands-free kit. This legislation is a result of concerns that holding a phone while driving is unsafe. Several communities in this country have already mandated hands-free phone kits, as have several nations in Europe and Asia. Even before legislative efforts, hands-free kits were gaining in popularity as a way of making phones easier to use while driving. Though hands-free sales are driven by both legislation and convenience, their increased popularity will provide an opportunity for voice recognition applications to piggyback on them.

Voice Portal Technology

The technology that powers voice portals is not just a single technology. In fact, it is actually several technologies used in conjunction with one another. Voice portals use speech recognition technology to understand user commands, additional technology to gather the information from data sources, and finally, text-to-speech technology to present that data to the user. For the voice portal developer, there are many technology choices available. Deciding which to use, and then integrating them, is a challenge.

Standards and Interfaces

Voice Markup Language (VoiceXML)

In the late 1990s, Motorola rolled out a programming language for coding data in such a way that it could be recognized by a voice-browser and be converted from text to speech. Called Voice Markup Language or VoiceXML, the software development kit was distributed free of charge by Motorola, and has become one of the standard voice programming languages. VoiceXML is based on HTML (hypertext markup language) which is the standard programming language for the Internet and can be readily understood and learned by programmers.

SpeechObjects

Another major standard for creating voice-enabled applications is the Java-based SpeechObjects developed by Nuance Communications, a leading voice-interface software manufacturer. According to Nuance, "SpeechObjects are grammars (what the user can say to the speech system), prompts (the recorded voice that responds back to the user), and dialog (the conversation flow between the system and the user)." Essentially, SpeechObjects are software that sit in the middle between the user and the speech recognition system, interpreting user commands and instructing the system to retrieve particular sets of data. SpeechObjects can be strung together to create speech applications. Their beauty lies in the fact that developers are not required to be specialists in speech recognition to create a working voice recognition application. Like VoiceXML, SpeechObjects are open-source and developers can download the development kit free of charge from Nuance.

Revenue Streams

Voice portals have caught the eye, or ear, of companies because they deliver highly targeted information to a demographic that is potentially extremely valuable. Voice portal services will likely appeal to a very mobile population that is somewhat technologically savvy. As these companies are currently organized, advertising is the key way they will make money. Advertisers will be able to reach this population with personalized ads that are targeted to their specific situations and needs. The main question for voice portals and advertisers alike is how many people will access voice portals, and how many will be willing to listen to advertisements while accessing the portals.

Figure 1: Consumer willingness to listen to advertisements in order to reduce the cost of wireless Internet access

Willingness to Listen To a Short Advertisement In Order to Reduce The Price Paid For Wireless Web/Internet Access
(Base: Respondent Has Own Cellular/PCS Phone or Plans to Purchase One in the Next Year)

Don't Know 4%

Definitely Would 10%

Depends on Discount 1%

Probably Would 23%

Definitely Would Not 30%

Might or Might Not 19%

Probably Would Not 13%

Most Likely To:
- Males and Females
- Younger than 35
- Who live in urban and suburban areas
- And spend 21+ hrs./wk. on the Internet
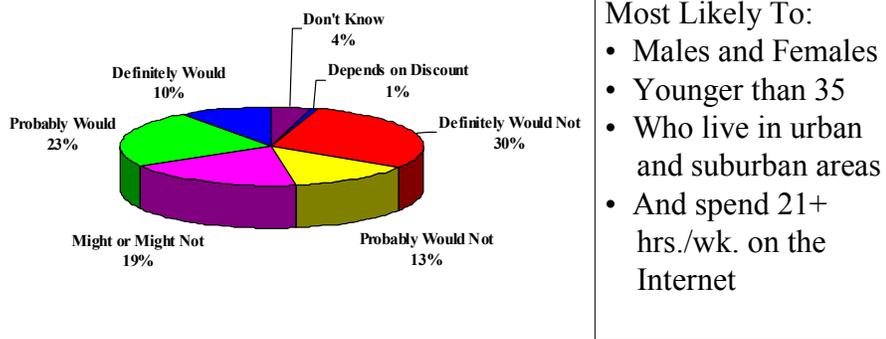
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Source: Cahners In-Stat Group

Cahners In-Stat Group recently completed two research studies, one with business users of wireless phones and the other with consumers. We found similar interests in voice services from both groups. More than 1,000 consumers were surveyed in June and July 2000 to determine their attitudes and buying plans for new technology. Close to half of all consumers surveyed would be very

or extremely likely to use voice portals. Adding advertisements to the equations lowers the interest in voice portals: less than a third probably or definitely would listen to advertisements to reduce the price paid for wireless Internet access.

Figure 2: Business likelihood to access voice portals

Likelihood of Accessing Information Over the Web Simply By Speaking a Command Into the Phone Such as "Give me directions to the nearest office supply store."

Not At All Likely
6%

Extremely Likely
21%

Not Very Likely
10%

Somewhat Likely
36%

Very Likely
27%

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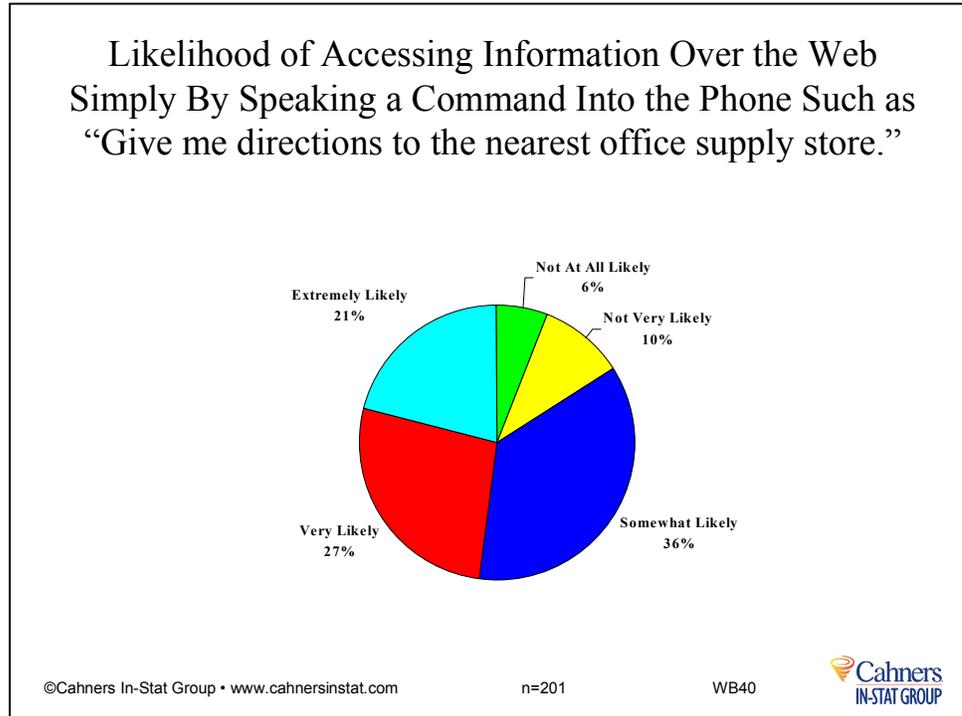
Source: Cahners In-Stat Group

Voice portal providers will need to devote their energy to changing consumer attitudes regarding advertising-supported voice portals or they will have to come up with a different revenue model. An alternative to advertising support would be to charge callers a fee, either on a per call basis or as a reoccurring monthly subscription. This approach, though, will almost definitely cause the voice portal to add subscribers at a much slower rate, something that the portals can't afford to have happen.

Figure 3: Business willingness to listen to ad supported voice portals

Willingness to Listen to a Short Advertisement To Reduce the Price a User Must Pay For Wireless Web/Internet Access

- Don't know 2%
- Depends on how much the price would be reduced 2%
- Definitely would not 26%
- Probably would not 17%
- Might or might not 22%
- Probably would 21%
- Definitely would 10%

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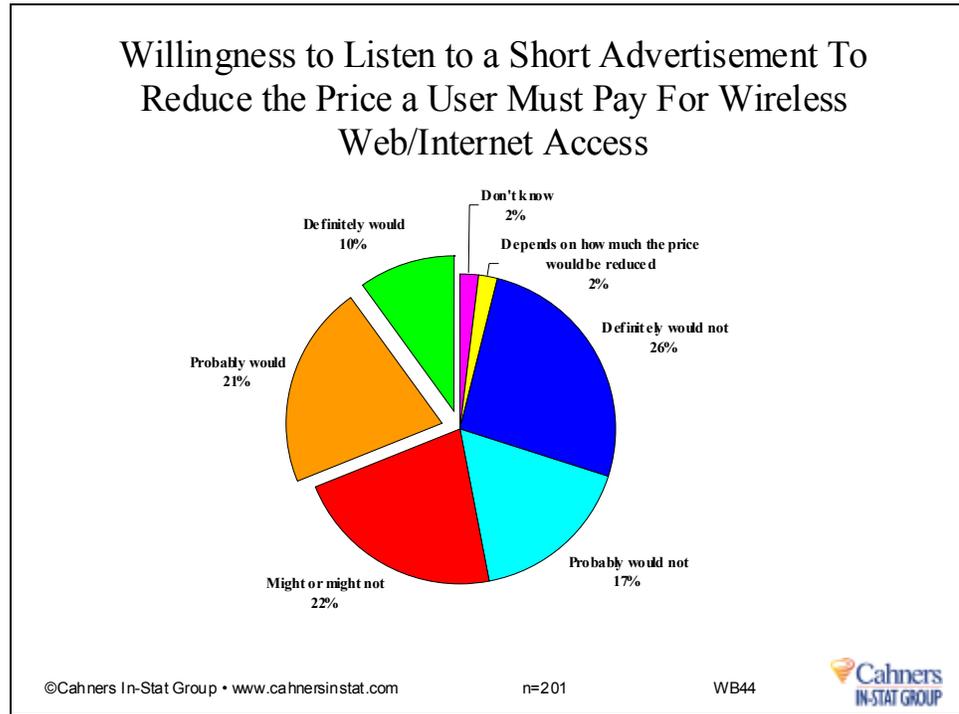
Source: Cahners In-Stat Group

Advertising will be a lucrative source of revenue for voice portals. Portals will be able to realize advertising revenue from a number of sources. Local and national advertisers will be able to insert short advertisements that will be played when users are accessing voice portal content. They will be able to realize additional revenue from content that is played only on consumer demand. They will be able to market advertisements that are tailored to customer profiles and locations, so that someone will hear advertisements that are related to specific interests that are played only at specific times and when the user is in a specific location. A key attribute of voice portals is that they provide advertisers with targeted customers that are interested in specific types of information. Voice portals that can successfully match customers and advertisers will be able to achieve high levels of repeat business from customers and strong revenue from advertisers.

Revenue Opportunities

Despite worries that customers may be unwilling to use ad-supported voice portals, the recognition that competition will drive some portals out of business, and complaints about the sameness of many of the portals, there is no doubt that this market will grow, and even flourish. Even by the most conservative estimate the total voice portal market opportunity will be worth more than one and a half billion dollars by 2005.

Figure 4: U.S. Voice Portal Forecast
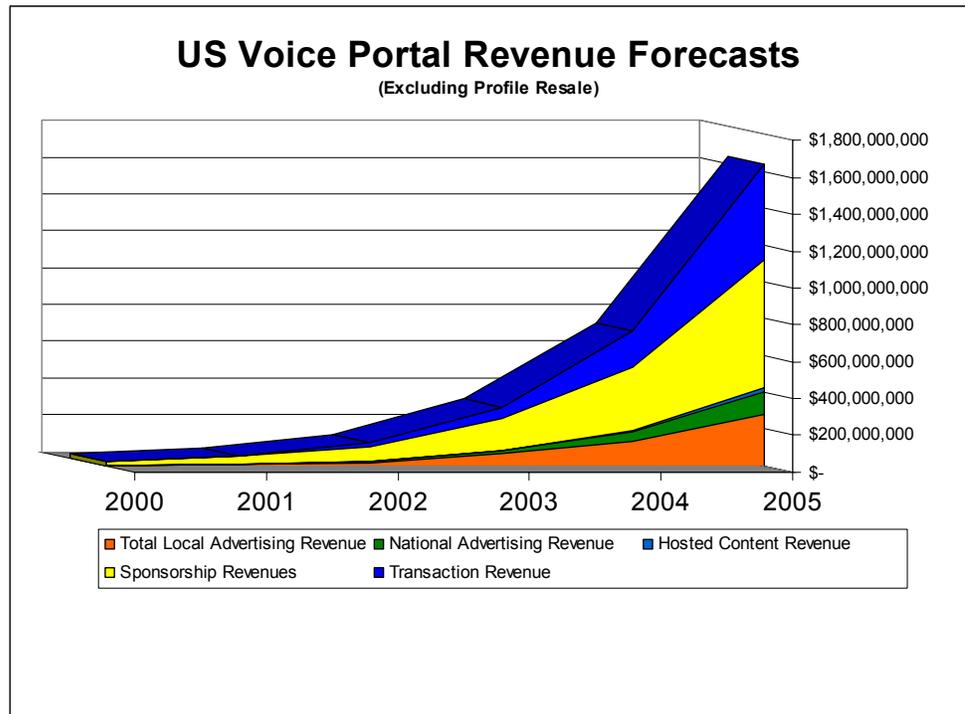
Source: Cahners In-Stat Group

Table 1: US Voice Portal Service Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Total Revenue Opportunity	$21,506	$54,639	$123,982	$319,187	$729,373	$1,640,758	42%

Source: Cahners In-Stat Group

Total Revenue Opportunity

Taken together, the total revenue opportunity for voice portals will reach at least $1.6 billion by 2005. With profile sales, this number could expand by several multiples. Several revenue streams will create the revenue opportunities for voice portals. Although advertising (local and national) is what voice portal vendors focus on today, Cahners In-Stat Group has identified six ways these vendors could profit from these services. Most are based on an advertising model, but over time the vendors will integrate Mobile-Commerce (M-Commerce) into their services. Initially, the bulk of the revenue will come from advertising and sponsorships. By 2003, once issues have been addressed that focus on security related to consumer concern about purchasing products over a wireless connection, transaction fees related to M-Commerce will begin to contribute more to the revenue mix.

Local Advertising Revenue

For voice portals that offer localized content, advertising will be especially powerful since it can be tailored to an individual's specific interests and needs. For instance, voice portals will be able to sell advertising for specific goods and services that can be delivered to a voice portal customer in a specific area. Moreover, that advertisement can be targeted to a users' individual interest, so that a customer who traditionally uses' the voice portal to find Italian restaurants while traveling can receive advertisements from Italian restaurants.

Cahners In-Stat Group expects that revenue from local companies advertising their services will be an important part of voice portal revenues for some time to come. Voice portal services will be localized and this type of advertising is important to sponsors. In-Stat projects that total local advertising revenue for voice portals grow from $445,015 in 2000 to $280 million by 2005.

The model for local advertising revenue is based upon a model for local yellow pages phone book advertising. Based on known impactable print revenue levels, voice portals were projected to draw advertising equal to a specific percentage of representative segments of yellow page advertising. In 2000 this was equivalent to 1% of print revenue for these segments, and is expected to grow to 40% by 2005.

Figure 5: Local Advertising Revenue Forecast
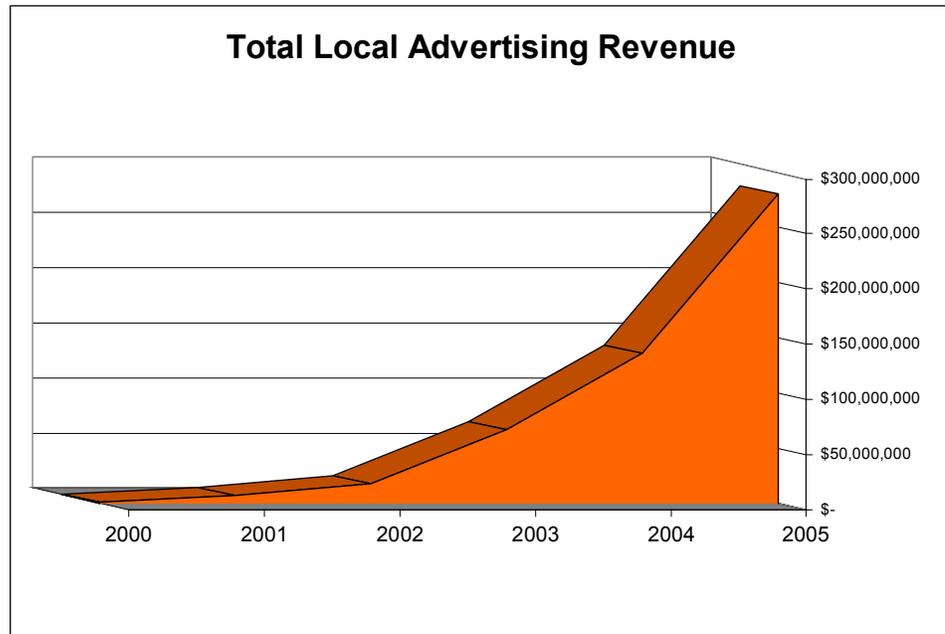
Total Local Advertising Revenue

Table 2: Local Advertising Revenue Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Local Revenue Opportunity	$445	$6,408	$17,601	$66,005	$135,970	$280,097	45%

Potential revenue from advertising could be as much as 100% higher than estimated, especially in the latter half of the projections as voice portals become more ubiquitous and advertising to this segment is more refined.

National Advertising Revenue

Cahners In-Stat Group believes that the bulk of revenues will come from local advertisers at first, but over time national advertising will grow. The national advertising revenue projection model is based on an average cost for Internet banner ads which are charged based on how often they are viewed (a cost per thousand or CPM). In this model audio ads heard in voice portals are assumed to correlate with Internet banner ads in terms of how they are sold. It is based on an average CPM of banner ads on contextually relevant sites and on assumptions of interactive click-through banner ad rate cards of $100, discounted for audio only and pay per exposure, not click though. The assumption is quite conservative since it uses an extremely low base price and it is assumed that ads are only heard in 50% of calls. Potential revenue from advertising could be as much as 100% higher than estimated, especially in the latter half

of the forecast period as voice portals become more ubiquitous and advertising to this segment is more refined.

Figure 6: National Advertising Revenue Forecast

National Advertising Revenue
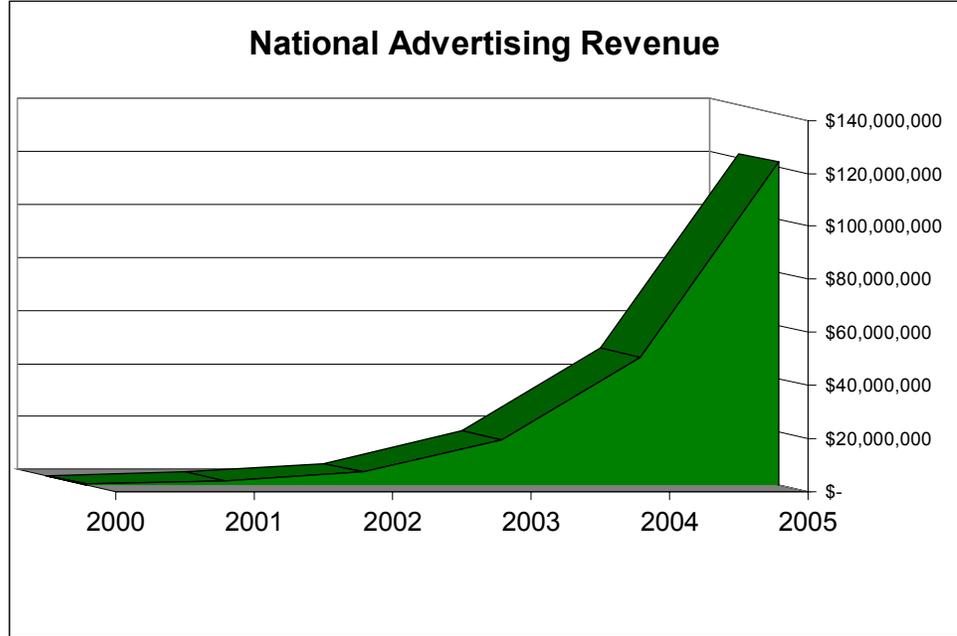
Source: Cahners In-Stat Group

Table 3: National Advertising Revenue Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
National Revenue Forecast	$132	$1,612	$4,786	$16,922	$48,120	$121,716	100%

Source: Cahners In-Stat Group

Sponsorship Revenue

Cahners In-Stat Group believes that sponsorship revenues will contribute substantially to the total voice portal market. Sponsorship revenues are basic charges that are based on total potential distribution for those expected to access a particular service. The model assumes a constant sponsorship fee per household of $.20 for targeted callers that have access to the service being advertised.

Voice portals are expected (and some are already doing this) to sell sponsorship for various service categories such as news, weather or sports. Sponsorship typically includes exclusivity and options for hosted content and associated additional revenue. An example of sponsorship revenue would be a service such as traffic information which is "sponsored by Hertz."

Figure 7: Sponsorship Revenue Forecast
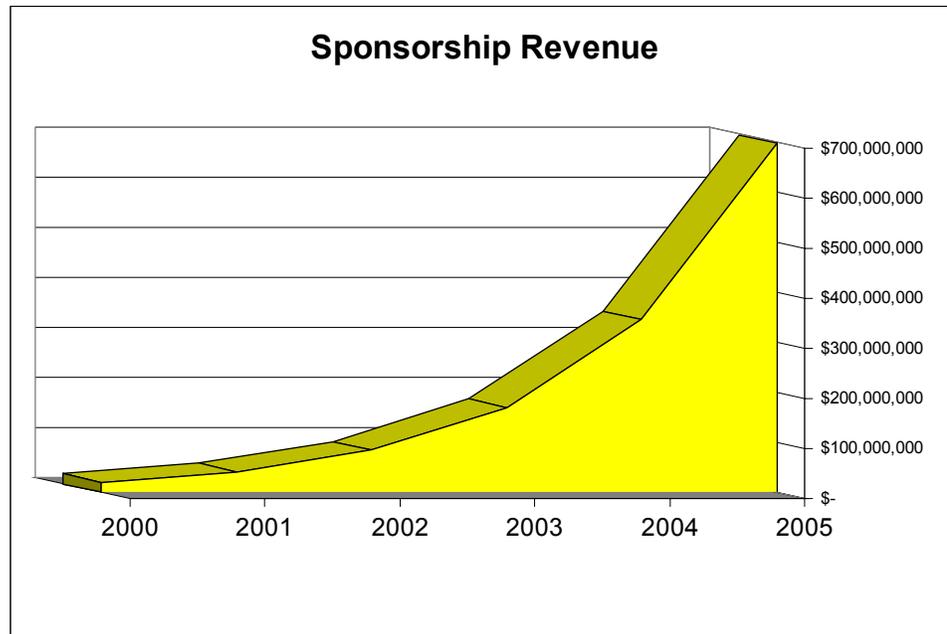
Source: Cahners In-Stat Group

Table 4: Sponsorship Revenue Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Sponsorship Revenue Forecast	$20,649	$41,738	$84,365	$170,506	$344,553	$696,439	50%

Source: Cahners In-Stat Group

Hosted Content Revenue

Hosted content refers to sponsorship that leads to some form of follow-up. For instance, an advertiser, such as a mortgage company could sponsor a particular voice portal service, such as weather. On hearing that a mortgage company sponsors the weather forecast, a caller could ask for more information about the company.

This model assumes a constant revenue per call of about $.20 and an average response rate of 1.5% from 2001 on. Both revenue and response rates are expected to remain constant. However, as the number of people accessing voice portals rises, the hosted content revenue will grow. Cost is calculated based on similar calculations for short radio advertisements in which rating points are translated into cost per thousands. Cahners In-Stat Group expects hosted content to play a more important role by the year 2003 and beyond, as people become more comfortable with this medium.

Figure 8: Hosted Content Revenue Forecast
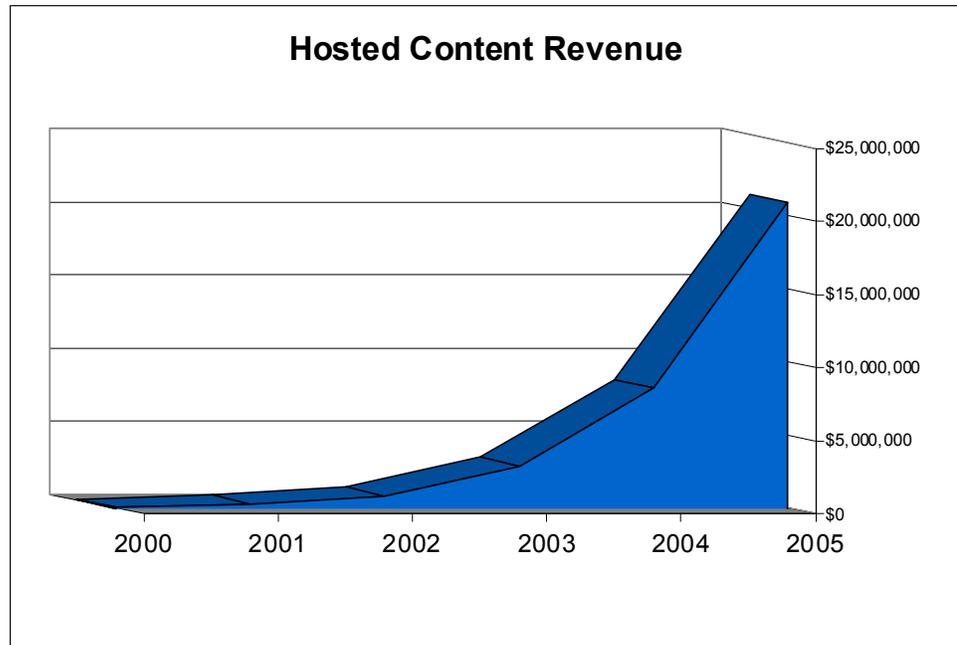
Source: Cahners In-Stat Group

Table 5: Hosted Content Revenue Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Hosted Content Revenue Forecast	$15	$276	$820	$2,901	$8,249	$20,865	93%

Source: Cahners In-Stat Group

Transaction Revenue

Transaction revenue is comprised of fees that can be chared by voice portal providers for third party sales that they facilitate. For instance, a record company can advertise a particular CD with a voice link that allows customers to purchase the album using the voice portal's browser. In that situation, the portal would receive a payment. The payment type and amount could vary and be either a flat fee or a percentage of the sale.

The model assumes a standard fee per transaction of $.50, and a slowly growing volume of calls actually leading to transactions that take place through the voice portal. Many more transactions will actually take place based on advertisements that callers hear through the voice portal. As the overall number of people using voice portals grows, the actual revenue from transaction will expand rapidly.

Cahners In-Stat Group expects subscribers to be somewhat leery of making transactions over wireless networks over the next few years. As people become more comfortable with the security of wireless networks and as carriers and vendors continue to strengthen their security, revenue from transactions will become a very large piece of the total pie over the next several years.

Figure 9: Transaction Revenue Forecast
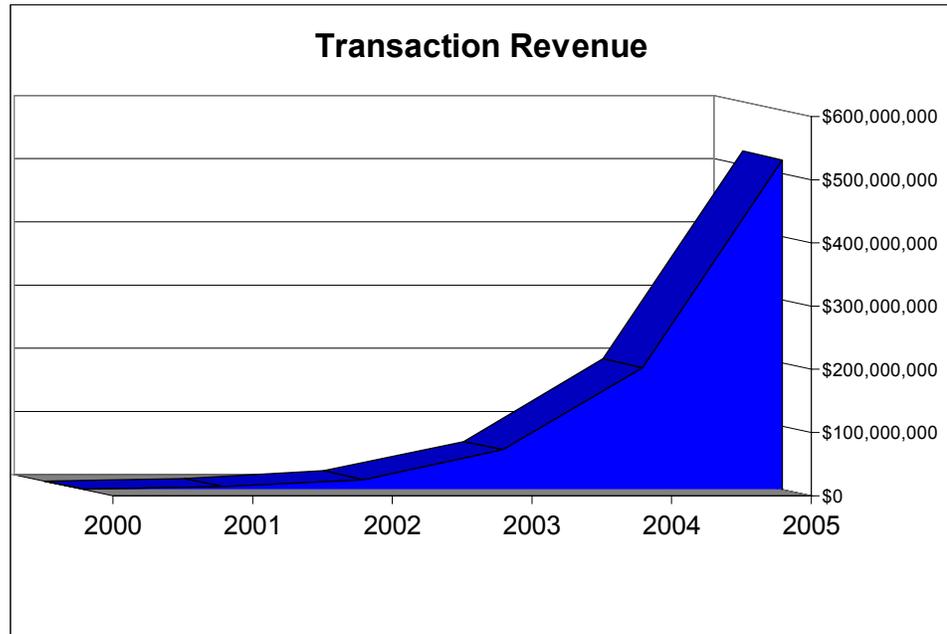
Transaction Revenue

Table 6: Transaction Revenue Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Transaction Revenue Forecast	$264	$4,604	$16,409	$62,853	$192,481	$521,640	86%

Revenue per Profile Sale

One of the most difficult, yet potentially lucrative, revenue streams for voice portals will be the sale of customer profiles. Profiles are created by users when they register with the site and provide information such as where they are located, and the type of information they want to access through the portal. Additional information is collected by the voice portal based on the types of information and advertisements that they access or respond to. The difficulty will come in convincing customers that they should opt in to allow their demographic information to be sold in exchange for using the voice portal. Portals will have to offer some premium service in exchange to help justify customers giving permission to sell their information.

Portals will also look for innovative ways to sell profiles. For example, they could sell general information about all of the customers that have dialed in to get directions, or to make reservations at an Italian restaurant. The portal could then offer the opportunity to reach those customers through mailings or other advertising campaigns that are handled by the portal. In this way, the companies are able to market to the customers without having to compromise customer privacy by revealing their names to third party companies.

Figure 10: Marketing Information Resale Forecast (x1 resale per year)
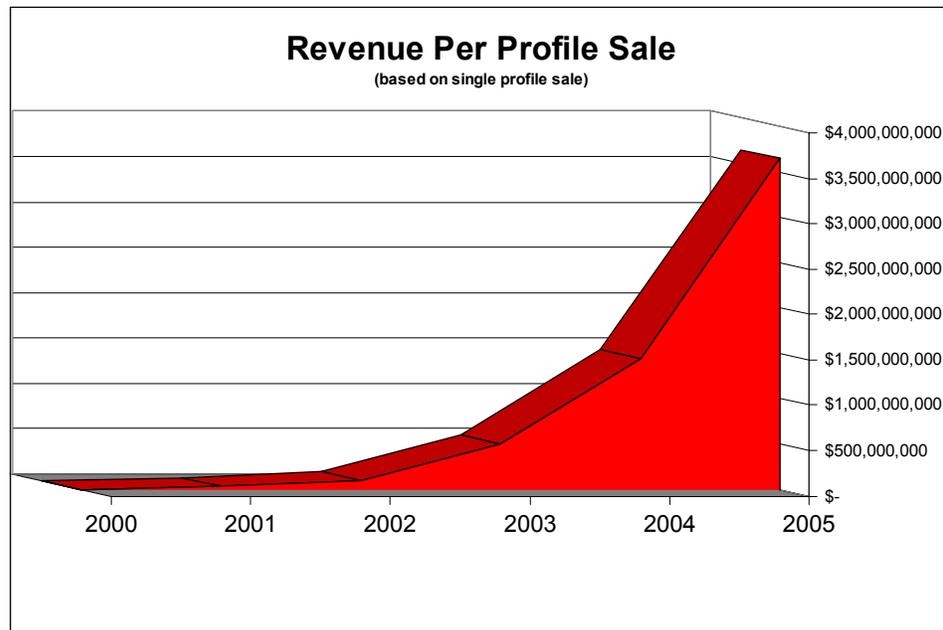
Source: Cahners In-Stat Group

Table 7: Marketing Information Resale Forecast (x1000)

	2000	2001	2002	2003	2004	2005	AGR
Marketing Information Resale (x1)	$1,323	$32,233	$95,721	$507,663,	$1,443,608	$3,651,480	29%

Source: Cahners In-Stat Group

Sale of profiles is important because they represent a revenue stream of at least an order of magnitude more than all other voice portal revenues combined. This is because specific demographic profiles can be bundled by portals and sold to advertisers for a

premium – and each profile can be sold multiple times. Profile sales are also the wildcard, since by 2005 the single sale of all potentially available profiles (that is, the estimated number of opt-ins) would represent a revenue opportunity of $3.65 billion dollars. Since this figure could be multiplied many times, potential profile re-sales could result in tens of billions of dollars worth of sales. A reasonable estimate for multiple re-sales (9 sales) in 2005 would result in revenue of $32.8 billion.

Barriers to Voice Portal Acceptance

The voice portal market could face several barriers that limit adoption among users. Initially use will be limited to early adopters willing to try new technology. That segment will be augmented by business professionals using voice portal services, as they become aware of them. Overall awareness will likely be one of the biggest barriers to subscriber growth.

Another barrier to acceptance that voice portals will have to overcome is users unwilling to receive data in an audio format. Certain types of information, such as weather or news, which are typically listened to as well as read, will be easily accepted. Other types of information, for instance travel reservations, will be more difficult for some people to comfortably use. Many studies have been performed that have determined that people take in more information when they read it than when they hear it. This is why people prefer to read a book, rather than to listen to a book on tape.

Cahners In-Stat Group believes that voice services can be difficult for people to navigate through. Subscribers must remember a great deal to efficiently maneuver through multiple menus. Still, voice will certainly co-exist with and augment text-based content in the future. Voice-based services could be very popular if they are made easy enough to use. Subscribers are often doing multiple things such as talking on the phone while driving. Voice-based services are simple to use in these situations, while text-based services require users to take their eyes off the road.

The use of voice and text will also differ by application. For example, if a user dials into a voice portal to get directions to a meeting, they must listen to the step by step directions as they drive. It is difficult to time the directions ("take a left at the stop sign") with the user's drive time. In this case, a user may request to download text based directions on a handset or have them emailed

to their wirelessly enabled PDA or laptop. Another alternative for a traveler is to have the directions faxed to a nearby location such as their hotel or a copy shop such as Kinkos.

Carrier Strategies

Voice portals are of interest to carriers of all stripes; including wireless carriers. That is because voice services leverage the carriers' existing network infrastructure and drive additional minutes of use. Carriers recognize that voice portals and speech recognition can drive wireless data access in mobile environments. The question for carriers is whether they should offer voice portal services, and if they do, how they should go about doing so.

The question of whether or not a carrier should offer a voice portal is a tricky one since it raises the larger question of whether carriers should be in the business of offering content or just simply offering connectivity. The consensus among carriers over this larger question appears to be crystallizing around the idea that carriers should offer content as a way to drive connections over their networks, as a way to find new revenue opportunities, and as a way to retain customers and combat churn. Cahners In-Stat Group believes this is useful to stimulate the market, but in the long run carriers should not remain content providers since that is simply not where their core expertise lies.

Once the decision has been made to offer their customers voice portal services, carriers must then decide whether they intend to build the portals themselves or contract that function out to a third party. Several voice portals have plans to work with carriers, either by partnering with a carrier to offer their service, or by operating their portal service under a private label for the carrier. In South Korea, Korea Telecom is taking the former approach by partnering with HeyAnita Korea. In the United States, at least one major wireless carrier appears to be planning to take the opposite approach by building its own voice portal. The choice that carriers make will be dictated by their own internal philosophies regarding what they see as their core competencies.

Companies

The major players in the speech recognition and voice portal area can be broken down into three groups. The first group includes companies that supply the voice recognition technology that actually interprets voice commands. The second group includes the companies that supply the text-to-speech software that converts the data to speech so it can be heard. The third group includes are the voice portal vendors themselves. All of these companies support wired as well as wireless callers, though this report is primarily focusing on the wireless user of voice portal services.

Voice Recognition Vendors

Nuance Communications

For a company whose business is in many ways dependent on the convergence of the Internet and wireless, Nuance has been around for a long time by industry standards – over six years. That has given the company the opportunity to develop a suite of voice applications and to gather a group of clients and financial backers that have made the company an early leader in the industry.

One of the critical benchmarks that any company, especially a company that is working in the space where the Internet and wireless converge, is their level of financial backing. By this measure Nuance Communications is doing very well.

Nuance is a voice recognition software company that creates the applications used by several of the voice portal companies covered in this report. Additionally, Nuance software is used by a number of other companies that offer voice response solutions, typically enterprise applications for automatic attendant functions, intranet access, reservations, brokerage services, or banking. Nuance's product line includes a server software platform, industry-specific applications, developer tools, and its voice browser platform.

Software Platform: Nuance 7.0 is the company's speech recognition and natural language server. The server is scalable and has a large vocabulary of 12 languages, with several more in development, including multiple English and French dialects, and several Asian and European languages too. Unix and NT servers are offered and supported. Operating systems include Windows NT, Sparc Solaris, x86 Solaris, AIX, Compaq UNIX, and SCO. It also supports most interactive voice response (IVR) platforms from a variety of vendors.

Voice Browser Platform: The company offers a voice browser, Voyager, which accepts speech commands to access data.

Nuance is especially interesting because of the effort it has put into nurturing companies that are developing voice-response products and services. Nuance not only offers tools for developers looking to create IVR products, but offers consulting and training for them. Consulting is not restricted to training and technical support, but can also include examination of business plans, access to focus groups and Nuance's IVR research, and perhaps most importantly, contacts with investors that are following the IVR industry.

A critical benchmark for any company, especially a company that is working in the space where the Internet and wireless converge, is its level of financial backing. By this measure, Nuance Communications is doing very well. Prior to its IPO in April 2000, Nuance put together a list of investors whose presence served to confirm the perception that the company was in a strong position in the emerging voice recognition field. This, combined with a carefully managed coming out party, served to ensure that the company's IPO was extremely successful despite its timing during a period of severe market skittishness towards Internet and related stocks.

Nuance's customers include American Airlines, Bell Atlantic, British Airways, Charles Schwab, Fidelity Investments, The Home Shopping Network, and voice portal vendors BeVocal and TellMe. Another Nuance customer, Parigon Communications, creates turnkey voice portals for other companies. Nuance also powers several companies that, like Motorola's MYA, offer virtual personal assistant services. Virtual personal assistants sometimes offer services similar to those offered by voice portals, but are typically much more customizable for the individual users, and typically charge for their services. As the IVR space evolves, expect the boundary between these services to blur.

SpeechWorks International

Boston-based SpeechWorks is another major player in the voice recognition field. SpeechWorks develops and provides speech recognition software to companies and helps them develop and implement IVR systems. Like Nuance, SpeechWorks is a relative veteran in the industry, having also been founded in 1994. The company has two speech recognition solutions for customers; its

SpeechWorks6 product for developing customized speech applications in multiple languages, and its SpeechSite product, a shrink-wrapped solution for companies that want a basic voice-based auto-attendant for call routing and related applications. SpeechWorks applications currently support multiple European and Asian languages.

SpeechWorks6 is a package that includes SpeechWorks' voice recognition engine, pre-packaged modular apps called DialogModules for creating speech applications (similar to Nuance's SpeechObjects), software tools for application development, and voice authentication technology. With SpeechWorks6 a developer can create an entire speech application. SpeechWorks speech recognition engine (SmartRecognizer or Smart – which stands for Self-Modifying Automatic Recognition Tuning) recognizes more than 70,000 words or phrases and includes a self-learning feedback loop that, according to the company, can improve the accuracy of an installed system from 30% to as much as 70%. It has the ability to recognize accents and modifies its applications for these variations. One of the key differentiators of the Smart system is that it is self learning, meaning that it is continuously improving its ability to recognize speakers.

SpeechWorks' customer list reads like a who's-who of corporate America. It is not restricted to dot-com companies but includes many of the older mainstream companies that are quickly adapting to the new economy.

SpeechWorks' customer list reads like a who's-who of corporate America. It is not restricted to dot-com companies, but includes many of the older mainstream companies that are quickly adapting to the new economy. Customers include FedEx, Foodline.com, BellSouth, E*Trade, Hewlett-Packard, MapQuest.com, and United Airlines. These companies typically use SpeechWorks applications to power their customer service, reservation, broker, or ordering telephone lines. The company also has a long list of partners that develop applications with SpeechWorks products. These partners include voice portals such as Quack.com, and TelSurf, as well as voice portal developer Paragon Voice Systems.

SpeechWorks has also received significant backing and funding from several major companies including America Online and AT&T. These companies not only invested in the company but have contracted with SpeechWorks to develop their own (to-be-developed) voice portals. Backers like AOL and AT&T helped the company when it launched its IPO in early August 2000, when it issued 4.75 million shares which rose 189% above their initial offering price on the first day of trading.

Other Players

Other major players in the IVR field include computer manufacturer and software developer IBM, Belgium based Lernout & Hauspie, Dutch company Royal Philips Electronics, New Jersey's Lucent Technologies, and Microsoft.

International Business Machines

IBM, recognizing that wireless handsets will soon be one of the most common devices for accessing the Internet, added a voice browser to its WebSphere server software, which is used for managing web pages. The voice browser incorporates IBM Voice Systems' ViaVoice Technology for use by call centers and others trying to move more functions to a web-based environment. The technology, which sells for $15,000, works on Windows NT and supports VoiceXML, the Wireless Application Protocol (WAP), and Voice over Internet Protocol (VoIP). IBM is also working with mobile phone manufacturer Nokia to develop speech recognition devices for accessing the Internet and is also working with Nokia on other IVR products.

Lernout & Hauspie

Based in Belgium, Lernout & Hauspie (L&H) manufactures text-to-speech and speech recognition software for a variety of companies. Of late, it has been on an acquisition spree, purchasing companies throughout the world, including speech recognition pioneer Dragon and also Dictaphone. L&H has a dominant position with its text-to-speech technology, but hopes to round out its technology by strengthening its expertise in IVR. One of L&H's star technologies is its intelligent agent, which it calls the Nak – a derivative of the Hawaiian word Nakulo, which means echo. The Nak recognizes voice commands, and like other intelligent agents for the Internet, can search for products or information for the user. While L&H does not operate its own voice portal or build voice portals for others, various technologies from the company, primarily text-to-speech, are used by some voice portal companies.

Lucent Technologies

Lucent is pushing its own voice recognition software, GeoWeb, to carriers. GeoWeb incorporates speech recognition with a location-based service so that users can take advantage of location-based

services tied to the Internet by voice access services. Lucent is also working with AT&T to develop voice-based platforms, applications, and services for accessing the Internet.

Microsoft

Microsoft is also interested in the ability to use voice for the retrieval of data and the navigation of the Internet. So far, Microsoft's efforts have primarily been concentrated on devices, with its MiPad handheld device as one example of this direction. However, Microsoft's Speech Technology Group is also exploring other speech recognition applications and has expressed interest in voice portals as well. While Microsoft has not yet made any major plays in this space, it has to be watched, simply because it's the largest software manufacturer in the world.

Royal Philips Electronics

Philips of the Netherlands is another company that develops core speech recognition technology. Through its subsidiary, Philips Speech Processing, it has developed a speech recognition engine for use in small consumer electronic devices such as wireless phones. It also has a dictation product, FreeSpeech 2000, for use with PCs. Its SpeechMania 2000 speech recognition software is significant because it does not rely on scripts, but instead lets users query the system using natural language. The software is used by several companies, including Italian wireless carrier Omnitel which is using it for its voice portal.

Voice Portal Strategies

Since a variety of companies are exploring technologies for using speech to browse the Internet and to access data, it should not come as a surprise that there are a variety of voice portals available. It also shouldn't come as any surprise that several of them offer many of the same, or at least similar services, since they are mostly targeting similar audiences – either business travelers or consumers that are away from the home and the office. The ones that are reviewed here do not charge for their services, though some have suggested that they may offer premium services in the future. Despite the fact that these voice portals do not charge for their services, several of them do force callers to listen to advertisements, which is a cost factor that should be kept in mind. Most of the

services have toll-free numbers, are offered nationally or soon will be, and are either in beta or have been publicly launched.

Voice Portal Vendors

Audiopoint

Fairfax, Virginia based Audiopoint (888-38-AUDIO, or dial #AUDIO (28346), on select wireless carriers, www.myaudiopoint.com) is a straightforward service that offers what is becoming the standard menu of options for voice portals. News, weather, traffic, sports scores, stock prices, and horoscopes are all available. The service can be customized for individual users by accessing the portal's Web site with a PC. Voice recognition is based on Speechworks software.

The service is free to users, who must listen to audio advertisements, which are about 4 seconds long and are played between requested information. The voice portal gets revenue from short advertisements and through its online store which sells products as diverse as computers, DVDs, toys, books, cameras, and travel services. The online store also sells wireless phone accessories, including, of course, hands-free kits. Key sponsors include Sony, Callaway, and Disney. Oddly, the Audiopoint store cannot be accessed through the voice portal section of the service, only via a visually based web-browser. This limitation seems strange for a service that is meant to encourage access away from a PC.

Users who register on Audiopoint's web-site can customize the service. The order in which various options such as news, weather, sports, or stock prices are read can be customized to fit the caller's preferences. In addition, customers can set specific traffic routes by time of day so that they can find out where delays might be. Specific stocks can be read, as can weather for specific areas.

Unfortunately, there are several nagging flaws with the Audiopoint service which, taken individually would not amount too much, but taken together limit the service's ease of use. The first is that the service often cannot recognize key words such as "go to the beginning" and "next" during the applications. Also, barge-in, which refers to interrupting a speech application in mid-service to issue a new command, sometimes does not work. What this means

is that the caller must sometimes listen to a long recording or may get caught in a loop in one of the sub-menus. Sometimes, the only way out of such loops may be to hang up and call again.

Another limitation to the service is that while it is offered nationally, certain services that will likely be used more heavily than others are only available for limited areas. These services include traffic information, and weather information. Traffic is currently only available for 20 cities, and weather information is not always available for smaller cities.

While such problems will likely be fixed over time, in the short term they are annoying. Users who experience these problems will likely not call the service back. Given that the number of voice portals is growing rapidly, services that do not "get it right" quickly probably will not flourish.

BeVocal

No other voice portal currently offers the level of location-specific content that BeVocal does.

Privately held BeVocal (800-4BVOCAL, www.bevocal.com) of Santa Clara, California offers fewer services than some other voice portals (callers won't find horoscopes or blackjack games here), but what it does offer is directly targeted at the mobile user. No other voice portal currently offers the level of location specific content that BeVocal does. BeVocal's founders recognized that one of the main reasons that people would access a voice portal is that they would be on the move and unable to access the Internet over a computer. For this reason, most of the content offered by BeVocal is designed to have a high degree of relevance based on the location of the caller, particularly callers in a mobile situation.

Launched in the summer of 2000, BeVocal offers location specific content such as traffic information, weather forecasts, airline flight schedules, and driving directions powered by MapQuest. Callers can also find the location of the nearest Federal Express drop box, which may be useful to a traveler in an unfamiliar city. BeVocal uses Nuance software for speech recognition and Lernout & Hauspie's RealSpeak text-to-speech technology for reading data to callers. Like every other voice portal service, users also have the option of receiving stock quotes. BeVocal also offers users the ability to find the location of some businesses. Like the FedEx locator, callers can request the location of specific businesses like a restaurant or store. Users can register with BeVocal so that when they call the service information that is optimized for their location is automatically accessed.

Not all of the features are as useful as they might seem, simply because of the difficulties inherent in using voice as a medium for presenting data. Take, for instance, driving directions. One of the things that makes MapQuest so useful for planning a trip is that PC-based users can print out step by step directions and a map. Getting the same information in an aural setting is quite different, since a typical trip usually has at least a dozen separate steps. Remembering these steps can be difficult. BeVocal has tried to ease the difficulty of using the directions by adding some aids. Callers have the option of pausing the instructions as they are being read. One slick feature is that registered users can recall their most recent set of directions and resume listening to them at the point that they left off. Users also have the option of emailing the directions to themselves. In today's mobile environment that might not be completely useful, but as wireless devices capable of receiving email proliferate (like the Palm V equipped with the Omnisky modem and service), this type of service will become more useful.

As the voice portal space becomes more competitive, one of the key factors necessary to succeeding, aside from content, will be the ability of the portal to promote itself to a wide audience. Portals will be able to do this through direct advertising and through strategic partnerships. Strong financial backing will be necessary to pay for advertising, as well as to support the portal until it can achieve a critical mass of users. By this measure, BeVocal has been quite successful, having raised more than $46 million dollars. BeVocal is actively working with several wireless carriers to form relationships to use the service for the carrier's voice portal needs. BeVocal is also recruiting customers for its Business Finder service which will let callers request the location of a business, as well as directions for how to get to that business.

BeVocal has done a good job of identifying some of the major needs that users of voice portals will have. While some of the services still have some rough edges, the service appears to be fairly responsive about trying to correct problems. While it is still too early to definitively say which voice portals will win and which will lose when the inevitable shakeout in this space occurs, the service looks to be well-positioned to be one of the successful voice portals.

HeyAnita

Los Angeles-based HeyAnita (800-442-6482, www.heyanita.com) is one of the latest entries in the voice portal space. In fact, at the time that this report was being prepared, the service had not yet gone live, so we were unable to evaluate the actual service. Nevertheless, Cahners In-Stat Group was able to get a sense of how the service will function, as well as what features will be available. HeyAnita is powered by SpeechWorks' speech recognition engine and uses Lernout & Hauspie's text to speech software for reading back the information. The service is being rolled out in the United States sometime in the 3rd quarter of this year, with a rollout in South Korea planned soon after.

HeyAnita offers a number of services, most notably a personalized information management (PIM) service which lets users access their email, personal phone book, and calendar. Users can enter the information that they want to be able to access through HeyAnita's website, or over the phone. This information is then available to them whenever they log onto the service.

Other services available from HeyAnita include stock quote information, weather forecasts, traffic, news, sports, movies, horoscopes, and soap opera updates. Most of the services offered by HeyAnita are similar to those offered by other voice portals. However, HeyAnita says that it will be constantly updating and adding new services, at about the rate of one new service a month. The main differentiator for HeyAnita seems to be that its services are, in the words of the company, "highly produced." By highly produced, the company seems to be referring to the accents that several speakers have (for instance the female voice reading horoscopes seems to have a combination Hungarian and East Londoner accent), and for the various sound effects that introduce each service. HeyAnita is clearly targeting a different segment of the market than is BeVocal – their service appears to be much more consumer oriented.

HeyAnita has a complex revenue model that is a result of its financial backing and its Korean operations. The portal gets its funding from Softbank Venture Capital and raised $17 million in its first round last February. However, a undisclosed portion of the money is earmarked for HeyAnita's Korean voice portal venture. A second round of fundraising is planned which is expected to

raise $30 to $50 million more. Softbank Corporation's interest and influence is not purely financial – its CEO Masayoshi Son sits on HeyAnita's advisory board and the executive director of Softbank Venture Capital is HeyAnita's Chairman of the Board. Although HeyAnita's funding is relatively small compared to some of the other voice portals profiled, its backers are much more closely tied to the company and therefore are more likely to pony up more cash as needed.

In the U.S., HeyAnita uses a advertising / sponsorship model. However, HeyAnita expects that much of its revenue will come from its international operations. In Korea, the company has a revenue sharing model with Korea Telecom. For every call that comes in on a landline or wireless connection HeyAnita receives a percentage of the revenue generated for the carrier. HeyAnita also expects that software licensing, consulting, and hosting of voice portals or voice applications will be a significant source of revenue.

Without actually testing the service, it is impossible to evaluate the quality of HeyAnita's service. The portal has brought together some of the leading speech recognition and text to speech technology for its service. It has lined up strong backing, though not on the scale of some of its competitors. It has not chosen to offer services that are unique from some other portals, which means that it will have to not only heavily promote its service, but also do a better job than its competitors. In what is still a relatively new space, it is curious that the company has not done a better job of differentiating itself. The portal could also suffer from being relatively late to the voice portal game. Since this space will likely not support a large number of portals, first mover advantage will play a significant part in determining who wins and who fails. However, HeyAnita does have a fallback position in that it already has an international strategy and could enter markets where wireless penetration is higher, wireline Internet penetration is lower, and voice portals would be even more popular than in the U.S.

Quack.com

Quack.com, (800 737 8225, www.quack.com) based in Sunnyvale, California, offers services that should appeal to the consumer market. Its speech recognition technology is based on the SpeechWorks voice recognition engine. Most of Quack's features

are pleasant to use, but it faces some problems, which may limit its popularity, and ultimately doom it over the long term. Luckily, these problems are correctable, but the company will have to respond quickly before it loses out to its competition.

Quack's first problem is a result of its lineup of services. Quack offers movie listings, a restaurant finder, stock price information, weather forecasts, sports scores, and plans to offer traffic information in the future. The problem with this service line up is that there is nothing new here. While not every voice portal offers all of these services, every portal offers most of them. The first problem would not be critical for Quack if it delivered the services particularly well. And in fact Quack seems to have nice ideas. Unfortunately, the services are often marred by small problems which individually are not really much of an issue, but which taken together could spell big problems for the company.

Negatives include long sign-in periods for registered users. Typical users of voice portals want to access information quickly, since they are often on the move. Typical wireless telephone calls last under 3 minutes. Quack requires that callers spend much of their first minute on the service just getting registered. Quack also plays many advertisements that last as long as 15 seconds. Some of the advertisements are quite frustrating since they are instructions on how to register for personalized service – and are played to users who are already registered! Quack's software also appears prone to loops in which the caller is sometimes not able to back out to the main menu until a sub-menu has finished running through its list. In this situation, the "barge in" didn't work or was misunderstood.

On the positive side, Quack's speech recognition software seems to work particularly well. A wide range of responses is typically recognized correctly. The text-to-speech voices are pleasant sounding, with none of the patchy sound that some text-to-speech engines have in which the listener can detect the strung-together nature of the sampled words. The ability to personalize the service so that, for instance, a specific movie theater's listings are automatically set in a user's preferences is a good idea. Personalization is probably one of the best ways to make voice portals like this "sticky" and will keep the user coming back.

Quack could be a very good voice portal. And it is still early enough that it can reach its potential. But first Quack must correct its problems. It should add more services to its lineup, streamline

the sign-in process for registered users, and correct some of the technical problems that resulted in loops. Still, it will have to work quickly if it doesn't want to be eclipsed by other voice portals.

The prospects of success for Quack were greatly improved following its acquisition by America Online (AOL) at the end of August, 2000. AOL announced that the acquisition was an important step in its "AOL Anywhere" strategy, which will allow its members to access AOL services from a variety of locations. The acquisition will give the voice-portal an immediate potential audience of 23 million AOL subscribers.

TellMe

TellMe (800-555-8355, [www.tellme.com)](www.tellme.com), based in Mountain View, California, is the voice portal with the best chance of winning the consumer market. Its lineup of services is the broadest of any of the voice portals, with most set to appeal to a broad range of interests, though primarily consumers, not business people.

TellMe services include restaurant listings, movie listings, stock quotes, weather forecasts, news, local traffic reports, airline flight information, 411 service for both white and yellow page lookup, lottery information, horoscopes, soap opera updates, and a blackjack game. Additionally, the portal offers callers the chance to place a toll-free long distance call through a partnership that TellMe has with AT&T. Users can get localized information based on their telephone's area code (TellMe can use caller ID), through their area code in their profile if they are a registered user, or by telling the portal the city and state they are in.

TellMe's service has a long line of pluses. Besides its extensive number of services, it should be commended for the execution of its services. The content for individual services is good, though some, like news, could use more categories. The portal keeps the number of ads to a minimum, and their length, at only 5 seconds or so, is much more palatable than some others. A nifty feature in some categories like sports is that a brief snippet of information, such as a sports score, is provided, and if the caller wants more details they can get them by saying "tell me more." Importantly, TellMe keywords are more intuitive than some other portals, which means that a caller can quickly navigate through the portal without having to learn many new keywords.

But every rose has its thorns, and TellMe has some glitches that stop it from being a runaway winner in the voice portal beauty contest. The first, and most critical problem is that its voice recognition (based on Nuance's speech recognition engine) is not as robust as that found with some other portals like, for instance, Quack's. Commands must sometimes be repeated several times before they are recognized. Since TellMe has not been available commercially for as long as some other voice portals, this problem may simply be that it has not yet had time to learn to recognize as wide a range of voice types as other voice portals. If so, then this problem will eventually disappear.

Another problem is that it takes a long time to access various services in TellMe – like Quack, users can't get in, quickly get the information they want, and then get out. Callers will also become frustrated as they discover they are not able to jump directly from one sub-menu to another. If a caller wants to switch from news to weather, they must first back out to the main menu and then go to weather. Again, this adds a needless delay and will turn some users off.

Besides more services, TellMe also has something that other voice portals don't have – more than $50 million in first round financing including backing from AT&T. More than anything else, this combination gives TellMe a decided advantage over the competition. To highlight AT&T's participation, callers can make a free 2 minute call through a "phone booth" feature on the TellMe voice portal site. Users simply say the phone number they want to call and are quickly connected. The sound quality, of course, is impeccable. The phone booth is nifty, but it would be much better if calls weren't cut off without warning after 2 minutes – a 5 or 10 second warning that the call was about to end would be nice.

For a voice portal that has just finished its beta trials, TellMe has managed to get a lot of things right. TellMe's services are now available nationwide. Their range of services is much greater than that of any other voice portal currently on the market, though that could change quickly. They have the financing and the type of carrier relationship that will be necessary for voice portals to be commercial successes. If TellMe can correct the technical bugs that currently afflict it, it stands a good chance of becoming the most popular voice portal.

TelSurf Networks

TelSurf, (888-295-1219, [www.888telsurf.com)](www.888telsurf.com), based in Westlake Village, California, is yet another voice portal that takes the concept of offering a wide array of services and combines it with personal information management. TelSurf, whose speech recognition technology is based on SpeechWorks' voice recognition engine, offers a number of services, most but not all of which are offered by the other voice portals discussed in this report.

TelSurf callers can access a wide range of information, including news, weather, sports, stock quotes, and entertainment (jokes, horoscope, etc). The key hook for the site is that it is highly personalizable. Using the site's email aggregation technology, registered users can arrange to have their Yahoo! and POP 3 email delivered to and read to them. Users can also reply to email or send new email – the user's voice is recorded as a streaming audio file which is embedded in an email and can be listened to by the recipient of the mail (provided their PC has a soundcard and speakers). TelSurf plans to support IMAP4, AOL, and Hotmail email accounts in the future. Registered users are also given their own TelSurf email address as well. Another customizable feature is the ability to customize a users stock portfolio so that stocks of interest are read when they call.

Users of the TelSurf voice portal don't access the service through a toll free number (the 888 number above is only for signing up). Instead, they dial a long distance number, which saves the portal from footing the toll charges of callers. It also serves the purpose, intended or not, of stopping callers from lingering too long – which may not be the best strategy for a service that bases at least part of its money-making strategy on ad revenue. However, TelSurf says that a nationwide toll-free number is planned.

While TelSurf offers more services than several other voice portals that were reviewed here, their service also has more than its share of minuses. Though available nationwide, not all of their services cover all of the country. Though the speech recognition was generally very good, in some situations commands were not always properly recognized. For instance, while in the news section, requests for world news resulted in domestic news being read. In the stock section, users may get caught in a loop and not be able to request specific stocks. In the weather section, weather

for some cities was read without giving the actual city name, so that a caller would hear "The weather in _____ is" with the blank representing dead air. All of these are teething problems that should be quickly corrected as the service gets more time under its belt. Nevertheless, the portal risks losing customers disappointed by a less than perfect experience.

Summary of Voice Portal Services Reviewed

While none of the voice portals reviewed were perfect, all showed promise. Despite that, it is questionable whether all will be successful. One of the biggest problems facing most of the portals is that they are competing directly with each other. Only BeVocal has differentiated itself from the other voice portals, by targeting the business traveler. All of the other voice portals attempt to differentiate themselves through the services they offer, rather than by the market they target. This strategy will not pay off for all of the portals since most of them do offer the same basic services (news, weather, sports, stocks, etc.). Moreover, if any voice portal does come up with a particularly innovative service, it will probably be copied fairly quickly (look at HeyAnita's plan to add a new service each month!).

Most voice portals attempt to differentiate themselves through the services they offer, rather than by the market they target. This strategy will not pay off since most of them offer the same basic services.

Some portals have attempted to stand out from the crowd by offering highly personalized content such as POP3 email access or traffic information optimized for a particular commuting pattern. However, these voice portals need to start taking a more focused approach and target specific markets rather than simply trying to catch anyone who will listen.

Voice portals can justify their wide flung service offerings and marketing as an attempt to bulk up quickly, based on recognition that the space is fast becoming competitive and some portals will not succeed. This approach is analogous to that of many dot.com approaches in which companies adopt a growth at any cost strategy. This strategy requires a combination of deep-pockets and an ability to convince investors that eventually the portal will reach a critical mass of customers that will attract a level of advertising revenue to make the voice portal profitable.

An additional revenue stream, which would benefit from high levels of customers, is the sale of subscriber profiles (in aggregate) to companies that are looking to offer targeted advertising. In fact,

as will be seen later, this is where Cahners In-Stat Group projects some of the highest revenues for portals will come from. The question for voice portals and their backers is which portals will be around long enough to reach these profit points?

The Holy Grail for voice portals is to partner with a company, like a wireless or wireline carrier or an Internet portal such as Yahoo! or AOL (one not yet voice-enabled) that can deliver a lot of customers. At least one of the voice portals listed above, TellMe, has a relationship, if not a full partnership, with a carrier. HeyAnita says that its soon to be launched Korean portal already has a relationship with Korea Telecom. Several other portals say that they are in discussions with carriers and one claims that it will have one or more partners by the end of 2000.

Table 8: Voice Portals by Service Offered

	Audiopoint	BeVocal	HeyAnita	Quack	TellMe	TelSurf Networks
Cost	Free	Free	Free	Free	Free	Free
Customizable	N	Y	Y	Y	Y	Y
Toll-free #	888-382-8946	800-428-6225	800-442-6482	800-737-8225	800-555-8355	N
Advertising	Y	N	Y	Y	Y	Y
E-mail	N	N	Y	N	Y	Y
Location Specific Content	Y	Y	Y	Y	Y	Y
Traffic Info	Y	Y	Y	Y	Y	N
Directions	N	Y	N	N	N	N
Address book	N	N	Y	N	Y	Y
N/W/S/H/F	Y	Y	Y	Y	Y	Y
Carrier Partner	N	N	N	N	Y	N

Source: Cahners In-Stat Group

Each voice portal has slight differences which their developers hope will make them stand out from each other. Though it remains to be seen whether that will be the case, it does appear likely that the average user will have a hard time telling the difference between them.

Conclusions

Despite the disappointing showing of speech recognition technology in years past, the technology is here and now today. The convergence of reliable speech recognition, the phenomenal growth of wireless telephony and the increasing relevance of the Internet to all aspects of consumers and business peoples' lives means that the time is ripe for an explosion of interest in voice portals. However, the window of opportunity for a voice portal to come out of nowhere and come to dominate the market is limited. With new voice portals coming on line every month, the space is quickly becoming crowded. Carriers and traditional Internet portals are taking a hard look at the potential of voice portals and are planning how they will go about speech-enabling their services.

Successful voice portals must do several things right. They must offer unique services targeted at a specific market segment – the market will not support five identical voice portals. They must secure strong financial backing – while revenue will grow quickly, profitability for the voice portals will not be reached as easily. They must carefully consider whether their model will allow them to operate independently or whether they need a partner – it will be difficult for most voice portals to avoid being crushed by carrier or Internet portal supported voice portals. These are the primary requirements. What scarcely needs to be said is that none of these things will help if the voice portal does not ensure that its site is easy to access and its speech recognition is not highly accurate.

Cahners In-Stat Group expects that voice portals will become a popular way for accessing data, especially for people in a mobile environment. Voice portals will be successful in driving more minutes of use for wireless carriers and, to a lesser degree, for wired carriers. Voice portals will also generate multiple revenue streams that will continue to grow over time.