

WiFi in the United States

Gerbsman Partners 2003

About this report

Gerbsman Partners decided late in 2002 to expand its international business model to focus on and to develop "Domain Expertise" in the worldwide Wireless and Technology market. Early research made clear to us that three areas of significant interest stood out among the wireless offerings out there – Premium SMS, WiFi and Wireless entertainment. As a part our commitment, we have spent the first half of 2003 visiting market leaders in each of these segments in the US, Europe and Israel. These interviews, conversations and findings serve as the foundation for this White Paper. Gerbsman Partners is committed to continuing its efforts in wireless and is offering assistance to understand, navigate and execute business related to these three themes.

Executive Summary

WiFi has been widely spoken about for quite some time. Intel and the venture capital community have provided significant funding for startups, developing various sorts of technology, services and applications. It is only natural to compare this too previous investment cycles like the dot-com era, and to wonder if WiFi will be different.

The cliché says that "only the strong survive", and with an overheated market as in the United States today, few new possibilities remain unexploited. With a developed infrastructure in place, the market eagerly awaits the next new development. Some believe it will be cross-provider roaming, others say streaming content to hotspots – only the future will show us.

Key observations for the US market includes:

- Hot spot markets are getting crowded. A significant fall out is likely to happen. With projected revenues of \$15k per hotspot on average per year, multiple current business models are not sustainable.
- Security and VPN are two key technologies that have to be in place in order for the enterprise to fully embrace WiFi into their IT budgets.
- With an extensive infrastructure in place, value added services at the end users level might serve as the revenue generating "extra" layer WISP's need to survive.

Looking ahead, there are significant challenges for the WiFi industry as a whole. Leading providers of content and various services suitable for the wireless lifestyle, etc are the ones that will boost the usage of the WiFi infrastructure. Service and network providers will have to find partners to differentiate their offerings. Gerbsman Partners expertise and network are very well positioned to identify and support activities of this nature.

Market overview

New initiatives and successes can be found almost every day. High profile concepts like Cometa Networks, Vivato and Boingo all ride a strong tide towards possible success. As the market deals only with connectivity, this is an industry touching upon several fields of technology –bandwidth, equipment, software and (most importantly) services. As with all new industries, the opportunities to watch are the ones setting themselves apart. Companies like Speakeasy.net, Mesh Networks, Cushcraft, Check Point Software Technologies and Cranite Systems all show interesting angles of what this market can bring.

WiFi has the capability to serve four major segments: the private household, the small company, the large enterprise, and the public hotspot. Still in its infancy, the US WiFi market accounts for approximately 1/3 of the global market. According to Pyramid Research, the telecom industry estimate of global WiFi users in 2008 will grow to 707 million users. Based on these assumptions, expected WiFi hotspot revenues in 2008 will be approximately \$2.4 billion.

The table below summarizes the expected number of US based WiFi service users and revenues:

USA	2002	2003	2004
WiFi service users	23,700	93,900	609,200
Expected service revenue (million \$)	\$8.40	\$34.30	\$204.70
WiFi enabled devices (millions)	9.5	22.3	38.7

Source: IDC

This forecast implicitly assumes that all users will be paying on an average \$30 a month. Pyramid Research offers similar forecasts, stating an average of \$30/month for WiFi/ hotspot users.

Average Revenue Per User (US\$)	Mobile	Residential Broadband	Business broadband	WiFi
2003	\$26.79	\$28.45	\$56.98	\$30.00
2008	\$22.89	\$23.69	\$37.60	\$3.46

Source: Pyramid Research

Segmented market analysis

Synergy Research Group announced in May that home and SOHO users have become the dominant segments of the WLAN equipment market in the United States. Furthermore, home/SOHO sales grew by 2% in the first quarter of this year and were up nearly 43% on the year, while at the same time larger enterprise spending was flat. Thus the home/SOHO segment accounted for 61% of the total market for the quarter, up from 49% a year ago, and overtaking large enterprise. Some feel the size of this market can be explained by the Yankee Group's report that the number of enterprise class WiFi nodes sold worldwide in 2002 was 6.9 million. Yankee projects that this number will increase six fold by 2007.

Understanding the WiFi Related Markets

As a concept, WiFi access points connect a user through wireless technology to the Internet/Intranet bound to one location. Early adopters have been households and vertical markets such as warehousing, manufacturing, healthcare, and education. The most common type of WiFi access points are hooked up to a broadband line and provide internet access to a maximum of 50 users of WiFi enabled devices in a distance of up to 300 feet. WiFi utilizes an unlicensed spectrum and is therefore unregulated.

Thus, a good way to analyze the implications of WiFi is to look at the potential uses of this technology by segmenting in the customers into 3 groups – Households and home media, enterprise (SOHO and larger) and “hotspots”.

Households and home media

Households deploy WiFi mainly for broadband Internet access. Newer home media equipment also utilizes WiFi to connect the home wirelessly. For example, the DVD player can stream movies to multiple TV's around the house without having to draw a cable to each and every TV. Although just an idea, most media equipment vendors and PC manufacturers are working hard to claim this market. Other beneficiaries are the software application developers like Microsoft, and residential broadband providers. Companies like Sony, and Panasonic, as well as PC manufacturers like Dell, Toshiba and HP, all offer their early versions of the home media center.

Enterprise - SOHO (Small Office/Home office)

Small business is a very important segment. This group also includes the home-office worker, which according to the Business Communications Company accounted for 44 million individuals in the US workforce in 2002. Their employers spent some \$72 billion on PC hardware, networking equipment, services and software. This is potentially the first group to take advantage of broadband and WLANs.

The main distinction between the home user and the small business is the latter's sensitivity to security issues. Such businesses might be interested in purchasing specialized software that would improve the efficiency of using the WLAN. Hence, the companies providing virtual private network (VPN) software or hotspot access represent an additional group that might strive to gain additional benefit from this segment. So far growth in the small business segment has been hindered since Internet service providers (ISPs) generally require a primary account if they are to help set WiFi access. Not surprisingly, there are companies trying to address this gap. The Internet service provider (ISP) Speakeasy.net recently announced that it is the first to set up a program allowing small businesses to share a WiFi hot spot. Speakeasy.net offers full customer support, secure connections, and bona fide legal standing throughout its 48-state network. Most interestingly, Speakeasy.net allows the owners of the primary accounts to charge the secondary subscribers on the WLAN. Speakeasy.net offers owners of accounts a revenue share on additional subscribers.

Enterprise - The Larger Enterprises

Vertical markets such as warehousing, manufacturing, healthcare, and education were the first to deploy WLANs, trying to boost productivity and efficiency. Most new devices have wireless capabilities and buying new antennas is relatively cheap. Thus, enterprises improve connectivity and usage of existing equipment at minimal additional cost. However, the Synergy Research Group reports that enterprise

equipment sales over the first quarter of 2003 were flat and were in fact down about 11 percent over the previous year. On the other hand Gartner projects that by the end of 2004, the vertical markets will account for more than half of all wireless-equipped users.

Applications like just-in-time inventory management, reduced paperwork and the instant recording and exchange of information are all well documented cost savings and provide real argument to install WiFi networks. For instance, UPS has spent \$120 M equipping its worldwide distribution centers with wireless networks and claim up to 35% productivity gain. Care Group reports a 50% reduction in medical errors after deployment of WLAN. General Motors also uses WLANs in 90 factory lots.

Obvious beneficiaries from this segment are the equipment producers, the software management companies that create specialized applications, the providers of VPNs and security, and especially the providers of hotspot access to employees on the road.

“Hot spots”

Today there are some 16,000 public hotspots around the world, of which 8,500 are in South Korea, operated by KT Corp. Europe has some 2,000 commercial hotspots and the United States, 4,500.

The question with respect to public hotspots is whether the value added can be captured and how to do it. Several questions remain to be answered before hotspots can prove that their business models are viable. A good example is the Korean KT Corporation, a South Korean ISP, which is well positioned to capture value as it operates in near monopolistic conditions, in a much smaller market. Reportedly, KT Corp. already has approximately 157,000 WiFi service subscribers (about 2% of its broadband base) and plans to expand its public hotspots network from the 8,500 as of last year to 15,000 this year. This is still less than Cometa Networks' ambitious business plan of building over 20,000 hotspots in the US by the end of 2004.

In the US, the hotspots' service providers are subject to a flat access fee. Unless pricing structure is improved to allow for flexibility with respect to location and roaming, or unless the operators find some other innovative ways to extract value, it will be very hard to reach profitability operating hotspots on a stand-alone basis. There are a few US based companies that have addressed this in an unconventional way. The first is Deep Blue Wireless, a Californian WISP (Wireless Internet Service Provider) that owns and operates 50 hotspots. Deep Blue offers customized services and pricing. Pricing structures increase only if each additional hotspot brings in positive cash flow. The second is iPass, a service aggregator offering worldwide Internet access, not just WiFi but also dial-up and Ethernet, to large enterprises. The larger companies such as T-Mobile, Verizon and Sprint are all moving aggressively into the Hotspot market. There are few barriers to entry in terms of offering affordable and flexible pricing.

Market Dynamics

The consumer electronics industry is taking advantage of the WiFi technology and uses them as the connectivity platform for the digital home. Many important developments in this area should be monitored closely. For instance, Linksys and Zandiant Technologies both have announced an alliance aimed at creating wireless products and standards that will link vehicles into WLANs. The Internet Home

Alliance, a network of companies advancing the home technology market, announced at the end of July that eight new members, including Microsoft, SBC Communications and Cushcraft Corporation, have joined. Cushcraft Corporation designs, develops and manufactures enhanced antenna solutions for the WiFi, broadband wireless access and cellular in-building markets.

Equipment Producers

The competition among the producers of WiFi related gear is fierce, prices are dropping fast and the gear is becoming a commodity. With some technical knowledge, free public WiFi access points can be built with cheap off-the-shelf components. The gear costs associated with setting up industrial strength hotspots have dropped from about \$10,000 in 2001 to about \$2,000 today. This sector appears ripe for consolidation since the high volume established players are best positioned to obtain cost advantage in this market. Cisco recently acquired Linksys – one of the leading home wireless networking equipment vendors for \$500 million in new shares. Cisco itself is well entrenched in the large enterprise segment. Another clear-cut winner will be Intel, which is spending some \$450 million in promoting its high margin Centrino chip. Estimates predict that Intel is strategically positioning itself in this market and is aspiring to earn some \$1.5 billion on Centrino during the next few years.

Chipsets

According to TechKnowledge, over 40 companies produce WiFi chips, with another dozen planning to enter this market. Staying with Moore’s law, the chip producers are facing particularly tough challenges - while sales volume will almost double this year, prices will be dropping by half as indicated in the table below:

Year	Sales Revenue (in million \$)	Chip units sold (millions)	Average Unit Price
2002	\$369	22.5	\$ 16.39
2003 ^e	\$340	41.3	\$ 8.24
2007 ^e	\$700	155.3	\$ 4.51

Source: TechKnowledge

These expectations are supported by the fact that Intersil, known as one of the leaders in WiFi chip sales, has announced the sale of its WiFi division to Globespan-Virata for \$365 million in cash and shares. In explaining its decision, Intersil cited the low revenue of \$49 million during the first quarter of 2003, associated with low margins resulting from the increasingly stiff competition in the WLAN semiconductor market, especially from companies based in the Far East.

Equipment manufacturers

In addition, Motorola, Nokia, and Ericsson are working on WiFi phones that would let people move from WiFi to cellular networks without even noticing. The phones should be ready in about 12 months and rely on the assumption that public hotspots will proliferate. Cordless phones are already offered by Cisco. Other interesting companies like MeshNetworks, a developer of WiFi systems that would allow emergency-response teams to create networks among themselves by simply turning on laptops and hand-helds, and Cushcraft as previously mentioned.

Telecoms

As outlined above, we believe that the broadband providers and telecoms in particular are in a good position to capture the value created in the home segment, the SOHO segment, and the public spots. Unsurprisingly, the telecoms have already entered the WiFi market. For instance, Verizon has converted 150 New York City pay-phone booths into hotspots. The implication is that in the near future the major WISPs might be acquired by the telecoms.

Software

We believe that the most important developments will be related to VPNs and security developed by companies like Check Point Software Technologies, Cometa Networks and Cranite Systems, to name just a few. The latter sold a \$960,000 WiFi security installation to a division of the US Army. Major players like IBM and Microsoft are also on the lookout. IBM is devising WiFi powered systems to monitor minute-by-minute operations of distant machines and Microsoft is embedding WiFi capabilities in its operating systems.

Future Developments to Watch

Some of the intriguing issues ahead include security issues, standards for roaming between WLANs, and value added applications.

Security

The improved security will lead to increased enterprise usage of WiFi and will thus boost high-end equipment sales. Developers have taken three different avenues in that regard – promoting the (g) standard, developing corporate VPN's, and Intel's WiFi Protected Access Roaming on the chip level. Given the entry of major players in the WiFi area and the signs of collaboration for its promotion we believe that a single reliable worldwide standard will eventually emerge.

Roaming

Roaming between WLANs is difficult to address especially with respect to public hotspots. Lack of flexible pricing is one of the main issues. However, provided that major wireless operators like T-Mobile, Verizon and AT&T have entered this market, we believe that obstacles will be overcome in the midterm. We expect this area to be of high importance and crucial for the public WiFi usage – ease of payment will spur usage.

Value added applications

The most interesting challenges and the true opportunities are associated with finding innovative WiFi applications. Companies like Werft22 among others are betting that Hotspots will utilize streaming content. Although just an early stage idea, this is a high stakes/high growth market with wide margins to be realized.

Conclusion

As hot as it seems, WiFi may not bring the revenue companies are hoping for, particularly with respect to public hotspots. Capturing value from the additional layer of infrastructure has proven to be quite difficult for everyone but the high-end large-scale industrial-quality equipment producers and security providers. The group that will certainly benefit is the broadband provider. Regardless of these findings, WiFi remains an area that is worth monitoring closely, since leapfrogging WiFi applications may still emerge. The real question is whether "hotspot" providers and equipment vendors will continue to raise large investments, despite the lack of revenue growth. Today, WiFi enabling software comes for free. WiFi access point detection software is embedded in Windows XP, Boingo distributes a good quality alternative for PC users, Mac and Linux users can download the free Kismet software. Will this continue? Already companies looking towards the value added layer to utilize the built out infrastructure – streaming media etc are areas that will find its way into the "hot spots". Whom and how are a matter of time.

About Gerbsman Partners

As a result of Gerbsman Partners' 23 years of maximizing enterprise value and specific domain expertise in technology related intellectual property, we have developed an established, proven and responsive distribution channel for our clients. Our channel reaches International and US institutional investors, venture capital funds, investment bankers, lawyers and accountants, as well as leveraging Gerbsman Partners' direct relationships with major wireless and technology companies.

Gerbsman Partners, supported by its International Board of Intellectual Capital, has been involved in over \$1 billion of transactions worldwide and has assisted in M&A, restructuring, licensing, partnership and capital formation for numerous companies and their Intellectual Property.

Our international business and technical team, which includes European and Israeli based sales and technical personnel, looks forward to earning the right to be a resource to you.

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For additional information, please call or email:

Steven R. Gerbsman
+1 415 456 0628
steve@gerbsmanpartners.com

Jason Gerbsman
+1 646 326 9716
jason@gerbsmanpartners.com

Gunnar Ostergren
+1 415 205 5700
gunnar@gerbsmanpartners.com

Motti Abramovitz
+972 54 774 762
motti@gerbsmanpartners.com

Patric Carlsson
+1 415 244 5018
patric@gerbsmanpartners.com