

Socioeconomic Benefits of Bulgarian Fiber Broadband



by Benoît Felten | January 2010

In September 2009, the Fiber to the Home Council Europe commissioned a study of the Bulgarian fiber market to evaluate the impact of the FTTB offerings in this country. The qualitative and quantitative study was undertaken by Yankee Group and Stratix Consulting between September and December 2009. The present document describes the main results and examines in particular the socioeconomic impacts of FTTB on Bulgarian broadband users.

Executive Summary

The Bulgarian broadband market is atypical in that some of the trends that have been emerging slowly in developed markets over recent decades seem to have played out much faster in Bulgaria. While the country still ranks last in broadband penetration in the EU, the growth in broadband penetration has been strikingly fast in the last few years and has been driven mostly by fiber connectivity. Fifty-five percent of Bulgarian broadband customers enjoy speeds in excess of 10 Mbps, and according to our survey results, approximately 30 percent have fiber to the building (FTTB).

This fast development of FTTB is due in part to the reluctance of incumbent Vivacom to allow any form of unbundling, as well as to the loose regulatory framework around physical network deployment. This has allowed a large number of small entrepreneurs to deploy fiber connectivity to buildings in their own neighborhoods and provide end-users with high-quality connectivity.

To assess the impact of FTTB on socioeconomic well-being in Bulgaria, the Fiber to the Home Council commissioned this study, composed of a quantitative survey administered to over 500 Bulgarian broadband users and complemented by a number of interviews with Bulgarian broadband experts and government officials.

The survey results show that beyond driving broadband availability, FTTB contributes significantly to the well-being of Bulgarian subscribers by providing a higher quality of service.

The survey clearly demonstrates that FTTB users are the most satisfied with their connectivity. Close to 85 percent of FTTB users are satisfied with their broadband, whereas that number is only 75 percent for cable users and 60 percent for DSL users. The differences are even more striking when looking at users who are very satisfied with their connection. Additionally, customers of large FTTB service providers are even more satisfied overall. Also, FTTB users spend more time actually using their broadband, even though the nature of their usage is not significantly different from that of other broadband users.

Connectivity is very important to Bulgarians in their work life: More than 30 percent of employed respondents claim to work from home very often, which suggests that a large proportion of professionals use the Internet as a work tool. A higher proportion of FTTB users work from home often or always (57 percent as opposed to 53 percent), which suggests that FTTB encourages smart working patterns and less commuting. Furthermore, FTTB users attribute more importance to the quality of their broadband when it comes to deciding to work from home.

Another area where broadband affects behavior is in choice of residence, where a majority of Internet users—especially the most experienced ones—state that the quality of available connectivity impacts where they choose to live.

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Overall, a majority of Bulgarian Internet users believe that the Internet plays an important role in most aspects of their lives: education, professional occupation, living standard, social life and overall quality of life. Regarding all of these aspects except education, FTTB users rate their quality of life higher than users who don't have FTTB. This highlights a likely correlation between FTTB and quality of life, especially since FTTB services in Bulgaria are not significantly more expensive than other broadband services and, in some instances, are even cheaper.

This survey establishes a strong connection between fiber broadband and improved quality of life for Internet users in Bulgaria today and suggests that as usage matures, the contribution of fiber broadband to quality of life can only increase.

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I. About This Study

This study was commissioned by the FTTH Council Europe's Market Intelligence Committee. The study was carried out by Yankee Group in cooperation with Stratix Consulting and ISOC-Bulgaria in the period between September 2009 and November 2009. The key objectives of the study were to assess the extent and impact of FTTB broadband in Bulgaria and its socioeconomic benefits. Key hypotheses the study aimed to test include:

- FTTB has an impact on well-being and quality of life
- FTTB users are more likely to be working (at least part time) at home
- The availability of FTTB is an important factor in how Bulgarians choose their place of residence

The main methodological approach was to compare the socioeconomic situations of Internet users in Bulgaria by making a distinction between users of FTTB and other types of connections. Research methods have been primarily focused on data collection through the deployment of an online Web survey. In addition, a number of face-to-face interviews with key experts in Bulgaria were undertaken to form a better understanding of context and add qualitative elements to the picture.

To ensure a high quality of output, a Bulgarian-language online survey was deployed with a local partner, ISOC-Bulgaria. The questionnaire addressed various topics related to the Internet situation and habits of the respondents and how these might contribute to their current socioeconomic well-being. The survey ran for a period of six weeks and was promoted through various channels including news releases, social networking sites, Internet portals and iCentres Bulgaria.

Six qualitative face-to-face interviews were conducted with experts in Bulgaria. The main topics for the interviews were the change in socioeconomic condition as a result of the emergence of broadband infrastructure, as well as the way FTTB has developed in the country in contrast with the generic broadband competitive landscape. Local key experts included government representatives, network operators and research institutes. A list of the names and titles of the interviewees can be found in Appendix A.

Our Interest in Studying Bulgaria

The emergence of Bulgarian broadband—in particular of fiber connectivity—has been extremely swift. The combination of this fast fiber-led growth and the general status of Bulgaria as an underserved broadband market by EU standards makes this country an interesting target for an in-depth study. The FTTH Council's interest is in understanding how the fiber deployment has happened, how the Bulgarian population adopted the resulting offerings and how Bulgarians see fiber broadband contributing to their socioeconomic welfare.

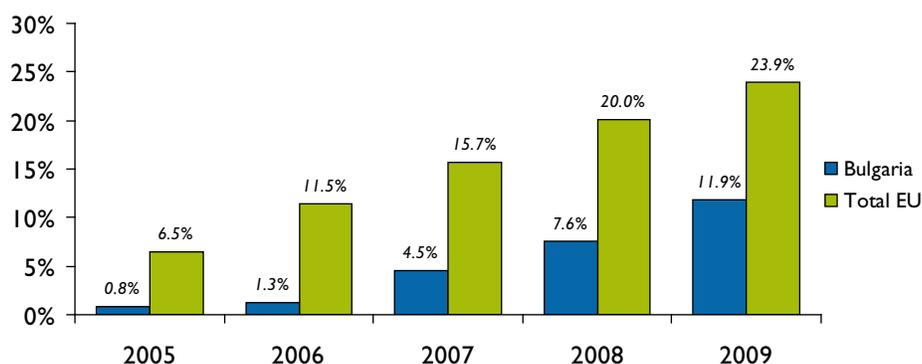
II. The Bulgarian Broadband Market

Explosive Growth Can Be Largely Attributed to Fiber-Based Connectivity

Compared to other countries in the EU, the information society in Bulgaria is still at a relatively early stage of development. In 2005, the broadband market in Bulgaria was nearly nonexistent, and broadband penetration stood at less than 1 percent (see Exhibit 1).

Exhibit 1: Fixed Broadband Subscriber Lines as Percentage of Population, 2005–2009

Source: CRC, Eurostat and Yankee Group, 2009



The main reasons for the nonexistent broadband market were the lack of availability and lack of affordability of broadband access in Bulgaria. Furthermore, low purchasing power among Bulgarian households hampered their ability to buy IT products and services. According to the National Institute of Statistics (NSI) of Bulgaria, less than 15 percent of Bulgarian households owned a computer before 2005.

In the years following 2005, however, Bulgaria experienced a steady take-up of broadband subscriber lines and, in particular, high-speed broadband lines. The total number of fixed broadband subscriber lines amounted to nearly 900,000 in the second half of 2009. However, according to interviewed experts, the actual number is probably higher since a significant part of the sector is still not regulated and therefore might not be included in official statistics.

The steady growth of broadband subscriber lines and emergence of high-speed offerings can be mainly attributed to the efforts of local broadband LAN services providers. Their service answers the growing need among users for an affordable broadband product, with high speeds and quality of connections. In recent years, broadband LAN has developed into the dominant type of access technology in use.

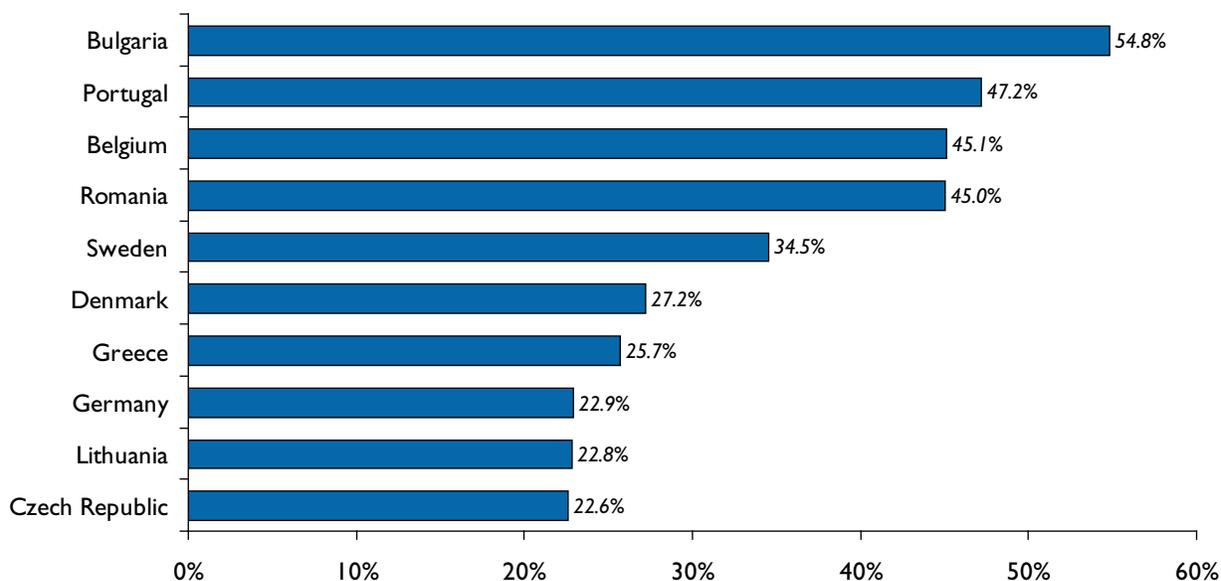
Today, about 91 percent of all fixed subscriber broadband lines offer service over 2 Mbps, and nearly 55 percent exceed speeds of 10 Mbps, making Bulgaria the leading member state in the EU regarding local penetration of over 10 Mbps lines (see Exhibit 2).

One of the main causes for this market situation has been the dominant position of formerly state-owned incumbent BTC (now Vivacom), which stalled the deployment of xDSL up to 2005. For years, the fixed telecommunications market in Bulgaria has been characterized by limited competition and the clear dominance of the incumbent, even after the market was liberalized in 2002 and BTC was privatized in July 2004. Because access to the copper and duct networks was impossible, ISPs and CATV firms decided to find their own way to launch broadband with self-constructed small aerial cable networks.

At the start, these networks were built on an amateur basis and with minimal regulation by local or national government(s), resulting in a situation where LAN operators deployed their cables in the private domain by spanning overhead cables across the gaps of apartment blocks. In other cases, they have accessed the incumbent's ducts without any authorization or payment.

Exhibit 2: Top 10 EU Countries by Percentage of Fixed Broadband Lines Over 10 Mbps

Source: EC and Yankee Group, 2009



Note: Missing countries have no official statistical reporting of fixed broadband lines by bandwidth capacity.

These amateurish methods of network deployment and the low level of regulation kept building and operational costs low and were key drivers in the fast increase in the number of LAN operators and subscribers.

Today, there are nearly 670 official ISPs that provide broadband LAN Internet access throughout Bulgaria, but interviewed experts have indicated that the actual number is close to 2,000. These unregistered ISPs, however, mostly operate on a very local basis and usually do not serve more than a few dozen subscribers each.

What Is Broadband LAN?

Broadband LAN is a broadband solution where fiber cabling runs up to a switch located in or near a residential building from which homes are connected via Category 5 LAN cables. For the most part, this type of Internet access is compatible with what the FTTH Council defines as FTTB; however, it does not match the definition in terms of the number of buildings served by a single switch.

Whereas FTTB is defined as a communications architecture handling communications for a single building, broadband LAN often serves more than one building. The number of buildings served depends on the type of buildings, e.g., house or high-rise.

Despite the difference in architecture between the FTTH Council's definition of FTTB and broadband LAN, comparable service levels can be achieved in terms of both bandwidth and symmetry. We estimate that all respondents with a broadband LAN connection of 20-plus Mbps are effectively FTTB users.

There are three main kinds of services provided by LAN operators: Internet access, IPTV and VoIP. The primary service used by clients is high-speed Internet access. Typically, symmetrical Internet services are provided with speeds of 2 Mbps up to 100 Mbps, but various options with different service characteristics are offered, depending on the provider's geographic location and the preferences and needs of the corresponding category of customers.

Broadband LAN offers the same speed as DSL and cable for comparable or lower prices, making it a slightly cheaper alternative to other broadband products. Appendix B shows a price comparison for the different broadband products, broken down by connection speed.

The Bulgarian Government Tries to Boost Internet Literacy as Availability Grows

Despite increasing availability and take-up of broadband, lack of computer and/or Internet skills among Bulgarians remains high. Survey statistics from the NSI of Bulgaria show that computer ownership in Bulgarian households in 2006 was only 21 percent compared to the EU average of 60 percent. The same survey found that 66 percent of the population has no Internet skills, compared to the EU average of 40 percent. Discussions with Bulgarian experts confirm that the availability of computers and IT skills among the population remains low, especially in the rural areas of Bulgaria.

Realizing the need for better IT skills, the Bulgarian government, together with other organizations, started a series of skill-development projects. In our interviews with Bulgarian broadband experts and government officials, the following projects were mentioned:

- **The iCenters Project:** Set up in 2006, this collaboration between the government of Bulgaria and the United Nations Development Programme (UNDP) provides IT-related services to users in small or economically underdeveloped communities.
- **The home Internet for teachers project:** In this project, the Ministry of Education and Science provides teachers a monthly reimbursement for Internet access at home.
- **The SELF project:** Initiated by ISOC-Bulgaria among others, this project aims to provide a platform for the collaborative sharing and creation of free educational and training materials on free software and open standards.

Market Consolidation and User Maturity Will Drive Expansion

The Bulgarian broadband market has started to consolidate, and this trend is expected to continue. In the past few years, several of the smaller networks have merged or have been taken over by larger operators. Cable operators have been the main drivers of consolidation, taking over companies providing broadband services via LAN networks in order to provide Internet services with speeds that, due to technical restrictions, could not be attained through their own networks.

Another important driver for the current industry consolidation has been the new constraints laid down by regulator CRC, which forces LAN operators to lay their fiber-optic cables underground. Before 2009, no measures had been taken to overcome the unregulated situation, but new legal amendments have given the CRC the right to fine ISPs for cables that run through the air. Since the beginning of 2009, many ISPs have already been fined.

In addition, there are signs that government IT stimuli programs are paying off. The home Internet for teachers project has been a success and has greatly boosted teachers' interest in using ICT. According to Orlin Kouzov, CEO of the ICT in Education Directorate at the Ministry of Education and Science, there were nearly 47,000 teachers participating in the project at the time of this writing. The largest Bulgarian training program, developed and implemented by iCentres, has been successful and so far has educated about 45,000 civil servants in basic IT skills.

Nevertheless, as our study demonstrates, user maturity among Bulgarian Internet users remains limited—most people use their connections mainly for leisure and information searches. But the signs of a shift toward experienced users are also visible.

III. Survey Results

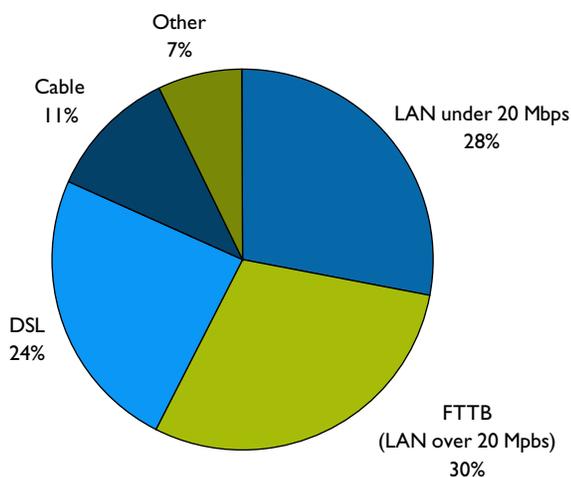
In cooperation with the Bulgarian chapter of ISOC, our survey was promoted in Bulgaria with press releases in national newspapers and exposure through online media such as blogs and social networks. This generated a large number of responses to the survey, providing a sample of 513 valid responses. Responses were carefully screened to exclude respondents who were not originally targeted (such as Bulgarian nationals residing abroad).

The main target group for the survey was Bulgarian citizens with an Internet connection at home, allowing for comparisons between different Internet access technologies. Demographics for the survey sample can be found in Appendix C.

Not surprisingly for an emerging market, respondents showed characteristics of early adopters (higher-than-average income, mostly urban, higher-than-average level of education, and so on). Overall, though, survey results on the distribution of Internet access technologies, as depicted in Exhibit 3, closely follow Bulgarian national statistics. This suggests that the survey sample is an accurate representation of the subset of the Bulgarian population that has an Internet connection at home.

Exhibit 3: Breakdown of Internet Access by Technology for Survey Respondents

Source: Yankee Group and Stratix Consulting



Fiber-Based Connections Provide the Highest Internet Service Speeds

As expected, fiber-based broadband LAN provides the highest connection speeds. A large majority of high-speed Internet services of over 20 Mbps in Bulgaria is provided via broadband LAN. For this study, we treat all respondents with broadband LAN Internet access with speeds of over 20 Mbps as FTTB users. An overview of connection types and connection speeds is provided in Exhibit 4. More than half (54 percent) of broadband LAN connections have download speeds of over 20 Mbps.

These results are corroborated by external broadband quality studies in which Bulgaria, and in particular Sofia, are reported to have some of the highest quality broadband in the world (see Oxford University's September 2009 Saïd Business School "[Broadband Quality Study 2009](#)").

Exhibit 4: Internet Access Technology and Download Speeds

Source: Yankee Group and Stratix Consulting

	DSL	Cable	Broadband LAN
Under 20 Mbps	84%	80%	46%
20 Mbps or higher	16%	20%	54%

Bulgarian Fiber Is a Mostly Urban Phenomenon Adopted by Younger Users

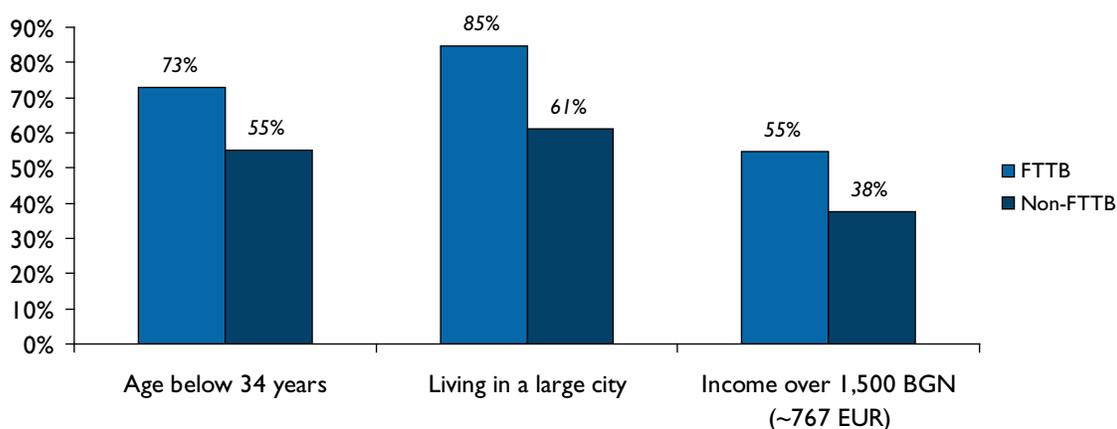
There are significant demographic differences between respondents who use FTTB and respondents who use another type of Internet access. Respondents with FTTB tend to be relatively younger, live more often in large cities and have a higher income. A schematic overview of these differences is provided in Exhibit 5.

FTTB Customers Are More Satisfied with Their Service and Use It More

Exhibit 6 presents survey results on customer satisfaction for different types of Internet access technology. It shows that respondents who use FTTB services are more satisfied with their Internet connection as compared to respondents with traditional broadband technologies, DSL and cable. In particular, the percentage of respondents who are very satisfied with their Internet connection is much higher for FTTB (49 percent) compared to DSL (13 percent) and cable (14 percent).

Exhibit 5: Breakdown of Respondents' Demographics by Internet Service Type

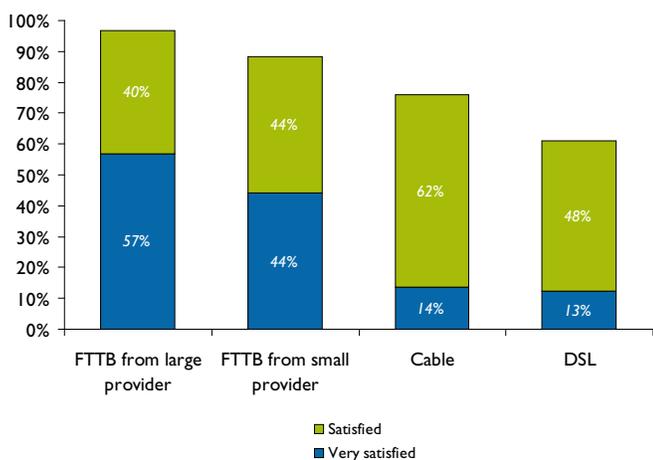
Source: Yankee Group and Stratix Consulting



Interestingly, large FTTB service providers outperform small FTTB service providers on customer satisfaction. Exhibit 6 shows that the top three FTTB providers in Bulgaria have higher customer satisfaction rates than smaller FTTB providers, which in some cases only serve a single neighborhood. This suggests that consolidation in the market will have a positive effect on quality of service.

Exhibit 6: Customer Satisfaction for Different Types of Internet Access

Source: Yankee Group and Stratix Consulting



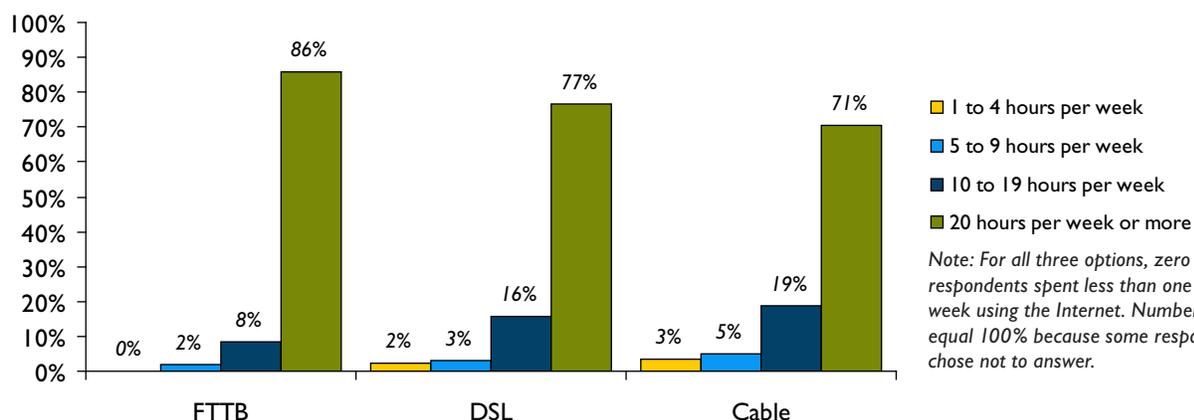
A breakdown of time spent on the Internet for each of the main types of Internet access technology is presented in Exhibit 7. Overall, Bulgarians with Internet access at home spend a lot of time on the Internet: More than 75 percent spend over 20 hours a week online. This is not necessarily surprising if, as we surmise, customers of broadband in Bulgaria are mostly early adopters. The exhibit also shows that respondents with FTTB Internet service tend to spend more time on the Internet than users of other Internet access types: Eighty-six percent of FTTB users spend more than 20 hours per week on the Internet, compared with 71 percent of cable users and 77 percent of DSL users.

Usage Maturity Is Still Limited

A breakdown of Internet applications used by respondents with FTTB Internet service and those with other types of Internet service is presented in Exhibit 8 on the next page. In general, the usage of Internet applications does not differ much between respondents with FTTB and respondents with other types of Internet access. The few instances where there was significant difference are highlighted.

Exhibit 7: Time Spent on the Internet for Different Types of Internet Access

Source: Yankee Group and Stratix Consulting



Note: For all three options, zero percent of respondents spent less than one hour per week using the Internet. Numbers do not equal 100% because some respondents chose not to answer.

Exhibit 8: Frequent Usage of Internet Applications, with a Breakdown Between FTTB and Non-FTTB Users

Source: Yankee Group and Stratix Consulting

<i>Communications</i>	<i>Internet Access</i>	
	FTTB	Non-FTTB
Telephoning over the Internet (e.g., Skype, Google Talk)	55%	55%
Video communications (via webcam) over the Internet	23%	32%
<i>Occupation</i>		
Remotely log in on a company network	45%	31%
Looking for a job or sending a job application	24%	28%
<i>Education</i>		
Doing an online course (in any subject)	10%	9%
Downloading course material (documents, books, presentations)	67%	62%
Learning from a distance (attending lectures by means of video conferencing)	5%	6%
<i>Entertainment</i>		
Online gambling (e.g., poker, blackjack, sports betting, etc.)	5%	3%
Playing games over the Internet (not gambling)	20%	23%
Listening to music or watching video online (e.g., Web radio, Web TV, YouTube, etc.)	70%	58%
Downloading large files (video, games, software)	68%	61%
Uploading self-created content to a Web site to be shared (text, images, video, music, etc.)	37%	36%
<i>Public Services</i>		
Searching for information on public authority Web sites	33%	43%
Downloading official documents from public authority Web sites	26%	30%
Electronic filling out and submitting of official documents from public authority Web sites	17%	16%
Seeking health-related information (e.g., injury, disease, nutrition, improving health, etc.)	35%	35%

Respondents with FTTB tend to engage more often in entertainment activities—like playing music or video—and downloading large files. They also use their Internet connections more often to log in to a company network. On the other hand, respondents with FTTB use the Internet for video communications and searching for information on public Web sites less often. The relatively small differences in usage are an indication of a lack of usage maturity, as users with broadband (whether FTTB or not) learn to use the Internet generically before they start testing their access lines to their limits with more focused (and demanding) applications and services.

Overall, Internet activity in Bulgaria remains relatively unsurprising, with key usages being work, entertainment and information searching. This and the fact that bandwidth intensity of applications does not seem to be a distinctive factor in Internet activity between different types of connections suggest that Internet usage and services in Bulgaria are in an early stage of maturity. Interviews with local experts Spass Kostov (National iCentres Association), Georgi Prangov (Department, Policy and Development of Information Society) and Todor Yalamov (Applied Research and Communications Fund) support this image of underdeveloped

Internet usage in Bulgaria with observations of entertainment-driven Internet behavior and a lack of advanced Internet services, such as e-health and e-education.

These observations are corroborated by survey results on the main purpose of the respondents' home computers, as shown in Exhibit 9. Again, differences in the type of connection have little to no effect on the result, whereas experience with an Internet connection at home has a significant effect. Respondents who have had Internet access at home for over five years more often list work as the main purpose of their computer and less often find entertainment an important purpose. This suggests early adoption of the Internet is more leisure-driven, while more vital uses emerge with maturity.

Another sign that the Internet market in Bulgaria has not yet matured is the fact that selection of the type of Internet access is mainly driven by fundamental characteristics like stability and availability of the connection. Differentiating properties like download speed, upload speed and price are less important, as can be derived from Exhibit 10 on the next page.

Exhibit 9: Most Important Purposes of the Home Computer

Source: Yankee Group and Stratix Consulting

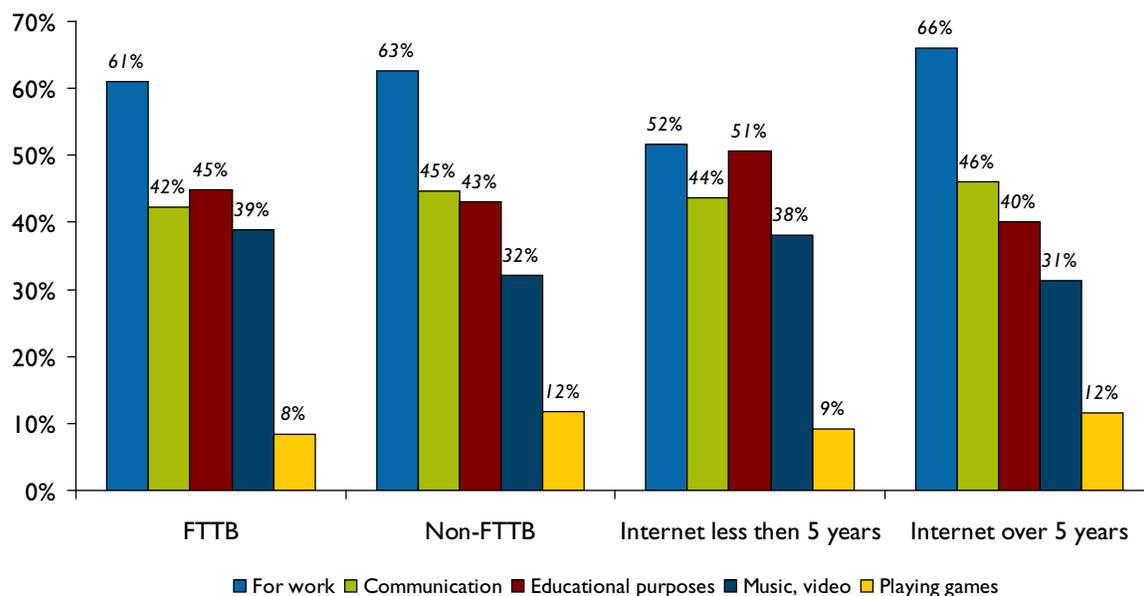
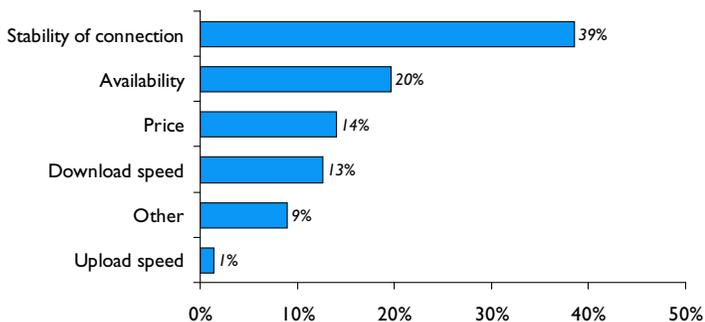


Exhibit 10: The Most Important Factor in Selecting the Current Internet Connection

Source: Yankee Group and Stratix Consulting



Note: Numbers do not equal 100% because some respondents chose not to answer.

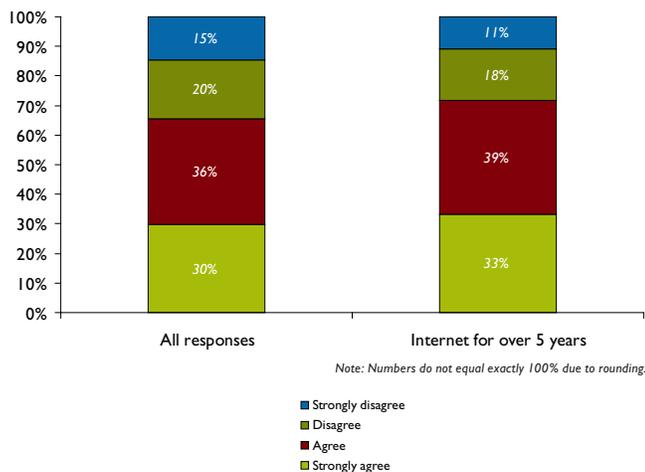
High-Quality Broadband Impacts Customers' Choice of Residence and Decision to Work from Home

A majority of respondents agreed with the statement that availability of high-speed Internet access is an important factor in their choice of residence, as presented in Exhibit 11. This is even more the case for respondents who have had Internet access at home for over five years. This result suggests that dependency on Internet access grows with the amount of experience one has in using the Internet.

Exhibit 11: Importance of High-Speed Internet in Choice of Residence

Source: Yankee Group and Stratix Consulting

Availability of a high-speed Internet connection affects choice of residence



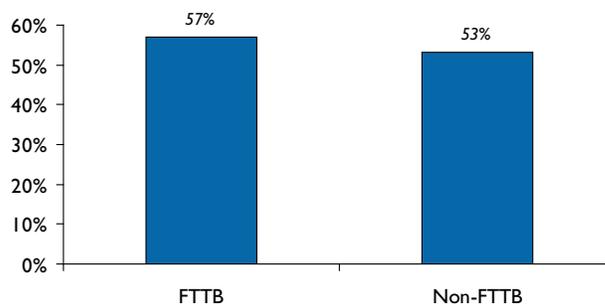
Note: Numbers do not equal exactly 100% due to rounding.

Exhibit 12 and Exhibit 13 present results for the frequency with which employed respondents work at home and how important their Internet connection is when doing so. A larger percentage of respondents with FTTB-type Internet services work at home often or always (57 percent), compared to respondents with other types of Internet access (53 percent). Also, respondents with FTTB services consider their Internet connection to be significantly more important when working at home.

Exhibit 12: Frequency of Working at Home, with Breakdown by FTTB and Non-FTTB Internet Services

Source: Yankee Group and Stratix Consulting

Percentage of respondents who often or always work from home

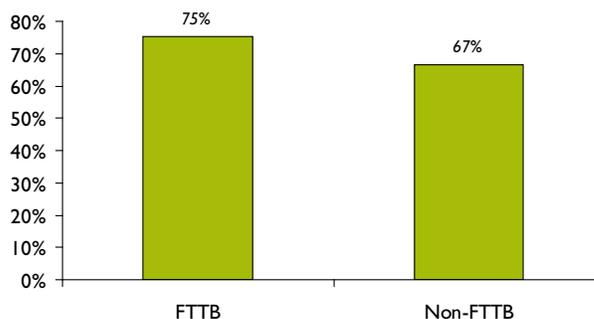


Overall, the majority of respondents consider their Internet connection to be very important when working at home. This suggests that for many Bulgarians, a reliable Internet connection is a prerequisite for working at home.

Exhibit 13: Importance of Internet Connection for Working at Home, with Breakdown by FTTB and Non-FTTB Internet Services

Source: Yankee Group and Stratix Consulting

My Internet connection is important when I work at home (Percentage of respondents who strongly agree)



Bulgarians Say the Internet Contributes Strongly to Their Well-Being

When asked whether they consider Internet access to be a contributing factor to important aspects of their lives, the majority of respondents agree that the Internet is indeed important (see Exhibit 14). In particular, many respondents consider Internet access to be important for their occupation and education. A total of 77 percent of respondents agree that Internet access is an important factor in their overall quality of life.

Considering the fact that Bulgaria is an underserved country and Internet usage has not yet matured there, this result suggests a huge potential for generating socioeconomic benefits from expanding the penetration of high-quality broadband access and services there.

When asked to rate certain aspects of their life and well-being, respondents with FTTB Internet services rate almost every aspect of their life higher than do respondents who have other types of Internet access (see Exhibit 15). For their overall quality of life, respondents with FTTB rate themselves almost an entire point higher than non-FTTB respondents (over 13 percent differential). Furthermore, Exhibit 16 on the next page shows that respondents with FTTB perceive that their life has improved in the past five years more often than respondents without FTTB.

Exhibit 15: Respondents' Average Ratings of Certain Aspects of Their Lives, with Breakdown by FTTB and Non-FTTB Internet Services

Source: Yankee Group and Stratix Consulting

Indicate how satisfied you are with each of the following aspects of your life on a scale from 1 to 10, with 1 being extremely dissatisfied and 10 being completely satisfied.

	FTTB	Non-FTTB
Overall quality of life	6.8	6.0
Education	7.1	7.4
Occupation	7.6	7.1
Living standard	6.5	5.6
Social life	6.7	5.8
Health	7.7	7.2

Note: Overall quality is a separate rating, not an average of the other ratings.

Although causality cannot be established for these results, they do suggest that there is some relation between access to FTTB Internet service and a person's quality of life.

Exhibit 14: Perceived Importance of Internet in Certain Aspects of Life

Source: Yankee Group and Stratix Consulting

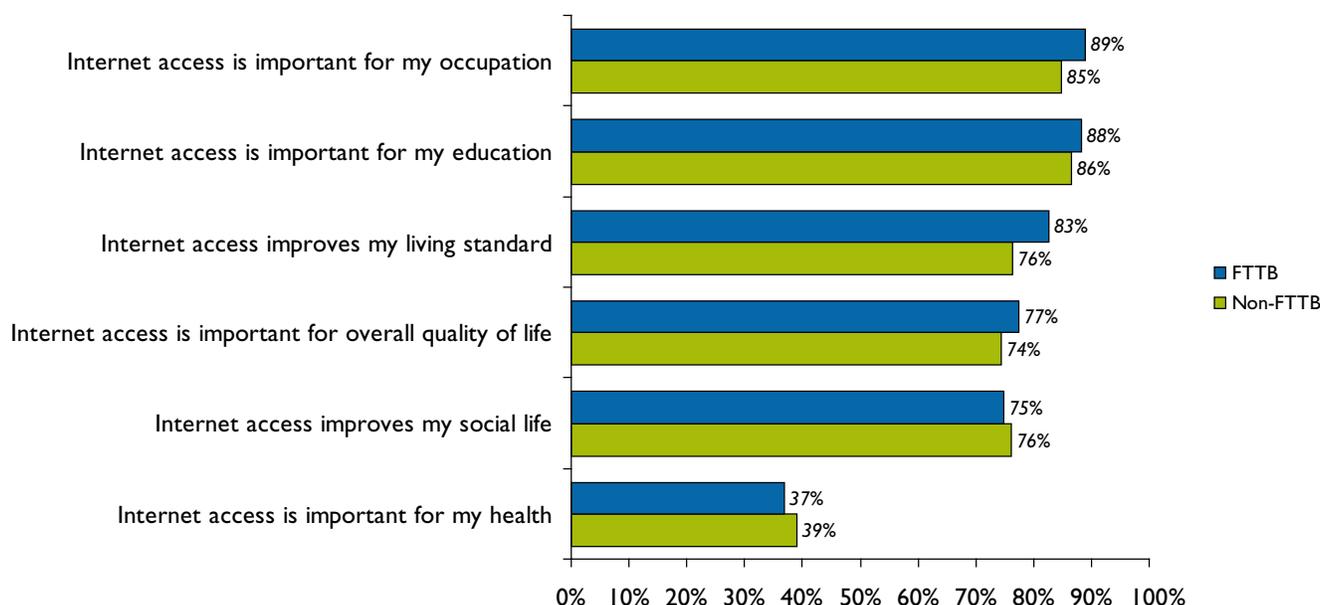
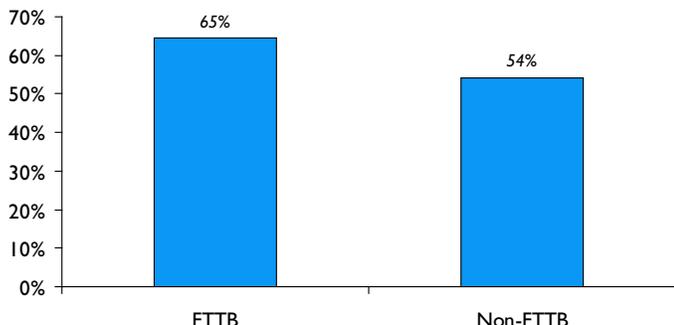


Exhibit 16: Perceived Improvements in Quality of Life, with Breakdown by FTTB and Non-FTTB Internet Services

Source: Yankee Group and Stratix Consulting

*How does your current life compare to your situation five years ago?
(Percentage of respondents who answered “better” or “much better”)*



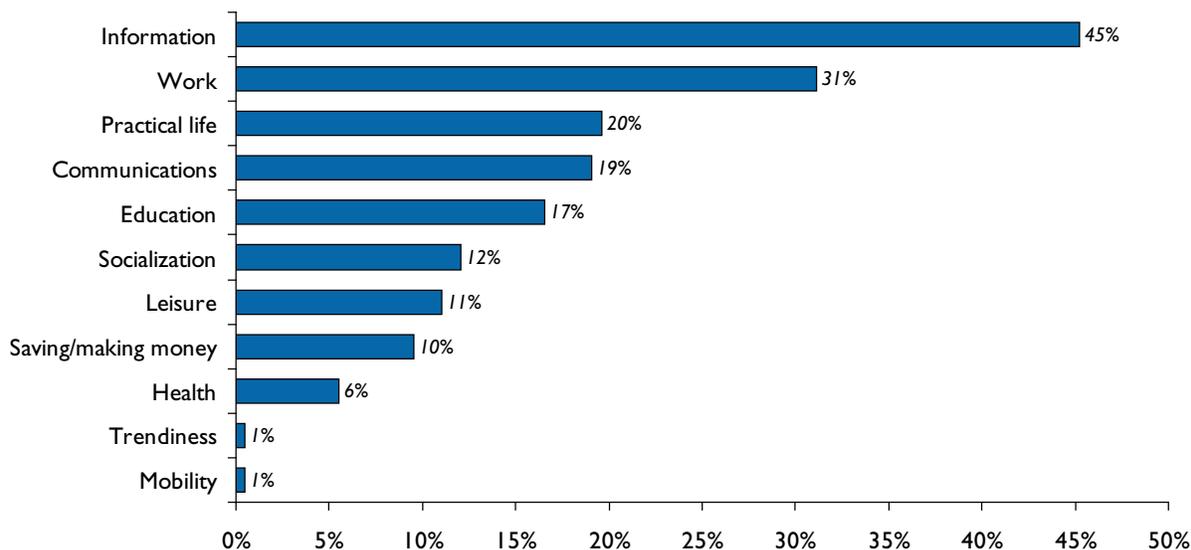
The final question of the survey asked respondents to give an example of how the Internet has improved their life. An impressive 200 out of the total of 513 respondents were able to give such an example. Many themes recurred throughout these examples, and we aggregated and counted them (see Exhibit 17).

The most frequently mentioned topics were access to information and the importance of the Internet in people’s occupations. Again, these might not be the most advanced types of Internet applications, but Bulgarian people value them greatly.

Exhibit 17: Most Common Topics Listed in Examples of Internet’s Impact on Respondents’ Lives

Source: Yankee Group and Stratix Consulting

Can you give one example of how the Internet has improved the quality of your life?



IV. Conclusions

The development of Bulgarian broadband connectivity, and particularly the role played by FTTB connectivity in increasing service penetration, is a result of both national specificities (lack of established competition to incumbent operator, limited regulatory framework regarding network deployment, etc.) and the relative lateness of broadband deployment. This allowed the Internet to be deployed over fiber when the technology was already mature. As such, it might be a replicable model, but most likely only in other emerging markets. There is evidence that other Eastern European countries, in particular Romania, might be going down a similar path.

Clearly, though, the development of FTTB in Bulgaria has contributed more than just availability of broadband. Key findings from this study include:

- **Broadband contributes strongly to quality of life, and fiber broadband even more so.** What is quite clear from the quantitative survey undertaken as part of this study is that Bulgarian Internet users are convinced that broadband has contributed to their well-being in many ways, and particularly that it has enhanced their professional lives and opportunities. This perception is even more tangible for FTTB users, suggesting that the quality and speed of the access provided (in the absence of more advanced services that would require FTTB to operate) have an impact on well-being.
- **Quality of broadband is significantly higher for FTTB.** Perceived quality of broadband is clearly more pronounced for FTTB, which in itself might partly explain the contribution of FTTB to perceived well-being. Furthermore, perceived FTTB quality from large providers is even higher, suggesting that as the Bulgarian market matures and consolidates, the perception of quality will be even more sharply differentiated between FTTB and other access methods.
- **FTTB connectivity encourages working from home.** People connected to FTTB were significantly more likely to be working from home (part time or full time). This highlights a connection between FTTB and sustainable business (with less private transportation to and from work) as well as quality of life and entrepreneurship.
- **A majority of Bulgarians believe that quality of broadband connectivity influences their choice of residence.** Highlighting again the importance of broadband in quality of life, a majority of Bulgarians indicate that the quality of available broadband affects or will affect their choice of residence. This is even truer for experienced Internet users, who stress the fact that high-quality broadband is no longer perceived as a luxury in Bulgaria and that experienced users value it even more.

In the study of socioeconomic benefits of FTTH users in Sweden undertaken by the FTTH Council in 2008, the difference in socioeconomic benefits between DSL and FTTH users was much less significant, suggesting that in an emerging market the impact of high-quality broadband might be higher. That said, a number of trends measured in the 2008 study have been verified in Bulgaria:

- The fact that FTTH users in Sweden worked from home more often was verified with FTTB users in Bulgaria.
- Customer satisfaction from FTTH or FTTB is really high, as was verified in both surveys.
- FTTH and FTTB users experience and expect significant quality-of-life benefits from their high-quality broadband.

In the case of Bulgaria, the prospect of further and even more tangible socioeconomic benefits is high. The Bulgarian authorities have understood this well. Several initiatives have been highlighted here that show that the government has approached these issues actively and pragmatically, with measurable results. As usage matures through experience and the acceleration of connectivity and literacy, it is likely that the socioeconomic benefits already visible through this study will amplify, making Bulgaria a very interesting blueprint for accelerated high-speed broadband development through fiber.

Appendix A

Interviewed Bulgarian Broadband Experts and Government Officials

Orlin Kouzov, CEO, ICT in Education Directorate, Ministry of Education and Science

Professor Roumen Nikolov, Ph.D., Sofia University; computer science and education expert

Spass Kostov and Angel Panov, National iCentres Association and National Research and Education Network of Bulgaria

Dimitar Ganchev, product development manager, Neterra (a backbone ISP); and Traycho Puliiski, owner, small E-LAN ISP to towns/villages 10 kilometers from Sofia

Georgi Prangov, acting head of department, Policy and Development of Information Society, Ministry of Transport

Todor Yalamov, coordinator, IT Group, Applied Research and Communications Fund; socioeconomic development and statistics expert

Appendix B

Breakdown of Broadband Prices by Technology and Connection Speed

Source: ISOC-Bulgaria

	DSL*	Cable*	Broadband Fiber
Up to 2 Mbps	N/A	N/A	~ 15 BGN (~8 EUR)
Up to 10 Mbps	~ 20 BGN (~10 EUR)	~ 20 BGN (~10 EUR)	~ 20 BGN (~10 EUR)
Up to 20 Mbps	~ 25 BGN (~13 EUR)	~ 30 BGN (~15 EUR)	~ 22 BGN (~11 EUR)
Up to 30 Mbps	N/A	N/A	~ 28 BGN (~14 EUR)
Up to 40 Mbps	N/A	N/A	~ 36 BGN (~18 EUR)
Up to 50 Mbps	N/A	N/A	~ 45 BGN (~23 EUR)

* Excluding telephone subscription of 12 BGN (~6 EUR) per month

* Excluding television services of 15-20 BGN (~8-10 EUR) per month

Appendix C

Survey Demographics

Source: Yankee Group and Stratix Consulting

Age

Under 16	0%
16 - 24	16%
25 - 34	45%
35 - 44	21%
45 - 54	10%
55 - 64	5%
65 or older	2%

Highest education in household

No education completed	0%
Primary school	0%
Lower secondary education	0%
Upper secondary education	7%
Professional education for adults	7%
Bachelor's or master's degree	78%
PhD and higher	7%

Employment status

Employed	65%
Self-employed	11%
Unemployed	6%
Student without job (<15 hrs p/w)	8%
Student with job (>15 hrs p/w)	4%
Retired	2%
Other	3%

Living area

Open countryside	1%
Village	5%
Small city (<50k)	15%
Medium city (50k -100k)	6%
Large city (>100k)	73%

Income (BGN)

Less than 300 (~153 EUR)	2%
301-600 (~154-307 EUR)	9%
601-1,000 (~307-511 EUR)	22%
1,001-1,500 (~512-767 EUR)	19%
Over 1,500 (~767 EUR)	48%

Number of FTTB connections

FTTB access	155
Non-FTTB access	317
Unknown	33
No Internet connection	8

Yankee Group—the global connectivity experts

The people of Yankee Group are the global connectivity experts—the leading source of insight and counsel trusted by builders, operators and users of connectivity solutions for nearly 40 years. We are uniquely focused on the *evolution of Anywhere*, and chart the pace of technology change and its effect on networks, consumers and enterprises. For more information, visit <http://www.yankeegroup.com/>.

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Yankee Group Link

Yankee Group Link membership brings clients the insight, analysis and tools to navigate the global connectivity revolution. It provides timely, actionable and accessible research and data that analyze the impact of connectivity and the transformation it will create in driving enterprises and consumers to an Anywhere society. The result is an experience that no other market research firm can provide.

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Yankee Group's qualitative research forms the core of our offerings, with analysis focused exclusively on the transformational effects of the connectivity revolution. Our research reports arm you with the insight and analysis to make the right decisions today and tomorrow.

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Yankee Group's quantitative data analysis includes monitors, surveys and forecasts. Together with Link Research, our data connects you to the information you need to make the most informed strategic and tactical business decisions.

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