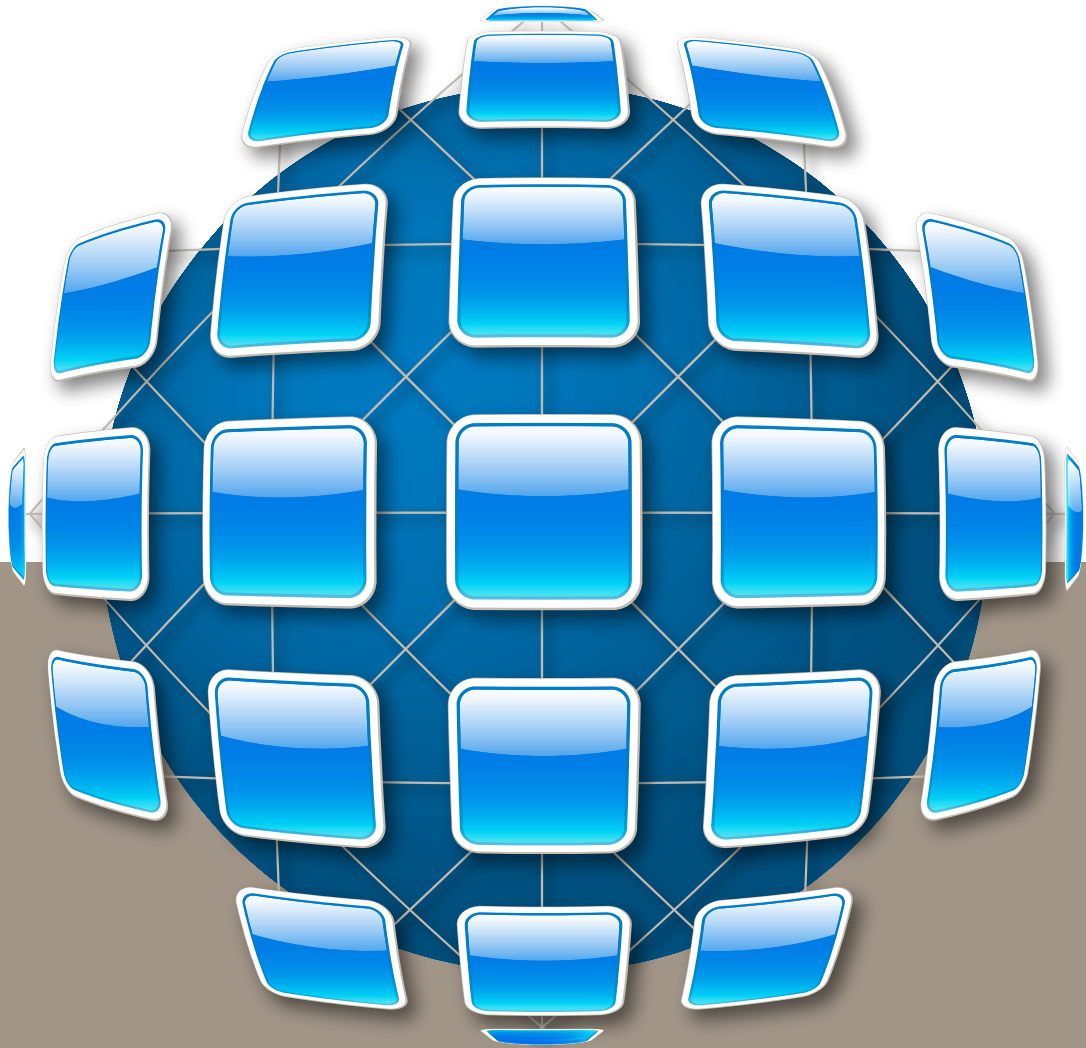
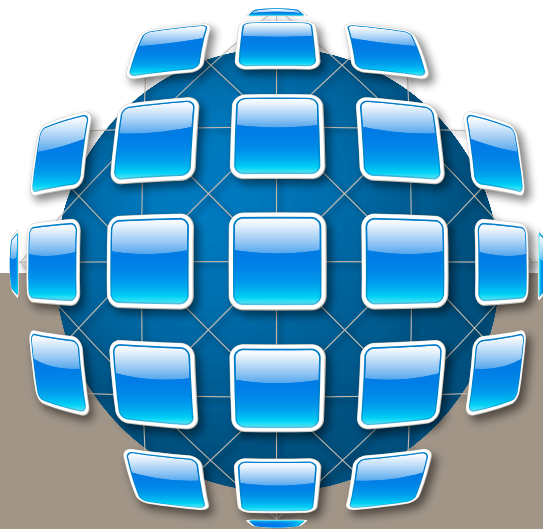


The German Internet Industry 2009–2012



Review, Trends, and Drivers



Executive Briefing

The joint study carried out by eco – Association of the German Internet Industry and Arthur D. Little systematically records the German Internet industry for the first time. Using the ADL-eco layer model, it sheds light on the complexity as well as the size of the industry and covers important indicators pertaining to the future development of market segments.

Four interconnected layers explaining the division of labor and value-added chains are identified and described in detail. In order to determine the indicators for the particular segments, a quantitative online survey was carried out. The study is the first

to show both current market development possibilities and interconnections by systematically breaking down the Internet industry.

Another part of the study examines trends and market development drivers in the Internet industry. These were identified and analyzed in interviews with carefully selected industry experts. Besides technical innovations such as IPv6, the study sheds light on the topic of open innovation and the effects of changing user behavior. As part of the analysis, the study pinpoints questions pertaining to the potential for change in these areas.

Contents	
Executive Briefing	2
Foreword	4
Greeting	6
1. Introduction	8
2. German Internet Industry Review 2009: Market Segments & Players	12
2.1 Market Segment Delimitation	12
2.2 Size of the Internet Industry	14
2.3 Business Climate in the Internet Industry	16
3. Market Indicators for the German Internet Industry Segments	17
3.1 Internet Backbone	18
3.2 Mobile Telephony Access Networks	22
3.3 Fixed Network Access Networks	25
3.4 Internet Access	27
3.5 Internet Exchanges	29
3.6 Housing/Hosting	31
3.7 Domain Service Provider	33
3.8 Online Applications	35
3.9 Online Advertising	38
3.10 Online Platforms and Web Portals	41
3.11 E-commerce	43
3.12 Internet Content	47
4. Trends and Market Development Drivers	49
4.1 IPv6 – Benefits for the Economy and Consumers	49
4.2 Open Innovation	52
4.3 Usage Trends and Effects	56
4.3.1 Current Developments	56
4.3.2 Mobilization of the Internet	57
4.3.3 Touch Screens	61
4.3.4 Web Oriented Architecture	61
4.3.5 Internet as Moving Image Medium	63
4.3.6 Microblogging/Lifestreaming	63
4.3.7 Social Networks	64
4.4 Media Use and Company Marketing	68
4.5 Challenges for the Internet Industry	70
5. Conclusion and Outlook	72
6. Method and Random Sampling	74
Bibliography	76
Imprint	78



Foreword

The development of Internet protocols began 40 years ago. The Internet as a communication medium for science came to Germany 25 years ago. Shortly after the fall of the Iron Curtain 20 years ago, the Internet was commercialized, and almost 15 years ago eco – Association of the German Internet Industry was founded under the name “eco Forum e. V.” The Mosaic browser marked the actual beginning of the triumphant success of the World Wide Web in 1993 due to the fact that its graphics abilities made it possible to put completely different content on the Internet. These milestones form the basis of an unmatched development of an entire industry, not only in Germany. Despite the fact that the Internet industry had been heavily ruled by technology during its economic first steps until 1993, content on the WWW was still rare and Internet access was something meant for companies; the name “eco Forum” chosen at its founding was supposed to indicate a wide application of new technologies and stood for “electronic commerce Forum.”

However, for some time thereafter, the Internet was seen as a gadget or a fad by the postal services who were responsible for telecommunication at that time, and it was not taken seriously in politics. Some politicians and industries such as the music and film industries are just realizing which developments have bypassed them without leaving a mark, even though for a long time Germany had been ahead of the other European countries when it came to Internet development.

Despite all adversity, the Internet is now firmly established and has an increasingly important role in the economy while its influence reaches the entire economy.

Old business models in many areas of traditional business therefore have had to either be completely reconsidered or have risked losing out to new media. Constantly new business opportunities have been created, new areas are reached by the Internet, and an end is not in sight for a long time – while, of course, every end is a new beginning.

Due to these conditions, it has been difficult to bring order into such a dynamic system, make comparisons possible, recognize trends early, and identify the respective driving forces.

As the Association of the German Internet Industry, we see it as one of our tasks to provide an overview befitting the significance of the Internet industry and to define the fundamentals in order to be able to provide a complete industry review pertaining to market size and business climate.

The present study was carried out in collaboration with Arthur D. Little. We created a layer model based on the Internet value-added chain organized by participants and market sectors. At the same time, with this study we created an instrument that will allow a repeat study at a later time which will provide a basis for data comparison. Current trends will be captured separately for each edition in order to point out the different areas that have an influence on the Internet economy itself.

We are anxious to see how the first review of the Internet industry in Germany will be received and how lawmakers and companies will react to this systematization and to the results of the study. We always appreciate constructive suggestions.

We certainly hope that the study will not only help our members and will not only be an indispensable tool for business development and evaluation but that it will also close a gap for the entire market that we believe has been present until now.

eco as the Association of the German Internet Industry committed to the economic, political, and technical concerns of its members. We see it as our obligation to provide food for thought and to support our members as well as the government with expert advice in this “new world”.

We would, of course, be very happy if this study were the reason for your future cooperation with eco.



Prof. Michael Rotert

*Chairman of the Board
eco – Association of the German Internet
Industry*



Greeting

When the Internet came to Germany 25 years ago, nobody dared make a prediction as to how important it would become in the future. The Internet was at first seen as a science network, but not before long it set off on a triumphant march that is still carrying on today. The diffusion of Internet usage in Germany is still taking place at a very fast pace and today almost every PC or laptop is connected to the Internet. Even mobile phones are, for the most part, equipped with fast Internet access. One of the last Internet-free bastions, television, is also turning into a gateway to the Internet these days. No entertainment electronics maker would forgo outfitting their new models with an Internet interface as well as preinstalled applications/widgets. So, the three most important screens, PC, mobile phone, and TV are connected to the Internet. Moreover, with the trend of “Internet of Things,” all imaginable objects of daily use are being connected to the Internet. This enables their own communication that will become part of our daily lives in the future.

In the meantime, an industry has evolved around the actual Internet access that reaches from network infrastructure, services, applications, and aggregation to user content. The Internet industry has in an unprecedented way ignited creativity and inventiveness in numerous young entrepreneurs and in traditional companies from neighboring industries as well. New services and new content are created as we speak. Even though just a small number of them are conquering the mass market, as a result, the telecom, IT, media and electronics enterprises, aka the TIME industry, have changed. They have already been in the middle of a huge transitional phase for several years that brings with it chances as well as risks for the players.

The consequences for the participating industries are an increasing number of mergers on the one hand, but also interesting growth potential from new services and business models on the other. Enterprises from all areas of the Internet industry as well as companies from rather traditional TIME industries are trying to participate in this growth and launch profitable services for end customers or business customers.

Apple, for instance, made a dramatic comeback from tough years and

revolutionized the global music industry at the same time with the development of the Internet portal iTunes as a legal payment model. Now, the entire industry is offering such services. The iPod has become a large family of products with the iPhone as its derivative which offers telephony as a side product, and keeps its focus on IP based applications.

However, even in upstream value-added layers there are innovative, groundbreaking developments without which an end customer service would not be possible. This is where the heart of the Internet industry is, and its importance cannot be overexaggerated.

The present study is the first to focus on surveying all value-added layers of the German Internet industry. During the period of May to June, 2009, around 700 companies as well as experts from politics and business were surveyed about trends and developments. With this in-depth analysis, we have been able to gain unprecedented insight into the German Internet industry. The result is more than encouraging: Even with the financial crisis in the background, the business climate in the German Internet industry, except the landline market, is very positive. Especially e-commerce, online platforms,

transaction services, and online advertising were rated by the respondents as increasing fast. This is where the changes happening to the TIME industries are being noticed most. But also upstream sectors, such as the applications market, are seen as increasing or increasing fast by the majority of the participants.

Many of our customers and business partners from the Internet industry are the drivers and engines of these developments. The growth of the Internet industry is owed to their creativity and their willingness to take risks. Their optimism, unwavering even through the recession, reflects the strong economy built in the last years. As co-authors of this study we hope that the Internet industry will continue to be a driving force, and will contribute to a positive economic climate with its economic performance.



Jürgen Morath

Director Arthur D. Little

1. Introduction

The Internet industry in Germany has developed into its own economic sector and reflects the infrastructure of the modern information society as a whole. The industry is continually growing in importance, at the same time it permanently paves the way in both, businesses and the government, for the economy to work efficiently as a whole. It is changing the societal communication and entertainment habits at a rapid pace. The first e-mail was received in Germany in 1984. Since then, these developments have expanded the limits of the TIME industries (telecom, information, media, and electronics) and their share of the world economy has permanently grown.

In Germany, the Internet industry has become a central factor for winning locality advantages through direct and indirect effects (Illustration 1).

- A direct effect besides revenue and employment effects is the stimulation of investment. ¹ Moreover, a strong Internet industry has a multiplier effect due to fast and inexpensive communication possibilities and innovative products, and thus initiates new economic activity in traditional as well as new business fields.
- Indirectly, it generates chances for future development and positions Germany as a business location with a future. A further indirect effect is the fact that the acceptance of new Internet based services in our society introduces a paradigm shift and guarantees the prerequisites for the future growth of the Internet industry as well as the economy as a whole.

The Internet industry is a central factor in promoting Germany as a location.

¹ Direct effects see Katz et al. 2009

Illus. 1



There are still white patches on the broadband coverage map.

The growing importance of the Internet industry is clearly noticeable when one looks at the indicators in the context of the keyword “Internet.” Both broadband access and the number of Internet users are constantly growing. With yearly two-digit growth numbers, Germany has already reached a very high saturation level. Nevertheless, there are still gaps in broadband coverage which need to be filled. This is made clear by the statistics:

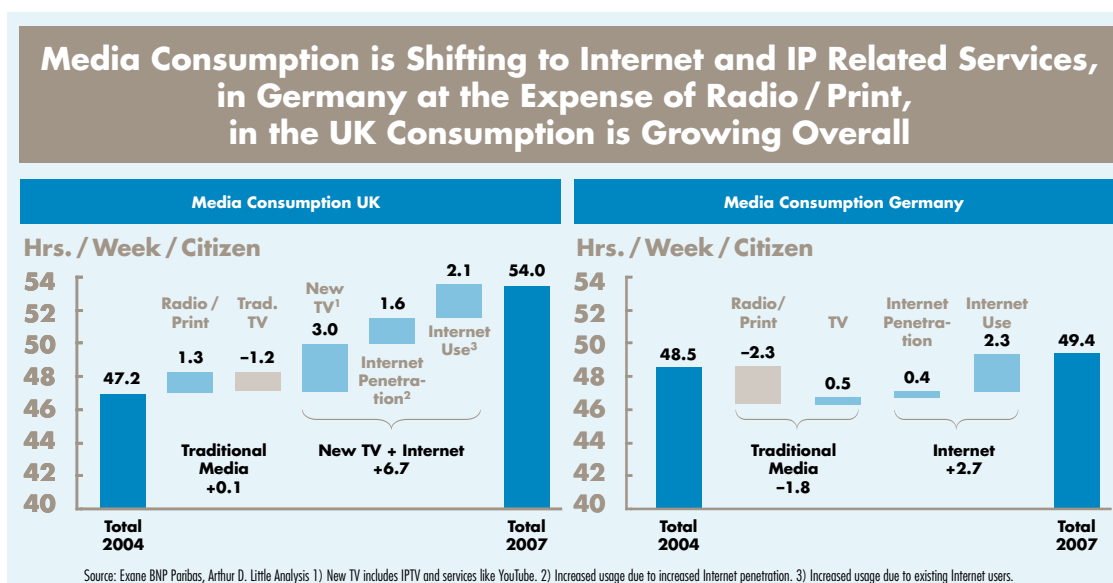
- According to the Federal Network Agency, there were around 21.2 million broadband connections with a transfer rate of at least 2 Mbit/s at the end of the year 2008 in Germany. Out of that, 4 million have a performance of 10 Mbit/s.² However, this is a DSL monoculture because only 7.5 percent of these broadband connections are based on technologies such as cable, wireless, or satellite.
- According to BMWi3, in rural areas around three quarters of the households can theoretically access a connection of at least 1 Mbit/s. Due to problems with the measurement of the theoretical accessibility (e.g. actual distance of a dwelling to the nearest distribution point, actual thickness of the copper twin wire) one has to realistically assume a smaller value. Especially the supply of broadband to small and medium-sized companies in rural areas continues to remain problematic.
- The number of Internet users in Germany has tremendously grown from 6.5 percent of the population over 14 years of age in 1997 to 28.6 percent in 2000 and 55.3 percent in 2004. In the first quarter of 2009, 67.1 percent of all German citizens were online. What is remarkable is the fact that meanwhile even the numbers of occasional and regular users are almost the same (see Illustration 2 on the numbers pertaining to regular Internet users).⁴

² see BNetzA 2009

³ see BMWi 2009c

⁴ Measured against the numbers of occasional users, see Eimeren/Frees 2009

Illus. 2



An especially high growth was recently recorded for the category “Internet users over 50.” Between 2006 and 2009 their numbers grew by about 9.5 percent yearly, while the growth rate for 14 to 49 year-olds grew by only 2 percent yearly, due to very high Internet acceptance in the previous years (see Illustration 3).

As a whole, the daily time spent on the Internet continues to increase tremendously. The media usage behavior is continually shifting towards the Internet. The predictions made by eco and Arthur D. Little for the time period up to 2012 are an increase in time spent on the Internet by 4.6 percent per year. That increases media consumption as a whole from 13 percent to 19 percent. As shown in Illustration 2, this development is significantly impacting radio and television.

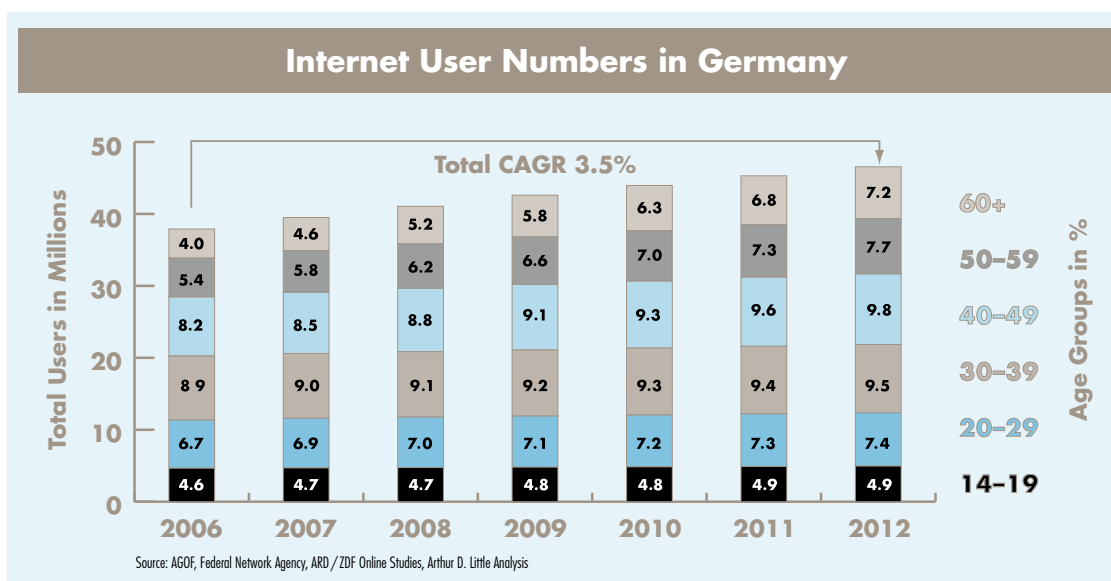
Internet users understand better and better how online services work and acceptance is growing. This development is demanding more from network operators as well as service providers who are active on the Internet: New business models and customer applications are in demand.

The study jointly conducted by eco and Arthur D. Little systematically analyzes the relevant trends and players in the German Internet industry for the first time and gives decision makers the most important facts and information. As a result, Internet industry players are gaining the following advantages:

- Based on the results, they can properly assess their chances and expectations in the context of the market development of either their market segment or the entire Internet industry.
- They can gain insight in regards to important future trends and seize opportunities in the Internet industry. At the same time, they receive background information about theirs and other relevant value-added layers.

Online services are accepted more and more – new business models and customer applications are in demand.

Illus. 3



- They can better identify their competitive position in the segments relevant to them and work out their respective potential opportunities.

Moreover, the study offers an integral overview of the market size, employment and business climate.

In Chapter 2, the Arthur D. Little – eco layer model systemizes the Internet industry based on the Internet value-added chain according to players and submarkets. The team quantifies the entire market and its layers and gives a detailed insight into the business climate and market development expectations.

The results are based on a large amount of data collected from managers and employees of companies in the German Internet industry. The data was collected by eco and Arthur D. Little in the summer of 2009.

Based on the Arthur D. Little – eco layer model of the Internet industry, Chapter 3 takes a detailed look at the individual elements and players. Special attention is given to submarket delimitations, players, overlaps, trends as well as expectations and outlooks.

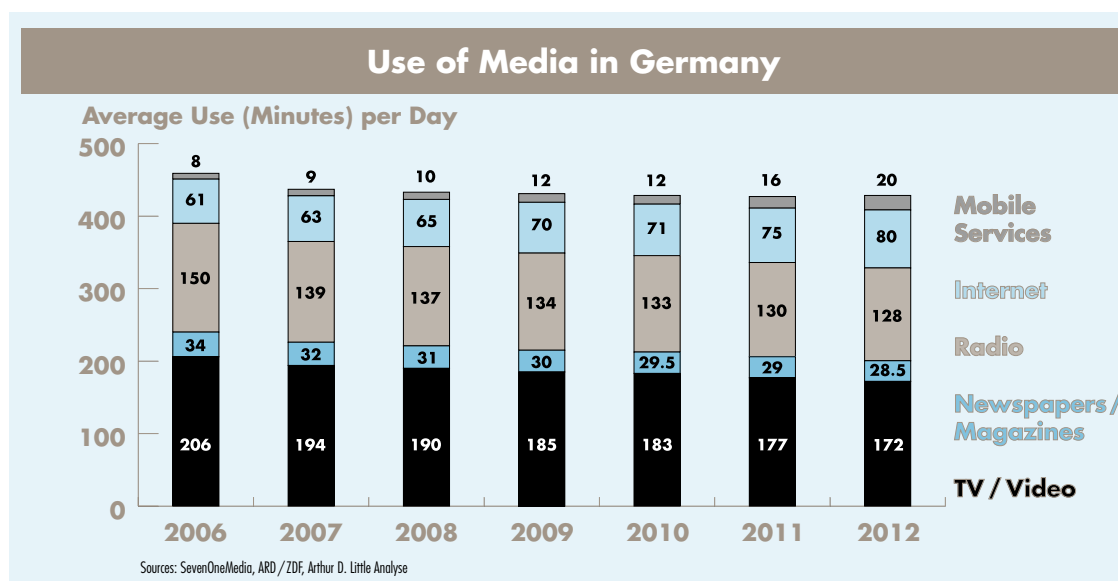
Chapter 4 is devoted to three current topics and gives insight into important developments:

- Key technology: IPv6
- Enabler: Open Innovation
- Internet usage trends and effects

The statements are mainly based on qualitative expert interviews with leaders and managers from the German Internet industry.

Chapter 5 wraps up with a summary of meaningful conclusions about the industry.

Illus. 4



2. German Internet Industry Review 2009: Market Segments & Players

2.1 Market Segment Delimitation

The classification of all industry relevant services and products is the first step to a sound analysis and evaluation of the German Internet industry. A clear delimitation of related industries and a systemization of its activities are therefore required.

The Internet industry consists of the operators of the individual networks as well as companies offering services through the Internet. However, content producers or providers of services that cannot primarily be obtained online are not part of the Internet industry.

Moreover, the Arthur D. Little – eco layer model based on the Internet value-added chain⁵ helps to clearly systemize the Internet industry. Illustration 5 shows the core activities of the companies and presents related segments that can be defined as part of the Internet industry in the broader sense.

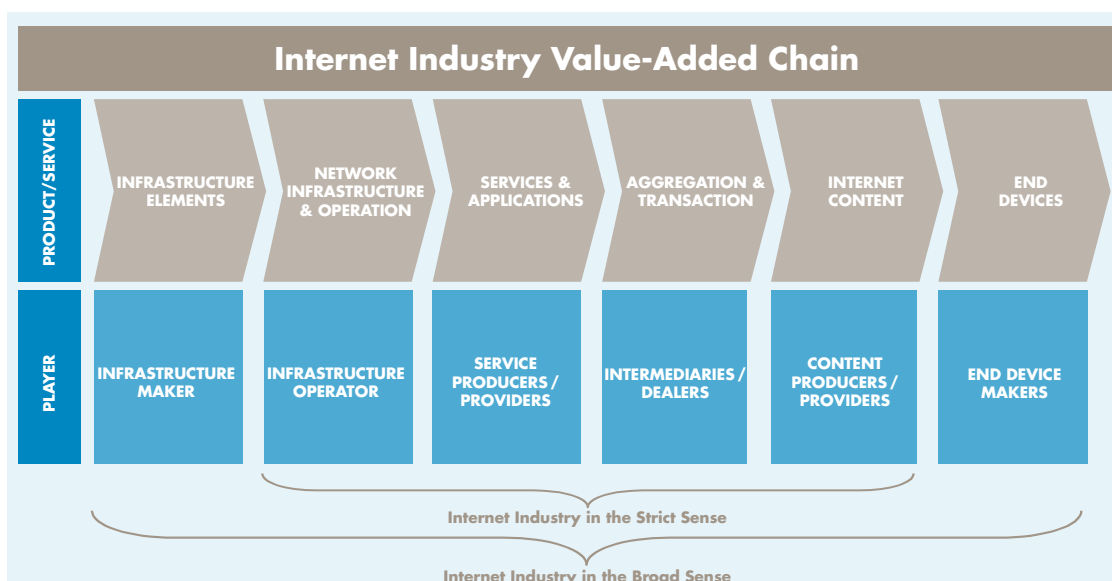
The value-added chain begins with the makers of operating and technical infrastructure equipment. It includes the entire spectrum of network operators and service providers as well as intermediaries and dealers. It also includes makers of terminal equipment.

The Internet industry in the strict sense includes any enablers who enable the operation of services. In the layer model, the Internet industry in the strict sense includes four interconnected layers (Illustration 6):

The Arthur D. Little – eco layer model helps to clearly systemize the Internet industry.

⁵ see Zerdick et al. 2001

Illus. 5



<p><i>Level 1: Network infrastructure and operation</i></p>	<ul style="list-style-type: none"> • <i>Layer 1:</i> <p>Network infrastructure and operation – This layer includes players who offer stationary or mobile access to the Internet by offering transmission paths and access points. This infrastructure is the basis of any type of Internet services and is used by private users and companies as well as providers in other Internet industry layers. Companies in these segments are access providers such as Deutsche Telekom, Vodafone, Versatel, regional carriers such as NetCologne, Internet access providers such as 1&1, congstar, and Alice / HanseNet, Internet backbone / transit providers such as Deutsche Telekom, Level 3, Verizon, Interoute, KPN or Telefónica and last but not least Internet exchanges such as DE-CIX.</p>	<ul style="list-style-type: none"> • <i>Layer 3:</i> <p>Aggregation and transaction – Players in this layer use services from layers 1 and 2 in order to aggregate layer 4 contents and make contents on layer 4 accessible. Moreover, they are responsible for the initiation and execution of transactions with other products. Some examples of e-commerce providers in this layer are mobile.de, bol.de, Scout24, Spreadshirt, Amazon or eBay in the B2C domain or wlv.de in the B2B domain. Online platforms such as studivZ, XING or Google and also online advertising companies such as IP Deutschland, Online Solutions Group or metapeople, and transaction services such as PayPal and ClickandBuy are found in this layer.</p>
<p><i>Level 2: Services and applications</i></p>	<ul style="list-style-type: none"> • <i>Layer 2:</i> <p>Services and applications – Players in this layer run off the network infrastructure and enable companies and private persons to put a multitude of services and contents on the Internet. Their business encompasses among other things the administration of Internet addresses, the uploading of Internet pages as well as the provision of functionalities and processes on the Internet. In this category are housing/ hosting providers such as STRATO, Host Europe or Global Switch, online applications providers such as salesforce.com and Google Apps as well as domain providers such as Denic, VeriSign or domainFACTORY.</p>	<ul style="list-style-type: none"> • <i>Layer 4:</i> <p>Internet content – Players in this layer generate content and offer it for marketing on the Internet. Internet content is any media content available on the Internet. This content is offered both web based as well as recycled by offline media and for different platforms and services. Companies in this layer are web originating content producers such as Netzeitung, Ehrensenf and Hobnox, and in addition traditional media companies offering online content such as Springer, Bertelsmann or SevenOne Media. Moreover, for several years, of course, users themselves have been generating content on the Internet, which has become a large portion of the Internet content in general (“user generated content”).</p>
<p><i>Level 3: Aggregation and transaction</i></p>		
<p><i>Level 4: Internet content</i></p>		

The Internet industry in the broader sense also has the following segments (see Illustration 5):

- Infrastructure elements in the form of cables, transmission routes, wireless devices, transmission technology, hardware firewalls, etc. are offered by many makers such as Ericsson, Nokia Siemens Networks, Cisco, Intel, Huawei and Alcatel-Lucent
- End devices that represent the connection to the user, for instance desktop PCs, notebooks, smartphones, tablet PCs or similar technology, are marketed by makers such as Nokia, Motorola, Apple, Samsung, Sony Ericsson and LG
- Standard software such as browsers, shop software or content management systems, and security software.

Along the chain of the different players of the layer model, one can see clear tendencies in relation to the characteristics, size and number of companies. Due to scaling effects and minimum size requirements, in the low layers there are often only few suppliers with a large number of employees who generate high sales with Internet services. In the higher layers, the number of companies that tend to have a small numbers of employees and fewer sales is increasing.

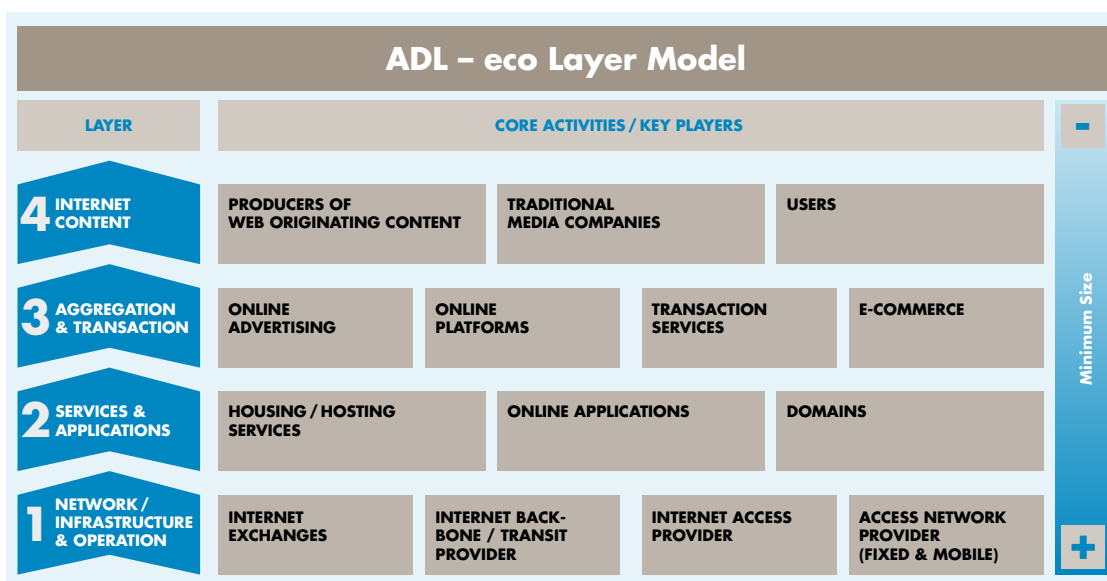
In 2008, sales attributed to the Internet industry in Germany, in the narrow sense of the term, amounted to a total volume of approx. 46 billion euros.

2.2 Size of the Internet Industry

In 2008, the sales volume of the Internet industry (in the strict sense) in Germany was around 46 billion euros. As seen in Illustration 7, 22.5 billion euros of this amount are accounted for by e-commerce activities in layer 3 “Aggregation & Transaction.” In contrast to the other market segments, in this case the value creation share was calculated against the total sales of 637 billion euros.⁶

⁶ see BMWi 2009a

Illus. 6



The stationary and mobile Internet access in the layer “Network Infrastructure & Operation” reaches 15.5 billion euros, online advertising 3.7 billion euros (in the layer “Aggregation & Transaction”). All other segments are much smaller compared to the total sales.

In Germany, over 6,000 companies can be categorized as part of the Internet industry in the narrow sense of the term.

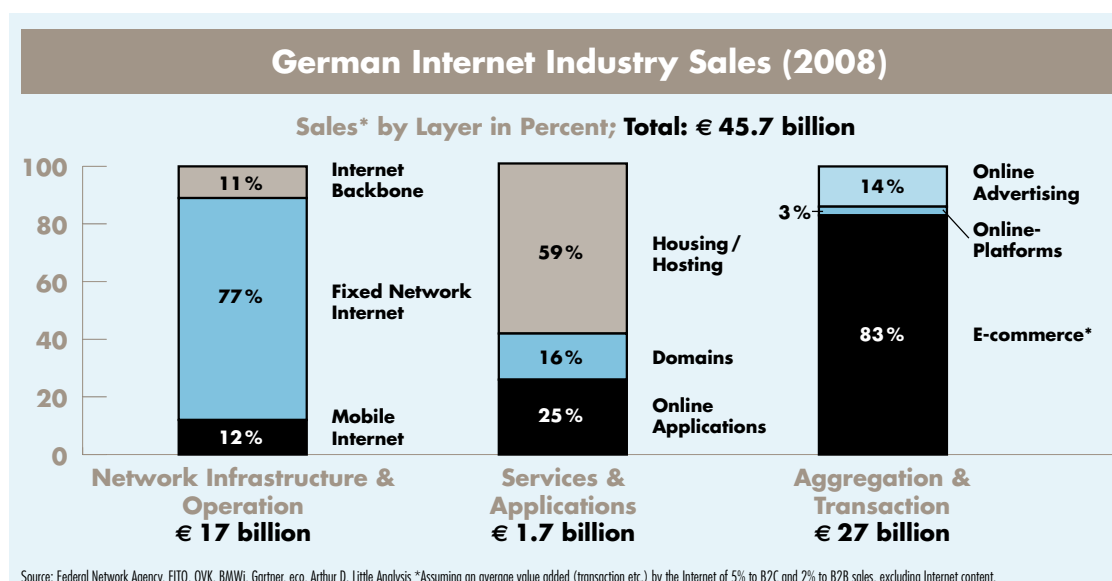
Layer 2 with the special B2B market “Services & Applications” has a share of 4 percent of the Internet industry market volume and acts as enabler between infrastructure layer 1 and downstream layers 3 and 4. In contrast to the other layers, this is a very special market with a smaller market volume.

A clear classification of the employees to the respective segments of the Internet industry is proving problematic because in many cases a significant number of the activities of a company cannot be completely allocated to the Internet industry. Arthur D. Little and eco assume that in the entire German Internet industry (in the strict sense) there are between 200,000 and 250,000 employ-

ees, whereas the largest share goes to the e-commerce segment. Next are Internet access providers, content providers, network access operators (referring to the Internet) as well as online advertising companies.

As seen in Illustration 8, we can classify over 6,000 companies in Germany as belonging to the Internet industry (excluding e-commerce and Internet content providers) in the strict sense. Most of them fit the classification fixed network Internet providers. In second place, there are online platforms, followed by housing/hosting service providers. Besides that, there are several thousand companies active in e-commerce especially; however, the exact number cannot be determined.

Illus. 7



2.3 Business Climate in the Internet Industry

The German Internet industry proves to be unimpressed by the current economic crisis, the business climate is very positive. The market expectations for the coming year based on the current business results are generally positive (see Illustration 9).

With the exception of fixed network and mobile access market segments, the respondents predicted a markedly positive development in the individual segments. (More on the specifics of the individual segments in Chapter 3.)

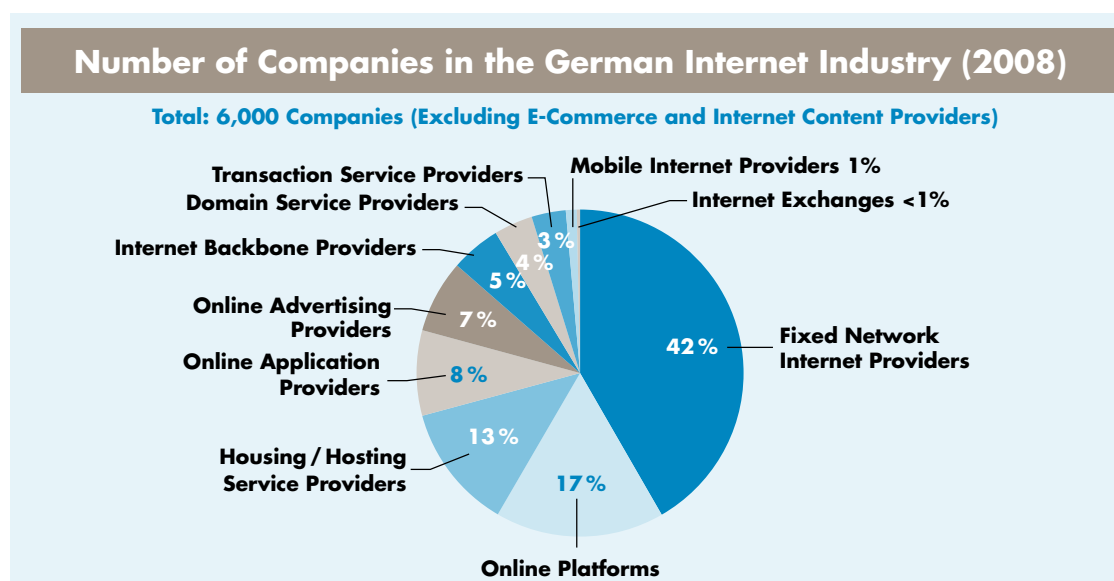
In comparison to other infrastructure services such as Internet backbone and Internet access provision, in layer 1 the estimates for future prospects were especially positive for Internet exchanges. However, the prospects for companies in the area of Internet relevant parts of mobile access networks are relatively level, whereas in the fixed network area a further worsening of the business cli-

mate is expected. The business development for housing/hosting as well as applications in layer 2 is viewed as mostly positive as well. Illustration 9 shows that a better business climate is only predicted for segments in layer 3. Between 29 and 42 percent of the respondents expected a “strong upward” trend for e-commerce, online platforms, transaction services, and online advertising.

The outlook for content providers (layer 4) was also positive, even if it was not as optimistic as for aggregators and transaction service providers.

The business climate in the German Internet industry is very positive.

Illus. 8

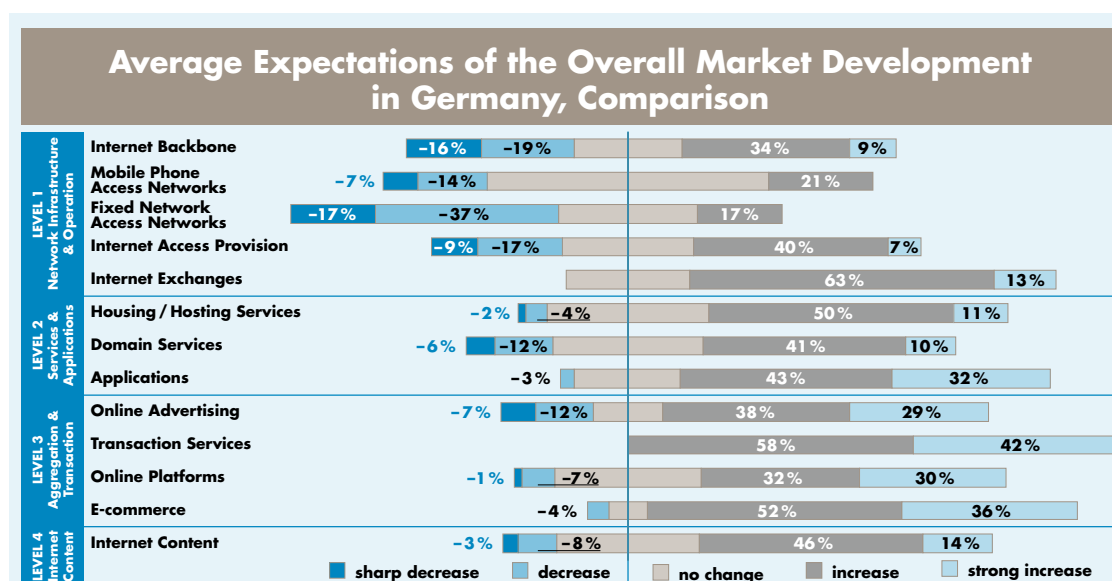


3. Market Indicators for Segments of the German Internet Industry

Chapter 3 offers a more detailed analysis of the individual segments of the Internet industry and gives answers to the different questions pertaining to the individual segments. The following questions become evident:

- How are the segments specifically distinguished from each other?
- How is the development of the segments evaluated by the market participants themselves?
- What are the differences between the short-term market development expectations and the medium-term prospects?
- How is the negotiation power of the players within the segment developing in comparison to the value-added layers upstream and downstream?
- How is the competition structure developing in regards to the market participants?
- How is the competition structure developing in regards to price levels?
- How are the initial costs developing in the individual segments?
- How is the entire structure developing between the segments and what trends will have a particularly strong impact on the market in the future?

Illus. 9



3.1 Internet Backbone

The Internet backbone providers and their fiber networks are the backbone of the Internet. Illustration 10 shows how the wide area backbone networks of these companies connect the subnetworks and access networks. The IP transport networks and the wide area networks as well as the subnetworks form the basic infrastructure of the Internet. Due to high data rates of up to several hundred Gbit/s, these networks are now exclusively based on fiber networks. The product portfolio of the backbone provider begins with dark fiber, a product that consists of leasing out only the “dark (unlit)” glass fiber cable. It also includes more complex services which consist of providing a secure high speed data cable between two points and offering technical support. The value-added by the backbone providers consists of leasing the glass fiber infrastructure as well as providing the services and data transmission services that go with it. Without the operators of the backbone infrastructure, the Internet as we know it would not be possible because the multitude of autonomous networks first have to be connected to one another in order to enable the flow of data in the first place.

In regards to transferring data packets between the networks of different providers, we differentiate between the pricing model “peering” and “transit.” With transit, the provider buys connectivity to all the other networks on the Internet worldwide. This model is also called “upstream,” and it is calculated by data volume. However, providers of the same size use the very popular settlement-free data exchange between ISPs, a method called “peering.” This practice is based on the assumption that in networks of the same size the data exchange volume is symmetrical and therefore any payment model would only create unnecessary costs. Regarding the exchange of data packages between providers of different sizes, however, an asymmetrical data exchange is assumed. The smaller provider is sending more data packages through the network of the larger provider than vice versa. However, in the past, the size of a provider has proven to be an incorrect reference parameter: for example, a provider with many end/business customers can create significantly less traffic than a provider specializing in online gaming because the data volume for the transmission of video files is several times larger than that of a document.

Without the operators of the backbone structure, the Internet as we know it would be impossible.

German Internet backbone operators', sales total around 2 billion euros per year.

With transit the exchange of data packages takes place at contractually established points of transfer through “private interconnects”, and with peering it takes place at Internet exchange points called Internet exchanges (see Chapter 3.5) by connecting to a switch infrastructure. That is where the most efficient peering takes place: All providers can peer settlement-free since only the infrastructure costs of the exchange point have to be paid by the connected market participants.

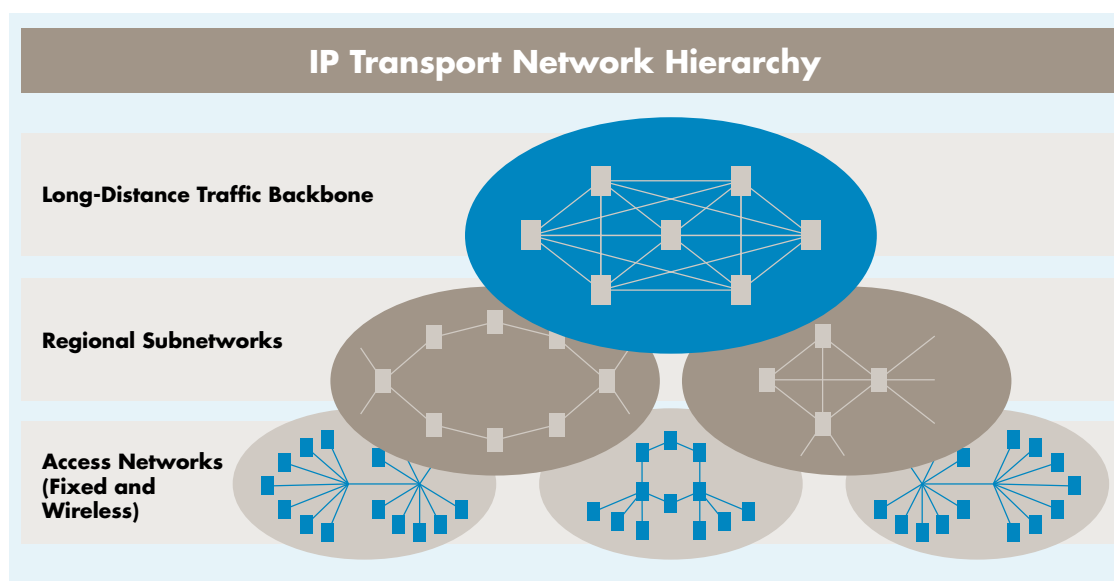
So the smaller ISP pays for data transit through the network of the larger ISP in order to reach connectivity to all the market participants who are not directly reachable through the next exchange point.

The companies active in the backbone segment are on the one hand specialized providers such as Interoute, Invitel or Telefónica Deutschland, who provide long distance lines with IP transit business models. They operate transregional glass fiber networks between the

important hubs, frequently across borders. On the other hand, most network access providers have IP backbones at different grades with which they can transport the traffic of other providers. These providers are companies such as HanseNet, Vodafone, or Deutsche Telekom. Within the backbone segment, these providers have a key function because they bundle the traffic of the Internet access providers in their concentrator networks and thus “process” it to be transmitted through the backbone routes.

Based on this definition, one can make the assumption that in Germany there are around 300 Internet backbone operators. This number includes many companies operating only regionally who possibly only maintain a point-to-point radio connection as a backbone (connection). Sales generated by these companies including the transit from IP traffic is roughly 2 billion euros per year.

Illus. 10



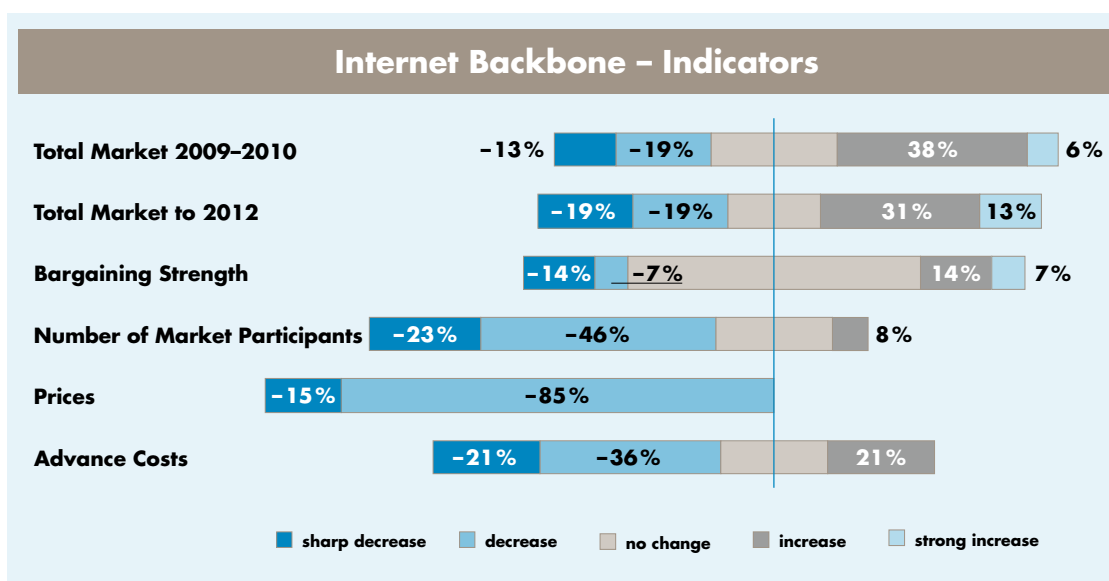
The surveyed companies of this type had a large overlap rate with three other segments of the Internet industry. Over two thirds (68 percent) claimed to also be active as Internet access providers. This results from technical overlaps as well as other synergies. Over 60 percent of the Internet backbone companies additionally provide housing/hosting services due to the fact that there are synergies between operating a glass fiber infrastructure and the directly connected data centers. Moreover, 48 percent provide domain services. Overlaps are significantly smaller with other areas and layers within the Internet industry. Less than 25 percent of the backbone providers were active especially in layers 3 and 4. A vertical integration into the layers of aggregation and transaction or Internet content is simply too far away from the core competence for the operation of infrastructure.

The respondents are counting on a slightly positive trend for the backbone infrastructure market in Germany by 2012 (see Illustration 11). In the short-term (2009/2010), a slightly better business climate is expected than for the entire period up to 2012. Some market participants explain this with the very tough competition in the last years.

The respondents are expecting a slightly positive development of the overall market for backbone infrastructure in Germany by 2012.

The respondents evaluated their own bargaining power as relatively steady. However, there is a slight tendency to expect a deterioration of one's own position in comparison to the market participants in other segments. What spoke volumes in this context are the expectations in regards to the developments of market participant numbers: Over two thirds (69 percent) are expecting a decrease in the number of market participants, almost half (46 percent) are expecting a rather moderate cooling. Only 8 percent are expecting an increase.

Illus. 11



The numbers are clearly pointing to a market consolidation. This seems plausible in light of a maturing market with IP traffic becoming a commodity product. An example of this consolidation is the takeover of the regional glass fiber operator BreisNet by Versatel in April 2009. Other takeovers will surely follow.

This consolidation process is also reflected in the opinions pertaining to price development in the backbone market. All respondents are expecting falling prices, 15 percent even significant price decreases. A part of the price decrease in the opinion of the respondents is due to the simultaneous decrease of initial costs (glass fiber, switching technology, transceiver, etc.). More than half (57 percent) expects the industry to see a decrease, while only about a fifth (21 percent) expects an increase in initial costs. This estimation is based on the assumption of scaling effects caused by growing demand which can be met due to technical development without additional investments in the backbone business.

Among the Internet backbone providers, the estimates on the business climate are relatively steady. Most of the respondents, however, expect a market consolidation as well as a strong price competition. They are also expecting a price drop at the access service level. The developments in this segment will probably not be able to be compensated by the slightly growing demand, which in turn accelerates the market consolidation trend. The first signs were already visible in the last years, and according to the opinions of the respondents will continue as seen. As a result of this development, some providers active on the market today will disappear from the market, other players will try to expand their product portfolio which will lead to a further competition intensification in the bordering market segments.

3.2 Mobile Telephony Access Networks

Mobile telephony network operation is clearly a section of the telecom industry. It is relevant to the Internet industry insofar as it is marketed both for voice communication and text communication as well as for mobile Internet access. Mobile phone access networks are (1) primarily bi-directional voice and data communication in (2) public networks using (3) radio waves for access (4) location independent and (5) mostly country wide, (6) made possible by a limited number of operators.⁷ Telecom companies connected to end customers through their own networks are defined as mobile phone operators. They use their network infrastructure themselves in order to provide telecom services, and/or provide these to Mobile Virtual Network Operators (e. g. BASE). MVNOs act as resellers without their own network infrastructure on this market.

Currently, mobile broadband is on the advance: Mobile data services, especially mobile Internet access via UMTS cards for notebooks, USB sticks or smartphones (iPhone among others) are in great demand. According to the Federal Network Agency and the mobile phone operators, by the end of 2009 there will be already 12 million registered regular UMTS users and around 4 million UMTS notebook card users. According to EITO⁸ (2009) the total sales volume for mobile phone services in Germany in 2008 was about 22.1 billion euros. Dialog Consult/VATM is talking about a market size of 25.6 billion euros for 2008.⁹

Though the volume of voice services is declining, it accounted for 77 percent of mobile telephony sales for 2008. Simple texts (especially SMS) continue to be a very popular application but cannot be included in the calculation for the actual Internet relevant sales. Based on this, eco and Arthur D. Little estimate a sales volume for 2008 of 2.1 billion euros for mobile data services/mobile Internet.

The mobile Internet constitutes the fourth largest sales in the Internet industry. In this segment, the market structure in regards to the number of companies on the market has a significantly larger oligopolistic character. Despite the fact that it is made more flexible by a multitude of virtual network operators (MVNOs) and service providers, it is not significantly open. This is especially the case for mobile Internet services, however, not for mobile voice services. Mobile broadband offered by the German mobile phone network operators T-Mobile, Vodafone, O2 and E-Plus are becoming increasingly user-friendly, meaning lower prices that increase acceptance and usage of mobile Internet services. Compared internationally, however, Germany still has a lot of catching up to do. A glance at Austria shows what potential broadband services have: There, already 39 percent of all connections are based on broadband technology.¹⁰

The mobile Internet is the fourth largest sales block in the Internet industry.

7 see Jakopin 2006

8 see EITO 2009

9 see Dialog Consult/VATM 2008

10 see Arthur D. Little 2009

Random sampling shows a large overlap with other layers and segments of the Internet industry. Approximately 75 percent of the participants are active as fixed network providers as well as Internet access providers. The fact that mobile phone companies along the value-added chain are looking for new revenue streams is also reflected in the survey results. Over 40 percent of the mobile phone providers offer online applications, online platforms, and domain services. The interlacing with e-commerce is less, but still relevant (29 percent), Internet content (29 percent), online advertising (14 percent) as well as transaction services (14 percent).

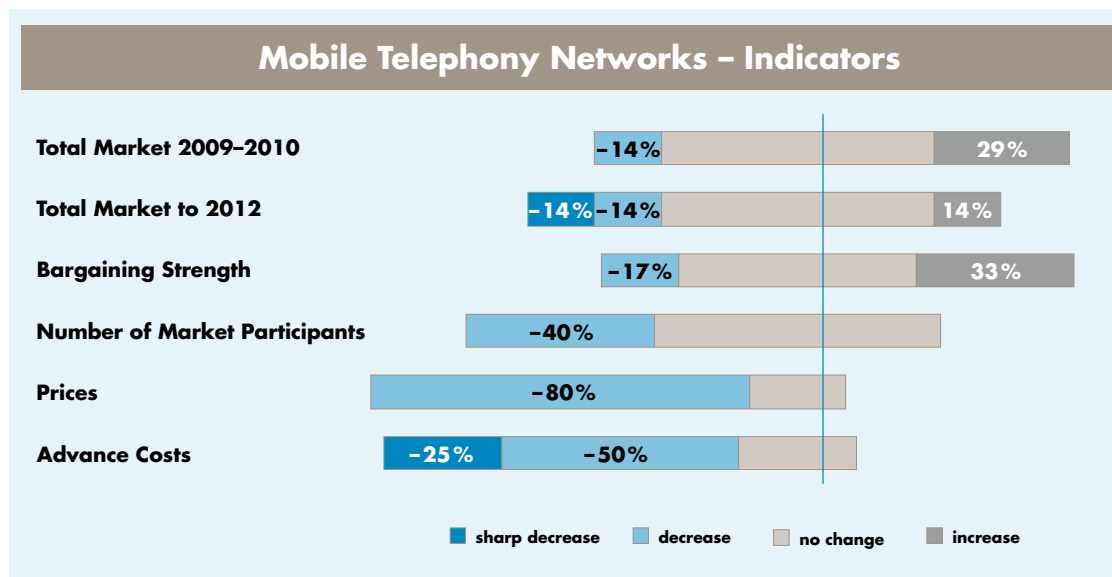
The market development appraisal is showing a highly interesting change for the mobile phone access networks segment in the coming years. The study participants are expecting a positive market development for the business years 2009 and 2010; roughly one third (29 percent) are even expecting a strong upward trend for the overall market. As seen in Illustration 12, there is a marked change

in this optimism for the phase up to 2012, 14 percent are expecting a strong downward trend for the overall market.

As far as the appraisals for the bargaining power of mobile phone providers as opposed to other subsections of the Internet industry are concerned, they seem to be mostly positive. The results are speaking for an improved bargaining position triggered by the growing competition among mobile end device makers as well as the increasing economic relevance – boosted by diffusion – of the mobile Internet to the industry as a whole.

Moreover, there are signs for a further market consolidation since 40 percent of the respondents are expecting that the number of market participants will fall. In the near future, no other transactions are expected from the four large providers. However, a consolidation is very probable for service providers and virtual network operators, and therefore in regards to the variety of providers from the customer perspective.

Illus. 12



The results also show that the mobile phone provider margins for mobile broadband will develop nicely: Although 80 percent of the participants expect falling end consumer prices, the simultaneous expectation of falling initial costs balances everything out. That means the effects of the continuing competition can be balanced by price reductions in the loaded fixed network capacities or in the infrastructure.

The outlook on the market development for mobile phone and access networks is influenced by a number of trends triggered by competition and technological developments. Especially the mobile broadband services that due to the growing network coverage outside of areas with a high population density, a larger number of end devices and falling prices are no longer only attractive to business customers but also to private customers, build the foundation for a rapid development in the area of mobile Internet usage.

On the one hand, one can see an evolution of the Internet usage since the consumers are growing accustomed to using the mobile Internet and are using social networks and indirect communication to stay in touch on the go. On the other hand, this trend is forced by the distribution of Internet capable end devices which offer the customer a mobile, comfortable, and innovative operation. The iPhone for instance, even if it is not a mass market end device yet, leads to a clear shift and rise in expectations on the part of the customer, as

far as the range of applications and quality is concerned. The providers also influence the market development by reducing usage barriers by means of less expensive flatrate oriented pricing. End devices and mobile services are made more attractive by using open innovation strategies. The end device makers and mobile phone network operators open their application environment and give independent developers the opportunity to offer their applications to customers. As a result, innovations coming from outside the company can be appropriated or at least incorporated and marketed in a win-win constellation through application stores.

Mobile phone access networks are becoming more and more relevant to the Internet industry and open the door to numerous new application user experience enriching possibilities. That creates a complimentary interaction with the other Internet industry segments. As the study results show, the future outlook for this market segment are consistently realistic-optimistic.

Mobile phone access networks are becoming more and more relevant for the Internet industry and make numerous new applications possible.

3.3 Fixed Network Access Networks

The operators of fixed network access networks have a pivotal part in providing Internet access in general. This segment includes all companies that have built their own wired networks and use these for telecom service provision such as data and IP services or put them at the disposal of third party providers. Either they offer their services to the end customer directly or they sell their infrastructure at the access service level. Customers at the access service level are usually virtual infrastructure providers or service providers who only have a rudimentary or no physical telecom infrastructure at all (see next chapter). Moreover, providers of fixed network access networks often are each other's customers in order to increase their reach. The individual advance provisioning products are not differentiated at this point. The core characteristic of these providers is the fact that they can provide access at different levels to end customers without needing additional outside infrastructure (see also Chapter 3.4).

Characteristic of companies within the fixed network access networks segment is the fact that they can provide their own infrastructure to their customers as "managed" or "unmanaged," that means either with clearly defined service parameters or under "best effort criteria." Some of these providers have their own access network that also includes a concentrator,¹¹ however, this more often than not has to be increased by leasing "unmanaged" infrastructures. Moreover, they may have to buy capacity from backbone providers.

The access network provider spectrum reaches from providers with national coverage (see previous chapter) and cable network operators (Kabel Deutschland, Kabel BW, Unitymedia) to city and regional carriers who have their own subinfrastructure and operate with different technologies such as copper, wires or glass fiber (such as NetCologne, HeLiNet, M-net or EWE). There are also providers such as COLT, QSC or LambdaNet, who primarily specialize in business customers. The sales volume for segments, fixed network access network and Internet access (see Chapter 3.4) was 13.4 billion euros in 2008.

¹¹ The concentrator bundles the datastream of a few to many access network owners for the downstream transport through IP backbone. The concentrator is connected to the DSLAM (DSL switch in the main distribution rack) on the access side, and on the network side it is connected to the BRAS (broadband access server).

There is an unusually large overlap for fixed network access network providing companies, with Internet access providers (80 percent). The operators of access networks also market Internet access to end costumers. Numerous access network operators are also active in the layers of Network Infrastructure & Operation as well as Services & Applications. With the exception of Internet exchanges, there were overlaps of 31 percent up to 45 percent in the segments on each of the two layers to be seen.

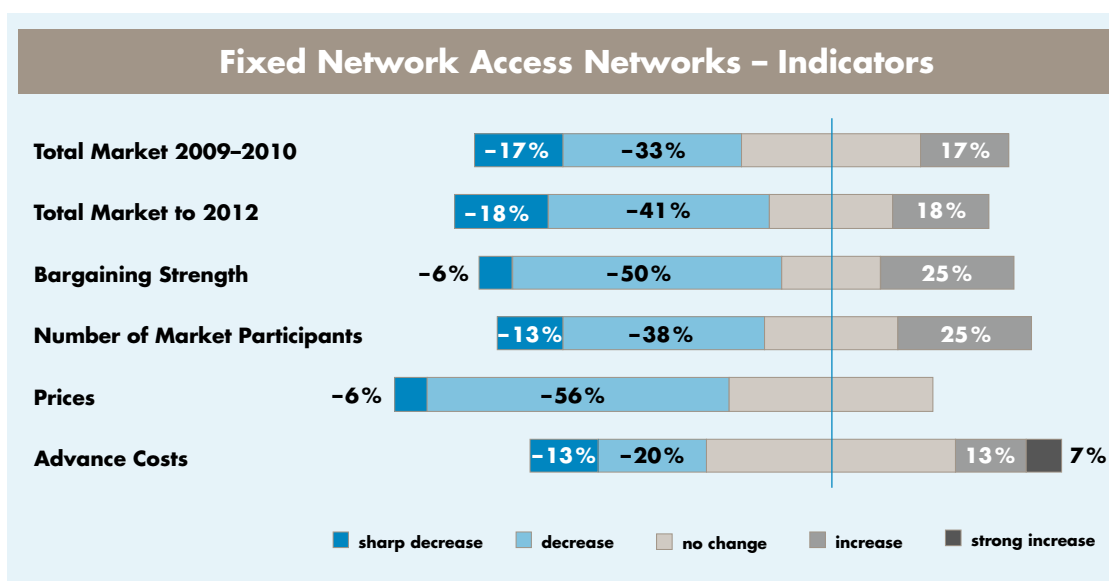
The appraisals of the respondents in regards to the development of the market in these subsegments allow the prognosis that in the coming year as well as up to 2012 a decrease of the total market volume is to be expected (see Illustration 13). Roughly one third of the respondents are expecting a moderate market downturn by 2010. While the majority is expecting a downturn or even a sharp downturn, all the same, 17 percent are still counting on a market upturn. For the market evaluation up to 2012 a similar picture arises, whereas here 41 percent are even expecting a shrinking

market. Thus, the overall prognosis is negative. It does show, however, that some fixed network access network providers see a chance potential for further market growth.

In regards to the development of their own bargaining strength, the respondents are expecting a slight decline as opposed to the participants upstream and downstream from them in the value-added chain.

The price battle in this market segment seems to be getting worse according to the opinions of the respondents. Fifty-six percent are expecting falling prices, 6 percent are even expecting plummeting prices. None of the respondents are expecting a raise in prices in the coming years. At the same time, 47 percent believe that inital costs such as buying backbone bandwidth or buying switching technology will not be subject to fluctuations.

Illus. 13



Moreover, the majority of the respondents are expecting a market consolidation. Due to high and only slightly decreasing cost burden and massive pricing pressure, the maximizing of scaling advantages is a decisive competition factor. On the one hand, this will take place with takeovers and market consolidations, on the other hand, providers will also realize scaling effects through network sharing and strategic relationships.

The fixed network access networks market segment will also be confronted with high investment requirements.

Currently providers are expanding capacities in order to attain higher bit rates for the provision of broadband. The increased demand for example for video content can only be met by increasing broadband capacity. Products like Next Generation Networks (NGN) that ensure quality all the way to the customer are not yet available on the market. Against all expectations, VDSL has so far not been able to assert itself in the access network or the access field. So the fixed network access networks segment will also be confronted with high investment requirements in the future.

3.4 Internet Access

Internet Access Providers (IAP) provide the end customer with services, content and technical services for the use of the Internet. Access service users can thus use Internet services by means of a packet switched Internet connection. For this purpose, access providers use their own and/or outside infrastructure (see previous chapters). So this category includes providers with their own networks who market access all the way to the end customer but also pure resellers who do not have their own network infrastructure but merely have dial-in servers.

Typical examples of resellers in Germany are providers such as ecotel and 1&1. Due to their cost structure, most of them offer more than pure Internet access. IAPs obtain their revenue primarily from selling Internet access to private and business end customers. Often, this pure access service is coupled with other products in the form of Internet services such as e-mail or website hosting. The product portfolio often includes fixed network and mobile telephony and more sophisticated communication services such as teleconferencing.

In this segment, we identified a 59 percent overlap with housing/hosting service providers. In contrast to the other segments of the Network Infrastructure & Operation layer, the IAPs are often more specialized. Activity in layers 3 and 4 is very low for Internet access providers.

The evaluation given by the respondents in regards to the development of the market overall turned out to be slightly positive in this segment (see Illustration 14); for the development up to 2010, a similar picture is given as for the expectations for 2012.

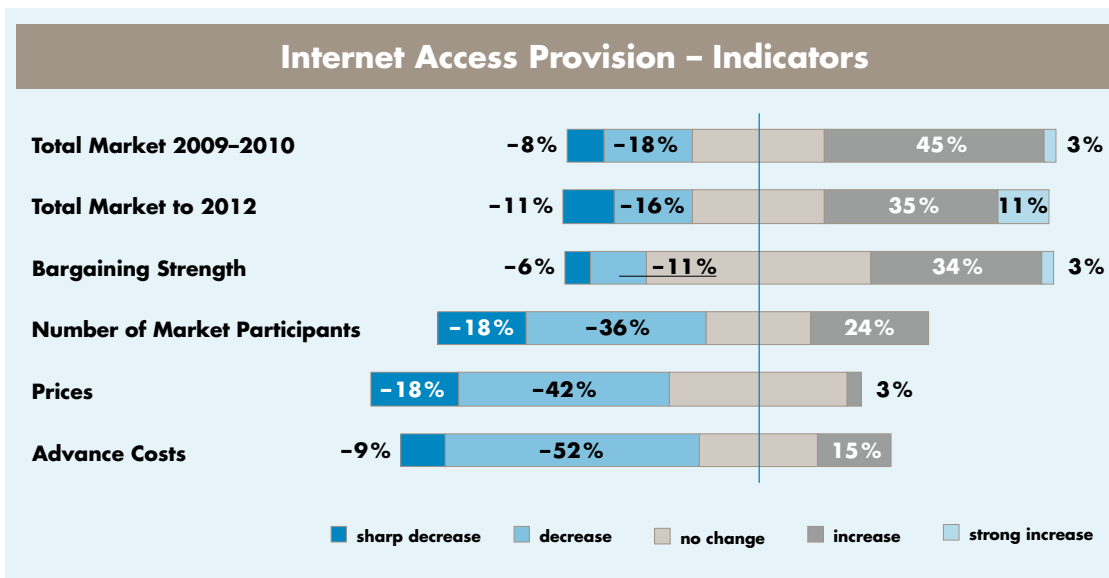
A similar, slightly positive picture is painted for the appraisal of the own bargaining strength. This can be explained by the strong pricing competition in the upstream layers.

As far as the price development is concerned, there is general consensus among the respondents and the results are pointing in the direction of falling end customer prices.

The Internet access provider segment will also be affected by a market consolidation. The results are indicating a decrease in the number of market participants. Almost one fifth of the respondents are expecting a sharp decrease, whereas two fifths are expecting a moderate decrease.

The respondents' expectations in regards to the development of initial costs (fees, broadband prices, switching technology) correspond with the expectations in regards to price development: Although only 9 percent are expecting a sharp decline, more than half (52 percent) are predicting a moderate reduction in initial costs. Altogether the expectations in this segment are lower initial costs, however, even with lower sales, margins are expected to remain the same.

Illus. 14



Internet providers will continue to bundle Internet and telephony products more and more. “Stand-alone broadband access” is already strongly declining. The trend is towards more complex services such as bundling Internet access with TV and video services.

Internet access operators are expecting a market growth despite falling prices.

The majority is expecting a positive overall market development for the coming years. This also applies to an improvement of one’s own bargaining strength. In contrast to the fixed network access networks subsegment, the providers are expecting a growing market despite falling prices.

3.5 Internet Exchanges

Internet Exchanges (IX) enable data exchange from networks of different backbone providers. There is a difference between public and private exchange points. The public ones offer any infrastructure operator a connection if the provider fulfills a few requirements, the grand requirement being an individual, unique identification through an autonomous system number (ASN) that can be applied for at the Réseaux IP Européens (RIPE). Whereas in Europe exchange points are regularly public and managed by cooperative oriented operators, in the USA the exchange points are managed privately by commercial companies. The costs for the operation of public exchanges are usually carried by flat rates paid by the participating providers to the exchange point operator for the connection to the switch infrastructure of the Internet exchange.

Respondents from the segment Internet Exchanges are expecting a considerable market growth.

As a rule, Internet exchanges were and are founded nationally or regionally in order to create a public peering point. Thus, national transit costs are avoided when all national/regional providers are connected. The individual provider is left with only transit costs for international traffic and the traffic that cannot be handled at the exchange point.

Some of the large players on this market are the Internet exchanges in London (LINX), Amsterdam (AMS-IX) and the German DE-CIX in Frankfurt. Following at a distance are smaller exchange points in other European metropolitan areas such as Milan, Madrid and Moscow. As far as capacity is concerned, DE-CIX is currently the leading Internet exchange worldwide.

Other important IXs in Germany are located in Berlin, Hamburg, Dusseldorf, Nuremberg, and Munich. The market overall currently reaches a volume of roughly 9 million euros in yearly sales. The sales, however, corresponds to a very high traffic volume that will be at 1 TB/s at the end of 2009 in Frankfurt alone. Eighty-three percent of the German traffic is handled by the IXs in Germany.

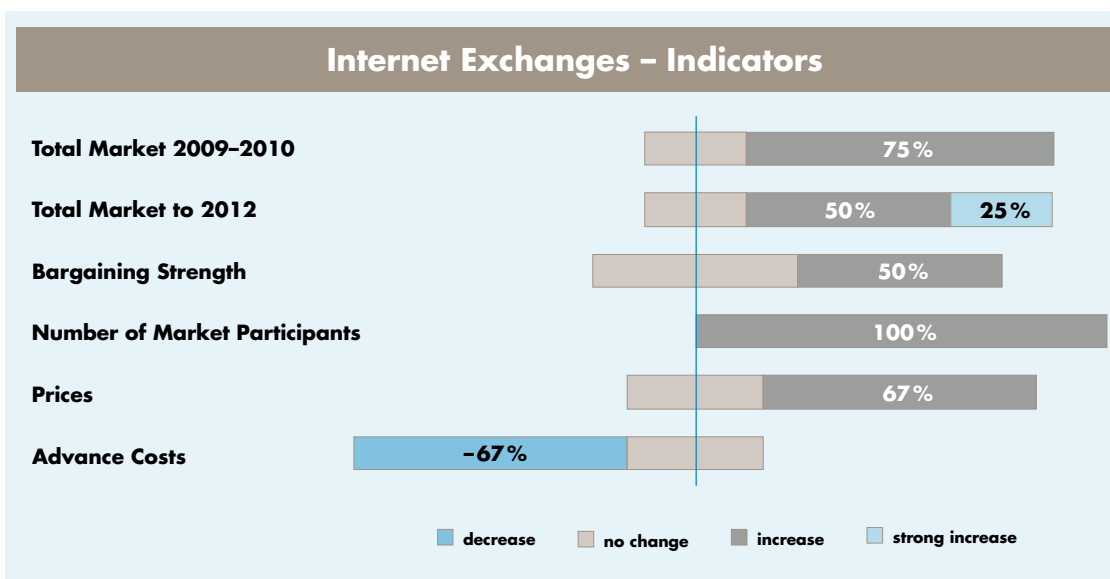
The majority of respondents from the Internet exchanges reported major overlaps with other segments in layers 1 and 2. According to that information, 64 percent of them are also active as housing/hosting service providers, 82 percent as domain providers and 73 percent as Internet access providers.

The respondents' expectations for the years 2009/2010 as well as for the period up to 2012 are for considerable market growth (see Illustration 15). In regards to developments in their own bargaining strength in contrast to other subsegments, half of the respondents predicted an improvement, while the other half expected stagnation.

The respondents are in agreement about developments in regards to the number of market participants: All of them expect an increase in the number of public peering point providers. At the same time, they are expecting rising prices and falling costs for access products. These estimates reflect the current developmental stage of the market because the market is in a growth phase. Meanwhile, scaling effects on the market for access products seem to lead to lower production costs. This especially holds true for the hardware needed for the IP connection like routers and switches (see also Chapter 3.1, Internet Backbone).

The overall demand is pointing to a leveling development. Notable is the fact that some smaller network operators are currently seeking to be connected to public peering points again. Some large network operators, however, want to stay connected but are not necessarily planning to peer. Nevertheless, an increase in data amounts is still to be expected. That is why the predictions for the overall market are very positive. The expected decrease in access product costs allows the margins in this segment to grow according to the respondents; however, the competition pressure may have the opposite effect in the long run.

Illus. 15

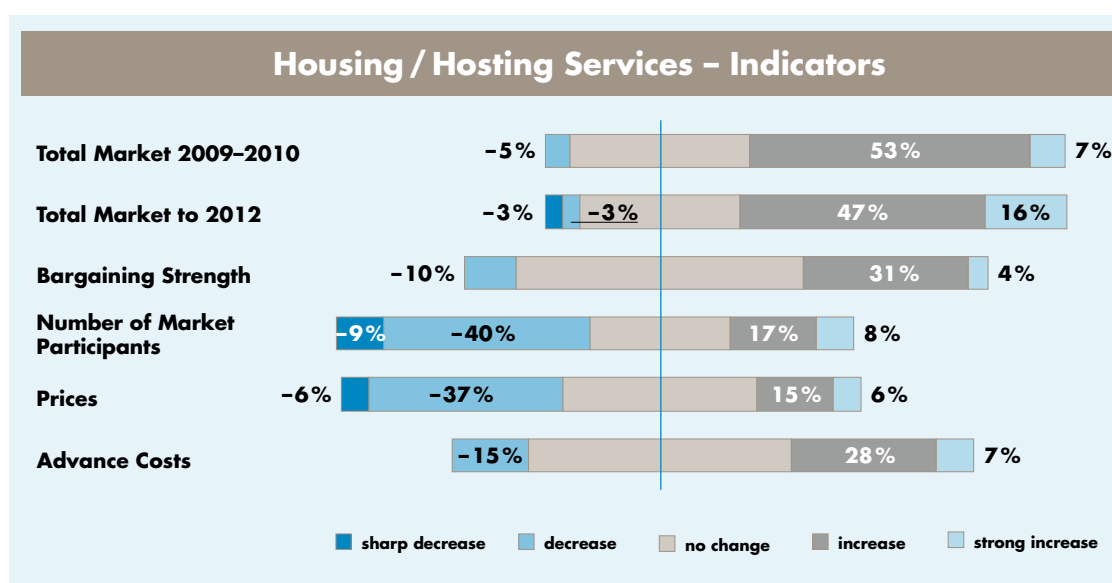


3.6 Housing/Hosting

All services and applications available on the Internet are stored on servers in so-called Internet data centers. The study looked only at data centers that offer their services to private as well as business customers. Data centers within companies were not included. The services can be divided into housing/colocation and hosting.

- Housing** is the act of housing one's server in an external data center and connecting to the network there. If at least one rack is used for the company's hardware and the infrastructure necessary to operate the server is provided by the data center, the term "colocation" is used. Besides providing the space, and possible racks for one or more servers, the service portfolio includes connection to the Internet, power supply, and air conditioning as well as security systems and support services. Companies that have specialized in this segment include Equinix, Global Switch, MESH, and e-shelter.
- Hosting**, however, is the act of storing and possibly providing applications and services on a server in a data center. The server hardware is normally not owned by the company that uses the hosting service. If a customer has access to his own server exclusively put at his disposal, one speaks of a dedicated server. The processors' performance, however, also makes it possible to install several virtual servers on one physical server, which then can be used by different customers (for instance, using the virtualization software VM a virtual server can be emulated). If storage for a website including applications like web shops and databases is provided on a web server, one speaks of "webhosting." Large providers on the market in the B2C field are for example 1&1, STRATO and Hetzner, and in the B2B field Host Europe, Interxion and Interoute.

Illus. 16



Furthermore, in this segment the provision of hosting services is of great importance. These are field specific applications and business applications such as CRM or ERP systems or dealer software in the automobile industry. Companies in this field are for instance DATEV and Fiducia. Some large IT systems companies such as IBM and Accenture offer hosting services. Normally, however, these are not offered on the free market but are coupled with further reaching services. Especially in this segment, it is difficult to sharply distinguish the companies from companies in the online applications segment.

The market for housing/colocation/hosting services is characterized by the imbalance in the size of the providers. Next to the few large players who operate their own data centers and are completely independent, there are numerous companies ranging from very small to medium-sized who often resort to colocation offers from the large companies. In the study, 44 percent of the respondents reported that they operate their own data center. The total number of companies in this segment is estimated at roughly 2,000. Especially among the larger providers, a consolidation wave is expected. Almost half (41 percent) of the respondents are therefore also expecting a decreasing number of providers (see Illustration 16).

Based on the study, sales for this segment in 2009 are estimated at almost one billion euros, and the growth forecast for the coming years is predicting a very dynamic development. Sixty percent of the respondents are expecting an increase in sales by 2010 and by 2012,

16 percent are even expecting a sharp increase in sales. The big demand for housing/hosting services is especially being pushed by developments in the fields Software as a Service (SaaS) and Infrastructure as a Service (for instance cloud computing; s. Chapter 3.8).

As far as the expectations in regard to pricing are concerned, the weight is put on falling prices. The background is provided by the fact that webhosting is now seen as a commodity and its price will slightly decrease due to the numerous providers, minimal start-up hurdles, and small differentiation possibilities. As far as the costs for access products are concerned, half of the respondents (50 percent) are expecting no changes, 35 percent are expecting rising or strongly increasing costs.

The “hottest” topic in this segment is currently the improvement of energy efficiency in the data centers. Solutions are constructional measures or changing the cooling concept. Great savings on energy costs can be attained by the use of virtualization software and more efficient hardware with lower power consumption. Across the industry, the average load on servers is estimated at just 10 to 30 percent of the available computing power. By vitalizing the server, the load on the hardware can be strongly increased without excessively increasing the power consumption. The importance of this segment for the Internet industry will therefore continue to grow overall, and the demand for external computing power or hardware will grow disproportionately.

The large demand for housing/hosting services is driven by developments in SaaS and cloud computing.

3.7 Domain Service Provider

In this segment, we put together operators of domain name services, registry and resellers. The market can be subdivided into a primary and secondary section:

- *Not yet existing domains are sold on the primary market.*
- *Already existing domains are traded on the secondary market.*

The primary market is shaped by a large number of providers. The product portfolio typically includes not only the domain registration but also related services: Sixty-three percent of the respondents offer housing/hosting services at the same time, and 45 percent also act as Internet access providers.

On the primary market, one distinguishes between “registry” and “registrar”:

- *The registries handle the administration and operation of the related top level domains. In Germany, this function is held by DENIC. Other registration places are for instance VeriSign for .com and .net as well as EURid for .eu.*

- *The registrars hold the position of a mediator between the end customer and the registry. In most cases, they take in the registration of a domain and forward the necessary information to the responsible registry.*

Currently, in Germany there are around 230 companies listed with DENIC as registrars, such as EPAG Domainservices, United Internet respectively 1&1, Key-Systems or InterNetWire. There are, however, numerous other providers who enable a domain registration as resellers.

The primary market currently counts 2,000 providers. It is hard to make any statements about the sales volume because registrar sales can for the most part not be separated from additional services offered together as a bundle.

Worldwide, the generic Top Level Domain (gTLD), .com, not bound to a country, is clearly in first place with over 80 million registrations.¹² Next are 13 million registrations each for the country codes (ccTLD) .de, for Germany, and .cn, for China. This is a clear indication that Germany is very important in the global Internet industry. The total number of registered domains in this country amounts to 20 million. Included here are domains registered under the TLD .de, and also under other TLDs such as .com, .net, .org, .biz and .eu.

¹² see WebHosting.Info 2009

Based on this, and using average prices, the sales for the primary sector domain service providers in Germany can be estimated at roughly 250 million euros.¹³

In contrast, already registered domains are traded on the secondary market. This typically is done with fixed price offers, and in the past years auctions have established themselves as an effective price finding tool. A further opportunity for the monetarization of unused, meaning registered but not used domains, is the so called “domain parking.” When the domain is requested, a neutral page with a sale note and keyword oriented advertisement is shown. The domain owner can determine the keywords in advance.

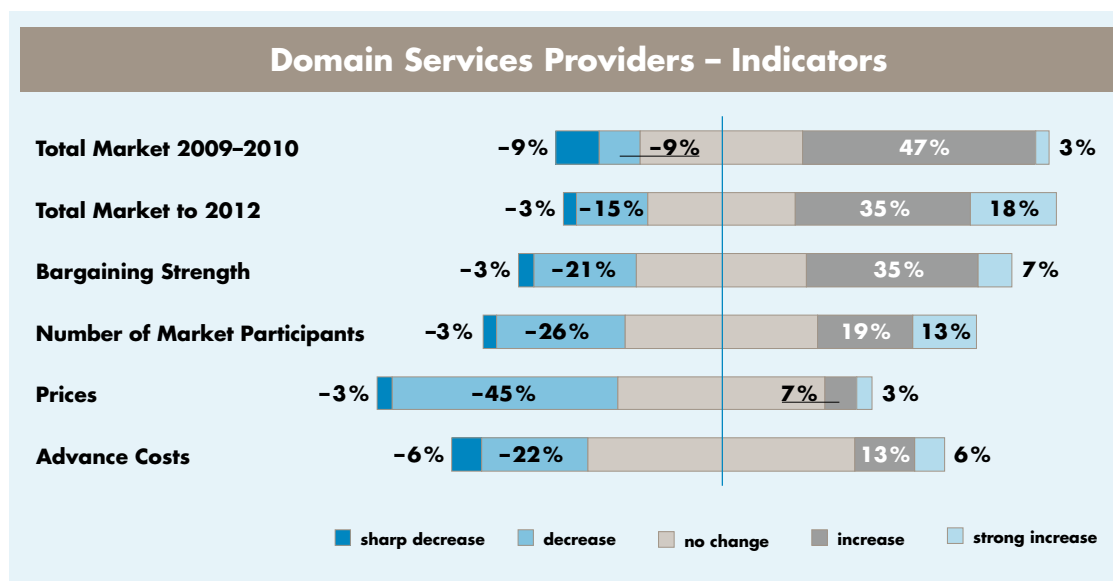
The global market leader on the secondary market is the German Sedo. Additionally, in this sector the trade platforms of NICIT IT-Solutions and NameDrive have established themselves in this country. The sales on the secondary market were at 20 million euros in 2008, and Sedo holds an estimated 90 percent of the market share.

The results of the survey are clearly pointing to positive expectations for business development in the German domain trade. In the short-term, half of the respondents (50 percent) are predicting an increase in sales, and by 2012 the expectations are even better (see Illustration 17). These above average high expectations can be explained by the steadily rising number of registrations. Moreover, the committee responsible for top level domains, ICANN, has approved the introduction of new TLDs such as .CITY, .COMPANY, or .BRAND.

New top level domains will give the segment additional growth impulses.

¹³ see DENIC 2009, WebHosting.Info 2009, EURid 2009

Illus. 17



The first registrations for the new domain endings are supposed to be available towards the end of 2010 and will give this segment additional growth impulses.

In regards to bargaining strength, the respondents are looking into the future with lots of optimism: Thirty-five percent are expecting an improvement, 34 percent are at least not expecting any changes.

The lower prices trend seems to continue, a similar development is also expected for the access services layer, which is pointing to a continued profitability.

To summarize, the companies in the domain trade are looking at the future optimistically.

3.8 Online Applications

Online applications have been growing in popularity for some time both in the business world and among private users. Application programs of different performance spectra made available on the Internet basically have the following characteristics in common: Installation, configuration, maintenance and updates are handled through a service provider and through a server. The users do not own the software/ application (as opposed to the conventional licensing system) but only pay for the use and service made available online.

Typical offers also include services like the integration of new applications into existing systems. In such cases, providers often take on a consulting function (for instance Accenture). Several scenarios come to mind, including archiving and storage, staff planning and placement, e-procurement, file management systems, sales management.

The advantages of online applications for the user are typically lower infrastructure, operation and maintenance cost, shorter implementation period, cost control, and good scalability. Access to broadband Internet is normally a major prerequisite for using online applications.

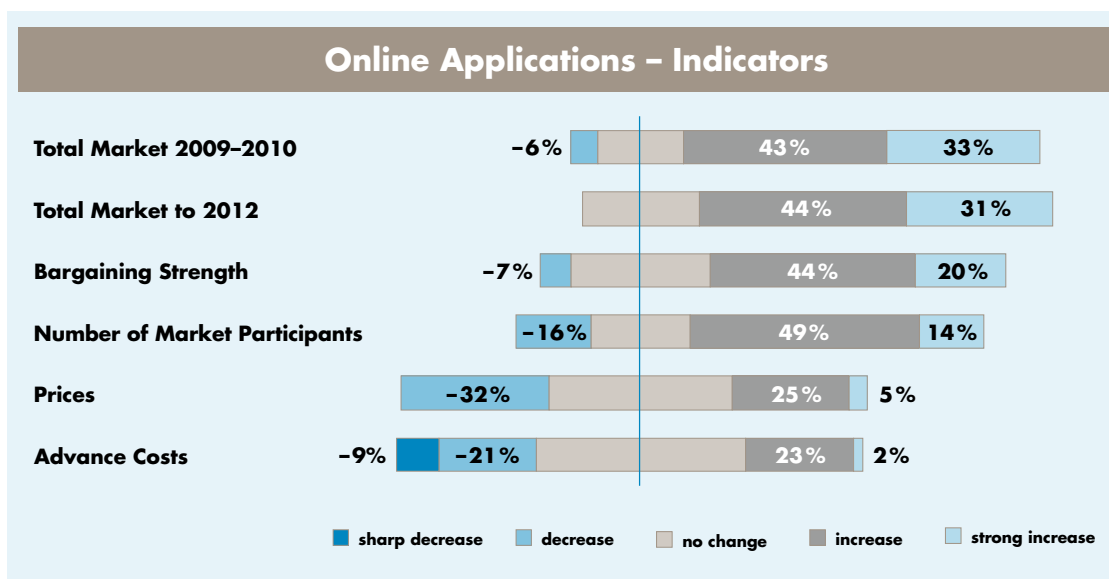
The history of online applications since the middle/end of the last decade has been marked by both terms “Application Service Provider” (ASP) and “Software as a Service” (SaaS), recently joined by cloud computing. ASP was still a classic, client-server structure hosted by third party providers; SaaS solutions were developed on the basis of existing web technology. ASP was similar to simple managed server solutions with a few web applications and limited client ability – customer specific individualizations were possible only within limits. SaaS offers these options with multiple client ability and individual interfaces for the individual customers.

During the course of the last decade, the audience for application solutions has also changed. They used to be interesting mainly for larger companies but due to lower cost in the last few years, they have become affordable for SMEs and private users as well; on the other hand, makers have recognized this niche and have developed attractive products for these segments as well.

In Germany, there are a number of online applications, as shown in the following provider examples:

- *Inxmail offers e-mail marketing software;*
- *amiando operates a platform for online ticket sales;*
- *salesforce.com and WiredMinds provide a sales assistants for entrepreneurs and companies;*
- *Google Apps offers a range of products for almost any use you can think of, not only for business use but also for private users.*

Illus. 18



The online applications segment offers the best outlook to market participants in the German Internet industry.

The market size of SaaS and similar products in Germany is currently estimated at 436 million euros.¹⁴ In the study, all providers of online applications also reported that they are active in the housing/hosting sector. This is not surprising since all applications require the hosting of central software. What is interesting in this segment is that hosting providers extend the range of their offers by including SaaS in order to be present in a growing market with high margins. Due to this tendency, these companies will inevitably and increasingly compete with classic software developers.

Sixty percent of the surveyed providers of online applications also provide Internet access. Apparently, the providers of access services are moving on the value-added chain towards the customers in order to couple their offers with SaaS, for example, in order to increase the share of wallet on the part of the customers. Thirty-seven percent of applications providers are also active on the backbone market. Another piece of background information is the fact that services such as cloud computing generally require a high-speed data connection by means of which the operators of glass fiber infrastructure can offer the customer advantageous online applications. So, offering online applications in one form or another is an attractive diversification opportunity for the owner of a high performance infrastructure. The market success for online applications, however, is very much a solution driven business.

The development of the business climate for the coming years is seen by the respondents very much in a positive light. In the short-term, the respondents are expecting a growing to strongly growing market. Moreover expectations

are slightly improving for the period up to the 2012. Accordingly, the online applications segment is offering the participants the best outlook for the future within the German Internet industry.

Therefore, it is not surprising that the respondents are expecting a development just as good in regards to their bargaining strength development in contrast to segments upstream and downstream on the value-added layers. Consolidation tendencies in this segment are not noticeable. Further innovative services will flood in with more newcomers on the market.

However, the price development received mixed evaluations. This reflects differing price developments in the individual subsegments that are caused by the different development stages of the product life cycle. The majority of the services are new and have not reached the stage where an intense price competition is taking place.

Generally, the increase in communications connection performance improves the application sectors of online applications. Especially, developments in the mobile Internet sector enable mobile SaaS and cloud computing. Therefore, in the near future, products can be expected that are even more customized for mobile use. Another growth driver is the growing cloud performance which makes the shift to virtual processes and functions more and more attractive. SaaS and Cloud developments are also pointing to an even better manageability and control of business processes through these channels.

¹⁴ Experton Group 2009

The market for applications such as SaaS or cloud computing is very much given growth potential by the sample taken in this study. The SaaS model has already proven itself as an alternative to the traditional licensing models. The current push into the SoHo and private user sectors will further fire up the growth in this subsegment of the Internet industry.

3.9 Online Advertising

The Internet has established itself within the population. Due to steadily growing online time, advertising on the Internet was increased significantly. The most popular form of advertisement is banner ads. Within these banners, traditionally the ad message was displayed statically as a picture (JPG), however, for some time now the developments are going toward video (GIF or flash). Next to these in-site formats where the ad space is built into the structure of the website, on-site formats in the form of pop-ups that temporarily cover the actual content of the website have taken root. The largest marketers for these advertisement spaces are **United Internet Media**, **InteractiveMedia** and, **SevenOne Media**.¹⁵

Besides advertisement of websites, search engines (as explained in Chapter 4.3) are increasingly the focus of advertisers. The search engines relevant in Germany, **Google**, **Bing** and **Yahoo!** offer the option of displaying search term oriented, paid text ads next to search results for the entered search term.

The display only comes up when the respective keyword was entered in the query field. With keyword advertising, the search engine providers typically use an auction model which means that, the text display of the highest bidder is listed first. In Search Engine Marketing (SEM), besides keyword advertising there is also Search Engine Optimization (SEO). This is not necessarily direct advertising; however, it heavily influences the success of companies on the Internet. The goal is to place a particular website as far up as possible in the search result list. Companies that have specialized in SEO are for instance **ABAKUS Internet Marketing** and **SUMO**. (Spending for SEM measures, however, was not taken into consideration here.)

The third largest advertisement format on the Internet is affiliate marketing. Typically, there are three parties involved in these partner programs. An affiliate network acts as the intermediary between e-commerce operators (merchant/advertiser) and website operators (publisher/affiliates). Its task is to mediate between advertisers and advertising spaces on websites that are relevant thematically and contentwise to the products being advertised. The compensation of the affiliates by the merchant is normally success oriented. Typical billing models are Pay Per Sale (PPS), Pay Per Lead (PPL) and Pay Per Click (PPC). Billing is handled by the network operator who receives a sales dependent commission from the website operator. Large affiliate networks in Germany are **zanox**, **affilinet**, **SuperClix** and **adbutler**.

SaaS as an alternative to traditional licensing models is further driven by the advancements made with SoHos and private users.

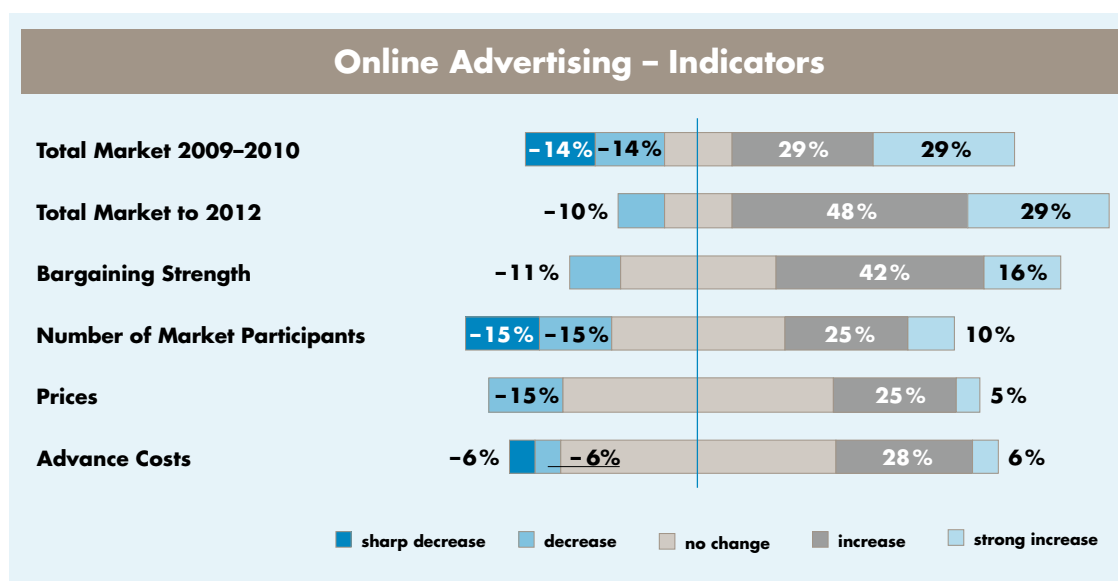
¹⁵ see AGOF 2009

The Internet has been able to establish itself as an advertising medium at the cost of traditional media. As a result, the online marketing segment is steadily growing while traditional media have to deal with shrinking advertising funds. The total investments from advertisers in the three subsegments listed in a study conducted by the Online Marketing Circle (OVK) amounted to 3.648 billion euros,¹⁶ of which 1.904 billion euros went to classic online advertisement (banner ads). For keyword advertisement, they spent 1.476 billion euros, for affiliate marketing, 308 million euros. Other advertisement formats on the Internet are:

- *E-mail or newsletter: E-mail senders get advertising companies together with providers of online marketing. They have an intermediary function and offer their customers an efficient and inexpensive platform for communication and business at the same time.*
- *Microblogging services such as Twitter, which were originally designed for the dialog oriented real time communication. However, currently they are used by a growing number of companies for advertising purposes despite display limitations such as a maximum of 140 characters per message. The messages are, for example, notifications for upcoming auctions, coupon codes or new sales, which are sent to the exact target group.*

¹⁶ see OVK 2009

Illus. 19



In the sample of the online advertising segment, the largest overlap is with the content provider sector (40 percent). Additional activity sectors were mentioned less, for example online platforms (27 percent) and housing/hosting services (23 percent).

The survey result shows that not even the economic crisis can dampen the mood of the online marketers. There is still quite a bit of euphoria in the sector (see Illustration 19). The significant increase of 25 percent in online advertisement spending from 2007 to 2008 will probably not repeat itself in 2009; however, the expected 10 percent is comparably high. A little optimism is noticeable with our respondents in regards to short-term growth, whereas a growth increase is expected by 2012.

The good forecast in the otherwise stagnating to declining overall advertising market is generating interest from other potential providers. It is therefore not surprising that the majority are expecting a rise in provider numbers.

The confidence in the sector is also reflected in the evaluation in regards to the bargaining strength in contrast to other market participants. Only 11 percent are guessing that their position may weaken. A rising bargaining strength is expected by 42 percent of the study participants and 16 percent are even expecting a strong improvement.

The price level is mostly expected to increase slightly. A similar picture emerges in regards to initial costs: The percentage of those who expect the same cost level is also at 54 percent. If the expectations come true, there probably will not be a change in margins worth speaking of.

Online advertising is therefore a long-term growth market. The attractive, younger target groups are reached through the Internet rather than through classic print and TV media. The online advertising trend is going in the direction of social networks where the advertising potential is still comparatively undeveloped. Due to steady improvements in web controlling, advertisements are more and more customized to the individual user. In this sense it is possible that the approach taken by performance marketing will gain significance; the goal of performance marketing is to measure the reaction/transaction with the user. Whereas the users used to be addressed unspecifically en masse, in the future target groups will be addressed specifically, the “right” user will be the focus, and billing models will go in the direction of success orientation. Due to the advancing broadband, the types of formats used are also changing. Video format use is currently soaring. From 2007 to 2008, its growth was at 236 percent.

*In the long-term,
online advertising
is a growth market.*

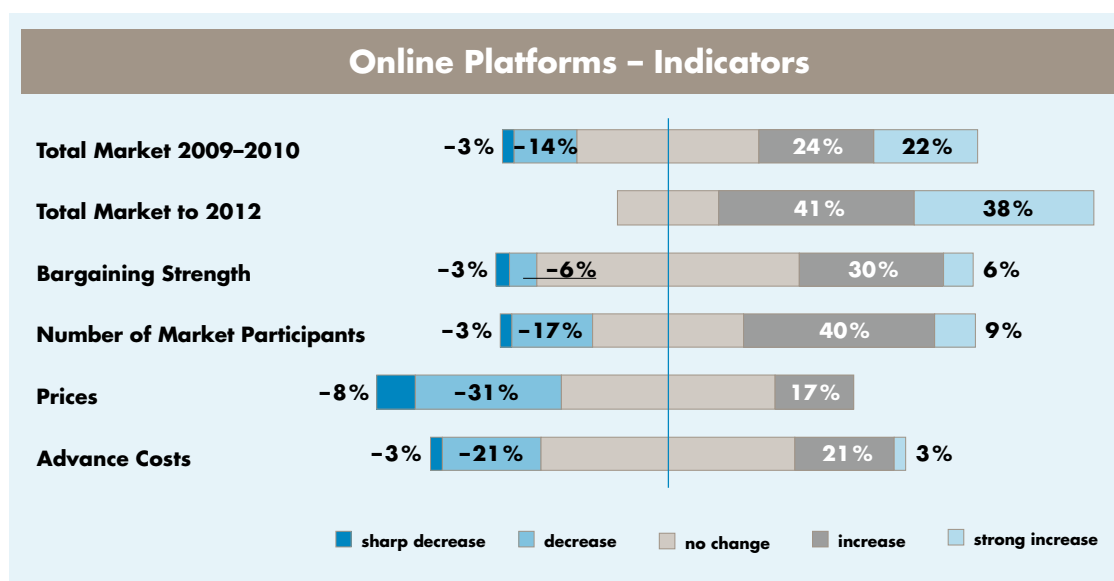
3.10 Online Platforms and Web Portals

Online platforms and web portals cannot neatly be distinguished from each other. Web portals are used for the purpose of an easy search for information in the form of links, usually sorted by topic. The goal is to help the user get started on a subject. There is practically no limit to the organization thereof. Portals range from city portals such as **meinestadt.de**, **koeln.de**, to political topics, such as the European Union portal **europa.eu**, to extensive collections of special knowledge such as the portal **KworkQuark.net** about particle physics. Especially the large German portal sites such as **gmx.de** or **t-online.de** often integrate services like e-mail account administration or a search engine.

A search engine is a program used for finding documents/websites and can also be seen as a portal. The main parts of a search engine are the creation and maintenance of an index, the processing of queries, as well as the processing of the query results. Next to e-mail communication, search engines are by far the most often used application. According to the **ARD/ZDF-Onlinestudie 2009**, 82 percent of all online users now use a search engine at least once a week.¹⁷ In Germany, **Google** is the definite market leader with a market share of 80 percent of all search queries. Following at a distance are **Bing**, the newest search service from Microsoft, **Yahoo!**, and the search function from **t-online**.

¹⁷ see Eimeren/Frees 2009

Illus. 20



While with portals the focus is the access to information, online platforms target interaction and communication. The necessary tool like forums, chat systems or the option to publish one's own content (user generated content) are provided by the platform operator. Well known types of platforms are online communities and social networks (see Chapter 4.2). Large German platform providers are for instance sevenload.de, XING, Wikipedia.de but also flirt page providers like PARSHIP.de. Another special case of online platforms are electronic marketplaces which we categorize as e-commerce due to the fact that they are transaction oriented.

The sample in the segment platforms and portals shows it is heavily interlocked with other segments of the Internet industry. About half of the respondents (48 percent) are simultaneously active in the applications sector. There are also large overlaps with the segments content providers (40 percent), e-commerce (39 percent), and housing/hosting (30 percent).

As seen in Illustration 20, the market forecasts for 2009/2010 were evaluated ranging from neutral to positive. A sharp decline of the market volume is only predicted by 8 percent of the study participants. However, almost half of the respondents are expecting a moderate (24 percent) to strong growth (22 percent) of the market overall. For the evaluation by 2012, a markedly more optimistic view is shown, which may be due to ripening business models and a growing number of revenue sources.

In regards to their bargaining strength, the participants predicted a slight trend towards an increase.

The number of market participants will develop in a positive manner according to the opinions of the respondents.

As far as the price development is concerned, the expectations tend to be more negative. Looking at the initial costs, the study results show no expectations of big changes.

The future outlook of the segment web portals and online platforms is overall positive. Especially the large commercial providers will be likely to count on rising member numbers.

The further development of search engines will continue to be exciting. Even if not much will change about Google's strong position in the near future, the question remains which market share Bing will conquer (it was launched for the public in June 2009). Due to the recent cooperation of Microsoft and Yahoo!, which includes the future use of Bing through Yahoo! which is no longer operating its own search engine, Google might get serious competition in the long term.

Ripening business models and more revenue sources are leading to positive market outlooks by 2012.

3.11 E-commerce

The sector with the highest sales volume in the German Internet industry is e-commerce, a subsector of e-business.

- *E-business includes any kind of business transactions where electronic communication is used by the transaction partners for business initiation, agreement or delivery of services.*
- *E-commerce exclusively refers to the sector of electronic trade, in other words, market transactions. The emphasis here is on the sales of products and services over the Internet. These products can be delivered offline as well as online (in the form of digital products). This includes not only the trade with end customers (B2C sector) but also business between companies (B2B-commerce), and transactions with authorities (A2B).*
- *Operator: Based on the initiators, one can distinguish between the buyer side and the seller side. There are regularly one or few buyers and a large number of sellers.*
- *Type: Vertical marketplaces cover a certain branch whereas horizontal marketplaces have specialized in offering products and services covering multiple branches.*
- *Organization: The platform operator handles data management and administration on a common system. With the decentralized model, the operator provides an integrated platform, but the data maintenance is handled by the users/providers.*
- *Access limitation: Is the access and use in principle open to anyone, we speak of "open" market places. In contrast, in a closed market the operator places access limitations.*

The most frequently seen trade platforms for e-commerce are web shops. However, electronic marketplaces are also important. They are "virtual markets based on Internet technology for the completion of market transactions."¹⁸ In contrast to portals, with electronic market places the overall transaction support is the focus and not primarily the initial business contact information. Auctions and direct price negotiation or price catalogs have established themselves as price finding methods. Marketplaces can be described using four different criteria:

B2B and C2C market places are abundant. In the B2B sector, market places for the electronic procurement of products and services over the Internet are very common. Central online platforms for bidding procedures have established themselves with both companies and increasingly with government agencies as well. Examples are the ThyssenKrupp Module "Strategic Sourcing" or the federal government platform evergabe-online.de. The most well known example of a C2C marketplace is the auction platform eBay.

¹⁸ see Gabler 2009

The Internet offers consumers an unequalled market transparency for the comparison of products and prices. Whereas there used to be a marked difference between the groups of people who only gathered information and those who really placed an order, shopping on the Internet seems to be gaining trust. According to the BMWi and TNS Infratest study, at the end of 2008, 63.3 percent of all Internet users were Internet shoppers.¹⁹ Online shopping is not only lucrative from the consumer's perspective. Many small retailers who otherwise only have a very small draw area are using their online store as a lucrative, additional sales channel.

Even if online shopping is gaining significance for end consumers, the driving force is the trade between businesses. TNS Infratest bases its estimation on a study conducted by Global Industry Analysts and concludes that the market volume for e-commerce is 637 billion euros. From that amount, 562 billion euros (roughly 90 percent) goes to the B2B sector, which equals 10.4 percent of the global share.²⁰ In the sector of B2C e-commerce, Germany is not only the leader in Europe with 75 billion euros in sales, but in the global per capita comparison also beats the USA (906 euros) and Japan (681 euros) with 913 euros.

The sample for this segment showed overlaps with other segments. They were especially significant with applications (39 percent) and online platforms (34 percent). Other overlaps were with the content provider segment (29 percent) and housing/hosting (25 percent).

The study results show that e-commerce will continue to grow. In no other segment are the predictions as clear on the market development. Fifty-three percent of the respondents are expecting a moderate and 31 percent a significant growth. The predictions up to 2012 are marked by even more optimism (see Illustration 21).

There is a similarly optimistic outlook for the evaluation of the bargaining strength. Almost one third of the participants (28 percent) are expecting a big improvement, about half (49 percent) are expecting a moderate improvement.

As far as the number of market participants is concerned, the majority of the respondents are set for an increase.

No clear trend is visible in regards to price development. Thirty-four percent think that the current level will probably remain unchanged.

The expectations are also balanced when it comes to initial costs.

The survey results show that e-commerce will continue to grow.

¹⁹ see BMWi 2009b

²⁰ see BMWi 2009b

The good forecasts for the overall market and the relatively small entry barriers will apparently convince more and more companies of the advantages of e-commerce. But what trends will drive e-commerce in the future?

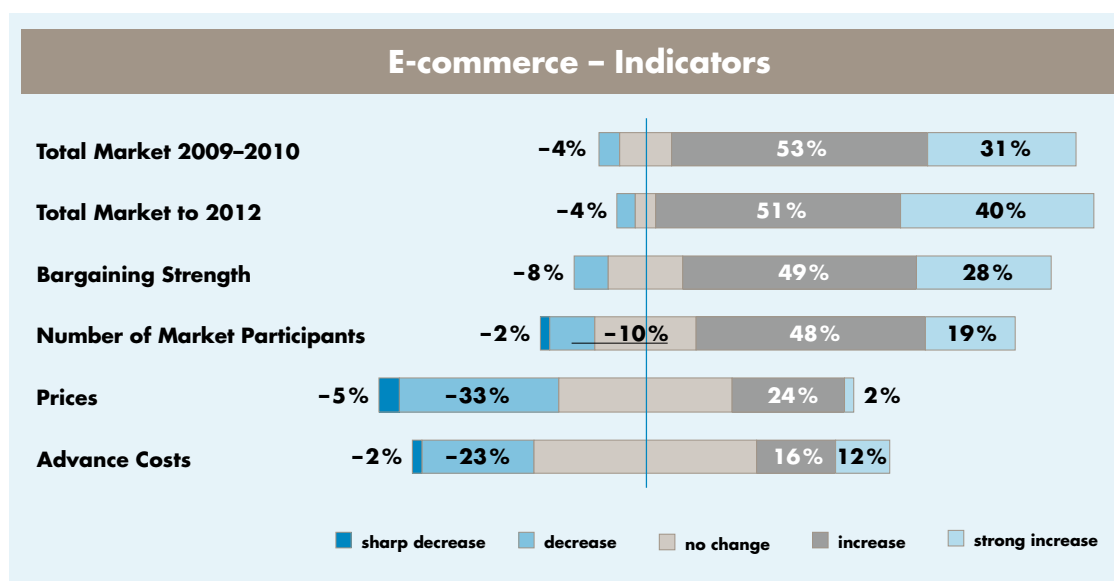
Currently, terms like mass customization, club and live shopping come up in the context of e-commerce future. Even if these concepts are no longer completely new, companies see growth in these business models.

The concept of mass customization is a hybrid of mass and individual production. The user can put together a customized product through online product configuration. Successful examples are Dell, spreadshirt.de and mymuesli.de.

With live shopping, typically only one product is offered at a (very) low price for a short period of time, usually only for one day. Since the supplier buys in mass, he can offer a price advantage to his customers and often sell the product under the manufacturer's recommended retail price. Suppliers in Germany are for example guut.de and preisbock.de.

With club shopping, exclusivity is the key. A registration is typically possible by invitation only or by member recommendation. The goods include high quality brand name articles that are sold at a limited amount well below retail price. Usually the goods are remaining stock. Some names are brands4friends.de, BuyVIP.de and vente-privee.com.

Illus. 21



As these results show, e-commerce still has an unexploited potential. Especially German medium-sized companies lag behind here. According to the study "IT and E-Business and SMEs 2008", across the board, slightly less than one third of the companies use online shops in their B2B or B2C business.²¹

The growing use and acceptance of Internet based transaction services (e-payment) could turn out to be growth drivers for e-commerce. Especially in B2C e-commerce, there are some disadvantages to the classic payment model that could have a negative impact on online trade. With paying before receiving there is a certain risk involved for the buyer. This is a deterrent especially with unknown suppliers. An invoice based payment option is often not accepted by the seller for the same reason.

A bank transfer regularly takes time which in turn prolongs the delivery time. A large number of potential customers refuse to pay by credit card for various reasons. With providers like PayPal, ClickandBuy or giro pay, Internet users have new payment methods that are user friendly and at the same time secure for both sides. Although, according to a study by ibi research, e-payment is not yet popular and only 8 percent prefer this method of payment.²² For small value goods, the willingness to use this method is growing. Up to a price of 100 euros almost half (46 percent) of the respondents would use e-payment.²³

Another factor that would speed up acceptance and use of e-commerce offers is the security aspect. Many Internet users are meanwhile sensitized to the dangers of data disclosure on the Internet. This applies, on the one hand, to the ordering process in itself, on the other hand, to the payment process. Security can be increased through the use of the so-called trust services. This includes clear identification systems, data encoding and counterpart verification.

Acceptance of transaction services as well as an increase in security are future growth drivers for e-commerce.

21 see IBM/Impulse 2008

22 see ibi research 2008

23 see ibi research 2008

3.12 Internet Content

Due to increasing bandwidth in the access sector, especially audiovisual content has become enormously popular on the Internet. Web 2.0 has tremendously increased user generated content – even if more often than not a profitable business model is lacking. Internet content has established itself with media consumers and consistently takes away advertisement revenue from classic print TV and radio media.

There are basically two types of professional entries on the Internet: one, net originating content, and the other, entries made by classic media enterprises. Web original producers create content on the Internet and for the Internet exclusively and distribute it on the web. Such formats include blogs, wikis, InternetTV, podcasts/audiopodcasts, vodcasts/videopodcasts, e-mail and social networks. Well known companies or pages in this sense are, for example, **Ehrensief, Elektrischer Reporter, netzpolitik.org, Heise, Carta, YouTube, and Clipfish.**

The category “classic media enterprises” encompasses those companies that primarily operate publishing media or produce for them. They make the bulk of their money by producing and distributing content for the press, radio, film and/or music. For some of these companies the Internet has become an additional distribution channel. Classic media enterprises like these include companies such as **Bertelsmann, Hubert Burda Media, M. DuMont Schauberg Group, ProSiebenSat.1 Media** or **ARD/ZDF**. Their content can be viewed at least in part on the Internet in the form of websites, through media libraries, as live stream or InternetTV or MP3.

The study results show that Internet content providers are also active in other Internet industry segments: Eighty-three percent of the respondents reported that they provide housing/hosting or domains besides content. Furthermore, 58 percent are also active in the online application sector and 42 percent in the platform sector. As can be expected, there is a strong connection between these individual subsegments that can be explained with the fact that existing infrastructure already in place (especially hosting infrastructure) will allow for a relatively quick addition of the subsegment Internet content.

The study participants in this subsegment have a positive view of the development of the overall market: For 2009/2010, the respondents are expecting for the most part a moderate market growth. There is even more optimism for the period up to 2012 (see Illustration 22).

Also the development in regards to their own bargaining position is seen in a rather positive light by the respondents: Over one third (36 percent) are expecting a moderate improvement, 13 percent are expecting a strong one. Across the board, the study participants are expecting an increase in the number of market participants.

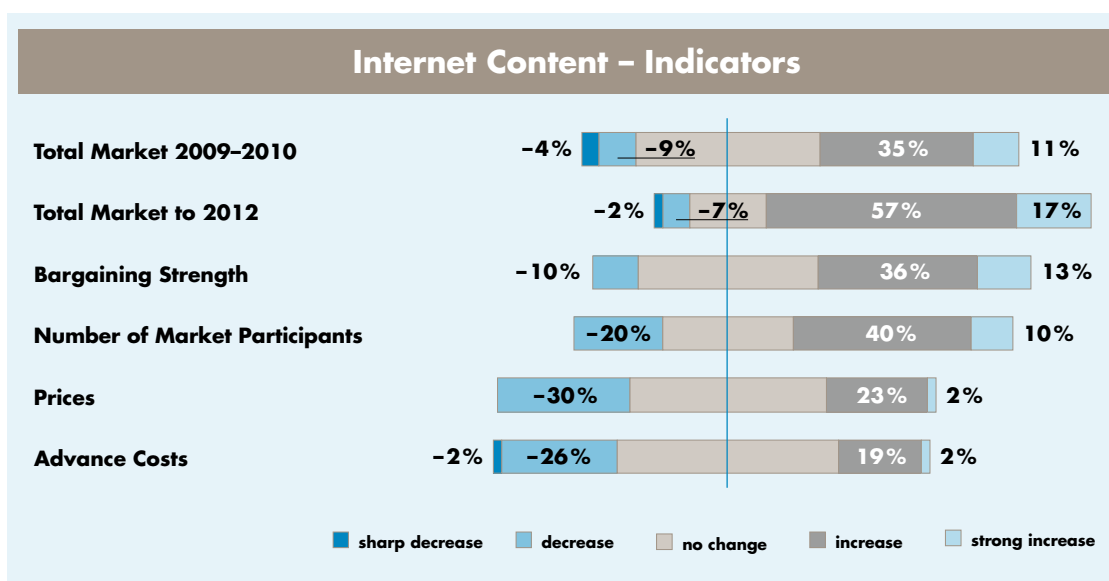
As far as price expectations are concerned, the opinions are rather balanced, which to a certain degree reflects the uncertainty pertaining to profitable business models. There is no clearly recognizable trend pertaining to initial costs either.

In this market segment, the main trends (as in all other segments as well) include the production of customized content, especially for mobile end devices and applications. There is also the continual expansion of video content (video on demand) of different media platforms. On the other hand, there is more and more experimenting with business models: for instance, trying to entice site visitors to buy premium content. For audiovisual content, this is certainly easier than with pure information such as news that spreads quickly and is published again at another place on the Internet. In this context, there is a current search on all sides for accepted payment methods and providers (micropayment).

The Internet meanwhile offers an enormous market for digital content of any kind. Thus, it provides a unique market platform for the sale of content. The common voice of the study participants clearly speaks for the development of this market segment. This growth is driven particularly by the continuing triumph of the mobile market and also by increasing bandwidth which makes access to Internet content easier and enables new formats. Many classic content providers – but increasingly all market participants – are faced with a growing competition that has a huge potential for innovation. The Internet content market therefore looks very exciting.

The balanced assessment of pricing in the Internet content sector reflects the insecurity pertaining to profitable business models.

Illus. 22



4. Trends and Market Development Drivers

The Internet and its developments have direct and indirect effects on the overall economy. Moreover, the medium Internet itself is in a permanent state of change. This chapter covers three issues that currently strongly influence the German Internet industry and the effects thereof.

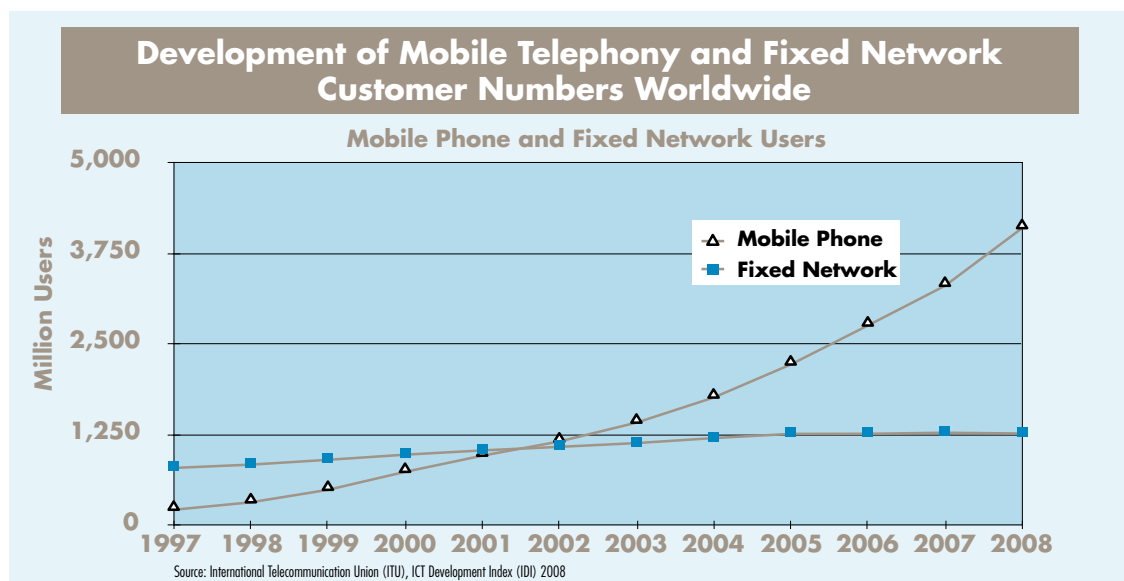
- *Key technology: IPv6*
- *Enabler: Open innovation*
- *Internet usage trends and effects*

These topics are analyzed based on qualified expert interviews with industry executives. The issue of open innovation is also analyzed with the help of the online survey results.

4.1 IPv6 – Benefits for the Economy and Consumers

The developers of the Internet technology did not foresee the growth rate of the Internet user numbers. The Internet protocol 4 (IPv4) is set up for a total of 4 billion addresses. For a long time, people thought that would be sufficient, but they are running out. The first scientists already predicted at the beginning of the nineties that the IPv4 address space would not suffice and began to develop a new version that finally reached the public as IPv6. Considering a world population of 6.8 billion people, the address problem becomes clear in the context of phone access development, especially mobile phones (see Illustration 23). Currently, around 5.37 billion addresses/ numbers are necessary for the telephone system worldwide.

Illus. 23



Many technical tricks were necessary in order to delay the final introduction of the new version (IPv6) which increased the whole dilemma since security and stability suffered. An example would be the allocation of dynamic IP addresses that are assigned to the user by the service provider for the duration of a session causing additional coverage and storage requirements due to regulatory requirements. Another example is the address translation of private addresses to international ones (NAT, Network Address Translation). The latter is more effort, slowing down networks and requiring additional functionality and household connection components.

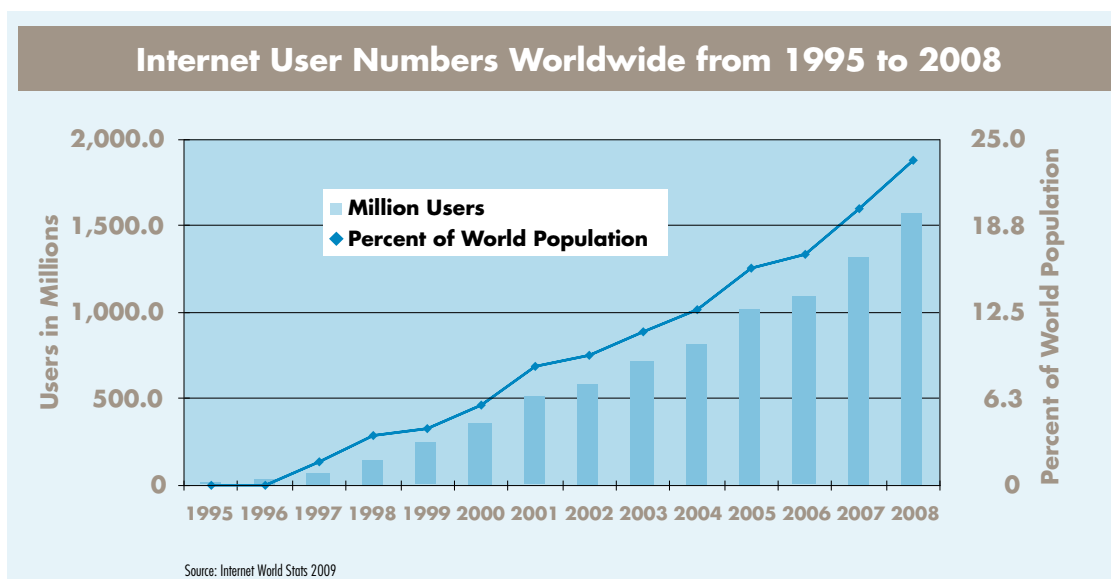
Thus, the new address system has many advantages. First of all, the goal is to give everybody the opportunity to have access to the Internet, which would not be possible with the current address space. With IPv4 neither China nor India would have a chance to provide sufficient Internet addresses.

However, the number of 4 billion addresses will soon be reached²⁴, if we project the expected growth and calculated at least two addresses per connection hardware and PC per user. What must be taken into consideration as well is the constant increase in appliances connected to the Internet (“Internet of Things” – refrigerators, TVs, etc.) and the numerous servers on the Internet. IPv6 enables 340 sextillion addresses, an address space almost inexhaustible compared to today’s benchmarks.²⁵

24 The exact time to the transition from IPv4 to IPv6 can be checked down to the second at <http://penrose.uk6x.com/> or a dynamic display can be installed in the browser (see Hurricane Electric IPv4 Exhaustion Counters). For instance, on October 28th, 2009 at 10:30 pm, the countdown to the central register exhaustion was 749 days, and 1,191 days, 2 hours, 28 minutes and 30 seconds to the exhaustion of regional addresses based on IPv4. Theoretically, after that no more Internet addresses would be available.

25 In other words this would be 600 quadrillion (one six and 17 zeros) addresses per square millimeter of earth surface or 2^{128} addresses (instead of 2^{32} before).

Illus. 24



The IPv6 address space offers the appropriate technological foundation for growth, future developments, and permanent innovation.

To make a long story short, the IPv6 is a change in the technical foundation of the Internet, a change that should not be noticed by the user. Nevertheless, for the economy and the Internet user, it is advantageous. An example is the broadband initiative taken by the government: Within the framework of this investment, every new technical acquisition has to be IPv6 compatible in order to maintain stability and communication infrastructure investment protection in the future. The IPv6 address space offers the appropriate technological foundation for growth, future developments and permanent innovation. Application areas that depend on IPv6 infrastructure to be competitive include:

- *Home networking and telemedicine;*
- *Internet of Things;*
- *Car2Car communication, traffic telematics;*
- *Intelligent building control, sensor networks (smart metering).*

In contrast to IPv4, IPv6 opens up new opportunities for applications:

- *Simple and sophisticated Internet telephony, online collaboration and other interactive services through a global addressability of all participants;*

- *Internet of Things and mobile flexible sensor network support that manage crisis situations and help with tasks such as building control for energy management;*
- *Interactive, Internet based television;*
- *Vehicle communication (Car2Car and Vehicle-to-X communication) between vehicles and also between vehicles and other services enables an efficient, safe, and resource saving traffic flow control;*
- *Integrated security mechanisms at network level;*
- *Mobility and better flexibility for participants and the option for an “always-on” functionality across network borders;*
- *More cost efficient and resource saving network operation as well as plug & play for many end devices through automatic configuration.*

Furthermore, the decided broadband expansion has no future without IPv6. Due to the adopted investments within the framework of the broadband initiative, IPv6 technology has to be introduced across the board.²⁶

²⁶ Detailed information on the national IPv6 plan of the German IPv6 Council at: <http://www.ipv6council.de/aktionsplan.html>.

4.2 Open Innovation

Open innovation, including stakeholders in the innovation process, is widespread in the Internet industry and especially there it is done efficiently and effectively. The Internet becomes a vehicle and a driver for open innovation processes in other industries as well.

The outstanding characteristics of the Internet industry have always been its innovation diversity and speed. Many layers of the Internet industry go through a rapid succession of changes, driven equally by product, process and service innovations, but also by business model changes. Google, eBay, YouTube or Apple are only a few companies picked as examples that have disruptively changed the competition landscape globally as well as in Germany on a large number of product and service markets. Due to its dynamic creation history on the one hand and the efficient forms of communication and cooperation on the other, the Internet industry is especially innovative and an industry that has involved stakeholders in the innovation process since its beginnings.

Open innovation is defined as a company internal innovation ability increase through opening the idea generation process and the innovation filtering and realization process to stakeholders who are actively.²⁷ Companies have always asked themselves how innovations would turn out best and how they should be steered. As a result of the advancement of Internet based interaction options and the ingenuity of companies on the Internet and the consumer electronics environment, the open innovation process is intensely discussed.

Cooperation along the value-added chain holds the highest risk potentials in respect to the creation of new competitors, as seen in the example of Apple from the perspective of the telecommunications network operators. As a mobile phone operator partner, Apple attacked the value-added layer of these companies when Apple claimed a portion of the proceeds from the total usage of the users. Next to the cooperation with upstream and downstream value-added layers, the integration of consumers in the innovation process is a priority for the Internet industry because monetization decides on end customers.

An example of open innovation in the Internet sector is the iLabs Initiative of the Norwegian fixed and mobile phone network provider Telenor. Telecommunications network operators that want to avoid a cannibalization of their core business (voice telephony and simple data services) often have a hard time with Internet oriented innovation. Especially opening up to potentially substitutive or partially cannibalizing services is something that often happens too late. The example of Telenor illustrates how established providers can try to include external partners in the development of new products. In 2007, Telenor started iLabs as a research project with its primary purpose to find out how open source can be used for the innovation of services in mobile telephony. Incentives for participation were created in the form of development funds and free API libraries (iLibs; for the iLabs see: www.ilabs.no).

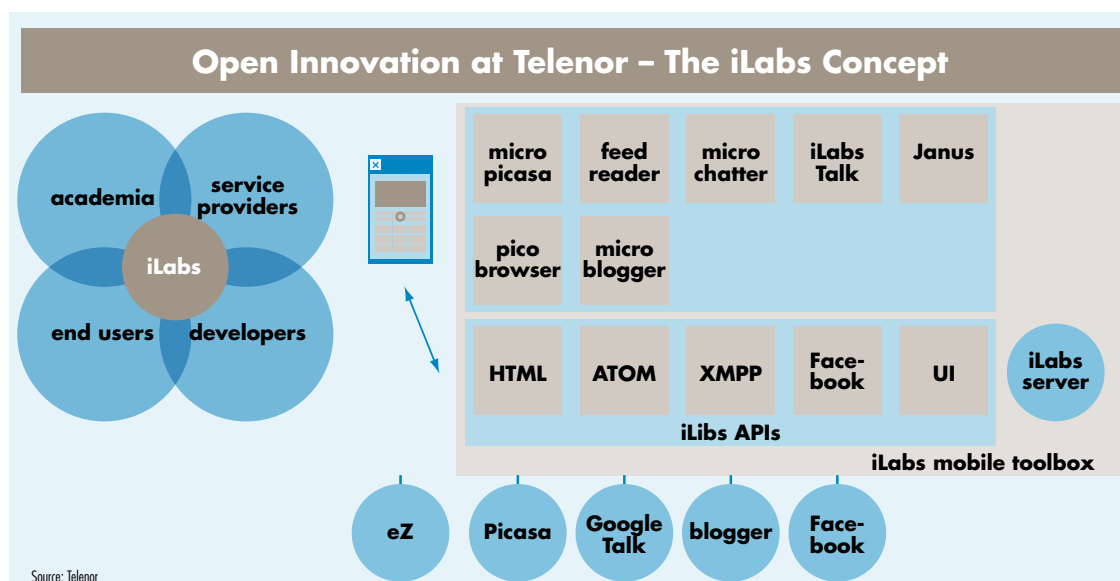
²⁷ see Chesbrough 2003; Picot/Doebelin 2009

A first result from iLabs is shown in Illustration 25 in the form of the “mobile toolbox” of the iLabs that includes a few APIs and test tools. These enable participants to take part in select social networks through the mobile end device, to develop mobile applications on Java ME end devices or to publish beta mobile services. Feedback from users is then used to improve the application architecture.

Open innovation promises advantages both in the form of additional sales by way of commercializing their products and through cost savings and differentiation. Faster, less expensive and more precise products and services that meet the customer’s demands are surely on the wish list of many companies. At the same time, the importance of open innovation is owed to the fact that even corporations, especially from the telecom and media sector, cannot compete with the multitude of free developers in order to appropriately enrich and develop the relevant applications and services. Real exceptions in this respect so far have only been some leading IT companies.

The increasing readiness of the users to participate in development processes and for instance rate products online supports the trend for open innovation. Companies in the Internet industry increasingly use this trend to improve the user friendliness of websites. Visitors used to be studied for the purpose of website optimization only implicitly through web controlling systems, but now within the framework of open innovation, web controlling data are linked with qualitative visitor surveys and that helps to ensure a user friendly experience.

Illus. 25



However, a company cannot readily initiate open innovation processes since often company internal information has to be published, thus potentially disclosing information to competitors. Companies must therefore first build up the appropriate basic understanding pertaining to the organization culture. Ibrahim Evsan, founder of sevenload, sums it up: “No open mind, no open innovation.” Opening up for insights from stakeholders promises advantages, but also holds extensive risks and only makes sense in certain constellations of an innovation project, a company and a competitive situation.

The study shows that the companies in the German Internet industry are already set up for innovation: Over 50 percent of respondents report that they use over 10 percent of sales for product development and innovation and devote over 5 percent of their employees to this task. In 15 percent of the companies, over 20 percent of the employees devote themselves to innovation (see Illustration 26). This reflects the innovation power of the Internet industry in contrast to other industries. Large telecommunications network operators for instance only invest around 2 percent of sales in research and development. In this sector, innovations are traditionally bought from infrastructure producers. In the self-perception of Internet companies, innovation is rated with high importance.

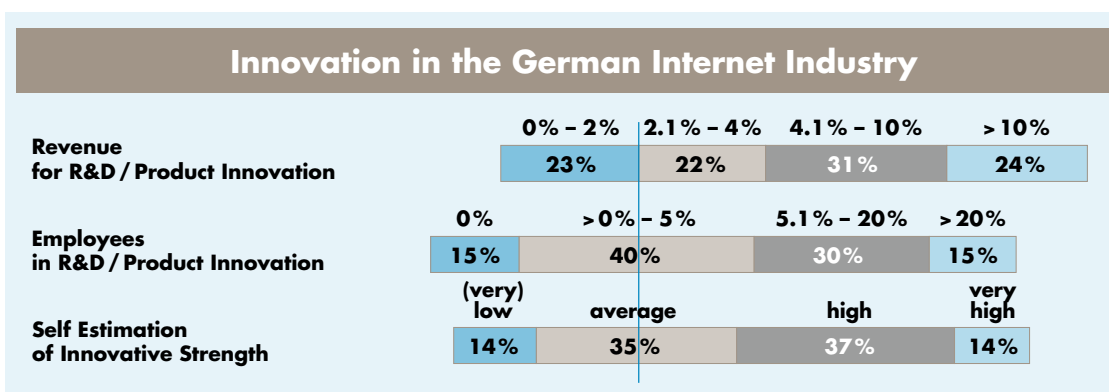
The companies within the German Internet industry are clearly innovation oriented.

“Without an open mind, there is no open innovation.”



*Ibrahim Evsan
sevenload founder*

Illus. 26



At the same time, around 50 percent rate the innovative power of their own company as high or very high. However, less than 30 percent of the respondents affirm that they had entered their own market as pioneers. Rather, over 50 are late followers in their respective sector. This result clearly deviates from the self-evaluation pattern as pioneering companies reported in the innovation literature.²⁸ The companies seem to be self-critical and they seem to recognize the importance of continuous innovations. Consequently, the open innovation approach has a great reception in the German Internet industry: At 47 percent, almost half of the study participants rate open innovation for their own company as important to very important.

There is a high degree of integration within the German Internet industry.

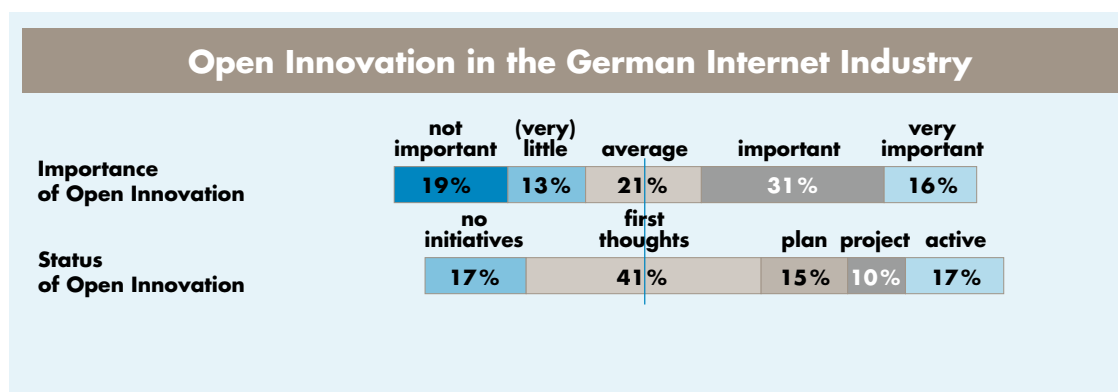
The number of companies that have advanced with their own open innovation activities is a little lower: Seventeen percent report that they already put this type of innovation into practice. A further 10 percent are preparing this at a conceptual level (see Illustration 27).

As seen in Illustration 28, companies assign different levels of importance to the different forms of collaboration. Fifty-eight percent see partnerships at the national level as “important” or “very important”, local/regional ones, however, are only important to 48 percent, and international ones to one third (31 percent). This result proves the existing limitations of the Internet market also caused by language barriers as seen from the German perspective. At the same time, the Internet has the effect that purely local/regional aspects of bundling business activities in one place that are characteristic of transitional industry clusters seem to be of subordinate importance to the German Internet industry.

Moreover, for 55 percent, partnerships and cooperation with companies in other layers of the Internet industry are more important than cooperation with companies in the same layer which at the same time are potential competitors (37 percent, also Illustration 28). In 43 percent of the cases, the cooperation is also primarily with other online companies, while 46 percent include online and offline companies equally. These results illustrate the high linkage within the Internet industry.

²⁸ see Gerpott/Jakopin 2008

Illus. 27



4.3 Usage Trends and Effects

4.3.1 Current Developments

The Internet has moved into almost all areas of our lives be it private, business or public life. The use of the Internet falls into very different categories. After the rapid diffusion of usage, users are found in all societal segments independent of age group, social class or sector. The use of the Internet continues to spread in Germany at a fast pace. The percentage of Internet users in Germany has gone up to 67.1 in 2009, that is an increase by 2 percent from 2008 (see Illustration 29).²⁹

The highest growth potential for the continued diffusion of the Internet among the German population is currently in the older generation. The Internet is used regularly by:

- 92.6 percent of 14- to 29-year-olds
- 81.0 percent of 30- to 49-year-olds
- 51.6 percent of 50- to 69-year-olds³⁰

Among Internet users, numerous different and in part also opposing trends are to be found in the type of usage. In principle, education correlates positively with the use of the Internet and the use of more complex application areas. A recent study conducted by the research group Wahlen concluded that 92 percent of Germans with a higher education entrance qualification use the Internet, whereas the group with a secondary school leaving certificate reached 83 percent. Eimeren/Frees (2009) also found distinct differences here by employment level. Accordingly, working people and people in apprenticeships use the Internet significantly more often than the unemployed or retired.

29 see Eimeren/Frees 2009

30 see Eimeren/Frees 2009; regularly = Internet us within the last four weeks

Illus. 28



In the long run, mobile Internet will not replace traditional fixed network broadband access.

The fact is that timewise the Internet use is increasing. This rapid growth among other things is driven by the currently typical usage trends:

- Mobilization of the Internet
- Internet as a moving picture medium
- Web oriented architecture
- Touch functionality
- Microblogging/lifestreaming
- Social networks

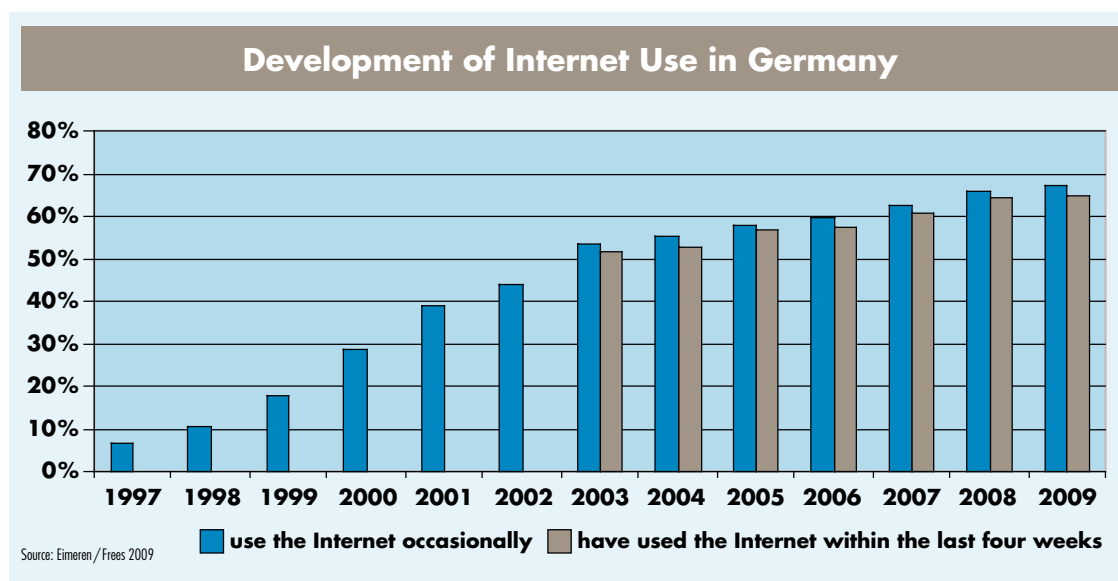
These trends are elaborated here as follows.

4.3.2 Mobilization of the Internet

Better devices, higher bandwidth, and most of all more inexpensive rates are turning the mobile Internet into a mass phenomenon. But mobile Internet will not be able to replace traditional fixed network broadband access – both types of utilization will coexist to serve both needs.

Mobile Internet is an example of a technology that has for the most part already completed the hype cycle – starting with the beginning euphoria on the market, to the disillusion phase, to the realistic perception and sustained growth. When UMTS licenses were auctioned in 2000, especially tri-level prognoses about mobile Internet use led to high bidding at the license auctions which amounted to almost 50 billion euros. After the Internet bubble had burst in 2001, the disillusion phase began, and the technology did not hit the mass market for another few years.

Illus. 29



The initial spark in Germany was struck in 2008 and the realistic growth potential was able to be explored on the mass market. Better devices, more broadband and especially more inexpensive rates are making mobile Internet accessible to the mass market. With the market introduction of iPhone, Android and Openmoko, the migration of the home PC to small, portable computers such as tablet PCs or netbooks and the cell phone has become reality. Now, it is possible to use Internet services fast and especially anywhere and anytime.

As this trend continues, the Internet will become even more mobile in almost all application areas. Mobile daily use services are the current topic because many things that were previously only possible from the computer on the Internet can also be done on a cell phone. It is expected that Internet industry companies and mobile end device makers will bring new products to the market in rapid succession.

The new connection technology of the LTE (Long-term Evolution) generation theoretically makes mobile download speeds of 100 Mbit/s and better possible. They significantly enlarge the spectrum of mobile applications. Once this becomes reality in a few years'time, there will be barely any services one will not be able to access from a mobile Internet connection. Germany will

“Mobile phone applications are more and more important to customers. Our Joint Innovation Lab Platform is a unique and outstanding answer to this trend. With our platform, the developers’ applications can reach over a billion people regardless of operating system, mobile phone type or network.”



*Frank Rosenberger
CEO
Consumer, Vodafone
Germany*

probably be trailing behind in the expansion of LTE as the case with the expansion of UMTS/HSPA. Regulatory authorities will assign the necessary frequencies for this utilization purpose only gradually. Furthermore, the investment requirements due to Germany's size are higher than in smaller countries. Also, investments may be driven up due to the assignment of certain unadvantageous frequency bands.

Mobile broadband with LTE will be available in Germany in the medium term only in high population density areas. However, in some Scandinavian countries comprehensive LTE services cover will be available for the mass market already in 2010.

Despite the fact that mobile Internet offers numerous advantages in contrast to fixed network services, in the long term, mobile Internet will remain a complementary product to the fixed network Internet due to high production costs on the supply side.

*Dr. Peter Meissner
Next Generation
Mobile Network
Operating Officer
(NGMN) Alliance*



“Regulatory agencies must timely release sufficient frequencies which allow for a cost-effective and all-encompassing provision of next generation mobile telephony standards (LTE and later IMT advanced) because the availability of mobile high speed/broadband access has a significant effect on the attractiveness of business locations, not only on a national level, but also compared to international standards.”

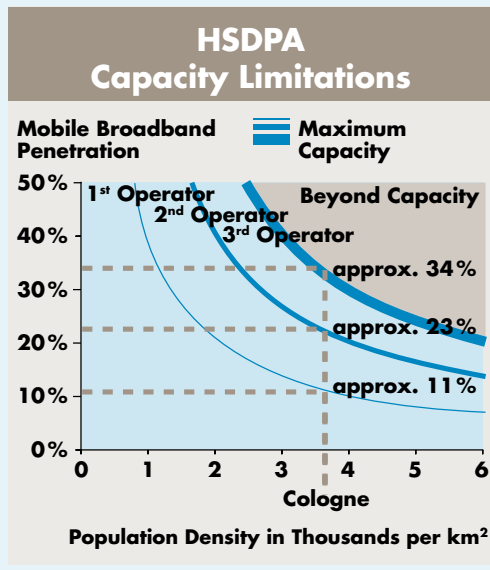
Illus. 30

Bluebox: The Physical Limits of Mobile Access Technology

Mobile access technology is currently growing significantly faster than access technology based on fixed networks. According to Informa, the mobile data traffic is supposed to grow 25-fold by 2012. A complete replacement of the fixed network, however, is physically not possible.

In the long term, mobile broadband will not be able to fulfill the growing demand for broadband, since the current network is not set up for flat rate charges.

In areas of high density, mobile telephony networks of all high speed/broadband standards are reaching their physical limits at a population penetration rate of over 40 percent. Moreover, the production costs for mobile broadband are significantly higher than the costs of fixed network operators. Mobile broadband will therefore coexist with fixed network broadband access as a complementary product.



- Notes**
- After the activation of the third operator frequency, the network capacity cannot be increased infinitely. There is a physical limit estimated at 1–2 access points per km² in urban areas.
 - Resulting in a capacity limit of HDPA networks (for instance in Cologne, the limit is 1 Mbps services for a maximum of 35 % of the users).
 - Potential short-term solutions might use indoor CPEs (for example **UMA, femto**), in the longer term 3G frequency refarming.
 - The capacity model shown left is based on the following assumptions:
 - User bit rate of 1 Mbps
 - 40-fold overbooking
 - 75 % indoor usage
 - 1.5 locations per km²
 - 3 sectors per location

Touch screens will enter many aspects of our daily lives.

The trend towards web oriented architecture has profound effects on the use of the Internet and the Internet industry.

*Georg Zedlacher
Marketing Leader
Central Europe, Dell*

4.3.3 Touch Screens

After the first touch screen had been developed by the company Elographics (electronic graphics) in 1974³¹, monitors sensitive to touch have been spreading at a very slow pace. The introduction of iPhone and Google Phone has propelled the touch screen into the mass market due to its use for Internet navigation. The 2008/2009 generation touch screen devices were very popular on the mass market because of their excellent user friendliness.

In the future, this technology will not only be found in mobile end devices, but also in other areas of daily life. Electronics manufacturers and software producers are currently placing touch screen monitors.

- *Tablet PCs (HP, Dell, Toshiba, Fujitsu Siemens and others)*
- *eBook reader (Sony, Amazon)*
- *Smartphones (Nokia, Apple, LG, Samsung, Sony Ericsson, RIM and others)*
- *Operating systems (Microsoft Windows 7, Mac OS X support for the multi touch trackpad)*

³¹ Elographics Computer Touch System, invented in 1974 by Dr. Samuel Hurst

Another application area for touch screen monitors currently still in the early stages is the presentation technology. So far, it has been seen on TV shows where presenters discuss more or less complex topics. Numerous application areas for this technology are found on the Internet, such as kiosk systems for moderating Internet based conferences or for operation control with Internet access. These devices are also gradually reaching the mass market.

4.3.4 Web Oriented Architecture

Another development regarding the use of the Internet which has a profound effect on the Internet industry is the trend to “web oriented architecture.” This refers to the shifting of processes as well as hard and software functionalities to the Internet. Today, business customers as well as private customers pull away from the classic, isolated working environment and move to an integrated, virtual environment.



“Cutting edge software combined with touch screen hardware offers evident user advantages to customers. They will shape the PC market in the coming quarters of the business year.”

- *On the private customer market, programs or storage or a combination of both are offered online.*
 - *Hardware functionality*
 - *Dropbox³² is an online storage provider. Private customers can store their files from any Internet access and secure them better that way. At the same time, they have flexible access.*
 - *A combination of hard and software functionality*
 - *Google Docs³³ is an Office competitor that offers the main functions of the Office programs free of charge or client for browser operation and thus enables word processing in spatially separated workgroups.*
 - *Spotify.com³⁴ is an Internet jukebox for entertainment purposes that allows you to listen to millions of songs anytime as audiostream for a monthly fee. The user does not need to store the tracks on his/her own hard drive.*
- *On the business customer market, “cloud computing”, “grid computing” as well as “Software as a Service” are currently big growth markets. The developments in these segments of the B2B telecommunications market are heading in the direction of on-demand and everything-as-a-service concepts.*
 - *Hardware functionality – Data center capacities are not set up internally but rather leased as needed from a cloud computing provider. Advantages for the company are availability and cost transparency.*
 - *Software functionality – Software does not run on internal company EDP but is rather leased from a SaaS provider. Thus, the company no longer requires a license and pays only for the use of the software.*

Web oriented architecture enables access to functionalities independent of specific platforms, anytime, anywhere, and mobile as well.

Managed services are an obvious growth market in the ICT communications solutions sector. In the coming years, cloud computing will become more attractive for a large number of applications and will be the preferred solution for many application projects. “The advantages are all too evident – an agile and scalable IT infrastructure combined with low cost,” says **Dr. Jürgen Hernichel**, Executive Chairman of COLT in Germany and Managing Director for COLT Northern Region.

32 www.dropbox.com

33 www.docs.google.com

34 www.spotify.com

4.3.5 Internet as Moving Image Medium

The Internet is currently turning into a moving image medium, driven by technology leaps and evolution due to demand.

Videos are more and more interactive and the online video viewing experience is better for the user.

In 2009, 62 percent of all onliners in Germany were watching videos through video portals or media libraries and watched live or time-delayed television on the Internet.³⁵ This signals a growth of 7 percent in comparison to 2008. Apart from the trend for Internet video as an entertainment medium, Internet users will not only release their videos to the public, but will also process them and tag or mark interesting parts. Thus, videos are becoming increasingly interactive and the “online video” experience is becoming more attractive to the user.

Companies must react to this trend because the customer dialog via video will find its way into the web presence of many companies. Different companies are currently planning product descriptions in the video format (for instance, video ratings at Amazon) or investor presentation conference calls as videocast. There is a strong trend in online marketing in the direction of moving pictures.

SevenOne Media and Nielsen Media Research are reporting distinct sales increase rates with online moving picture advertisements. This growth will even significantly speed up when this segment has reached a higher maturity level.

Also the professional level of UGC websites, which include professional (premium) content in what they offer, is going up. One of the most characteristic examples is the video-on-demand service of YouTube.

4.3.6 Microblogging / Lifestreaming

People and companies use microblogging applications like Twitter to distribute small pieces of information with entertainment value. The instant aggregation of information from different online activities on one platform is a trend called lifestreaming, which indicates the future development of Internet use.

Microblogging applications such as Twitter directly inform users through updates from sources that they chose themselves. The user receives a constant flow of updates about friends and acquaintances on the one hand, or companies and politicians on the other. Photos, videos, press releases or pod- and videocasts are also used.

Lifestreaming includes microblogging and takes it to the next level, where additional information about the user’s online activities is automatically aggregated and published.

- *Microblogging/lifestreaming applications are gaining increasing acceptance. Users are getting more and more used to talking about the private sphere via lifestreaming in order to manage their social relationships and to generate an online reputation. The actor Ashton Kutcher already has 3.9 million followers (virtual fans) on Twitter as a forum for his thoughts and opinions. This trend is strengthened by mobile applications that enable “always on” and that make it easier to constantly put new information on the Internet or retrieve information about others.*

³⁵ see Eimeren/Frees 2009

- *Microblogging is the main trend this year for companies as well. Informing interested stakeholders by microblogging is one of the most promising PR channels. In the future, this direct flow of information will be indispensable for communication with investors. Politicians will not be able to do without staying in direct contact with voters/stakeholders via a blog or a Twitter account. Moreover, microblogging is used as a distribution channel to present the newest sales and products to interested target groups; Lufthansa and Twitter illustrate this: Lufthansa has 9,720 followers (virtual fans), which is a target group for special ticket sales and advertisement in general. Compared to Ashton Kutcher's 3.9 million fans, of course, companies are trailing far behind.*

Due to the amount of available information, it will become increasingly important to take care of one's own reputation on the Internet, this is the case for companies as well as users who are for instance applying with a company. The core issues will be:

- *Is the online identity distinct? Is there clear information about the brand core?*
- *What is the result when the name is entered into a search engine?*
- *Do self-perception and the perception by others match?*

Managing these aspects is becoming more and more important for a company or even a person. Service providers such as the reputation management service, **Revolvermänner**, are already gaining importance. They make it possible to be coherently represented on the Internet with a clearly recognizable online identity.³⁶

4.3.7 Social Networks

Currently, 51 percent of German Internet users are members of a social network. This changes communication and keeping in touch among the population on a daily basis and therefore it also changes the daily business conducted by companies at different levels. The opening of source codes, the convergence of networks and the mobile use of social networks are the main trends of 2009. The greatest challenge still is to find business models that work.

“The increasing use of social networks impacts on many levels of the Internet industry.” Some of the most well-known large social networks in Germany include **wer-kennt-wen**, **StudiVZ**, **MySpace**, **Facebook**, and **XING**. They are part of the Internet evolution: “They created a user driven level, a dynamic, linked, and interactive online world.”³⁷

Social networks turned the online world into a more user driven, dynamic, connected, and interactive world.

³⁶ see www.revolvermaenner.com

³⁷ see Arthur D. Little 2006

At the end of 2008, social networks had already reached 51 percent of online users, that means every second user accesses social networks for private or even professional Internet use.³⁸ Compared to the previous year, the social network range has gone up by a remarkable 13 percent. That is the highest increase in the large European markets studied by the market research company Nielsen. Facebook Germany grew at an average growth rate of 180 percent between 2007 and 2009 and increased its user numbers to 3.8 million. A further growth in membership and increasing length of stay can be expected. An above average growth rate was especially noticed for the members aged 54 and over.

Thorsten Vespermann (XING) comments: “Social networks will grow successfully when they offer their target groups a real added value. Members approach business networks and leisure oriented networks with different expectations. Those who want to be successful in business should simply listen to their community when it comes to developing their product.”

Innovative services increase the draw by linking social networks with other technology such as GPS and mobile telephony and will facilitate a further spread. Utilization of social networks is becoming more intense and takes more time. According to a Nielsen study, the time spent online on social networks has gone up from 3.1 percent to 7.5 percent since December 2007.³⁹ Conservative predictions made by Datamonitor market researchers for Germany from the point of view of the overall market indicate increases of 20 percent for user numbers and sales alike.

³⁸ see Nielsen 2009. That puts Germany clearly behind the reference markets USA (67 percent), Japan (70 percent), UK (69 percent), France (67 percent), Italy (73 percent) and Spain (75 percent) – however, for these markets, Nielsen also includes professional use (at work) while the data for Germany is based on Internet use at home.

³⁹ see Nielsen 2009

Thorsten Vespermann
Director Corporate
Communications
XING AG



“Social networks will grow successfully when they offer their target groups a real added value. Members approach business networks and leisure oriented networks with different expectations. Those who want to be successful in business should simply listen to their community when it comes to developing their product.”

Apart from the well-known large communities, there are also many social networks in the form of “vertical” communities i. e. specialized on certain topics – as well as wikis or blogs. Numerous existing Internet portals launch network functions primarily in order to tie in the user and to achieve a long-term positioning in the market niches of the Internet industry. However, parallel to this granulization and differentiation, network convergence increases. More often now, networks are being opened in the form of data exchange and the central administration of user information, for instance reducing redundant entries and therefore entry barriers. Examples are the applications **Atomkeep** or **lifestream.fm**, as well as **FriendFeed**. With these platforms, the user can be present in several social networks (such as **Facebook** and **LinkedIn**) and bundle his/her profiles and activities from over 60 social networks. The omnipresence of the leading communities is underpinned by widgets and the integration in other well-liked applications (for instance **Facebook Connect**). **Marc Ziegler**, CEO of **Mediencluster NRW**, is convinced that the future belongs to these applications: “Besides profiles linked across networks, there will be more and more of these intelligent links and complementary services in the future.”

Due to social networks, contacts and interaction between Internet users is growing. However, the question remains how much value they add to relationships outside the networks. For example, a current study of 18- to 24-year-olds concludes that they maintain an average of 88 contacts in their social networks. At the same time, the number of “real” friends and work colleagues in their

analogous environment is 32 and 28 people, respectively. Participants in the study reported that they would theoretically only call 9 percent of their **Facebook** contacts, 4 percent of their **LinkedIn** acquaintances and 0.3 percent of their **Twitter** followers to ask them out for a beer⁴⁰. So the social online networks seem to have a rather small effect on the real local networks.

Social networks increasingly improve their application options on mobile end devices. Examples are **Flickr**, **Facebook**, **MySpace**, **Twitter** or **YouTube** who provide their services customized for small displays so that the main functions (for instance, checking profiles on **Facebook** or uploading photos on **Flickr**) can be used from the mobile device almost anywhere and anytime. Due to the spread of social networks, makers of end devices also jump on this bandwagon and provide products that make the mobile use of social networks easier. Examples are **YouTube Cams** by **Casio**, **Samsung** or **Kodak**. According to the market researcher **Nielsen**, among mobile phones the **iPhone** heads the range with 13 percent of social network users, followed by **BlackBerry** (9 percent) and **Motorola** (5 percent). Communications service providers are also launching products customized for the use of social networks. The aim is, on the one hand, to draw the users of these networks and, on the other hand, to generate traffic on their networks. The mobile telephone provider **O₂** enables users to send or check status updates via SMS. Other cooperations of this type are to be expected in the near future.

Social networks are increasingly used anytime and everywhere through mobile access.

⁴⁰ see Smith 2009 based on UK market data

Advertisement based business models – next to “freemium” models – continue to be the most important ones in the social media scene.

Social networks are attempting to generate revenue by using different business models. Advertisements, premium membership fees, usage fees, item shop and upselling are the main options for companies, operating on the market independently. For outside companies social networking is used predominantly for customer retention. Typically, the business model of one's (own) social network requires subsidy. The original operators of social networks, on the other hand, depend on a business model that generates actual revenue and they have to do so on the basis of their reach. Lopsided financing of social networks on the basis of advertising alone, however, has been challenged by many analysts and more creativity and multimodality is called for in order to generate revenue. But despite these estimations, Facebook (in the USA), according to their own information, has already reached the break-even point in September 2009, which shows that business models based on advertising alone can be feasible as well. According to a current comScore study, one fifth of all Internet ads can already be found on social networking webpages. Marc Ziegler of Mediencluster NRW emphasizes this as well: “Ad-based business models continue to be the most important business model. In the social media environment, however, a so called ‘freemium’ model like XING will prevail in which basic services are free and premium services are paid. And yet, premium services will only be able to take hold if there is a certain exclusivity, a must-have character of the network.”

Social networks increase interaction options by including bidirectional communication in the form of instant messaging, SMS, or voice services such as Skype/ VoIP lifestream enablers like Facebook connect. Moreover, User Generated Content (UGC) is increasingly integrated in social networks, or UGC portals are changing in the direction of social networks.

Finally, social networks can be seen as part of the already described open innovation trend because they make it easier for outside players to participate in the innovation process and they themselves propagate an opening of the development process. Examples are Facebook or open operating systems for mobile end devices like Android or Openmoko.

4.4 Media Use and Company Marketing

The evolution of Internet use puts huge challenges before the marketing of companies of any kind, but it also offers opportunities for growth in online and off-line marketing.

Sven Herold, Global Head of Media Relations, Television and Global Communications at SAP AG, comments on the future influence of companies on the media: “Companies will be tomorrow’s television broadcasting companies as soon as the Internet replaces the classic TV distribution channels. I expect this development to take place in the next five to ten years at the most. Global corporations have to completely change their thinking for an effective communication with audiovisual media. Classic PR was yesterday, today, companies have to produce content like television broadcasting companies in order to be successful in their communication. Classic TV storytelling and reuse are playing an increasingly important role. Focussing on repetition of the company name or filming classic advertisement phrases will be less and less successful with the broadcasters. Journalists are

looking for interesting and extraordinary stories for their programs and platforms, and at the same time budgets are shrinking. This is exactly the gap that can be filled by companies offering material that is incorporated into the program seamlessly without it being advertisement. All the offices of a corporation worldwide will act as the correspondent offices that can participate with local stories, a network that almost no television broadcasting company can boast with. SAP maintains a worldwide reporter network with TV journalists from the respective countries. They not only deliver stories they researched and footage material, but they work together closely with the local TV broadcasting companies at the respective location. Story research, production and pitching come from a single source and are customized to the local, culture specific requirements of the stations. In this process, Internet servers provide not only additional platforms but also replace costly satellites and enable the distribution of the material with virtually no time loss. The only difference from a TV station is the missing transmitting frequency. In the ‘new world’, however, that is no longer needed.”

“Companies will be tomorrow’s television broadcasting companies as soon as the Internet replaces the classic TV distribution channels. I expect this development to take place in the next five to ten years at the most.”



*Sven Herold
Global Head of
Media Relations,
Television and
Global Communica-
tions, SAP AG*

Besides this form of PR, there are other trends exclusively pertaining to the Internet:

- *“Performance marketing” – with shrinking budgets, it is a winner in this time of crisis. Currently, those advertisement channels are developed whose performance can be clearly measured. Thus, companies will verifiably optimize their performance and in that way get the most out of their budgets. This in turn will entail that individual advertising spaces will be scrutinized in regards to their performance because advertisers want to see how their spending can be linked to higher sales. In the end, they will redistribute their advertising budgets accordingly: less money for traditional media (print, TV and radio), more money for performance marketing.*
- *The already mentioned “Search Engine Optimization” (SEO) has become a significant standard item in marketing budgets of companies from all industries and sizes. Florian Matthias, Creative Head Online at Draftfcbi, confirms this trend when he says: “If you are not listed on the first page, you are not relevant.”*
- *“Going straight to where the target group already is.” Against the background of decentralization of content and target group communication, companies have to understand where the target groups are and how to deal with this knowledge. While companies have so far erected brand temples on the Internet, they now will have to act right there where their customers are.*
- *Numerous companies have discovered that customer relationship management activities are carried out without their knowledge, for instance in the form of Facebook groups organized by satisfied or dissatisfied customers.*
- *The incubation time of bad news has become considerably shorter due to microblogging and social networks. The tolerated reaction time for believable answers from companies pertaining to current developments through these channels is short.*
- *Recommendation marketing is becoming increasingly important. Customers trust their peer group more than all other players. Successful companies will have to place their advertising messages at this level.*

4.5 Challenges for the Internet Industry

The demands on Internet based business models are growing in regards to the realization of significant and fast revenue. In the end, noncapitalizable network effects are losing significance, at least from the investor's point of view.

In the context of the financial and economic crisis, the demands on the business models of the Internet industry have changed in 2009. All business models depicted, on the Internet in the end depend on a far reach and intense utilization. However, focus now is placed on reaching a positive cash flow fast; the previous orientation towards a fast growth of customer numbers and the realization of network effects, is taking a back seat. Only business models uniting those aspects will get hold of the scarce venture capital in the future as well.

In the long term, only business models with a straightforward USP, and above all with traffic that can be turned into money, will prevail. Numerous examples have shown that even half a million users that cannot be capitalized on are no basis for successful business in the long term.

The shortage of venture capital is a serious problem for the German Internet industry. In 2008, only 251 million euros of venture capital were invested.⁴¹ Due to the low investment volume, industry experts are currently observing a “brain drain” of successful entrepreneurs in the Internet industry, who move especially to the USA.

“We are losing our Leonardos, people who work on long-term projects, visionaries!” Ibrahim Evsan says, regretfully. He is the founder of **sevenload**, Germany's most successful video-on-demand site.

Since many startups still cannot show how they will generate revenue, a significant number of startups are driven into illiquidity because access to capital is limited. The crisis, however, also has positive effects for some business models. With the recession, people increasingly use the Internet to help them make purchase decisions. This happens regardless of whether the purchase in the end is made online or offline. For many Internet users, e-commerce gains center stage. In this context, portals will be able to hold their ground that besides providing sufficient well-organized information to compare the available options will also offer added value and additional services. After all, 2009 has been a year of savings: spending has been cut. Business models and services that either save money or make money are becoming increasingly popular.

In the long run, only business models with an evident USP and revenue producing traffic will be able to assert themselves.

⁴¹ see Majuhnke 2009

Regarding Internet business models and bordering digital media, it can already be said that – except for these smaller niches – it will be the business models financed through advertising that will take hold. In general, the point is: Business models have to be simple and coherent. They must not push customers into business and IT processes, but rather focus on the user's needs.

In order to survive in the highly dynamic competitive environment of the Internet industry, it is essential to take the above mentioned user trends and demands on business models into account. In no other industry, the entry barriers intended to ward off disruptive business models at the individual levels have been so weak, while the threat posed by newcomers has been so ubiquitous. The positive business climate of the sector primarily reflects the opportunities generated by these developments – for many companies, however, they will also hold significant risks.

5. Conclusion and Outlook

In just under 20 years since its commercial availability, a prospering industry has developed around the communication technology of the Internet, an industry that has already radically changed the private and business communication behavior in many areas and is increasingly shaping the sociocultural and political environment of modern society as a whole. The influence new developments in the Internet industry have on our social and economic activity has become ever stronger and ever more noticeable.

The innovative power of the industry is unbroken and will stay that way for the next few years. The creative potential of the Internet industry lies in the medium-sized structure of the economic players. With very few exceptions, the decisive impulses mainly come from small to medium-sized companies. The Internet industry is made up of many service providers operating with divided workloads. The value-added chains of the companies close to infrastructure thus form the basis for almost all subsequent economic processes. In the near future, “all IP” will be the basis of all electronic communication.

While at the beginning of the Internet age the Internet Service Provider acted purely as access provider, the classic ISP is rarely found anymore. Given the specialization of the access business through addition or substitution, today’s ISP is undergoing the change to a provider of managed services. Besides access services, they offer hosting services and more and more integrated solutions for industry, trade and service. Increasingly clear structures are beginning to show in regards to the cloud services trend.

For the Federal Republic of Germany, the importance of the Internet industry keeps growing on a microeconomic scale as well as on a macroeconomic scale. Sufficient coverage of living and working spaces with broadband Internet access is vital for the location appeal and the competing power of our national economy.

As far as the second layer, Services & Applications, is concerned, it is evident which potential must be developed for the future. The Internet is becoming the central application platform, the central resource for storing and managing data and processes. The classic data processing center is being replaced by the modern, connected and secure data center. But it will become necessary to promote this form of information processing to gain more trust. At the same time, for instance in the area of cloud computing, standardization is necessary: A secure legal framework is needed, adjusted to legally cover today’s form of commissioned data processing. Here, the market participants are asked to call for more practicable general conditions and a simply and well functioning value-added chain sequence. The same holds true for the mobile Internet: Examples of m-payment standardizations in other countries show how this can fuel the acceptance and usage of mobile payment systems and therefore mobile commerce. Most of the added value in today’s smartphones lies in the personalization of applications that can be customized by the user according to his/her personal needs. Depending on the operating system, the development of applications can be easier in one case and harder in another, so that the consolidation of the operating system market at the latest will be decided with the question: Are there enough attractive applications for this machine with that platform? The application stores of the end device producers are also crucial in this context. A large se-

lection and clear functionalities will have a direct and positive effect on the sales of the respective hardware in the future.

The already classic e-commerce applications constitute a superstructure in relation to the infrastructure. Here, the numerous private and business transactions are taking place, transactions that by now have had the predicted revolutionary influence on the New Economy. The mature companies survived the burst of the dot.com bubble and they are shaping a fast growing sector of the Internet industry with their products. E-commerce sales today (as it relates to this study) amounts to 83 percent of the total sales for the layer Aggregation & Transaction, and at 22.4 billion euros it is almost half of the total sales of the Internet industry overall. Last but not least, online advertisement will not replace classic advertising altogether, a two-digit growth can be expected here, too. The tendency: innovative and on the upswing.

The content market is literally exploding although providers are still looking for sustainable business models after they had failed to jump on the bandwagon for a long time. Here, the question will have to be answered how “plain content” can be turned into “paid content”. The mobile Internet might point the way.

One challenge that is tackled across all layers in the Internet industry is the issue of security. In the layer Services & Applications, data centers are trying to get certifications and ensure data security for their applications, while at downstream layers it’s an issue offending of spam and malware, and providing secure m-payment, as well as legally impeccable content.

In this context, a number of institutions – such as the Internet hotline operated by eco in cooperation with The Voluntary Self-Monitoring of Multimedia Providers (FSM) – and vigilant users are striving to make the Internet safer.

The overall picture of the Internet industry is shaped by optimism and expectations of further growth. Almost all segments in the Internet industry are looking into a bright future.

The Internet industry continues to hope for business friendly regulations – just like the legal framework that for the last 20 years shaped an Internet of extensive self-regulation and clear legal structures, which originated in Germany and became the foundation for the EU’s E-Commerce Directive.

With the present study of the Internet industry we hope to provide an approach which clearly illustrates the Internet as a medium and its importance for the national economy in all its facets. After all, the study confirms what we have always believed – the economic future lies on the Internet.

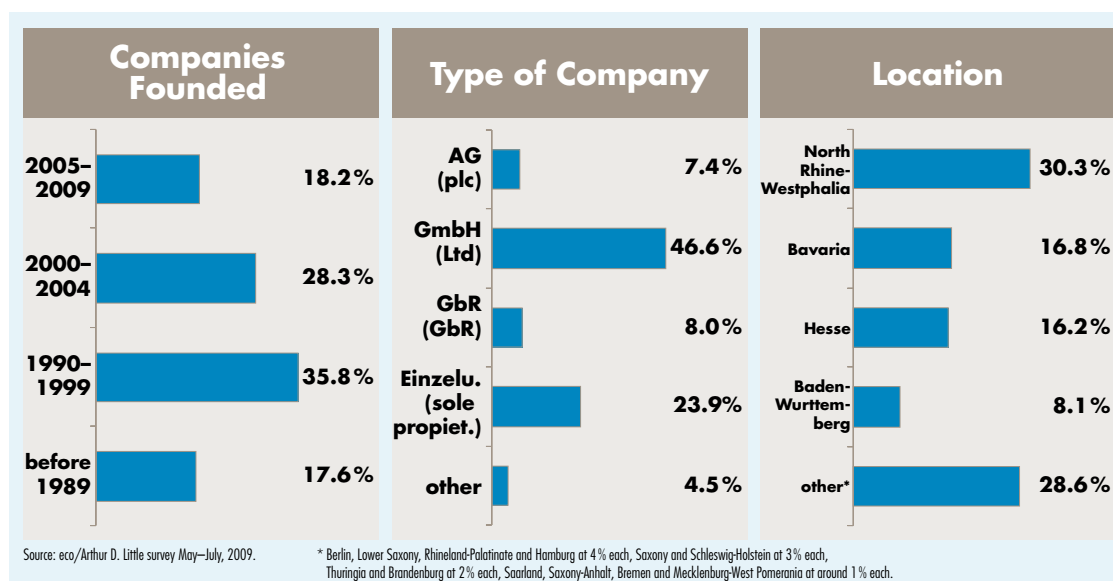
6. Method and Random Sampling

The eco/Arthur D. Little study was accompanied by an online survey and interviews with experts which took place between May and August 2009. The empirical data was collected via a written standardized online survey of German-speaking experts and executives from companies in the Internet industry. The random samples were taken from the member and newsletter directory of the eco association. Additionally, companies in Germany that are active in the Internet industry were picked by searching relevant freely accessible directories and databases. A total of 6,322 e-mail queries as well as another 3,986 mailed queries were sent to companies of the Internet industry, and in some cases several people from the same company were surveyed. After an e-mail reminder was sent out to the addressees contacted via e-mail, a total of 629 surveys were sent back filled out completely or for the most part and used for this study and its various evaluations. The return rate of 6.1 percent is low, but considering the volume of the questionnaire and the methodology of the survey, it is acceptable.

Out of the 159 participants who provided additional information to statistical questions, 18.2 percent reported on companies founded between 2005 and 2009. At 28.3 percent and 35.8 percent, the share of companies founded between 2000 and 2004, and between 1990 and 1999, respectively, was the highest. Almost 18 percent of the companies have already existed for over 20 years; almost half of this group for over 30 years (see Illustration 31).

The GmbH (46.6 percent) and the sole proprietorship (23.9 percent) were the most frequently named types of companies who provided information about this fact (see Illustration).

Illus. 31



The company location for the majority was either in North Rhine-Westphalia, Bavaria, or Hesse. At 30.3 percent, North Rhine-Westphalia was represented most. Further 16.8 percent and 16.2 percent of the participants were from Bavaria or Hesse (see Illustration 32), 8 percent came from Baden-Wurtemberg. Thus, the latter federal state percentage almost equals to the percentage of eco memberships. In contrast to that, North Rhine-Westphalia, Bavaria, and Hesse were clearly overrepresented, while Lower Saxony was underrepresented.

The 178 respondents who filled out further personal information on the questionnaire are mostly employees who have been working at their companies for a longer period of time (58.4 percent more than five years); 22.5 percent reported to have been working at the company between one to three years. Moreover, 26.3 percent were CEOs, 31.6 percent held an executive position, and 42.1 percent were managers/project managers.

In regards to age, the participants covered a “healthy” range, showing that the Internet industry is attractive to employees of all age groups: 16 percent were over 50, 36 percent between 40 and 50, 33 percent between 30 and 40, and 16 percent were between 18 and 30 years old.

By definition, when we refer to the German Internet industry, we mean companies that

- *actively perform business in Germany;*
- *make their entire or at least a significant part of their sales or significant absolute sales with IP relevant products and services;*
- *provide or enable IP relevant products/services that are directly related to the Internet. The study, however, does not include Internet related products and services of the second or third order (for example, an accounting firm that makes its money working for Internet companies).*
- *Sales of German companies made in other countries are not considered in this study, sales of foreign companies that are made in Germany are included in the estimates.*

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