THE DIGITAL DIVIDE IN AUSTRIA

REPORT

INSTITUTE OF TECHNOLOGY ASSESSMENT
AUSTRIAN ACADEMY OF SCIENCES
Georg Aichholzer
Rupert Schmutzer

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1 Introduction

The issue of a 'Digital Divide' as a major social problem of the information society has some old roots in research on the 'increasing knowledge gap' in the 1970s. The original hypothesis is, that segments of the population with higher social status tend to benefit more from the use of mass media than segments with lower social status. Such a tendency works clearly against the widely shared values of equal opportunities and a reduction of social inequalities in a democratic society. The digital divide stands primarily for a new social inequality and social exclusion associated with uneven access to the Internet, leading to or reinforcing an uneven distribution of life chances and social participation in a society, and, in a global perspective, between north and south. Of course, social inequality and endangered social integration have other sources as well. Especially level of income, employment, education and training, health and conditions of housing may be regarded as more fundamental factors determining life quality. But poverty and deprivation of these traditional factors tend to be perpetuated or reinforced by the new, digital divide.

In a second meaning the notion of "digital divide" is also used for particular social effects observed within the group of Internet users. This double meaning is, for instance, at the heart of a recent Stanford study undertaken by Norman Nie. He found both the digital divide in the first sense, a far lower access to the Internet among the poor, the less educated, the female and the black Americans. But he also observed a second form of divide among all groups of users of the Internet: a reduction of social contacts stated by every fourth Internet user which means less talking with friends and families and less contacts with the outer world in general. Perhaps one can also regard this as a new form of "cocooning". What can be learned from this dual finding is to avoid to see Internet access for all as a simple solution to the digital divide.

Overall, however, the emphasis of a digital divide rests on the assumption that access to the Internet is in principle advantageous and therefore desirable for all. This is not to ignore or deny the problems and perils which may be and indeed are associated with Internet use too, such as the issues of violation of privacy, illegal content, attacks by hackers, fraud, addiction, isolation, etc. These issues certainly are major challenges and deserve serious efforts to develop solutions through adequate policy and regulation measures. The aim of this paper, however, is to leave these other Internet issues to separate treatment and to concentrate on the digital divide problem as such, in particular its existence and possible counter measures in Austria.

The analysis of the issue of a digital divide in this paper is structured as follows:

First, in chapter 2, a basis is laid by investigating the general state of IT penetration and Internet access in Austria. Then the structure of Internet users is analyzed with a view on the present situation and trends over time (chapter 3). The goal is to determine, a) the extent of a potential digital divide, and, b) the direction of change. Chapter 4 asks for possible explanations and factors behind a digital divide in general and some evidence for such factors in Austria. Chapter 5 investigates which measures are taken against the digital divide in Austria and chapter 6, finally, draws some conclusions.

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1 The 'increasing knowledge gap' hypothesis has been formulated first by communication scientists in the United States (Tichenor/Donohue/Olien). A summarizing account in German is provided by Saxer 1987.

2 The World Bank warns that the already existing enormous gap between poor and rich countries will be exacerbated by the digital divide. Especially Africa is extremely disadvantaged as for instance in countries like Mozambique only 4 among 1000 people have access to a telephone line (by 1998) and only 9 among 1 million can access the Internet. In some countries notably those devastated by recent wars like Rwanda and Angola there is no online access for ordinary citizens at all (Der Standard, 15/4/2000 and http://pressetext.at/).

3 http://www.stanford.edu
The digital divide in Austria

2 General state of Internet diffusion

2.1 PC equipment and Internet hosts

Basic preconditions for accessing the Internet are a suitable computer equipment with a corresponding telecommunications link to Internet services. Therefore the diffusion of PCs both in private households and in business is an important first indicator of the status of connectivity in Austria.

As concerns IT penetration in general, Austria finds itself more or less in the upper middle group among the members of the European Union, above the average on most indicators: with 68 business PCs per 100 white collar worker, 22 PCs per 100 population and 518 Euro IT expenditure per capita (EITO 2000). The diffusion of PCs and related equipment as well as Internet accounts in private homes is shown in Figure 1.

In Austria already a slight majority (51%) of the population over 14 years has a personal computer (PC) at home (March 2000). In absolute numbers this corresponds to 3.37 million people or 1.63 million private households. The increase of PC diffusion has been accelerating during the last three years and the growth curve will most likely continue at this level (taking into account that data for 2000 do not yet represent figures for the full year). Relevant features for multimedia use such as CD-ROM drive and soundcard have increased in parallel, but have not yet reached full coverage of existing PCs. A first direct indicator for Internet connectivity is the number of Internet accounts and modems which have reached a level of 21 and 23% respectively.

Figure 1: PC equipment and Internet access in private homes in Austria 1996-2000 (percent of population over 14 years)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)

4 For more details see Table 4 in appendix.
5 Figures for 2000 refer to 1st quarter only.
The uptake of the Internet can be observed in several domains: households, businesses (large companies, SMEs), institutions of education (schools, universities), institutions of government and public administration (both federal, state, and local level). However, exact data on diffusion are not available for all fields.

A further, although rather ambiguous indicator is the number of Internet hosts in Austria which can also be compared to other European Community member states (EC 1999). Figure 2 shows that Austria ranks sixth with a density of 36 Internet hosts per 1000 inhabitants. This is clearly above the EU average of 30.7 but far below the top position held by Finland with 120.6.

It should be mentioned that in the first published version of this EC report the data for Internet host density in Austria had been miscalculated. The wrong number (119.3) would have put Austria (together with Finland) even in the lead among EU countries. In fact this message had already been picked up by the media under the headline “Internet boom in Austria”. But there was no public discussion on the validity of these data, although there was no easy explanation for Austria’s sudden lead in Internet host density as well as for the unusually high increase within one year. Obviously the strong wish for such a development and a good headline as well as trust in a usually reliable source had made many people believe in the numbers without critical judgement.

2.2 Forms of Internet access and frequency of use

In any case, a more meaningful and reliable picture of the Internet diffusion is provided by a survey program which collects and updates data quarterly, the Austrian Internet Monitor (AIM). The numbers of the AIM are based on regular telephone surveys of a representative sample of the Austrian population (n=4500). It is since 1996 that comparable data over time are available through these surveys.
According to the AIM of March 2000 some 40% of Austria’s population over 14 have access to the Internet in at least one of various ways, that is from home, office, school, university, or from friends or a cybercafe, etc. The marked pace of growth is indicated by the fact that this proportion has increased by 279% within only four years as can be seen from Figure 3.

Some other trends are remarkable in this table:

- Internet access from home has the highest increase; already 22% of the population can use the Internet at home. A major driver behind the marked increase of home access observable especially since 1998 is certainly the burgeoning variety of special initiatives, combined hardware and online offers and reduced tariffs by providers and media industries.
- Access from office (18%) has been outpaced by home access already in 1999; the proportion that can use the Internet from the workplace is growing more steadily.
- Schools as an option of offering Internet access show a surprisingly low increase, compared to other reports on achievements in (Inter-)networking of schools.
- Access at universities had probably been provided earliest all over Austria, reached its potential already from the beginning of the observation period and therefore remains at a constant level of some 3% since then.
- Cybercafes and access via friends etc. have played an increasing role, too, but seem to reach their limits, even if one has to take into account that the drop off in trends by 2000 may be largely owed to measuring only the situation at the first quarter of the year.

If we compare this first result on the state of Internet access for Austria with other countries and especially within Europe we get the following gross picture (taking into account that definition of population, samples, methods of data collection and time periods are differing to some extent):

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6 Figures for 2000 refer to 1st quarter only.
Figure 4: Frequency of Internet use in Austria 1996-2000 (percent of population over 14 years)\(^7\)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)

Among EU member states the proportion of “online users” (Internet access and/or Internet users) lies within a range of 8.7\% (Portugal) and 56\% (Finland).\(^8\) With a figure of 39\% for Internet access Austria shows up at the more or less same level as The Netherlands and Denmark, only outpaced by three countries in the lead (Finland, Sweden, Germany). Further evidence of Austria’s relatively advanced position in Internet access is provided by the Information Society Index (ISI).\(^9\) This source ranks Austria 15\(^{th}\) out of 55 countries world-wide.

The provision of access is the necessary condition for making use of the opportunities which are offered by the Internet but access alone does not say much about use itself. The AIM does also offer information on the extent of Internet use over time. The main result is that not only more and more people are getting connected to the Internet but also that, among this group with access to the Internet, the frequency of use is clearly increasing (Figure 4):

It should be stressed that the diagram does not take account of the absolute growth of people with access but looks at the changing structure of users within this group. One can see that the group of “never users” has been markedly shrinking to around 10\% while the group of “heavy users” (almost daily to several times a week) has been increasing to a share of over 60\%.

To draw an interim conclusion: The diffusion of Internet access in Austria (by March 2000) has reached a level which is clearly above European average, grows with a more or less linear growth curve, enables access for some 40\% of the population (still a minority indeed) and is accompanied by a steep increase in frequency of use among those connected (around 60\% of them are “heavy” users).

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\(^7\) Figures for 2000 refer to 1st quarter only.

\(^8\) http://mediaresearch.orf.at/inter_06.htm, see full table in appendix (Table 5).

\(^9\) http://www.worldpaper.com/ISI/intro.html

This index is based on 23 variables which are supposed to measure the “ability to access, absorb and effectively take advantage of information and information technology”. Variables include for example PC and Internet diffusion, cost of local phone calls, e-commerce spending as well as some relevant social factors (education, newspaper readership, etc.) in order to benchmark nations’ information society infrastructure.
Let’s take a closer look at different institutional contexts of Internet use and factors influencing existing patterns and trends.

2.3 Specific institutional contexts

2.3.1 Households

As has been shown, during the last two years the growth of Internet access has above all been driven by the increase of access in private households where the pace of growth has been highest. Nearly a quarter of the population over 14 years is now able to access the Internet directly from home. This is remarkable since it also reflects a lowering of access tariffs in the most recent past while, until mid 1998, Austria still had been (together with Belgium and the Czech Republic) among the countries with the highest Internet access costs (Figure 5).

During the last two years, however, Austria has experienced a real boom of advertising with low cost or even “free offers” of Internet access by specialized providers as well as by various other businesses such as telecom firms, bookshops, newspapers, magazines, including forms of cooperation between these two groups. The growing number of Internet providers and intensity of competition among them has brought down the online-tariffs to a lower level and contributed essentially to the rise of home-based Internet connectivity in Austria. Moreover, general awareness of and interest in new media have already been stimulated by massive and highly successful campaigns by providers of mobile telephone services in the course of the liberalization of Austria’s telecommunications market.\(^\text{10}\)

\(^{10}\) According to data provided by Austria’s telecom regulator (Telekom Control) the number of mobile telephone subscribers has risen to 4,737,682 by April 2000, which gives a penetration rate of 59% (http://www.tkc.at).
In fact, many Internet providers are offering free access but are charging fees for use which vary considerably among different providers and which are very difficult to compare for users because of highly differentiated products. In July 2000 the Chamber of Labor’s consumer service compared the products of 39 Internet providers and published the results: The comparison assumes two standardized usage patterns for consumers, 10 and 30 hours per month online respectively, of which 20% during business time and 80% off-business:

For 10 hours the costs ranged from ATS 91.20 to ATS 503.40, for 30 hours from ATS 350.40 to ATS 892.80. Packages include different conditions for components such as e-mail account and server space for individual homepages.

A special stimulus for Internet diffusion to private households has come from combined hardware and Internet access packages. Several big print media (such as Kurier, News, Der Standard) have started offering such special-prized packages (often advertised as “free personal computers”) in cooperation with Internet providers for a one to three year subscription. In practice, however, this comes close to an installment plan payment of a PC through an obligation to use a certain provider at increased tariffs. The attractiveness of these packages decreases with the lowering of standard online tariffs. Increasing competition has already brought them down to ATS 0.33/min. (business time) and ATS 0.14/min. (off-business time) at the provider with the lowest tariff.

The Austrian telecommunications policy is particularly concerned with the need for regulatory measures to foster the provision of cheaper Internet access and connection costs (as addressed for example in the e-Europe initiative of the European Commission (1999a). With a consultation procedure on the issue of unbundling the local loop to foster greater competition in local access networks such regulatory developments are currently underway.

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11 http://www.akwien.or.at/Internet/
12 http://www.akwien.or.at/Internet/
2.3.2 Businesses

Five different most recent studies provide data on current Internet use among businesses. Their main results are summarized in Table 1.

The studies use different types of enterprise samples. The results suggest that at least more than 40% of Austrian businesses had access to and used the Internet by 1999. In the more recent IDC study and within the more homogeneous sample of medium-sized enterprises the proportion of those with Internet access even reaches almost 90%.

However, recent studies of medium-sized enterprises (International Data Corporation) and of the business sector (Boston Consulting Group) also state the need to speed up active use of the Internet. While Internet penetration seems to be higher in the Austrian business sector than in Germany, there is only slow development in the Austrian economy to use the Internet for e-commerce. As concerns the small enterprises sector in particular, there is no recent study at hand which would provide quantitative data, but various indications suggest that the level of Internet diffusion is much lower there, in particular in the manufacturing industries.
Table 1: Internet use in the Austrian business sector

<table>
<thead>
<tr>
<th>Study</th>
<th>Scope</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austrian Chamber of Commerce(^{13})</td>
<td>trade and industry, n=1166, May/June 1999</td>
<td>42.7% use Internet; usage: e-mail (76.8%), contact with clients (49.3%), contact with suppliers (49.1%), marketing (45.7%)</td>
</tr>
<tr>
<td>International Data Corporation (IDC)(^{14})</td>
<td>medium-sized enterprises (3.6-36 million Euro turnover), n=424, October 1999 - January 2000</td>
<td>89% have Internet access, 60% offer products or services via Internet, 7% use electronic signatures</td>
</tr>
<tr>
<td>Boston Consulting Group(^{15})</td>
<td>business sector, 1999</td>
<td>56% of Top-50 companies, 49% of Top 500 and 32% of the trade sector have a homepage and 16% of them offer online shopping</td>
</tr>
<tr>
<td>Institute for Business and Trade Research(^{16})</td>
<td>industrial sector, n=4000, 1999</td>
<td>45% have Internet access, 17.3% have a homepage, 8% offer online credit card payment</td>
</tr>
<tr>
<td>Industry Research Institute(^{17})</td>
<td>manufacturing sector and business services, 1999</td>
<td>78% of SMEs have Internet access and e-mail; only 7% allow for electronic interactions (have homepage or offer news-fora or chatrooms). Main benefits are seen in fast and simple access (75%), improvement of customer relationships (68.9%), new market potentials (60.7%).</td>
</tr>
</tbody>
</table>

2.3.3 Educational institutions

By mid 2000, access to the Internet is provided in 52%, that is 3307 of all 6382 Austrian schools\(^{18}\). The coverage of the different types of schools (as well as the equipment provided) is rather uneven. It is lowest in primary schools (34%) and special needs schools (44%), and highest among secondary academic schools (97%). According to a recent documentation of

\(^{13}\) Wirtschaftskammer Österreich (http://www.wk.or.at/infoges)
\(^{14}\) Der Standard, 10/3/2000 and http://pressetext.at/
\(^{15}\) Die Presse, 3/3/2000
\(^{16}\) Institut für Gewerbe- und Handwerksforschung; Kurier, 24/1/2000
\(^{17}\) Clement, Hajek, Lux and Macek 1999
\(^{18}\) Ministry of Education, Science and Culture (http://www.bmuk.gv.at/fssin.htm)
Austria’s progress within the initiative “eEurope”\textsuperscript{19} secondary level schools in Austria (schools you attend after the age of 14) are being connected to the Internet practically to 100 percent in the immediate future (eAustria 2000). This would mean that all schools under federal responsibility do have Internet access. Among the schools under “Länder” responsibility the proportion of those with Internet access is indicated with 43\%. There are also efforts to guarantee the provision of Internet access in all other schools in the near future.

In quantitative terms, therefore the necessary infrastructure seems to be already provided to a large extent and there are hopes that the remaining gap will be decreasing rather soon. However, there are some indications that suggest a more critical assessment of the state of Internet diffusion in schools. For instance, an Internet-based survey addressed at all Austrian schools with an own homepage came to a much less positive result. 26\% of the 260 schools responded and the conclusions drawn by the researchers were disappointing:

They found that the often enthusiastic reports on Internet diffusion among schools would hide the fact that – with few exceptions – the Internet is scarcely used in Austrian schools. Further criticisms concern the restrictive organization of practical access (narrow time slots, locked rooms etc.), lack of user advice and support, insufficient IT and specific Internet competencies among teachers and inadequate, too much technology-centered approaches in IT- and Internet training which often tends to slow down initial enthusiasm among pupils (Stangl 2000).

As concerns teachers, at least 17.000 have Internet access via the Austrian School Network and an additional number of them has access via alternative providers. The official documentation on eAustria also states that 50\% of teachers for Internet related tuition have experienced the required training themselves which points to a crucial training gap still to be filled, at least for a part of the other half.

This is also suggested by results of the study “Computers in Education” (COMPED) which investigated the use of computers among 4500 teachers in lower secondary schools and secondary academic schools in the early nineties: It showed that only a marginal percentage of present teachers had received systematic IT training at universities or colleges for teacher training. 90\% of teachers’ computer skills are acquired through further training, self-study or privately financed adult training courses. Until 1992, around 9\% of teachers in secondary schools had a supplementary formal training in IT; 70\% of IT-teaching was undertaken by qualified teachers for computer science, on average two per school were available in the early nineties (Haider 1997). More recent studies (Stangl 2000) confirm that the subjects where the Internet is directly used in teaching are still almost exclusively computer science and EDP.

### 3 Internet users and non-users

#### 3.1 Is there a digital divide?

Having outlined the rising diffusion and status-quo of Internet access in Austria as well as some general aspects of its use, the main questions are: who are the users and are there indications of a digital divide?

It can be expected that the use of the Internet is influenced by a number of social factors: gender, age, education, occupation, income, media literacy, etc. To assess this influence, the

\textsuperscript{19} “eEurope” was launched by the European Commission on December 8, 1999. Entitled “eEurope. An Information Society for All”, this policy program proposes ambitious targets to bring the benefits of the Information Society within reach of all Europeans. The initiative focuses on ten priority areas, from education to transport and from healthcare to the disabled. It is a key element in the new president’s strategy to modernize the European economy (European Commission 1999a).
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social structure of Internet users can be compared with the distribution of the population across some of these variables (Table 2).

As far as the distribution of Internet users by gender is concerned there is a clear under-representation of women: Only 41% users are female, but interestingly, their share among strong users is only slightly less (39%). This is echoed by a more qualitative study of the Institute of Communications Research at the University of Vienna which also found that women participate in the Internet significantly less and explained this mainly with traditional gender-specific education (Hummer 2000).

The situation with users by age is even more uneven: The majority of Internet surfers (51%) is 14-29 years old, the teens (14-19) are the most active users. This means that the younger age groups from 14-29 are significantly over-represented, those with 50 years and above extremely under-represented (36% of the population fall in this latter group, but only 9% of Internet users are of this age). Only the share of the middle aged group of 40-49 among the Internet users equals its proportion in the general population.

The distribution of Internet users by education is also very skewed: people with higher educational qualifications (colleges and universities) are twice as much represented as they are in the population while all lower educational levels are under-represented.

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20 With this figure the Austrian status corresponds exactly the gender distribution of Internet use worldwide, since "men currently make up 59 percent of the online population worldwide" according to a March survey of 34 countries by the Angus Reid Group, San Jose Mercury, author: Anick Jesdanun, Associated Press (http://www.mercurycenter.com/svtech/news/breaking/ap/docs/199147l.htm)
Table 2: Social structure of Internet users compared to population in Austria

<table>
<thead>
<tr>
<th>variables</th>
<th>population over 14 years</th>
<th>Internet users</th>
<th>Strong Internet users</th>
</tr>
</thead>
<tbody>
<tr>
<td>gender</td>
<td>6.600 000 = 100%</td>
<td>2.250 000 = 100%</td>
<td>1.600 000 = 100%</td>
</tr>
<tr>
<td>male</td>
<td>48</td>
<td>59</td>
<td>61</td>
</tr>
<tr>
<td>female</td>
<td>52</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-19 years</td>
<td>8</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>20-29 years</td>
<td>22</td>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>30-39 years</td>
<td>18</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>40-49 years</td>
<td>16</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>over 50 years</td>
<td>36</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary level schools</td>
<td>34</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>vocational school/apprenticeship</td>
<td>44</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>high school/university</td>
<td>22</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>occupational status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manager</td>
<td>8</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>employee</td>
<td>36</td>
<td>37</td>
<td>36</td>
</tr>
<tr>
<td>self-employed</td>
<td>5</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>student</td>
<td>11</td>
<td>28</td>
<td>29</td>
</tr>
</tbody>
</table>

Source: Austrian Internet Monitor 1st quarter 2000 (http://mediaresearch.orf.at)

Finally, the following already expectable picture is presented as to occupational status and income\(^{21}\) of Internet users in Austria: The Internet is most popular among students and people in managing positions. Both groups are strongly over-represented (by 2-3 times), while the share of employees equals their proportion among the general population. In terms of household-income Internet users differ markedly from the general population: People with an income above ATS 30,000.- amount to a much larger percentage among Internet users. The distribution of Internet surfers by region is not so much unbalanced any longer: The share by states (“Bundesländer”) is very similar to the distribution of the general population, the only exceptions are the overrepresentation of Vienna (26% vs. 20% share in population at large) and the under-representation of Lower Austria. Unfortunately the AIM provides no further data on an Internet usage gap between residents of urban and rural areas.

Additional evidence on the user structure comes from an Internet study undertaken by the enterprise Henkel Austria in 1999.\(^{22}\) The survey among 953 Internet users claims to be representative for this segment of the population in Austria, however, more detailed information on the sample and the organization of this survey are lacking. Therefore the results need to be interpreted with some caution, also because some directly comparable results deviate significantly from the well documented AIM. They should be mainly taken as an supplementary

\(^{21}\) [http://mediaresearch.orf.at/inter_01.htm](http://mediaresearch.orf.at/inter_01.htm)

\(^{22}\) [http://www.henkel.at/cee/at/deutsch/index4.htm](http://www.henkel.at/cee/at/deutsch/index4.htm)
evidence on major trends. It is the second time that Henkel undertook such a study after its first one in 1997 and therefore allows for some longitudinal comparisons. It goes without surprise that a main result of the AIM is confirmed: the typical Austrian Internet surfer is young, male and urban. But it also shows that the average age (33 years) as well as the share of female users (45%) are increasing, while the regional gap tends to decrease with a growing diffusion of Internet access among users in the provinces, although Vienna still dominates with a share of 43%.

There are some clear indications of a pronounced and continued social segmentation also according to this study (similar results have been found by Kirchner et al. (1997): Users are mainly located in larger cities (42%) while only 26% live in cities with less than 10,000 inhabitants. Academics and people with higher education account for 50% of the Internet users, while people with vocational training and apprenticeship career paths have only a share of one fifth. Interestingly, the share of apprentices seems to have risen sharply to a level of 20%. This also contributes to the corresponding result that the share of students has decreased in favor of employed people. The results concerning employment and income levels in particular are somewhat surprising and have to be read with caution: Unemployed people seem to be significantly over-represented (16% vs. 6.7%23) and as to income, 13% of users have none, while the majority (57%) has a monthly income of up to ATS 30,000 (EUR 2,180) and 23% a higher one.

Overall, the results of the Austrian Internet Monitor (AIM) on the present structure of Internet users indicate a significant digital divide in Austria. This divide seems to be less pronounced with regard to gender, but stronger with regard to age groups, educational levels, occupational groups and different income strata. The two Henkel studies would suggest that the Internet is gradually getting less elitist and that the digital divide in access is rather decreasing than widening. But does this allow to say that the diffusion of the Internet is on the way to its generalization in Austria? To answer this question it is necessary to take a closer look at the extent and direction of change in Internet use over time. Making use of the longitudinal information of the AIM will help to assess a widening or a closing of the social gaps identified.

3.2 Is the digital divide closing or widening?

Let’s begin with the situation as to male and female users of the Internet. This examination of the relative shares by gender shows that the big gap which had still existed less than three years ago has been steadily decreasing: roughly speaking from a ratio of 70:30 to 60:40 at present (Figure 6). Would the trend continue along the same more or less linear course, one could expect equal shares within three years.

A look at the change in terms of absolute numbers provides additional information: The distance between the absolute figures for men and women using the Internet is almost constant, in fact has been slightly increasing until now (Figure 7).

Behind the almost parallel course of these growth curves in absolute numbers stands the fact that female users have been growing at a much higher rate although starting from a much lower level: within the time period from 3rd quarter 1997 to 1st quarter 2000 their number has increased by 354% compared to 167% in the male group. If one takes just the figures for the last full year – end 1998 vs. end 1999 – Internet access of male users has increased by 40% while the corresponding rate for women was 66.2%. In fact, almost in each quarter the female growth rate was higher (see Appendix, Figure 10). In absolute numbers, however, there is nevertheless a continued male lead and it is still slightly increasing while women are strongly catching up in relative shares (see Appendix, Figure 11).

23 Bundeskammer für Arbeiter und Angestellte (2000, 158 pp.)
As regards the development of Internet users by age, the amount of change is less dynamic (see Figure 8). Indeed, among the oldest age group, people aged over 50, who have been characterized as being heavily underrepresented, there has been almost no increase at all over time. The share of the youngest group (14-19) has remained almost constant too, but they are over-represented anyway. A clearly visible reduction of the share of the 20-29 group has taken place, primarily in favor of slight gains for the middle age groups of 30-49 years. What seems to be most problematic therefore is the persistence of the divide at the expense of people aged over 50. This group amounts to around one quarter of the population and is above average affected by unemployment.

![Figure 6: Internet users by gender in Austria 1997-2000 (in percent)](http://mediaresearch.orf.at)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)
The digital divide in Austria

Figure 7: Internet users in total and by gender in Austria 1997-2000 (absolute numbers)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)

Figure 8: Internet users by age in Austria 1997-2000 (in percent)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)
As concerns the divide in Internet use between people with different levels of education there is some more erosion of the gap (Figure 9): The dominance of Internet users with higher education (colleges and universities) has been decreasing from a level of 50% to 40% during the last two and a half years. However, the gains have been more or less exclusively in favor of middle levels of education (Secondary Vocational Schools and apprenticeship). In contrast to those, the share of the lowest educational category, that is people with compulsory school education only, did not increase at all. Again the perspective that there is no indication of a likely closing of the gap in Internet use in the most disadvantaged stratum has to be emphasized as a special problem.

To sum up the trends of the digital divide in Austria: The development of the divide is different across particular social groups. The gap between men and women in the use of the Internet is more and more closing as women are strongly catching up in terms of relative shares. If the existing trend continued with same speed, equal shares by gender could be reached within the next three years. Because of the decreasing potential (saturation effects) a slowing down of the equalization to a later point in time will be more likely. With regard to age as well as education the amount of change is much less dynamic and among non-Internet users the most disadvantaged groups dominate strongly. The persistence of the divide at the expense of people aged over 50 and people with only compulsory school education are becoming major problems. A closing of the digital divide at least with respect to these two social groups (and people with related disadvantages such as poverty) is not in sight.
4 Reasons for the existing digital divide

The uneven distribution of Internet access and structure of current users have revealed the existence of a significant and sustained digital divide in Austria. Various social characteristics have turned out to be correlated with the extent of Internet connectivity and use. This pattern points to specific disadvantaged groups as well as a variety of barriers faced by major segments of the society.

4.1 Types of barriers to Internet access and use

To develop appropriate counter strategies the causes and social mechanisms behind the structure of the divide and the different barriers need to be identified first. Key factors which constitute barriers of access and use are displayed in Table 3.

Table 3: Barriers to Internet access and use

<table>
<thead>
<tr>
<th>Key factors</th>
<th>Social-cultural</th>
<th>Technological</th>
<th>Economical</th>
<th>Media literacy</th>
<th>Use disabilities</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific barriers</td>
<td>lack of awareness, information, motivation</td>
<td>lack of network infrastructure, equipment</td>
<td>costs of equipment, training</td>
<td>limited education, lack of computer and language skills</td>
<td>physical or other personal handicaps</td>
<td>lack of local information, cultural diversity, multilingualism</td>
</tr>
</tbody>
</table>

Major barriers responsible for the existence of a digital divide can be identified on two principal levels:

- In **accessibility** (social-cultural, technological and economical factors causing a split between privileged groups with and deprived groups without access), and
- In **use** (media literacy, disabilities and content as factors causing a split into groups who have the required skills and know how to make efficient use of the Internet and those who lack these qualifications).

It is evident that many of these factors are strongly interrelated or reinforce each other. A principal access barrier is constituted by a lack of awareness of the potentials of and the interest in the Internet. The attitudes towards new media are typically unevenly distributed in society. Age, gender, educational level, social stratum or milieu, income level, employment situation and the differing levels of information, motivation and types of attitudes associated with these factors tend to filter the chances of access to the Internet.

Evidence on barriers to adoption of ICT surveyed by the European Information Technology Observatory shows this (EITO 2000: 359pp): Interest in new technologies depends on gender, age and level of education; perceived complexity as a barrier is also significantly correlated to age, income and education. Half of those who are not interested in online services are convinced that they do not need them in their private life. Second to absence of need as a reason for disinterest is cost. For people aged 50 and above a disinterest in new technologies and the perceived complexity are significantly more frequent than among the population in general. Lack of time as an obstacle is getting more important with higher income.
Technological and economical barriers very much interact with and are to a certain extent predetermined by social-cultural ones: computer equipment and access to network infrastructure are less affordable to people in lower social strata and with lower income. On the other hand, physical, technological, and economic factors interact in constituting barriers to Internet use: physical or other personal handicaps tend to affect not only mobility but also usability of IT equipment and impact negatively on employment chances and income situation. Finally, media literacy is among others predetermined by factors such as age, education, employment career, area of living.

The notion of media literacy comprises an instrumental and a cognitive/evaluative component. The instrumental aspect means to know how to use new media and related interfaces and to be able to operate them effectively. The cognitive/evaluative component means the competency to critically reflect on contents, to judge their ethical, political and esthetic quality (Gapski et al. 1997: 275). It is evident that the latter aspect is even more dependent on a certain level of education.

Only recently attention has been paid to the barriers which exist because of inadequate contents to many potential users. A report by the US nonprofit organization The Children’s Partnership, caring for the interests of children and youth, particularly the disadvantaged, identifies four major barriers related to content (Lazarus et al. 2000): a) lack of local information (about the user’s communities); b) literacy barriers (22% of adult Americans lack the required reading and writing skills); c) language barriers (an estimated 87% of documents on the Internet is in English); and, d) lack of cultural diversity (relevant to particular ethnic communities).

4.2 Barriers in Austria

To illustrate some existing barriers with a view to the situation in Austria:

Social-cultural barriers: Attitudinal barriers, for example, have become evident in a very recent UK survey which had revealed the following profile of non-Internet users: Half say they will never get connected (51%) and only one in ten has intentions to get access in the near future.24 A quarter of non-users does not at all know what the Internet is used for and costs are the main cause for younger non-users to get connected. Similar attitudinal as well as related social-cultural and economic barriers among a certain segment of the society are also present in Austria. For instance, a skeptical general attitude towards new technology and new media is more frequent among older people, less educated ones and also more often among women than men. However, the specific requirements women have to face in private everyday life contain additional obstacles to Internet use such as unfamiliar style of communication, inadequate contents and special time constraints (Birbaumer 1998).

Technological barriers: The general gap in equipment with PCs and modems has been described in section 2.1. As to telecommunications infrastructure, Austria has a telephone network with very high density (49.1 per 100 inhabitants respectively) but is still below the corresponding average among EU members or high income countries (56.1) according to (ITU (International Telecommunications Union) 1999). On the household- and individual level there are some indicators of existing supply gaps in special segments: According to a special census in 1995 (Wolf 1995) only 86% of households of people aged over 60 had a telephone (vs. 88% in general). Among households of small peasants the rate drops even to 72% and to 79% among people receiving welfare payments. Only 1% of households of people aged over 60 had a PC at the time of this census (while the provision of TV reached 91% and cable links 25%).

Economic barriers: Although Austria ranks among the leading group of countries in terms of GDP per capita, lack of financial means does also play a role as a cause for not having Internet access to a considerable number of people. An indicator is the extent of relative poverty.

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24 UK consumer information company, Which? Online (http://www.which.net)
According to Haberhauer et al. (1999: 17pp) 420,000 persons (5.3% of the population) are classified as poor, based on a household panel survey and a relative definition of poverty. The underlying definition regards a person as poor if the weighted monthly per-capita household net-income is below 50% of the average monthly per-capita household net-income in Austria. Poverty is especially pronounced among the group of children, where the proportion of poor is (8%) which is above average.

Media literacy: Stangl (2000) as well as the document “e-Austria in e-Europe” provided by the Ministry of Education, Science and Culture point to some existing gaps and needs for improvements in the provision of IT- and Internet literacy. Around half of the teachers lacks sufficient media literacy for adequate IT teaching. Although computer science is a compulsory subject in all secondary schools and practically 100% use personal computers for instructions in one or the other way since 1992 (OECD 1996, 212) insufficient Internet training has been criticized e.g. by Stangl (2000). IT qualifications equivalent to the standard of the “European Computer Driving Licence” have so far only been sufficiently integrated into the curricula of Secondary Schools and Colleges for Business.

Disabilities: According to a special census in 1995 (ÖSTAT 1995) there are some 2.1 million people with any kind of physical handicap in Austria (27% of the population); 5.7% suffer from an impairment of sight, 6.4% of hearing and 6.7% of mobility. At least a considerable proportion of these is facing major operational or other problems with existing means of accessing and using the Internet although, in principle, this technology offers special opportunities to overcome mobility problems.

Content barriers: According to a UNESCO estimate there are around 300,000 people (3.7% of the population) in Austria who suffer from functional illiteracy. Sufficient English language ability is not guaranteed for all who had English at school; the proportion with appropriate language skills is certainly less than half of the population. On the other hand the “language of the web” is still predominantly English and not only sites in German language but still more so in one of the languages of small communities in Austria such as Turkish, Serbian, Bosnian, Croatian or Albanian are absolute minorities.

Of course these various barriers differ with respect to the possible extent and required level of intervention as well as the time horizon to influence the digital divide effectively. Social-structural barriers and also certain individual handicaps cannot be expected to be overcome easily, whereas for instance the provision of basic equipment to certain groups is more likely to be feasible. Therefore the investigation of crucial barriers calls for actions and has also shown some starting points. The next chapter will look at the measures which have been already taken or are in planning in Austria.

5 Measures against the digital divide

5.1 General measures

It has to be said first that compared to the United States the digital divide has not been a big issue of public debate in Austria up to now. However, public policy began to pay attention to the provision of Internet access and corresponding skill requirements on a broad base during the former Federal Government. A special Internet Board was established at the Federal

http://www.bmwf.gv.at/service/board/000505.htm
http://www.orf.at/orfon

According to a study by Vilaweb almost 70% of web pages are in English, Japanese ranks second with 5.9%, German third with 5.8% (http://cyberatlas.internet.com/big_picture/demographics/)
Chancellery and Federal Chancellor Klima started a first broad initiative under the title “Go on! Österreich ans Internet. Eine Initiative des Bundeskanzlers” (Austria for Internet. An Initiative of the Federal Chancellor).²⁸

Main aims of Go on! were

- to raise awareness of the Internet and the need for permanent further training, notably in ICT among the general public,
- to show concrete individual use and benefits of ICT and the Internet (telebanking, online-shopping, online government) and increased opportunities on the labor market,
- to implement a national training program for Internet novices and PC users by promoting the European Computer Driving License (ECDL),
- to raise Austria’s competitiveness by lowering online-access costs and removing access barriers.

The whole Go on! initiative was made up of three phases, starting with an Internet Summit and opening of a Summer Academy by the Chancellor in July 1999. Go on! was organized as a public-private partnership being sponsored by around 20 firms, mainly from the IT and telecom sector. The kick-off for the information campaign on TV was organized as a big popular event at the Heldenplatz in Vienna in November 1999. Between November 2 and December 5 a total of 67 TV spots were broadcast at peak times with a reach of 51 million viewers in total. Main actor of the 35-40 seconds spots was a very popular performer of satirical cabaret (the three spots won an Intermedia Globe Award in gold in the category “Public Relations – Public Information” at the world media Festival in Hamburg, May 10, 2000).

Additional PR activities included more than 100 spots on various radio programs, 3500 posters and 20 000 fliers, in most popular newspapers and magazines. 100,000 copies of a special Internet book were printed and distributed for free (a service hotline established at the Federal Chancellery mailed 15,000 of these Internet books).

Introductory courses for Internet novices are offered at a quite reasonable price of ATS 390.- (EUR 28.-). Three specific “bundles” of computer equipment (hard- and software), training course and online-access are sold by various firms at reduced prices. Trainers in these courses are people with appropriate Internet knowledge who were qualified in special workshops to introduce people to the Internet on a basic level. 280 trainer workshops were held by the communications agency managing the initiative and 950 trainers got certificates.

A second focus of the initiative is to get companies, in particular small and medium sized enterprises, connected to the Net. Go on! offers initial advice for free and specific packages comprising hardware, software and qualification support to SMEs, too.

Also during the former government period a study had been ordered on “strategies for a socially integrative path towards the information society” by the Ministry of Science and Transport. It investigated a wide variety of projects internationally and in Austria which where using ICT in a socially integrative way (Aichholzer et al. 1998). The analysis of the corresponding Austrian project landscape during this study showed a concentration on education and training, telework and city information systems, and considerable gaps with projects for disabled and elderly people, ethnic minorities, marginalized social groups and the unemployed.

On April 14, 2000, the new Federal Government presented an ambitious program in the area of IT under the title “e-Austria in e-Europe”. It includes the promise to provide one billion ATS

²⁸ http://www.austria.gv.at/go_on
by autumn 2001 in order to produce 21,000 IT-trained people yearly until 2003 (600 of which from polytechnics or “Fachhochschulen”, 1500 from universities, and the vast majority with qualifications below that level) and to have online access in all schools by 2001. A study to develop an organizational model for a “task force e-Austria” was ordered.

A documentation by the Ministry of Education, Science and Culture provides a comprehensive list of measures within the “project e-Austria”, comprising those which have already been implemented and those which are planned until 2003.29 A number of them are directly relevant to counter the digital divide, including among others:

- to connect also the schools under the responsibility of “Länder” (state level) to the Internet at 100%;
- training of all teachers in using the Internet and introducing a course of study for IT managers;
- to provide access to the Internet for people in rural areas, starting with a pilot project ("Profi-Paket") which offers PC plus Internet packages including software for agricultural applications at low cost;
- to create a number of CD-ROMs for people with handicaps including training programs and projects for people with special needs;
- to provide ECDL-courses to blind people and to extend the ECDL-initiative to as much as possible segments of the population;
- to amend the media law with an obligation to deliver electronic media products to Austrian libraries;
- to improve supported service in the area of public service online, an existing advanced directory for citizen services organized along frequent life events and everyday demands.30

The Ministry of Education has recently announced an initiative to promote Internet access and e-learning and to improve Internet literacy through educational measures. Main actions comprise the establishment of new university courses and technical schools as well as training of teachers. A special role in training is also played by the Internet platform LISA which offers various services in the area of new media and school to teachers. The yearly summer academy with Internet courses had 729 participants in 1999, the majority of them women and teachers from compulsory schools.31

The Ministry also supports the European-wide ECDL initiative as a contribution to raise computer and Internet literacy beyond ordinary school level among pupils. By the end of the school year 2000 a total of 19,800 school leavers have acquired ECDL-equivalent IT competencies. In addition to measures for schools and higher education the action plan is directed towards adult education: It includes the training of 200 advisors on ICT until 2003, the extension of public libraries to public media centers and the improvement of Internet access for disadvantaged groups (e.g. Internet training for elderly people).

At state level, a special initiative has been started by the Land Salzburg under the slogan “online-access for all Salzburg citizens”: A budget of EUR 363,000.- has been provided to facilitate access to the Internet for 10,000 citizens by means of a so-called Internet check worth 1,000 ATS. This check can be used by all Salzburg citizens of age 15 and above when they buy a computer or a modem. Together with the leading telephone company, Telekom Austria, an additional very special offer is made to those citizens who do not own a computer but a television set (which 97% of the households in Salzburg do): they can get a so-called set-top box with keyboard and cable connection for free, in exchange for the check.32

29 http://www.bmwf.gv.at/service/board/000505.htm
30 http://www.help.gv.at/
31 http://www.lisa.or.at/
The 

The Land Styria has launched a comprehensive telecommunications infrastructure program titled TELEKIS (Telekommunikationsinitiative Steiermark). Its aim is to foster the transition to a knowledge society with three strategic focus areas: business, citizens and regions.\textsuperscript{33} It also includes measures orientated at improving Internet connectivity and use among specific groups.

Some cities and communities have also undertaken special actions to promote Internet access. The city of Wörgl in Tyrol has ambitions to become Austria’s prime Internet city. Within the next five years 85% of all citizens, 90% of all firms and 100% of all public institutions shall be online. A net of optical fiber cable is planned to be established in the city to allow every household to access the Internet. According to the mayor, an Internet account for each citizen and a virtual Wörgl is the aim.\textsuperscript{34} A similar project is planned near Vienna in the city of Perchtoldsdorf in Lower Austria. In Rauris in Salzburg a feasibility study to build a community Intranet has been undertaken which integrated all groups of the population, in particular women and elderly people.

Since 1990, a number of Austrian cities and communities have established telecenters and telecottages as a community resource which, among others, enable access to IT and the Internet to all local citizens. By now, a total of around two dozen such centers exist all over Austria (Aichholzer et al. 1999: 146pp).

The Austrian Employment Services introduced three new IT-course programs in 1999, \textit{it.basics}, \textit{basics.social services} and \textit{tele.soft} which all include training in Internet use. Figures show that 2,500 people have been trained in \textit{it.basics} (69% women) and 1,736 in \textit{tele.soft} where women and men had equal shares (Leitner and Wroblewski 2000, 60 pp.).

\subsection*{5.2 Area-specific measures}

Further measures to counteract the development towards a digital divide can be distinguished in two respects: addressing different groups of the population or different access channels.

\subsection*{5.2.1 Youth}

Under the umbrella of the broad telecommunications infrastructure initiative \textit{TELEKIS} the Land Styria is funding the establishment of Internet cafes especially for young persons. 15 such Internet centers are planned and allow young people to surf the web for free or at the very low price of ATS 10.- per hour.

The daily newspaper DER STANDARD has initiated a competition for Internet projects of schools ("cyberschool.at"). Anticipated effects of a participation are: improved Internet literacy, project-oriented team work, new learning experiences, and better job qualifications.

The Ministry of Education promotes Laptop-classes. Up to now these comprise around 500 pupils across various school types. A pilot project by the Ministry of Education was started in July 2000 which invites computer firms to offer low-priced notebooks for sale or leasing to pupils and teachers.

The Austrian Computer Society (OCG) has started the initiative “TEC – Tomorrow’s Experts in Computers” as an attempt to attract more young people of all backgrounds to computers and Internet with various competitions, awards and certificates.

\textsuperscript{33} http://www.telekis.at/

\textsuperscript{34} http://www.pressextet.at/
5.2.2 Elderly people and people with disabilities

Except for the training and awareness raising courses planned by the Ministry of Education as mentioned above, there are several past projects to be mentioned which were, e. g. offering ICT training, public access terminals, personal support in using ICT and Info-terminals, or information via TV or telephone to elderly and disabled (Leeb et al. 1997).

5.2.3 People with low education

Less educated people are integrated into several of the general training measures. Measures for absolutely low education levels, however, are quite rare. An exception is a special project for people suffering from functional illiteracy which was run with support from the Austrian Employment Services Styria and the European Social Fund for 50 people. The course used ICT and multimedia and led these people successfully to a level of literacy which enabled them to read newspapers and to write simple own texts.35

5.2.4 Women

The Styrian TELEKIS initiative is funding Internet cafes also especially for women, where not only access to the Internet but also various Internet courses are offered. The Internet cafe NOWA in Graz is a special example and provides an evaluation report: 79 courses had been held for some 600 participating women. It contributed to counter the gender-specific polarization of Internet use, increased motivation for further training and networking among women.

The Ministry of Education has announced new special IT training projects for women, one called TELMA, another one “FIT – Frauen in die Technik” (women for technology) as well as a tele-tutorial for ECDL trainers.36

5.2.5 SMEs and industry

The Ministry of Trade has promoted the diffusion of electronic data interchange (EDI) technologies in small and medium-sized enterprises (edi business austria) for several years. The funding of EDI-projects ended in January 2000. Currently it is unclear which form a future initiative in the field of EDI will take. There are considerations to establish an E-commerce competence center and an information service on e-commerce.

Several measures to support EDI where decided in a submission to the Council of Ministers in September 1999: an analysis of potential uses of EDI in each ministry, coordination of different EDI initiatives through the IT department of the Federal Chancellery, consideration of international norms and standards.

The Styrian Chamber of Commerce has launched a multimedia roadshow to raise awareness for the potential of e-business.

The Chamber of Commerce (Wirtschaftskammer) has issued a position paper on the digital economy, which includes proposed measures to maintain Austria’s competitiveness.

The national Association of Industrialists (Industriellenvereinigung) demands several measures to improve the electronic interaction between businesses and administration: provision of an online guide to administrative procedures for businesses (modeled after the highly successful citizen guide help.gv.at), electronic processing of files in all stages, online application for funding, electronic procurement, electronic transmission of annual balance sheets to the business register.

35 http://www.orf.at/orfon/steiermark/forum/kultur aktuell/aktuell_000522_analphabeten.html
36 http://www.bmwf.gv.at/service/board/000505.htm
5.3 Specific access channels

Finally, there are some deliberately designed measures against a digital divide as well as various other activities which are orientated at particular forms of access:

5.3.1 Internet at home

The enormous stimulus to raise private Internet connectivity by an ever growing offer of special packages at lower costs has been already described above. One such example is the promotion by Yline: it offers a free personal computer but includes a relatively high monthly rate and high connection costs for two years obligatory subscription. Other free Internet offers include UTA, 1012, surfEU, i-ONE, Yline, Lion.cc.

5.3.2 Internet at place of education

The Ministry of Education has established a virtual platform for questions of Internet use in education (schule.at) already in the late nineties. This platform serves the exchange of knowledge and experiences between pupils, teachers, and parents and allows especially access and support to those young persons who live in households without Internet.

5.3.3 Public terminals

Vienna is particularly active in providing public access to the Internet. The Vienna Access Points Initiative had started in 1993 with first public terminals located in service offices of the municipality advising on housing issues. In 1998 a total of 23 Access Points were installed, 27 more in 1999 (altogether 60 public terminals, 100 are planned for 2000). Contents include the city information system Vienna-online, the housing information system ELWIS, the citizen guide to public administration, job offers by the employment services and a number of other information sources. The most recent models of Access Points are modern touch screens which won a design award, too.

In addition to these access points a pilot project is in planning by Telekom Austria, Bank Austria and Wiener Stadtwerke under the title “Citytip”. It also plans to install multifunctional communication terminals located at public places.

Lower Austria also plans to install so-called “Infopoints” in each community and a “Service point” in each district head office to offer an easier access to information for citizens and tourists via Internet. The first such public access point has been placed in the lounge of the State Government building.

Other developments concern the private sector: There is a growing number of Internet cafes in Austria. In Vienna the existing number amounts to over a dozen and also in the other Federal states one can find quite many. Some are still primarily cafes but offer also some workstations for Internet surfing, others like the bignet.cafe in Vienna offers 18 terminals in a more campus-like atmosphere.

Recently, a retail group in Vienna has opened an outlet with two terminals and plans to extend Internet access after initial limitation on marketing its own products and holiday offers respectively.

37 Recently the promotion included a cooperation with a newspaper. 65,000 Internet subscribers were reported in spring 2000, which were expected to rise up to 100,000 until mid year.
38 http://www.wien.gv.at/ma18/07/05/03.htm
5.3.4 Screenphone

A specific technological development is the integration of telephone and Internet access in a new device called screenphone. The bookshop Libro together with the Internet firm Web3000 and Samsung Electronics announced the appearance of such an innovation on the Austrian market by end of July 2000. It deliberately aims at offering the broader population a simple entrance via Internet-telephone. The units should be kept at a moderate price and be designed in a way to allow everybody immediately to phone and surf the web. It had also been planned to integrate such a device in one of the Go on!-packages (Alcatel Screenphone plus telephony service provider 1012 tele.ring).

Further technological developments in the mobile phone sector based on the WAP technology (wireless application protocol) together with the very high penetration rate already achieved in Austria let expect some additional effect on Internet diffusion.

6 Conclusions

The paper investigated the general state of IT penetration and Internet access in Austria, analyzed the structure of Internet users, determined the extent and change of the digital divide and asked for reasons behind as well as countermeasures taken. It was shown that Internet access in Austria (by March 2000) has reached a level which is clearly above European Union average, grows more or less linearly by 55% per year, enables access for some 40% of the population and is accompanied by a steep increase in frequency of use among those connected (around 60% of them are “heavy” users).

Overall, the results indicate a significant digital divide in Austria. It is less pronounced with regard to gender, but stronger with regard to age groups, educational levels, occupational groups and different income strata, although the Internet is gradually getting less elitist. The trend of the digital divide is different across particular social groups: The gap between men and women in the use of the Internet is more and more closing as women are strongly catching up in terms of relative shares. If the existing trend continued with same speed, equal shares by gender could be reached within the next three years. However, the persistence of the divide at the expense of people aged over 50 and people with only compulsory school education are becoming major problems. A closing of the digital divide, at least with respect to these two social groups and people at the lowest income level is not in sight. This is the main conclusion, despite the fact that both a number of major general initiatives and measures orientated at specific groups have already been undertaken to close the divide. The persistence of the social divide in Internet use therefore underlines the necessity to design more appropriate measures for the disadvantaged groups and to find ways to implement them as soon as possible.
## Appendix

*Table 4: IT penetration by country 1998*

<table>
<thead>
<tr>
<th>Country</th>
<th>IT/GDP %</th>
<th>IT per capita (Euro)</th>
<th>Number of business PCs per 100 white collar workers</th>
<th>Number of PCs per 100 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Europe</td>
<td>2.54</td>
<td>514</td>
<td>61</td>
<td>21</td>
</tr>
<tr>
<td>EU</td>
<td>2.51</td>
<td>499</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>Germany</td>
<td>2.41</td>
<td>560</td>
<td>55</td>
<td>24</td>
</tr>
<tr>
<td>France</td>
<td>2.71</td>
<td>590</td>
<td>59</td>
<td>20</td>
</tr>
<tr>
<td>UK</td>
<td>3.31</td>
<td>694</td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>Italy</td>
<td>1.59</td>
<td>289</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>Spain</td>
<td>1.73</td>
<td>218</td>
<td>57</td>
<td>9</td>
</tr>
<tr>
<td>Austria</td>
<td>2.21</td>
<td>518</td>
<td>68</td>
<td>22</td>
</tr>
<tr>
<td>Belgium/Luxembourg</td>
<td>2.4</td>
<td>532</td>
<td>57</td>
<td>18</td>
</tr>
<tr>
<td>Denmark</td>
<td>3.02</td>
<td>891</td>
<td>74</td>
<td>43</td>
</tr>
<tr>
<td>Finland</td>
<td>2.69</td>
<td>576</td>
<td>72</td>
<td>32</td>
</tr>
<tr>
<td>Greece</td>
<td>0.91</td>
<td>91</td>
<td>49</td>
<td>7</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.9</td>
<td>370</td>
<td>93</td>
<td>20</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3.07</td>
<td>654</td>
<td>69</td>
<td>35</td>
</tr>
<tr>
<td>Norway</td>
<td>2.79</td>
<td>816</td>
<td>123</td>
<td>43</td>
</tr>
<tr>
<td>Portugal</td>
<td>1.49</td>
<td>142</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Sweden</td>
<td>4.17</td>
<td>952</td>
<td>93</td>
<td>46</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3.41</td>
<td>1123</td>
<td>97</td>
<td>39</td>
</tr>
<tr>
<td>US</td>
<td>4.38</td>
<td>1157</td>
<td>118</td>
<td>51</td>
</tr>
<tr>
<td>Japan</td>
<td>2.72</td>
<td>725</td>
<td>27</td>
<td>13</td>
</tr>
</tbody>
</table>

*Source: EITO 2000*
## Table 5: Online users in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Online-Nutzer (in 1000)</th>
<th>Date</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Island</td>
<td>134,300</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Norway</td>
<td>2,224,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Finland</td>
<td>210,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Sweden</td>
<td>3,360,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2,347,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Germany</td>
<td>24,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Denmark</td>
<td>2,760,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Austria</td>
<td>2,570,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>17,000,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Slovenia</td>
<td>460,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Belgium</td>
<td>2,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>France</td>
<td>11,200,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Italy</td>
<td>9,900,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Spain</td>
<td>8,400,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Ireland</td>
<td>592,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Greece</td>
<td>1,730,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Hungary</td>
<td>1,140,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Poland</td>
<td>3,345,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Estonia</td>
<td>840,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Slovakia</td>
<td>550,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Portugal</td>
<td>862,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Russia</td>
<td>6,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Ukraine</td>
<td>1,530,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>311,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Latvia</td>
<td>80,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Lithuania</td>
<td>680,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Croatia</td>
<td>1,000,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Lithuania</td>
<td>57,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>United States</td>
<td>134,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>Japan</td>
<td>27,000,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
<tr>
<td>China</td>
<td>504,300,000</td>
<td>2016</td>
<td>Austria</td>
</tr>
</tbody>
</table>

Online-Nutzer / Internet-User
A: Zugang zu Internet oder Online-Dienste (Internet Access)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)
Table 6: Internet access in Austria 1996-2000 (percent of the population over 14 years)

<table>
<thead>
<tr>
<th>place of Internet access</th>
<th>1996</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000&lt;sup&gt;41&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>office</td>
<td>6</td>
<td>10</td>
<td>13</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>home</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>university</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>school</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>friends, cybercafe, etc.</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Internet access in one or another way</td>
<td>14</td>
<td>20</td>
<td>27</td>
<td>34</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)

<sup>41</sup> Figures for 2000 refer to 1st quarter only.
### Table 7: Internet access and homepage provision by school type in Austria, July 2000

<table>
<thead>
<tr>
<th>School type</th>
<th>Schools in total</th>
<th>Schools with Internet</th>
<th>Schools with homepage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Primary School</td>
<td>3413</td>
<td>1176</td>
<td>34.5</td>
</tr>
<tr>
<td>Lower Secondary School</td>
<td>1194</td>
<td>878</td>
<td>73.5</td>
</tr>
<tr>
<td>Special Needs Schools</td>
<td>472</td>
<td>209</td>
<td>44.3</td>
</tr>
<tr>
<td>Pre-vocational Year Schools</td>
<td>334</td>
<td>247</td>
<td>74.0</td>
</tr>
<tr>
<td>Vocational School for Apprentices</td>
<td>186</td>
<td>143</td>
<td>76.9</td>
</tr>
<tr>
<td>Secondary Academic Schools</td>
<td>329</td>
<td>318</td>
<td>96.7</td>
</tr>
<tr>
<td>Secondary Schools and Colleges for Engineering</td>
<td>183</td>
<td>117</td>
<td>63.9</td>
</tr>
<tr>
<td>Secondary Schools and Colleges for Business</td>
<td>127</td>
<td>120</td>
<td>94.5</td>
</tr>
<tr>
<td>Secondary Schools and Colleges for Occupations in the Service Industries Management</td>
<td>111</td>
<td>102</td>
<td>91.9</td>
</tr>
<tr>
<td>Secondary Schools and Post-secondary Colleges for Social Services and Social Occupations</td>
<td>71</td>
<td>54</td>
<td>76.1</td>
</tr>
<tr>
<td>Secondary Schools and Colleges for Agriculture and Forestry</td>
<td>128</td>
<td>86</td>
<td>67.2</td>
</tr>
<tr>
<td>Secondary Schools and Colleges for Teacher Training</td>
<td>41</td>
<td>33</td>
<td>80.5</td>
</tr>
<tr>
<td>Post-secondary Colleges and Institutes for Teacher Training</td>
<td>54</td>
<td>45</td>
<td>83.3</td>
</tr>
<tr>
<td>Other schools 1)</td>
<td>125</td>
<td>34</td>
<td>27.2</td>
</tr>
<tr>
<td><strong>Total 2)</strong></td>
<td><strong>6382</strong></td>
<td><strong>3307</strong></td>
<td><strong>51.8</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education authorities</td>
<td>41</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Other education institutions 3)</td>
<td>81</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Foreign schools</td>
<td>5</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

1) nursery schools etc.; 2) corrected for double counts; 3) psychological services for schools, adult training

Source: [http://www.bmuk.gv.at/fssin.htm](http://www.bmuk.gv.at/fssin.htm) (adapted and own translation)
The digital divide in Austria

Figure 10: Growth rates of Internet users by gender in Austria 1997-2000 (in percent)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)

Figure 11: Total Internet users and male lead in Austria 1997-2000 (absolute numbers)

Source: Austrian Internet Monitor (http://mediaresearch.orf.at)
8 References


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Hummer, D., 2000, Trägt das Internet zur Integration der Gesellschaft bei?, *computer kommunikativ (1/2), 16-17*.


