Patterns of ICT diffusion in Nyugat-Dunántúl region

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Content

Abstract

The acceptance of info communication technologies (ICT) is an inevitable element of rural development since the infrastructure is more or less developed in Hungary. The problem of acceptance lies in the attitude toward new technologies. The attitude change is a bottom up approach, were members of local communities teach and either change each other. This network of local inhabitants as a key element multiples the effect of every top to bottom approaches fulfill the aims of the governmental policies. But the different attitude of members of the local communities leads to different types of diffusion of new technologies and different acceptance level. A regional quantitative research of a social network based online web service can describe what cause these differences.

Keywords: IT, internet usage, social innovators, rural development, diffusion of IT.

Introduction

Digital illiteracy, digital divide and information society became the buzzwords of the part of regional development dealing with the state of the information society technologies (IST) since the beginning of the new century. There are two main topics discussed if one does research on this field: infrastructure and those people who use it. Proper infrastructure gives the opportunity for the society to step to the information phase. But the infrastructure in itself is not enough for this jump the attitude of the society toward the new prospects has to change. Developing the infrastructure is a matter of financial and political and strategic issues, but the attitude change is a more complex problem.

From the user side, this issue has another face. Looking through a spatial perspective the process to create and develop the accepting attitude of new technologies differs in Hungary. This article tries to present the user's view on the topic of IT use taking the diffusion of a very popular online service as an example. During the research the spatial expansion of the service in rural areas and it's key factors were examined to complete the knowledge on the Hungarian IT embedness. Besides the wider spatial comparison we attempt to specify the most active groups who disseminate the new technologies in their communities on the example of three small settlements of the Nyugat-dunántúl region. This group could be a catalyst in a top to bottom approach aiming to change attitude toward new technologies in order to expand the number of ICT users in Hungary.

The development of info communication (IT) sector is about 20 years old in Hungary. One thing was permanent during this period: crucial things were always missing and steps depended on central decisions and national support and subsidies. This kind of central intervention can be seen since the eighties – when the industry of informatics and information culture first appeared. Hungary was successful in providing schools with computers and with the Information Infrastructure Development Program that ensured info communication technology (ICT) tools for research & development, academic network, universities and some members of the administration. (Z Karvalics 1998:317.) The recognition of the IT sector's importance did not bring a quick change, because the possibilities remained unused in education, and the socializing process of IT did not happen in the eighties. Contrary infrastructure development quickly started, and results were achieved in developing the telephone network. This process was already being developed with mobile phone, PCs and the spread of Internet but only with the economic participants. In the field of infrastructure and tools Hungary's place is average in comparison to other European countries, but the changes in using tools and the differences of social classes are small.

Table 1. The most important IT characteristics in Hungary and in the EU 25 in 2006

	Hungary	**EU25**
PC in the households	54%	61%
Internet in the households	32%	51%
Broadband in the households	22%	32%
Inhabitant internet-usage	45%	54%
Shopping on internet	7%	27%

Source: KSH 2007 and Eurostat

Examination of the social effects of information technology and the status of information society is a rather new perspective in Hungary. The first examinations took place in 2001 about the country's preparation, and of the inhabitant's relation to ICT. The newly (in May 2002) established Ministry of Informatics and Telecommunications (IHM) has made its programs and strategies based on these researches. Neither of these researches published an analysis on regional comparison. Mostly the questions examined hardware and software supply, Internet penetration and its usage in a technocratic way without looking deeper into the issue. The Hungarian Office of Statistics has started gathering data related to information society since 2001. These differences shown the groups attitude towards the topic, and on the other hand it pointed out the difficulties of accessibility. In addition to the continuously developed academic network of spine (HBONE), the Hungarian Government involved in developing the ICT infrastructure of institutions in public education. A program called Sulinet was launched in 1996 as a unique phenomenon in Europe. Firstly all institutions of compulsory education were equipped with IT equipments, then connected to the internet. The other part of the initiative supported newly bought IT equipments for families with children in compulsory education. Nowadays this initiative is a part of Közháló Programme (Public Network), in which every public educational institution was grouped till 2006, by the strategy of IHM in 2003. Connecting many public institutions and local governments was also an initiative of Közháló project.

The "Telehouse" campaign first started as a bottom up initiative, but it's development of governmental tools made local communities accessible by eMagyarország (eHungary) points. (If a DSL connection was not possible, the problem was solved with a satellite connection.) In addition to this many projects started without governmental support, this was attributed to wireless technologies becoming cheaper. The hardware exists now it's high time to use it. Hungary has to face a new challenge on the field of IST. As a member state of the EU Hungary had to reconstruct it's own national strategies in order to fit into the EU's Lisbon 2010 strategy and it's side projects like eEurope dealing not only with the infrastructure but the improvement of the human factor in knowledge based societies. The side result of this process was the improvement of national statistical data collection methods related to IT and the usage of IT since the methods of Eurostat were accepted by the Hungarian Statistical Office (HSO).

The for-profit sector also put an effort on to enhance the complexity and accessibility of the IT infrastructure for example the three major mobile telephone company have covered the whole country with their service offering mobile internet connections for two years no. These services give opportunity for those who live in settlements where building the infrastructure for a custom wire-based access were not profitable for the companies.

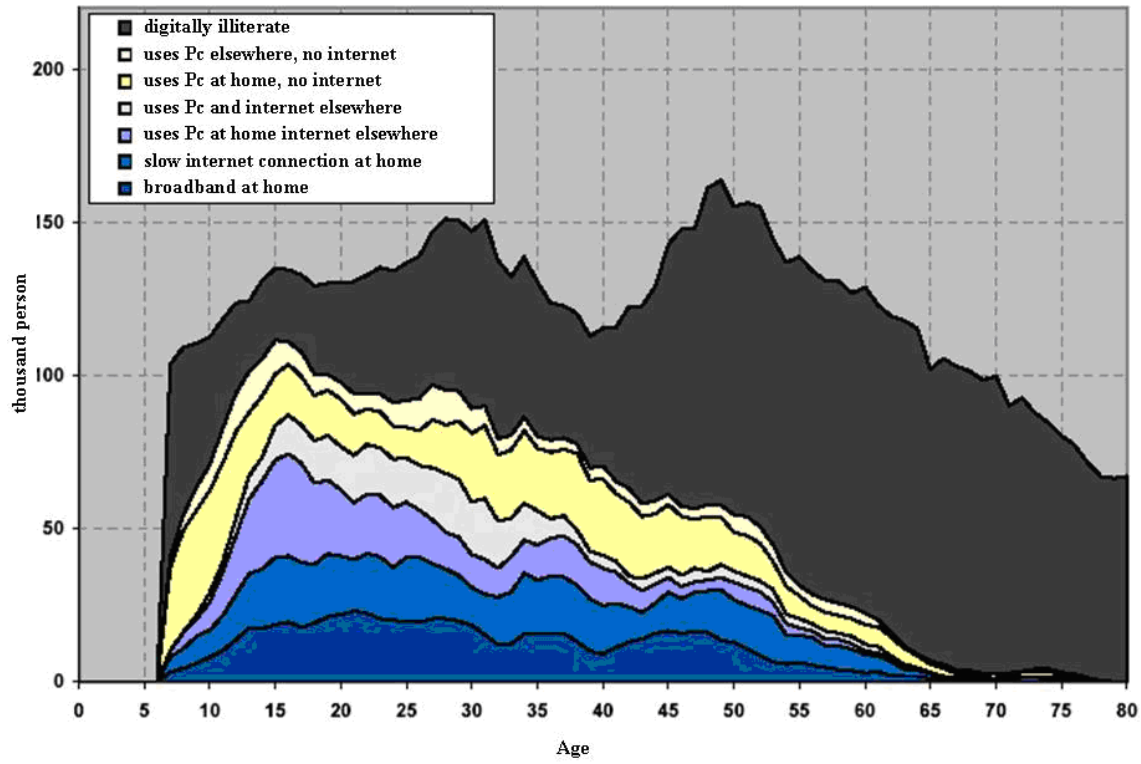
With all these projects and effort the Hungarian IT infrastructure – mostly the public sphere's infrastructure – became fully developed until 2005. This led to the reorganization of governmental structure in 2006, when the IHM was incorporated into the Ministry of Economics and Transport (GKM). Although the so called Easter-Western and the urban-rural slope was slowly vanishing as the infrastructure became more developed, the ratio of IT users haven't increased significantly since 2001. And unfortunately as the World Internet Project 2006 quoted the Hungarian government hasn't got a clear strategy on creating or encouraging the development of the information society (WIP 2006).

Development on the human capital side of the IT related change nowadays is a bottom up phenomena where members of the society give information and knowledge to each other. The diffusion of IT knowledge and acquiring new members is more like a peer to peer phenomena the governmental efforts haven't got real effect on this change (Letenyei et al 2003).

Aim of paper

Research activity on the use of ICT got stronger during Hungary's preparation process to become a member of the EU. The first EU compatible researches on this field were carried out in 2001 focusing on the business sector. The first researches of Hungarian households were carried out in 2003. The first internet penetration and diffusion-related research was a side-research of an EU funded international benchmark survey (SIBIS 2003) in one micro-region in Hungary (Letenyei et al 2003). The results shown that the so called Granovetterian weak ties (Granovetter 1973) connections which point beyond the inhabitant's settlement form the attitude toward IT and new information of the new and innovative technologies and know-how arrives to a certain community using these channels. The benchmarking research pointed out that most serious issue and disadvantage were the extremely expensive services related to IT. Five years passed since that time and the above mentioned changes had effect but barriers still exist or altered. Attitudes became a major setback of development. Almost 60 % of the Hungarian population belongs to the group of digitally illiterate (Figure 1). Two main factors determine this group: age and the level of education. The spatial element is not as vigorous as it was in the early 2000's while the infrastructural investments had effect on it.

Figure 1 Division of digital literacy groups between age groups in Hungary, 2005

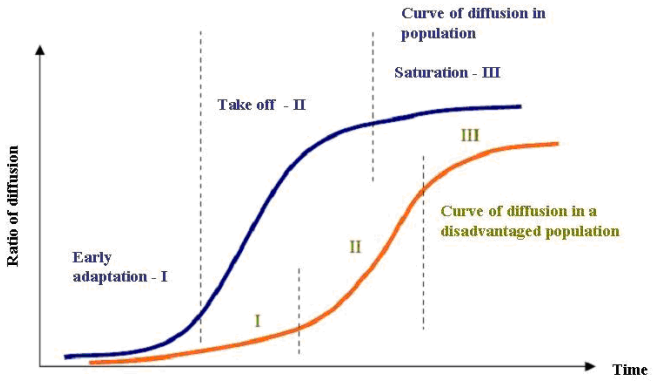


Source: IHM 2005

In our research we deal with another form of technology diffusion. We considered the infrastructure available for everyone (either at home or in a common access point – telecottage, school, at workplace). We examined the use of the infrastructure through a use of an online service. Our hypothesis were:

- The embedness of the service in a community is a result of the settlement infrastructural development.
- The aforementioned governmental related infrastructural developments had an effect on the recently experienced attitudes toward ICT.
- The group of innovators – those who bring the new opportunity into the community have outside connections and more mobile than those who get know the new opportunity later. These channels lead to places with higher density of population, higher population.
- Diffusion barrier is the attitude which leads to abnormal S-curve of diffusion as can be seen on Figure 2.

Figure 2 Diffusion of internet use



Source: Hüsing - Selhofer 2004 edited by the author

Methodology

We've used the webpage and the database of the first Hungarian social network site called International Who is Who (commonly used as: IWIW) which has more than 2 million users in our research.

In order to underline the relevance of this online phenomena with our research topic a short description of IWIW is needed. The site started as a free-time activity project of a group of friends, mostly young sociologists, economics and IT programmers in 2001. The aim of the project was to put one's friends, relatives and acquaintances on a digital figure using the Small Word theory of American sociologist Stanley Milgram and network research. The simple rule of the site was: to find the friends of my friends, in order to have more friends. The philosophy behind the project was to remap relationships digitally, where friends could invite each other trough email. The system was closed to the public, only an insider's invitation meant the possibility of registration. Once one was invited by a registered friend the whole database of users became available. Free search among them and the invitation of others was possible for the newly registered users. From 2004 the project has become something different. At the end of December 2004, the owners of the site tried to undertake a financially successful reform with the help of an investor company. After reprogramming and renaming the site (the 'International' surname was given) a heavy marketing campaign was undertaken and the number of users increased rapidly. After a year of construction work the new site was launched on 26.10.2005. The site had 80.000 users at this time, mostly a group of 18-35 years old youngsters with a university degree or close to graduation, living in Budapest. After the relaunch of the new site the number of new registrations increased exponentially. Two months later the daily registrant's number reached 5.000. Even the users socioeconomic background had changed. In 19.02.2006 the share of users outside Budapest grew to 43% from 23% and the average age of the users dropped down dramatically; although the older generation has also appeared in the system. In July 2006 the site reached 1 million users. The hype began, and nowadays, the site exists as a part of the biggest Hungarian internet provider's media firm with more than 2.540.223 users mostly from Hungary. It means that almost the total population of Hungarian internet users are the part of this digital community. (The total population of Hungary is circa 10 Million and the inhabitant's internet usage is about 25% according to the latest World Internet Project research (ITTK- Infonia 2006).

Since the site aim is to find friends, and to be present in order to get hits by our friends the use of avatars and alter egos are very rare. The public data from a user (the date of registration, the date of last visit on the site, place of residents, gender and sometimes age and the school the user had attended) is available for everyone who has a registration.

During the registration the system doesn't offer all the settlements of Hungary only those which have been already registered by their inhabitants before. In order to register a new settlement it needs 100 votes from registered users in the system. This newly voted settlement gets a unique id in the IWIW database. The number of id's represent a time series where the smaller the number the older is the registration. (This process is valid for the individuals registered in the system, furthermore the exact registration date is also available for other users.) [1]

During the first phase of the research we've focused on one statistical region in Hungary. The data of the settlements of the Nyugat-Dunántúl region were completed with spatial statistics using the Hungarian Statistical Office's database DATASTAR and we collected data on the number of common internet access points

[1] The system has several users who live in an still unregistered settlement. These users choose another settlement and wait until their group reaches the tipping point and votes for the registration. Therefore a settlement marked as unregistered having zero users does not represent the real state of a settlement in IWIW.

(eMagyarország Point and telecottages) in each settlement from the Prime Minister's Office's website. Another database was provided by the National Communications Authority (Nemzeti Hírközlési Hatóság) with the number of dsl contracts for each Hungarian settlement. The spatial data used in analysis were mostly demographical or dealing with the rate of unemployment or the available IT equipment in households.

In the second phase of the research three small settlements with a population under 1500 (one from each county of the region, one early registered – Pornóapáti, one registered later - Győrság and one registered only lately – Szentpéterúr) were chosen. We did qualitative and quantitative research on the downloaded user's profiles to reveal the attributes of the group of people that could be described as early adopters, and the group which undertakes the real dissemination in the community.

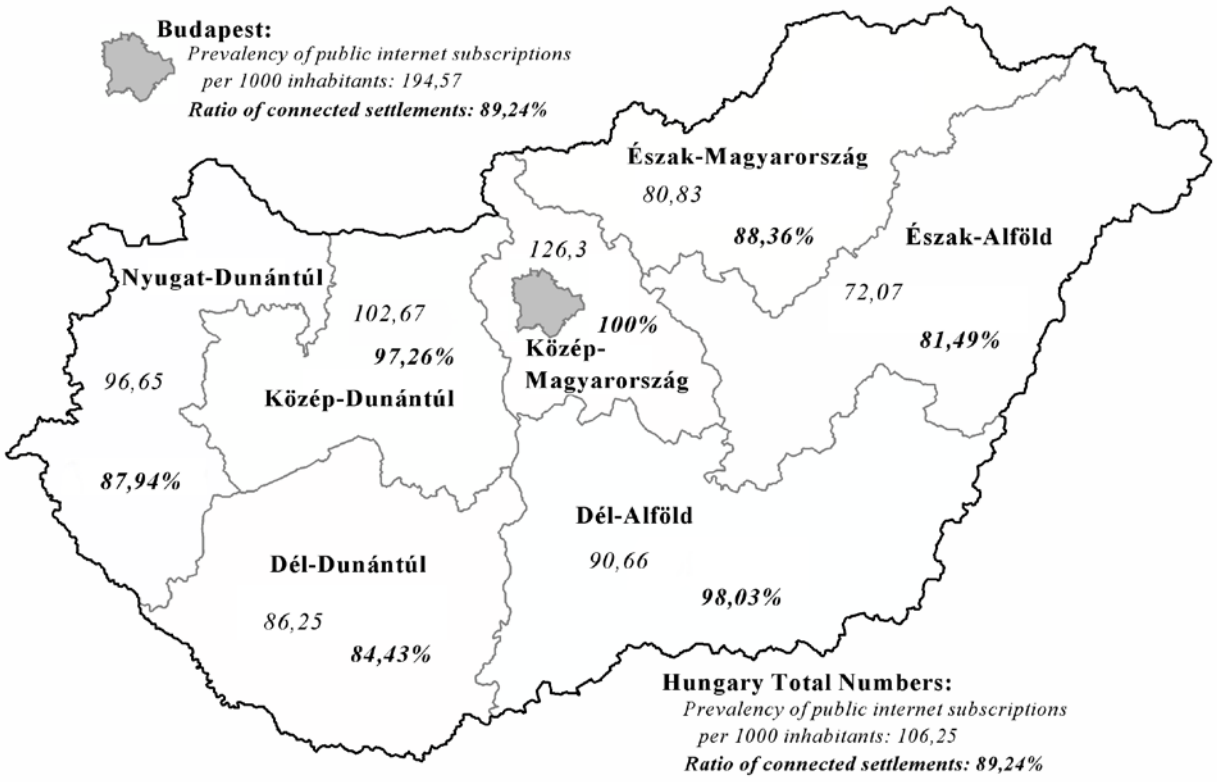
Findings

The group we've focused on is a special population in many ways. First we must say that these people are definitely not part of the group of digitally illiterates. In order to use the service one must have a PC, internet connection (own or common access), and a working email address. It also requires a higher trust in the new technology because one has to upload his/her personal information. According to Roy and Ghose (2006) these items are the signs of a more conscious use of IT. In this case we must say it was a matter of fashion and buzz about a new phenomenon.

1. Settlements turn online

Just to underline the aforementioned processes in Hungary some regional spatial data about the IT sector have to be shown before examining the databases of iwiw. We took the datas of the National Communications Authority (NHH) from 2007 to show the IT state of each region in Hungary. Budapest as the capital and also the Közép-Magyarország region are far more well developed regions according to the data shown in Table 2. The economically well-developed Northern Western Hungarian regions follow these regions. Our research area, the Nyugat-Dunántúl region is a well-developed area where 87,95% of the settlement were connected somehow in 2007.

Figure 3 Regions of Hungary and their main IT figures in 2007



Source: NHH database, edited by the author

*Budapest is part of the Central Hungary region but has rather different figures

First time data was collected from the site (August 2007) the service had 2.540.223 registered users in 1010 registered Hungarian settlements (we ignored the foreign addresses and the users signed there). Five months later, in January the number of registered users in Hungarian settlements were 3103599 and the number of registered settlements was 2208. It means the whole network is improving very rapidly. That means approximately one third of all Hungarian population registered (this percent is definitely lower because of the numerous non-human registrants like businesses who use the website as a channel for advertisement and fake personalities.). Budapest on it's own has the highest share of users (48,82 %). Nyugat-Dunántúl region has 420 registered settlements in IWIW which means the share (11%) is around the Hungarian average (11,7%) and the smallest share between the seven regions with Dél-Dunántúl (8,69%), although the region is economically well developed.

Table 2 Divison of counties and settlements registered in IWIW between the number of inhabitants in Nyugat-Dunántúl region

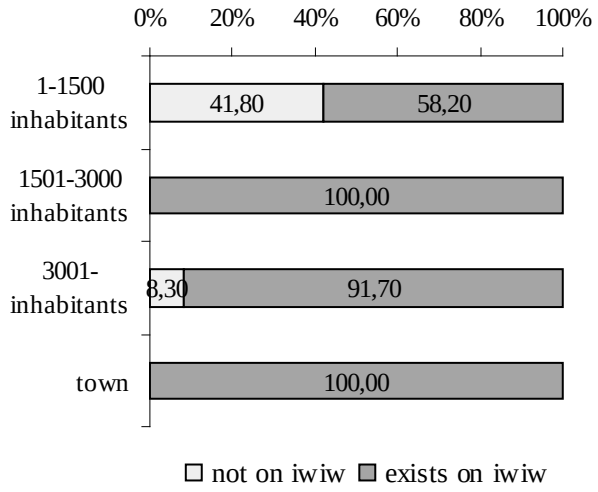
		1-1500 inhabitants	1501-3000 inhabitants	3001- inhabitants	town	Total
Győr-Moson-Sopron	**not registered settlement**	21	0	0	0	21
	registered settlement	109	35	8	9	161
Vas	**not registered settlement**	91	0	1	0	92
	registered settlement	105	8	1	10	124
Zala	**not registered settlement**	122	0	0	0	122
	registered settlement	112	12	2	9	135
	Total	560	55	12	28	655

Source: IWIW database, edited by the author

The answer to this question lies in the settlement structure of the territory. Density of settlements is the highest in this region and a vast number of little settlements can be found here as well especially in Southern part of the region in Zala county.

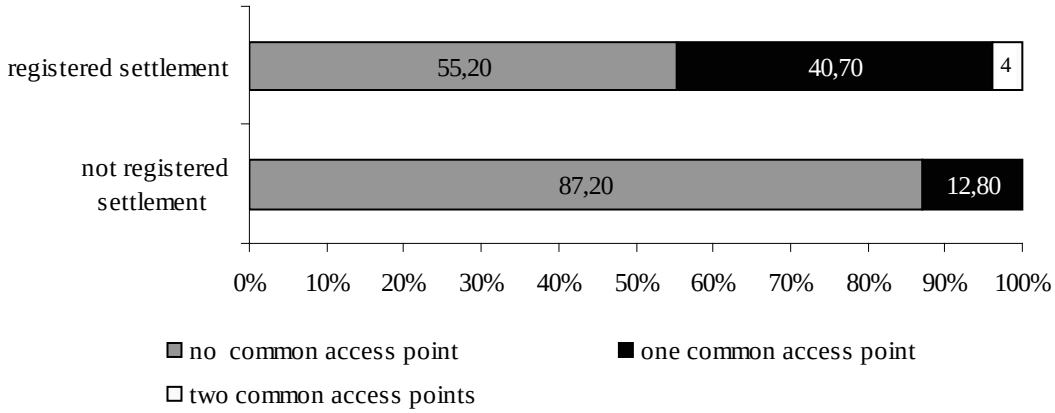
As we mentioned before, the infrastructure is given almost everywhere in Hungary. 'Almost' means that there are uncovered regions, characterized by mostly with low density of population and an ageing group of inhabitants. These are the settlements with small populations. Almásháza from Zala county is the settlement registered to IWIW with the lowest population of 58. It's obvious that only a little portion of the smallest settlements are part of the IWIW community (Figure 4) and all the towns are part of it.

Figure 4 Division of settlement's IWIW registration between types of settlement in Nyugat-Dunántúl (Chi2=0,00 Cramer's V=0,3)



Source: edited by the author

Figure 5 Division of number of common access points between registered and not registered settlements (Chi2=0,00 Cramer's V=0,329)



Source: edited by the author

These variables were taken into consideration during the research of correlations:

Variables related to demographic data:

- Share of age group older than 60 years in total population (oregek)
- Density of population (nepsuruseg)

Variables related to previous common infrastructure development:

- Number of common access points (sum_kozosnet)

Variables related to infrastructure and equipments of inhabitant households

- Number of telephone lines per 1000 inhabitant (DTAAR015_1000)
- Number of ISDN lines per 1000 inhabitant (DTAAR012_1000)
- Number of cable TV subscribers per 1000 inhabitant (DTAAR008_1000)
- Number of DSL subscribers per 1000 inhabitant (adsl_1000lakos)

Variables related to inclusion

- Number of unemployed per 100 inhabitant (DTAAS002_1000)

Linear regression was chosen with a forward method to analyze the two dependent variables: the IWIW code of the settlements (iwiw_kod) and the share of number of IWIW users in total population (userhanyad). One is measuring the effects of the aformentioned variables on how quickly a group of people will build a common online identity related to their spatial identity the other shows how the proportion of the offline group diverted into an online group is dependent from offline infrastructural and inclusion variables. .

Table 3 Results of linear egression with IWIW ID code of settlements as dependent variable (R Square=0,386)

	Unstandardized Coefficients		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	0,839744945	2,003353701		0,419169588	0,68
Density of population	0,033280808	0,005032466	0,316720739	6,613221242	0,00
Number of ISDN lines per 1000 inhabitant	0,087250053	0,019437281	0,213517651	4,488799188	0,00
Number of telephone lines per 1000 inhabitant	0,033850235	0,007585723	0,172412582	4,462361325	0,00
Number of common access-points	2,307480249	0,568390824	0,158213879	4,059671888	0,00
Number of DSL subscriptions per 1000 inhabitant	0,039710576	0,011557522	0,153170188	3,435907315	0,00
Dependent Variable: share of number of IWIW users in total population					

Source: edited by the author

None of the variables have any connection to the settlement's inclusion variable but each of them had significant and strong connection to equipments in the households.

Table 4 Results of linear regression with share of users in total population as dependent variable (R Square=0,462)

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	85458,86351	6381,057735		13,39258585	0,00
Density of population	-95,44277279	13,97431354	-0,308343918	-6,829872003	0,00
number of ISDN lines per 1000 inhabitant	-271,017805	53,71252606	-0,225151892	-5,045709537	0,00
Number of common access-points	-8838,108413	1589,782759	-0,205719569	-5,559318317	0,00
Number of DSL subscriptions per 1000 inhabitant	-107,1470757	33,5357501	-0,140300133	-3,195010559	0,00
share of agegroup older than 60 years in total population	892,3526116	231,0384622	0,174112668	3,862355224	0,00
Number of telephone lines per 1000 inhabitant	-60,76808005	24,04054274	-0,105073326	-2,527733284	0,01

Dependent Variable: IWIW ID code of the settlement

Source: edited by the author

Table 5 Division of registrants code's means between types of settlements (Sig: 0,0 Eta Sq: 0,604)

	Mean	**N**	**Std. Deviation**
1-1500 inhabitants	45418,84	45	12989,400
1501-3000 inhabitants	35108,94	35	13314,770
3001- inhabitants	23807,9	10	8712,104
Town	9292	28	6986,910
Total	31956,92	118	18258,140

Source: edited by the author

The case of three small settlements in Nyugat-Dunántúl

While we downloaded all the user's profile of registered users in the region it became clear that these databases need a strict crosscheck because of the numerous non-human registrants like schools and firms in the system. Three small settlement were chosen for further examination after reordering the settlement's registration IDs. The first and the last settlements were picked and one settlement from the middle. Their main spatial figures can be seen in Table 6.

Table 6 Main figures of the three settlements

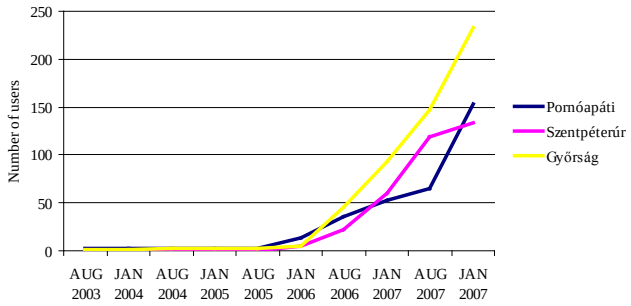
	County	Population	Share of IWIW users in total population (%)	Share of 0-17 years old inhabitants in total population (%)	Share of 60- years old inhabitants in total population (%)	Density of population (pers/km2)	Number of unemployed per 1000 inhabitant	Number of ISDN lines per 1000 inhabitant	Number of cable TV subscribers per 1000 inhabitant	Number of telephone lines per 1000 inhabitant	Number of dsl subscribsions per 1000 residences
Szentpéterúr	Zala	1082	12,72	19,13	18,3	65,23	58,23	11,09	0	161,74	47,51
Pornóapáti	Vas	393	38,351	13,23	18,83	26,29	27,99	10,18	302,8	264,63	53,57
Győrság	Győr-Moson-Sopron	1477	15,99	15,64	19,57	182,56	29,79	20,31	85,99	251,86	226,28

Source: edited by the author

Győrság is situated in Győr-Moson-Sopron county about 18 km far from Győr in an economically well developed county town's agglomeration. Pornóapáti is also a part of the agglomeration of a county town, situated near the Austrian border near Szombathely. Szentpéterúr can be found somewhere halfway between the three biggest settlements of Zala county: Zalaegerszeg, Keszthely and Nagykanizsa. Pornóapáti was the first registered settlement in IWIW between settlements with population under 1500 in Nyugat-Dunántúl region, Szentpéterúr was the last in this group in August 2007.

If one examines the increase of registrations in Figure 5 a permanent increase can be proved. These curves are just like the "normal" deterministic S-curves of Rogers (1995) more like curves of a disadvantaged population described by Hüsing and Selhofer (2004:24). Taking into consideration the data of the town of Hévíz one of the best developed IWIW settlement in the region with a share of 37,7 % IWIW users the last statement can be confirmed. One third of the town's population is registered, but the process of diffusion is really slow. The three settlements show three types of diffusion. Szentpéterúr has reached the turning point and the number of users started to level off. Pornóapáti's line can be described as diffusion in a disadvantaged population and Győrság has a normal diffusion curve. If we take the models of Valente (1995) and apply it to the graph of Győrság it shows only the first bit of diffusion and one or two more years needed to reach the turning point.

Figure 5 Cumulative number of registrations in three small settlements



Source: edited by the author

Since almost all the users of ICT are registered into the service the only reason of this slow diffusion is the lack of interest in those groups who are not interested in using these equipments. The arrival of new 'IT baptized' users is too slow, that's why the system doesn't get enough registrants.

As the user profile contains a link to the inviter's profile it was easy to collect data on the source of the diffusion in one case of each settlement. These links lead to the bigger municipalities of the micro-region of each settlement and to the capital (Table 7).

Table 7 Main figures related to the registrant's inviters

	Inviter's settlement	Share in all settlement mentioned (%)	Mean (months passed since registration)	N	Std. Deviation
yőrság N=147	Győr	34	12,06	50	8,899
	Győrság	25,2	7,22	37	4,951
	Budapest	5,4	12,50	8	6,024
	Foreign place	5,4	-	-	-
Pornóapáti N=67	Budapest	33,8	11,38	13	6,305
	Szombathely	20	16,32	22	10,191
	Pornóapáti	9,2	18,00	6	3,899
Szentpéterúr N=119	Szentpéterúr	30,3	6,00	36	4,283
	Zalaegerszeg	22,7	8,11	27	4,886
	Budapest	12,6	10,73	15	6,041
	Keszthely	7,6	7,44	9	4,978
	Abroad	5	-	-	-
	Nagykanizsa	3,4	7,00	4	1,633

Source: IWIW database, edited by the author

The bigger the settlement of the inviters the earlier the registration request was sent. But who are the first inhabitants invited to use the system? We examined the level of education and the several age groups in one model. The two variable together hasn't got significant effect on the invitation's date, but separately yes. The result showed that the first users of the system in case of each settlement have a higher level of education (tertiary level) and their age proves that most of them are still attending a university in Hungary. This means they are mobile (have to travel to another town to take part in education and they have the basic ICT skills since the whole tertiary education system is based on IT technologies (for example one can only sign to courses and exams or pay the hostel through the internet). All the infrastructure development paid off in this case because each school on elementary and the secondary level of education is equipped with ICT.

Table 8 Division of means of number of months passed since registration between age groups and level of education

Age groups	Level of education	Months passed since registration Mean	N
0-17	Elementary	5,49	35
	Secondary	9,87	39
	Total	7,80	74
18-22	Secondary	10,91	35
	Tertiary	18,04	23
	Total	13,74	58
23-33	Elementary	4,00	1
	Secondary	9,20	30
	Tertiary	15,83	36
	Total	12,69	67
34-45	Secondary	7,45	20
	Tertiary	13,38	16
	Total	10,08	36
45-	Elementary	14,00	1
	Secondary	9,35	26
	Tertiarys	10,16	25
	Total	9,83	52
Total	Elementary	5,68	37
	Secondary	9,57	150
	Tertiarys	14,53	100
	Total	10,79	287

Source: IWIW database, edited by the author

In the case of the elderly we must say that only those are part of the system who attended tertiary education, mostly white collar workers.

Discussion

The research on the database was successful. All the hypotheses proved to be right. The same elements that determined the attitude toward the IT equipments in the early IT researches in Hungary in 2003 also determine the way one uses services accessible through those devices nowadays. Density of population and the share of certain age groups influence these attitudes the most. The existing infrastructural environment is also a key factor in a community's sensitiveness. Common access points either a result of a top to bottom approach as eMagyarország points or a bottom to top initiative like the telecottages let the community to act together and reach the tipping point (in our case register their own settlement in the service) but the state of supply of ICT in households let individuals to get know the new technologies. Of course the infrastructural background is not enough to set off the diffusion process. Certain groups needed to play the role of the innovators. These groups are highly trained, young and mobile people whose daily routine contains the use of ICT (at workplace or as students in tertiary education). Mobility is a key factor because in this case diffusion spread through physical and spatial connections. We can't talk about diffusion entirely undertaken in an online environment because the service examined by us is based on real social networks. Another interesting direction would be a research on social networks that only exist in an online environment.

Conclusion

Contrary to the relations of purchasing Pc and the expansion of using Pc am found in the aforementioned 2003 research in our case we can talk about real diffusion. If we take the generally used S curve diffusion we must say that this particular diffusion of registering into IWIW is in it's early, evolving phase. The pattern of diffusion is more or less the same in places with higher density of population and in less inhabited parts of the Nyugat-Dunántúl region the whole process only started later and ends with fewer registrants. If we extrapolate the registrations in the future saturation will continue the only boundaries are the low increase rate of new IT users.

Examining the three example settlements other elements of the diffusion could be proved. Diffusion if we examine it through the spatial differences comes from towns with high density of population. Innovators of the three settlements can be described with age and level of education. Young, mobile groups attending in tertiary education or with a degree represent the innovators. They bring home the new customs and give it to the younger and the older generations with lower mobility capacity. The late adopters are more likely have a lower level of education.

Further researches need to be undertaken where the relationship between the online and offline part of everyday life can be described for example the relations between two settlements physical availability and their online connections. More elements can be added to the aforementioned system with a more intensive research on the existing database concentrating on the connections of individuals bringing new viewpoints in diffusion examination.

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