
SIGNIFICANCE OF DEMOGRAPHIC VARIABLES FOR TARGETING OF INTERNET ADVERTISEMENTS

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Abstract. Broad ad targeting options belong among the major advantages of internet advertising. Demographic targeting has become a standard option in most of on-line advertising systems. There are more ways how to target on-line advertisements by using demographic variables. In some cases, e.g., social media, we can use data from user registrations. Modern technologies enable to estimate the demographic profile of internet users using on behavioural data. The traditional approach to the demographic targeting of advertisements based on affinity targeting assumes the existence of internet servers with sufficient homogeneity of visits. The aim of this article is to identify the differences in the internet content consumption habits of Czech internet users based on gender and age. The analysis is based on the data from the extensive research which was carried out by the Netmonitor project, and which was provided for the purposes of this study by the Association for Internet Development (SPIR). The research results show that the traditional affinity-based method of targeting according to gender and age is still suitable on the Czech internet. On the other hand, in some cases, the traditional approach of ad targeting based on affinity leads to wasted ad impressions that miss defined target group.

Keywords: internet users, internet advertising, demographic targeting, affinity-based targeting, internet advertising, gender and age.

JEL Classification: M31, M37.

1. Introduction

The internet is one of the kinds of media which is becoming increasingly popular among advertisers (Chitu 2009). In the long term, expenditure on internet advertising will increase. This holds true for the internet in the Czech Republic, as well. In 2014, 20% of advertising expenditure went on internet advertising.

Besides the traditional advantages of the internet (see Jemmeson 1997; Sedláček 2006; Javalgi *et al.* 2005); the most important one from the point of view of the internet advertising, is the very precise targeting of advertisement campaigns and good interaction with consumers. A very important point is that it is relatively easy to measure the results and to precisely evaluate the effectiveness of the advertising campaign. Bok (2014), however, recommends measuring also less visible indicators of the effectiveness, such as awareness and brand recognition, intention to purchase, and other communication effects.

Boudreau and Watson (2006), emphasise the global reach as the crucial difference between the internet and other types of media. For this reason they also attach the strategic significance of internet advertisement links with companies' entire strategies in the case of international firms. Because the Internet allows to effectively reach more potential customers at a lower cost, it also opens up new possibilities for advertisers from other countries, such as India (Khare 2009), where the online advertising market is growing dynamically (Ziaul 2014).

The effectiveness of internet advertising, as well as advertising in the traditional media, is largely determined by proper targeting. On the one hand, the internet offers a lot of innovative advertisement targeting options. On the other hand, it is important for many advertisers to target on traditionally defined groups of customers. Although the Internet provides a lot of advanced methods for targeting advertisements, it begs the question: can we target internet users on the biggest servers; according to their basic demographic characteristics; effectively? Potential problem could be low internet penetration within some demographic groups. For instance, 96.5% of individuals aged 16 to 24 years old are connected to the internet, while only 18.9% of people aged 65 and over, are online (Czech Statistical Office 2014b). It can be seen from the data of the Czech Statistics Office that the number inhabitants in the Czech Republic, who are online, contains a very high proportion of young people with higher education; mostly men; as well as students aged 16 and over. Finding suitable sites for the effective placement of advertisements presupposes differences in the preferences of users when they consume internet content. According to recent research, differences in user behaviour are changing. However, the differences between men's and women's behaviour on the internet still persist. (Ono, Zavodny 2003; Hu *et al.* 2012; Tsai, Lin 2004).

This article should answer the question of whether on the Czech internet it is possible to find thematic categories of servers with an above-average interest of internet users within the different demographic groups defined by gender and age. The aim of this article is to identify the differences in the internet content consumption habits of Czech internet users; based on gender and age; in order to determine differences in preferences in the type of internet sites visited. From these results, it should be possible to assess the possibilities for the demographic targeting of internet advertising by gender and age in the Czech Republic. Attention is paid to the traditional way of targeting

by affinity. For this purpose the data from the Netmonitor is analysed. NetMonitor is an extensive research project aimed to gather information on internet audience in the Czech Republic as well as socio-demographic profile of Czech internet visitors. Socio-demographic research of visitors is realized on a panel (sample of visitors) of Czech internet users. The panel consists of 2 parts: Pop-up panel which collects information by showing pop-up questionnaires on participating websites and NetMonitor panel which uses a local application, NetSoftware, installed on individual NetMonitorPanel members' computers. The resulting Joint panel comprises ca. 30.000 people and reports unified data. The system processing eliminates inaccuracies arising from deleting cookies and delivers the actual number of visitors (real users). Research infrastructure is used now for overlying research, such as post-buy analyses, ad-hoc research, and campaign pre-tests and post-tests. Mutual comparability (and possible interconnection) of results enables standardized monitoring of the Czech internet in this area (Netmonitor 2012).

2. Internet advertising targeting options

The appropriate targeting of advertising is one of the basic requirements for its effectiveness. Some of the methods used to address internet users are very inexpensive. This may discourage advertisers from expending any great effort on advertising activity on the internet in order to get a better target. Advertisers, however, in this case, should also consider the issue of ethical behaviour (Cheyne, Ritter 2001). Traditionally, the purpose of targeting advertisements is to reduce the costs of unnecessary advertising, by minimizing its distribution to groups of "targets" who do not belong in the category of active users (Iyer *et al.* 2005). At present, advertisement targeting options, however, allow for much more than just not displaying advertising to non-users. It can really target the advertisement based on well defined market segments respecting, among other things, the target group's preferences, purchasing habits and media. Current changes in the direction taken by the fragmentation of the media have also contributed to the more precise targeting of advertisements (Nelson-Field, Riebe 2011). Bergemann and Bonatti (2011) have demonstrated that the development of targeted advertising has the effect of lower costs for advertisers.

At its simplest level, the basic characteristics of the target group are divided into geographic, demographic and psychographic aspects (Lin 2002; Vysekalová, Mikeš 2007). Behavioural characteristics are also vital for market segmentation. The popularity of the use of demographic criteria in the definition of target groups, for the purposes of marketing communication, is based on several factors (Koudelka 2005). Traditional segmentation criteria are often logically associated with the different behaviour of consumers. The advantage is also their easy measurability. The essential argument is the availability of information from secondary data sources, because traditional demographic characteristics are the data which is routinely monitored in most consumer surveys.

Geographical criteria, along with the user's language, belong among the default methods of targeting advertisements with international reach. Traditional methods can certainly include placement targeting, according to the thematic focus of the server. The internet offers the advertising industry a rich selection of specialized servers on which to place their advertisement. On the Czech market, 21 specialised categories of servers were defined by Netmonitor, the official internet monitoring project (Netmonitor 2012). From the content focus of servers, the interests and demographic characteristics of visitors can be indirectly inferred, but technically the server type is being targeted, not the type of user. Also contextual advertising works by targeting a server according to its content. In a broader sense, as a contextual advertisement can be also understood search advertisements which appear in the context of the user's query. Indubitably, this targeting has the advantages that it: responds to active user's demands and that it reaches potential customers in the advanced stages of the buying cycle.

Nowadays, the targeting of advertisements is slowly moving from the traditional method of targeting according to the server, to targeting according to the user. This includes targeting the interests of users. In the past this option existed only on those platforms where the user declared his/her interests upon registration. The new development is called: behavioural targeting. In general it means targeting according to the past behaviour of users. The collection of data about user behaviour on the internet causes people to feel alarmed, which results in efforts to pass laws which more strictly regulate this activity (Goldfarb, Tucker 2011; Berger 2011). It is certainly an unpleasant fact for marketers, because according to studies carried out in the field, it is a very effective way of targeting advertisements. Goldfarb and Tucker (2011) found that in cases where regulation has limited behavioural advertising, the impact of advertising on users' intention to purchase the advertised product was reduced by about 65%. Behavioural targeting can also bring higher profits, even for the content providers (advertising servers) themselves; up to double amounts (Jianqing, Stallaert 2014). Under the heading "behavioural targeting", we can also put the specific form called "retargeting". This consists of reaching users based on their previous interactions with the advertiser's website. Today's technology basically enables the advertiser to target differentially, according to the customer's values. However, account should not be taken only of users' current values, but also their future values (Tahal 2014). This is a current challenge for further development in the area of internet advertising.

Although it is argued that targeting users' interest reduces the importance of traditional demographic targeting (Bailey *et al.* 2012), there are obvious attempts to offer the possibility of demographic targeting even in advanced advertising systems, which had, first of all, to discover the technological ability to identify the demographic characteristics of visitors. A number of studies have confirmed the importance of demographic

targeting and its positive influence on the effectiveness of internet advertisements (Banerjee, Dholakia 2012; Jansen, Solomon 2010).

Demographic targeting on the internet uses three basic approaches. Advanced technologies make it possible to identify the demographic profile of the user by his/her behaviour. That means that the profile is built up according to the servers he/she visits, or the specific topics which he/she searches for on the net. A much more reliable method is targeting by demographics on those platforms where users register and declare their demographic characteristics. This is typical for advertising on social networks. The third approach is to estimate the demographics according to the type of server. Advertisers have at their disposal internet data from an official source of measurement of the medium. In the Czech Republic there is an extensive research project called Netmonitor. On the basis of data purchased from this project, advertisers can get very precise information about the traffic and profile of visitors to the advertising servers involved. They can then target servers with above-average number of visits by the target group (by affinity). This traditional way of demographic targeting is a compromise because it does not enable a clean hit on a specific target group. The following analysis can help to answer the question, to what extent can this traditional method help make a hit, of sufficient quality, on demographic groups which are defined according to sex and age, on the Czech internet.

3. Methods

The research for this article is based on the analysis (data minig) of database carried out by the project NetMonitor. This is an extensive research project, which is the official source of data on the size and socio-demographic profile of the Czech internet population. The project was commissioned by the Association for Internet Development (SPIR 2014), and implemented by the company Gemius, S.A. in cooperation with Mediaresearch, a.s. The research on the profiles of the internet population is carried out on the so-called joint panel of approximately 30,000 respondents. Data for measuring server traffic are collected via the JavaScript code. The data for June 2014 was made available for the purposes of this research (full database is not publicly available). Software Gemisu Explorer was used for data minig. During the research period, the project covered 457 major internet sites. The reach of the project NetMonitor, in June 2014, amounted to 97.7% of the Czech internet population. The total size of the Czech internet population was 6,500,147.

In the analysis, attention was focused on the key demographic criteria – age and gender. NetMonitor measures the online population aged 10 and over. The age intervals for analysis were set as follows:

- Juniors – 10 to 29;
- Middle age – 30 to 49;
- Seniors – 50+.

The analysis is being worked with thematic categories of servers; 21 were defined by NetMonitor. The results of the analysis show differences in the behaviour of users, according to gender and age. For this purpose, the following indicators were used:

- The number of real users (RU) – The number of Internet users in the relevant target group who have generated at least one page view on the selected web server during the given month (week, day);
- The average time spent per visitor (ATS) – the total time spent by the average visitor (real user) from the target group, on the selected web server during the given month;
- Reach profile – the ratio of the number of visitors (real users) from the particular target group who visited the selected web site, to the total number of visitors who have visited the selected web site during the given month (week, day).
- Affinity Index – the ratio of the composition of visitors of the particular target group for the selected web site, to the composition of the target groups for the group of all the servers which were measured. (Coefficient expressing the relationship between the audience of a chosen medium and the audience of all measured media).

An affinity higher than 100 indicates the suitability of a server or category of servers to address defined target groups (it means above average representation of the target group on this server or category of servers).

The analytical software Gemius Explorer version 5.6.40.0., was used for analysis of the data.

4. Results and findings

Based on the analysis of the data of the research project NetMonitor, it is possible to evaluate differences in the behaviour of internet users, and thus to assess the suitability of the traditional method of demographic targeting in internet advertising. It is implemented based on the placement of the advertising format on the internet servers with the highest affinity, and at the same time, reach to the defined target groups.

Table 1. TOP 5 categories according to the number of visitors (RU) (source: authors, data mined from Netmonitor database 2014)

Category	No.of RU	TOP server	No. of RU
HP of portals	5 728 186	Seznam.cz – Homepage	5 317 113
Databases, catalogs	4 700 222	Mapy.cz	2 808 534
News	4 470 459	Novinky.cz – Zpravodajství	3 517 353
Communication services	4 351 230	Seznam.cz – Email	3 881 881
E-commerce	4 038 878	Heureka.cz	2 235 915

For the following analysis it is useful to get an idea about the traffic on web sites categories for the entire internet population. This allows an easier evaluation of the specifics of the behaviour of individual demographic groups. The most popular categories of servers which were measured are shown on Table 1.

4.1. Gender differences in internet use

The composition of internet users in the Czech Republic is relatively gender balanced, with slightly more men. This is one of the differences between the profiles of the general population and the internet population in the Czech Republic. The analysis shows that in June 2014, 3,239,000 men, aged 10 and over, visited the Czech internet. In the same year it was 3,094,000 women. As stated above, most internet users visit, most frequently, the fairly traditional categories of web servers such as, for instance, news or communication services (e-mails). As regards the reach of the target groups by gender, we can expect a similar composition of the categories of servers as in the general population. However, if an advertiser were to target advertisements only according to the reach of an internet server, then, in many cases, a significant proportion of paid advertisements would by-pass the intended target group.

From the analysis of the data, it is clear that men visit most often the category sites, in a similar order to the rest of the internet population. Compared to the visiting order for the rest of the online population (see Table 2), men give preference to the TV and radio categories (2,022,000 RU) over the e-commerce category. This latter is the sixth most visited category for men on the internet (2,020,000 RU). Men are also interested in tabloid magazines (1,945 thousand. RU), and servers focused on IT and mobile and digital technology (1,701,000 RU). Women give preference to the internet communication services more than to the news servers (2206 thousand. RU compared to 2,122 thousand. RU).

The results show that there are no great differences between men's and women's visits to the most important categories of web sites. When comparing the actual value of the traffic (indicator: RU), and reach, it can be seen that relatively more men prefer news servers (70.5% men, as opposed to 67.0% women), and watching, or listening to, internet radio and television stations (61% men, as opposed to 58% women). On the other hand, relatively more women visit communications sites (70.0% women, as opposed to 64.4% men). The remaining most popular categories for women and men are not very different – as for their reach.

Differences in the preferences of men and women are captured best by the calculated affinity index and reach profile (composition of visitors), which indicate the suitability of a given category of servers for reaching the defined target groups. This analysis answers the question of whether there can be found, on the Czech internet, servers which have homogeneous traffic from a gender perspective.

Table 2 shows the categories of servers which are most popular among men, and which are least popular among women. The results of the analysis show how web sites are of above interest for male users. Server categories are not too homogeneous from the gender point of view. Men can, relatively effectively hit on content servers which are directly aimed at this target group, such as lifestyle magazines for men (for the resulting statistics: see Table 3). However, the indicator reach profile is here, too, surprisingly less than 64%. This means that advertisements targeted on the whole category will hit almost 36% of women users. Similar results for the affinity index and reach profile is the predictable auto-moto category, which is also one of the “usual” male categories. Although on the five most popular categories of servers we find a considerable traffic of women visitors, it can be seen what the main items of interest for men exist on the Czech internet, and which topics are interesting for this target group. Apart from the aforementioned male lifestyle magazines, and auto-moto, we see that sports and IT servers are also well represented.

Table 2. Men’s internet preferences
(source: authors, data mined from Netmonitor database 2014)

Ranking	Category of server	Affinity index	Reach profile
1.	Men’s lifestyle magazines	123.99	63.57%
2.	Automoto	123.57	63.36%
3.	Sport	116.45	59.71%
4.	IT servers, mobile phones, digital technologies	110.85	56.84%
5.	Economy, finance, law	104.35	53.50%

More precise targeting of male internet users demands a more careful selection of specific sites which have a higher affinity index, or, profile reach. However, it is necessary to take into account a much lower reach of users. The analysis which was carried out confirms that it is possible to find such servers with a relatively high homogeneity of visitors. These servers show visitor traffic in the tens of thousands of RU. Some examples are: Eurogamer.cz (affinity index 171.09, reach profile 87.72%); Tryhard.cz (affinity index 168.15, reach profile 86.22%); Jiskreni.cz (affinity index 166.05, reach profile 85.14%); Sportrevue.cz (affinity index 161.28, reach profile 82.69%). There are, however, also servers with hundreds of thousands of visitors RU, such as Autorevue.cz with interesting affinity index values, as well as compositions of visitors (152.59, 78.24%). As for women, the analysis shows a relatively lower number of opportunities for the effective deployment of advertising campaigns which target the thematic category. Women’s preferences on the Czech internet are shown in Table 3.

Table 3. Women’s internet preferences
(source: authors, data mined from Netmonitor database 2014)

Ranking	Category of server	Affinity index	Reach profile
1.	Pregnancy and parenthood	132.35	64.49%
2.	Health	121.99	59.44%
3.	Hobby	112.21	54.68%
4.	Social networks, teens servers, photogalleries	108.51	52.87%
5.	Entertainment and games	107.16	52.22%

In comparison with the male categories, typical women’s categories achieved lower values on the affinity index, so they are less homogeneous in terms of gender. The only exception is the group of servers focused on pregnancy and parenthood with affinity index of 132.35. Women accounted for 64.5% of visitor traffic to these sites. The first two categories with the highest reach profile, however, have a relatively lower reach, each less than 600,000 RU. Compared with male server categories, targeting women is more demanding in this respect. For men, the second best category (auto-moto), at the same time, offers a very interesting reach for this target group, with 1,126,000 RU. The other three categories of female servers, on the contrary, already show a relatively low level of homogeneity. These groups have a significant number of male visitors. The analysis has yielded the surprising result that those categories which are aimed at women and fashion are, while in terms of affinity index more attractive for women (affinity index 106.4), their internet visitor traffic is in absolute terms, essentially identical to that of the male internet population, thanks to the lower representation of women in the Czech internet population (women within this category make up only 51.82% of visitor traffic).

Just as in the case of men, targeting of women can also be done more effectively by the careful selection of high affinity individual servers. The highest values of the index affinity are achieved by those servers which have the number of their visitors in the lower tens of thousands. Examples are: Stastnezeny.cz (affinity index 173.87, reach profile 84.72%); Porodnice.cz (affinity index 173.39, reach profile 84.49%); Elle.cz (affinity index 167.71, reach profile 81.72%). Servers with significantly higher visitor traffic (in the hundreds of thousands of RU) can also be found. These are, for instance, the server Votocvohoz.cz (affinity index 157.19, reach profile 76.59%); or Modrykonik.cz (affinity index of 154.7, reach profile 75.38%).

Differences in behaviour between men and women can be observed based on the average time spent online per visitor per month. This indicator thus expresses, on which internet themes men and women spend the most time. The first two categories of servers are identical for both men and women and are the following:

1. HP of portals (8 hours 16 minutes for men, and 7 hours 39 minutes for women).
2. Communication services (4 hours 47 minutes for men, and 6 hours 7 minutes for women).

The third category with the most time spent per visitor is for men, with news servers (2 hours 11 minutes). News servers are in tenth place among women (only 1 hour 9 minutes). Men continue to spend most of their time on sites which focus on e-commerce (2 hours 08 minutes) and sport (2 hours 3 minutes). Women spend a similar amount of time on e-commerce, but here, it is now the category with the third highest amount of time spent spent on it (2 hours 2 minutes). Next come the categories Entertainment & Games (1 hour 37 minutes), and tabloid magazines (1 hour 31 minutes). Men spend less time on these categories (56 min), putting them in twelfth position according to the amount of time spent on them.

4.2. Age differences in internet use

Explored age categories have different incidence of representation on the internet. The youngest users account for 30.72% of the internet population, while the middle age and oldest users make up 41.65% and 27.63%, respectively. The age structure is one of the main differences between the internet population and the general population, in which the representation of the senior population plays a role.

From the results of the analysis, we can see certain specific features in the behaviour of the defined age groups of internet users. It is no surprise that the most popular category of servers is common across all age groups. These are the Home pages of major portals, such as Seznam.cz or Centrum.cz. In the case of the youngest and middle age groups, the second most popular categories – databases and catalogs – have traffic equal to that of the entire internet population. Their reach is very similar (the population reach in this category is 72.31%. The youngest generation has a reach of 72.46%). The youngest user age group has a similar composition to the top five categories as the entire internet population, but the difference is now on the third position of the “most visited site” category. The internet population likes news servers, which, however, do not address the younger generation so much. In terms of visitor traffic, the news category approaches 6th position, with a reach of 60.71% (compared to 68.77% of the wider internet population). Young people prefer more categories of communication services, as well as e-commerce and TV and radio. The middle age group, which is the largest group on the internet, is an exact copy of the order of the most popular categories of the entire population. Certain differences can be found only in the reach where, for example, the middle age group is relatively more attracted to news servers and communication services. In the oldest age group we can identify different rankings in the most popular categories. In the first five rankings, we find that e-commerce servers are absent, but tabloids are present. Tabloids, among the oldest age group, have above average visitor traffic (64.03%, as opposed to 59.56% of the total population). News servers are very popular among the oldest internet users. They now occupy second position in visitor traffic, with a reach of 77.94% (compared to 68.77% of the population). Next come the categories database and catalogs and communication services.

In the next part of the analysis we have evaluated the differences in the behaviour of the different age groups, according to affinity index and composition of visitors (reach profile). The results show the thematic categories of web sites with the greatest homogeneity of visitor traffic by age.

Table 4. Preferences of the 10–29 age group of users
(source: authors, data mined from Netmonitor database 2014)

Ranking	Category of server	Affinity index	Reach profile
1.	Men’s lifestyle magazines	144.74	45.60%
2.	Entertainment and games	132.15	41.63%
3.	Social networks, teens servers, photogalleries	117.50	37.02%
4.	Pregnancy and parenthood	116.57	36.72%
5.	Health	115.14	36.27%

Table 4 shows the category of servers which are exceptionally interesting for the 10 to 29 age group. The youngest age group is characterized by the highest values of the affinity index for the preferred categories of servers. The first category – lifestyle magazines for men – is in fact purely a junior category. Almost half of the traffic belongs exactly in the 10–29 age group. Other topics are not really surprising. The category Entertainment & Games is also characterized by a significant dominance of young visitors in the 10 to 29 age group. It is also a category with a significant reach (49.94%). Compared with the homogeneous category of male lifestyle magazines there is a marked difference; in that this age group’s reach is only 14.77%. Among the other categories which are exceptionally interesting for the young internet population are the community and teens servers and photo galleries. These, along with the health category, are still on servers where only those users in the 10–29 age group have a value of affinity index greater than 100. Web sites from pregnancy and parenthood category have above average visitor traffic among the middle age group (see below), while they appear not to hold any interest for the oldest age group.

The analysis of the age criteria also examined the differences in behavior by gender for each age group (according to above-average visitor traffic to the respective categories of servers).

For men in the youngest age group, the following categories of servers are most popular:

1. Lifestyle magazines for men (index affinity 201.26).
2. Entertainment and games (index affinity 138.12).
3. IT servers, mobile and digital technology (index affinity 125.08).
4. Auto-moto (index affinity 118.19).
5. Community and teens servers, photo galleries (index affinity 107.43).

For women in the youngest age group, the homogeneity of visitor traffic with a significant share of this target group, can be found in the following categories of servers:

1. Pregnancy and parenthood (index affinity 140.09).
2. Health (index affinity 136.24).
3. Entertainment & games (index affinity 127.61).
4. Social networks, teens servers, photogalleries (index affinity 125.18).
5. Hobby (index affinity 117.94).

The analysis shows that the thematic categories of servers, in the youngest age group, with a relatively homogenous load of visitor traffic, are those for men, rather than for women. With careful selection, it is possible to find a number of sites; for the youngest age group; with interesting values of affinity index and reach profile. Servers with a monthly visitor traffic of tens of thousands RU, even, hundreds of thousands of RU were identified. Examples include the servers: Tryhard.cz (affinity index 293.55, reach profile 92.48%); Eurogamer.cz (affinity index 278.31, reach profile 87.68%); Lamer.cz (affinity index 269.30, reach profile 84.84 %). The following servers have visitor traffic in the lower hundreds of thousands: Titulky.com (affinity index 261.41, reach profile 82.35%); or, Loupak.cz (affinity index 252.91, reach profile 79.68%).

The 30 to 49 age group is the dominant one in the Czech internet population. This fact is reflected in the relatively high values of the reach profile on servers in the categories of topics which are typical for internet users in the middle age group. On the other hand, it is logical that the affinity indices for the thematic categories are likely to be lower. Table 5 shows the results of the analysis.

Table 5. Preferences of the 30–49 age group of users (authors, data mined from Netmonitor database 2014)

Ranking	Category of server	Affinity index	Reach profile
1.	Automoto	111.73	46.95%
2.	Pregnancy and parenthood	108.24	45.49%
3.	Real estate, housing	104.17	43.78%
4.	Sport	101.40	42.61%
5.	Communication services	101.31	42.57%

Above average interest in the server categories of auto-moto and pregnancy and parenthood can be seen in the middle age group of internet users. This is the category with the highest index of affinity, and representation of the target group, in their visitor traffic. The auto-moto category still has an interesting reach, as it receives hits from about a third of this age group (30.64%). In contrast, the pregnancy & parenthood category receives hits from only 14.72% of these users. The housing and real estate category looks fairly interesting, with a lower affinity index, but a reach of 32.84%. Categories with a higher reach already suffer from a low homogeneity of visitors in terms of age.

Taking account of gender in this age group, different preferences for thematic categories with a higher affinity index were identified. Men in the 30–49 age group are above average visitors to these server categories:

1. Auto-moto (affinity index 137.62).
2. Lifestyle magazines for men (affinity index 116.28).
3. Sport (affinity index 115.64).
4. IT servers, mobile phones, digital technologies (affinity index 106.28).
5. Economy, finance, law (affinity index 100.47).

Women in this age group have a higher than average interest in following category servers:

1. Pregnancy and parenthood (affinity index 139.55).
2. Health (affinity index 115.46).
3. Hobby (affinity index 110.39).
4. Communication services (affinity index 108.50).
5. Real estates, servers about housing (affinity index 108.23).

The middle age group has rather less homogeneous categories for both men and women. There are more typically female categories here, unlike the situation with the youngest age group.

For the middle age group, there are also Internet sites with relatively high values of affinity index and reach profile, but with a rather lower reach. Given the large representation of this age group among the Czech internet population, there are no servers with an index of affinity greater than 200, as there was with the youngest user age group. Examples include the servers: Powerplaymanager.com (affinity index 163.11, reach profile 68.55%); I-creative.cz (affinity index 146.42, reach profile 61.53%); Mtbs.cz (affinity index 146.36, reach profile 61.51%). Greater visitor traffic was achieved by, for instance: the server Tipcars.com (affinity index 128.93, reach profile 54.18%). Larger servers with homogeneous visitor traffic completely in the 30–49 age group are, in principle, unavailable. Targeting by affinity in this case appears to be fairly difficult.

Users from the oldest age group form a smaller part of the internet population. This is reflected in the relatively lower values reach profile. When targeting the older internet population by means of affinity to the categories of servers, the effectiveness of an advertisement will be lower, since the greater part of the advertisements on these servers will hit a younger age group. In terms of index values of affinity, sport, economics and law belong among the exceptionally popular categories of servers. Rather more educated people, in line with the general assumption, than the general population move with the internet, primarily with the information servers. Table 6 shows the results of the analysis carried out on the 50+ age group. Naturally, individual categories also differ in terms of their reach. While the reach profile for the oldest age group in the top five categories is very similar, the best reach offers the category of news servers (77.94%). Conversely, servers focused on housing and real estate show a reach of only 35.81%.

Table 6. Preferences of the 50+ age group of users (source: authors, data mined from Netmonitor database 2014)

Ranking	Category of server	Affinity index	Reach profile
1.	Sport	119.10	31.53%
2.	Economy, finance, law	118.04	31.25%
3.	Real estate, housing	113.62	30.08%
4.	News	113.32	30.00%
5.	Women's and fashion magazines	112.01	29.65%

As for the differences between the preferences of men and women in the 50+ age group, the results of the analysis show quite different preferences. Men in the 50+ age group show an above average interest in the following categories:

1. Sport (affinity index 132.53).
2. Economics, finance, law (affinity index 122.63).
3. News (affinity index 115.82).
4. Society magazines (affinity index 110.94).
5. Auto-moto (affinity index 110.36).

What is even more significant is the level of interest shown in the information content of news sites, including that of sports, economics, finance and law. Women in the 50+ age group show an above-average interest in the following categories:

1. Real estates, servers about housing (affinity index 124.82).
2. Women and fashion magazines (affinity index 118.39).
3. Society magazines (affinity index 112.83).
4. Economy, finance, law (affinity index 110.19).
5. Health (affinity index 109.99).

Women in the 50+ age group give the greatest preference to the hobby and socially oriented servers. With the 50+ age group, just as with the youngest age group of internet users, the homogeneity of site visitors can be found more among men than among women. As far as specific servers are concerned, where it is possible to much more effectively target the oldest age group; there is, in terms of the affinity index, a fairly interesting selection. The reach profile values are, however, weaker, caused by, as mentioned above, lower representation of this age group in the internet population. Some examples of suitable sites are: Moneymag.cz (affinity index 283.78, reach profile 75.12%); Spa.cz (affinity index 232.34, reach profile 61.50%); Prazskypatriot.cz (affinity index 219.75, reach profile 58.17%); Ecards.cz (affinity index 214.01, reach profile 56.65%). These servers get tens of thousands of visitors each month. The server Eurozpravy.cz, with an interesting affinity of 211.51 (reach profile 55.99%), receives a much higher number of visitors per month.

Also the analysis of age groups has taken into account the average amount of time spent online, per month. This indicator complements the view of the attractiveness of the individual thematic categories of the servers, as well as the intensity of consumption of their content. The first two categories of servers do not vary across the different age groups, because a longer time spent surfing the net is a typical feature of the entire internet population. They are HP of portals: 7 hours 20 minutes for the 10–29 age group; 8 hours 44 minutes for the 30–49 age group, and 7 hours 27 minutes for the 50+ age group and communication services: 3 hours 35 minutes for the 10–29 age group; 6 hours for the 30–49 age group, and 6 hours 40 minutes for the 50+ age group. Furthermore, users in the 10–29 age group spend the most time on the social networks, teens servers and photogalleries (2 hours 9 minutes); e-commerce (2 hours 6 minutes) and sport (1 hour 58 minutes). Users in the middle age group (30–49) spend the most time visiting the following categories: e-commerce (2 hours 8 minutes); social networks, teens servers and photogalleries (1 hour 38 minutes), and pregnancy and parenthood (1 hour 32 minutes). Users in the 50+ age group, in addition to the aforementioned two categories, most often visit the following categories: news (2 hours 47 minutes); e-commerce (1 hour 59 minutes), as well as spending quite a lot of time playing games (1 hour 57 minutes). The entertainment & games category is typical in that the average time spent here increases with age. Young people spend, on average, only 1 hour 19 minutes, while the middle age group spends 1 hour 25 minutes in this category.

5. Discussion

From the results of the analysis we can see that the preferences of users, by gender and age, on the Czech internet still differ, but also that the homogeneity of preferences is not always clear. The traditional method of demographic targeting in such an environment as the internet; with its wide variety of themed servers; places quite high demands on the planning of advertising campaigns. For target groups, which are broadly defined by sex and age, we can, in some cases, find thematic categories with high value of affinity indices. More satisfactory results are only guaranteed by careful selection of the specific internet sites. The homogeneity of the traffic across thematically defined categories of web sites tend to be lower. The analysis of the targeting strategies, which were aimed at men, have yielded satisfactory results, when two broad categories of male servers have a greater than 60% share. Such is the case with the men's lifestyle magazines and auto-moto servers. This applies to the case of women only in one server category; that is: pregnancy and parenthood. One very surprising thing is that almost half of the hits on sites devoted to women and fashion, were from men. Generally, the analysis shows the greater demands placed on the planning of advertising campaigns which are aimed at women's web sites. By careful selection of the specific servers, however, both sexes can be successfully targeted; when addressing the groups concerned; with a rate of accuracy of between 80 and 90%. However, the lower values of the reach of the advertising campaigns must be taken into account.

In the case of the age groups, the results of the analysis show the homogeneity of visitor traffic consisting of the youngest internet users. Here, a wide category of internet servers were identified which had a relatively high number of young visitors (between 40 and 50%). Sites that are of interest to young men (men's lifestyle magazines), and which have high affinity index values, can be successfully targeted by advertisers. Choosing specific web servers can achieve a share of young visitors with a value of more than 90%. As for the median age category; which forms the majority of internet visitors in the Czech Republic; it is difficult to find themes with higher values of affinity index. The auto-moto category has the greatest share of visitor traffic (which attracts mainly middle-aged men), and pregnancy and parenthood (which attracts primarily middle-aged women). In this age group, more women's than men's category internet servers were identified. Targeting can be more accurate with the choice of specific internet servers. In this case, the reach profile is still relatively lower; between 60 and 70%. We can say that it is still difficult to target the 50+ age group effectively. Some categories are characteristic for the older age group, in particular the information servers. Homogeneous preferences in this age group can be seen more with the men than the women, when several broad categories of web sites with relatively high affinity index values were identified. However, indicators showing the composition of the internet visitors were problematic, when the older age group makes up a maximum of one-third of the visitor traffic; and advertisements largely miss the intended target group. The placement of advertisements on carefully chosen internet servers solves this problem only partially. We have identified servers with high values of affinity index but with a rather low value of reach profile (50–60%). With the increasing penetration of the internet within this age group, a gradual increase in the efficiency of such targeted advertising can be expected.

6. Conclusions

The internet is one of the types of marketing media which is, for many reasons, very attractive to advertisers. This is because it enables, among other things, the accurate targeting of advertisements. One way of reaching the desired audience, for advertisers, is to target the demographic characteristics of internet users. For many advertising systems, the method of demographic targeting presents great challenges. For instance, collecting data about internet visitors and estimating their profile is difficult and encounters many obstacles. Demographic targeting via those platforms where data can be obtained from the registration of users brings a distinct competitive advantage. Social networks such as Facebook, can serve as an example. The disadvantage of this method, however, is the relatively limited reach of these systems, especially for the selected target groups, which is determined by the number and profile of the registered users of the service. The opportunity for reaching users is also limited by the fact that the advertisement can only reach those internet users who visit the social network; and their readiness to buy is very limited. The alternative to this is the traditional method of targeting, whereby advertisements are placed on those content sites where the demographic profile of their visitors is known. The placement of advertisements on those internet sites with a high volume of traffic, and which also have an affinity for the given target group, can be a very effective way of targeting, too.

The results of this analysis have thus shown us that, especially when targeting by gender (particularly for men); and for targeting the younger age groups; quite effective use can be made of affinity in the traditional methods of advertising campaigns. Based on the results presented above we can see that on the Czech internet it is possible to find thematic categories of servers with an above-average interest of internet users within the different demographic groups defined by gender and age. On the other hand, we cannot ignore the current internet boom in targeting advertisements based on user data. This solves the problem of wasted advertisement impressions outside of the target group. With the traditional method of demographic targeting, this can never be completely eliminated.

Disclosure statement

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