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CHAPTER 16

AN ENTERPRISE AS A SUPPLIER IN THE INTERNET KNOWLEDGE MARKET

Introduction

ICT revolution, enterprises' specialization as well as strengthening market rivalry, typical for globalization and deregulation of economic affairs, stimulates an increase in significance of knowledge and information. This phenomenon is described as the process of *knowledge-based economies* creation. The term coined by OECD in 1996 was referred to those 'economies, which are directly based on the production, distribution and use of knowledge and information'(OECD, 1996, p. 7). Since then there have been developed many other definitions related to this issue. Harris defines it in a context of the economic wealth which, in his opinion, in knowledge-based economies depends both on knowledge management processes and knowledge-based products. In this sense '…economic value seems to be increasingly concentrated in non-material objects'. (Harris, 2001, pp. 22-23). Other authors emphasize that the main force which transforms existing industries, and facilitates the emergence of entirely new industries is not the information and knowledge as they are but the ability to identify, locate and deliver information and knowledge to a point of valuable application (Blumentritt, Johnston, 1999, p. 287). For these different points of view it appears common that in the knowledge-based economies there is strong connection between information/knowledge sources, distribution channels and places of their application. For this reason the problem can be examine as market related. If one assumes that the information/knowledge distribution is achieved via market, sources can be treated like suppliers (sellers) while users like customers (buyers). This model is reflected in Desouza-Awazu definition of the *knowledge markets*, who describe them as 'the logical space where buyers and sellers can engage in exchange knowledge products and services' (Desouza, Awazu, 2004, p. 60). The expression 'logical space' emphasizes that in these kind of markets the exchange process can be organized virtually based on technological (eg. internet) platform.

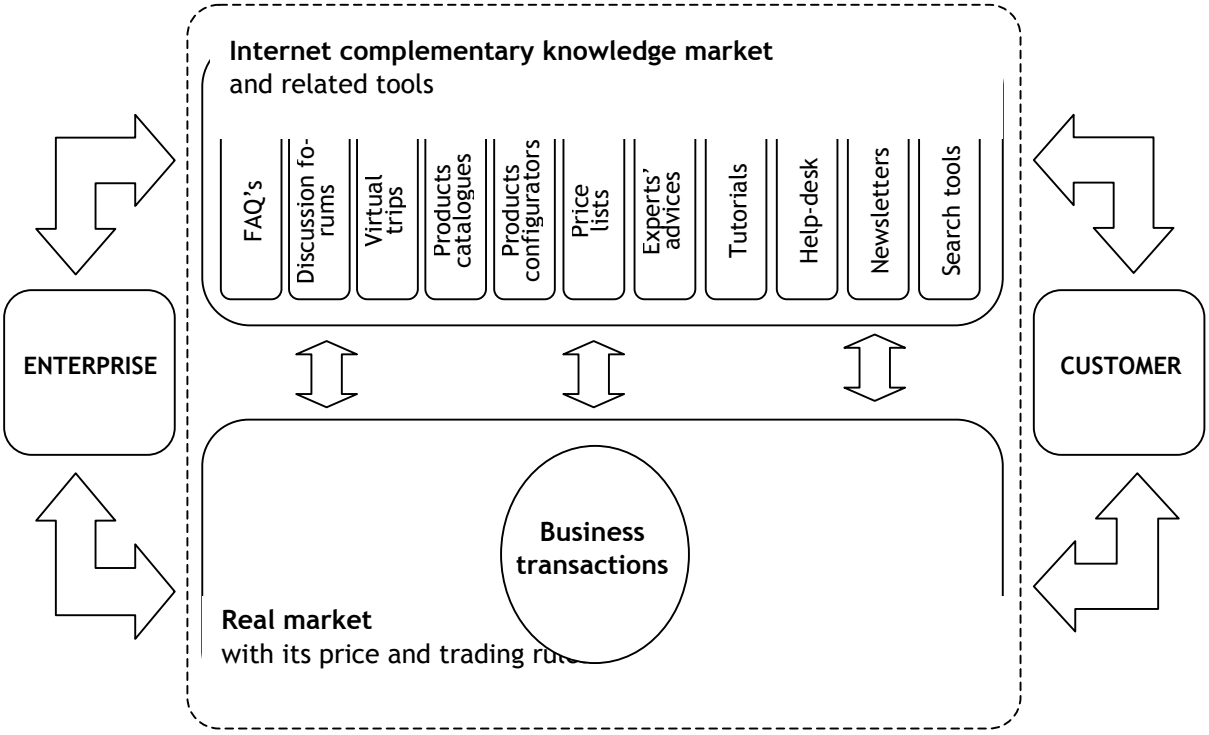
Despite broad discussion of the nature of information and knowledge no consensus has been achieved. Usually *information* is defined as data that have been arranged into a meaningful pattern and *knowledge* is identified with the application and productive use of information. This general distinction, as Roberts points out, shows that 'knowledge creation is dependent upon information, yet the development of relevant information requires the application of knowledge'(Roberts, 2000, p. 430). Referring to the distribution aspect, knowledge transmission requires its translation into information, and, after successful transfer, another re-translation into knowledge (Blumentritt, Johnston, 1999, p. 294). In this context it may be useful not to diversify between information and knowledge, but rather between tacit and explicit knowledge. The first one can be to some extent equated with knowledge in the general sense (understood as operational skills and *know-how*), while the second one can be compared with information. The critical differences between these two kinds of knowledge are widely discussed in the literature of the subject and formulated with reference to the following areas: codifiability and mechanisms for transferring, methods for acquisition and accumulation, potential for aggregation and modes of appropriation (Lam, 2000, p. 490). As tacit knowledge is intuitive and unarticulated as well as cannot be formalized or communicated is not regarded

as an economic asset (Desouza, Awazu, Yamakawa, Umezawa, 2005, p. 100). For this reason only explicit knowledge can be examined as an object of market exchange.

There are different types of knowledge markets. Generally they can be classified as internal or external. The first ones are typical for the situation where a firm plays the role of buyer and offers some profits for ideas of most creative, skilled or experienced employees. The second means knowledge exchange between different firms or firm and groups as well as single persons not involved in everyday business of the buyer. In particular, this mechanism is applied with reference to actual or potential customers, which approach is known as *co-opting customer competence* (Prahalad, Ramaswamy, 2000, pp. 79-87). This is a way of seeing and anticipating change that puts the customer, as involved in knowledge exchange and development process, at the heart of all decisions and strategies of the firm (Raymond, 2003, pp. 14-16). Based on this idea another type of knowledge market can be defined, which is not separate one with its own pricing and trade rules, but is complementary to the product market (*complementary knowledge market*). This is the case when producers parallel to offering their products in a real market support the selling process by delivery of related knowledge. The latter is offered in the market, usually a virtual one based on enterprises' internet portals, and its exchange with potential customers may precede a real transaction (in a real market) as well as may follow it. As examples of knowledge-related facilities which via internet are offered potential customers in advance one can point out FAQ's, opinions of previous customers published on discussion forum, references, virtual excursions into the firm, facts supporting the products brand, catalogues of products, price lists, products configurator and experts' advice. After the customers made the decision and bought the real product they are supplied by knowledge codified in forms of tutorials (e-learning trainings) for products users, help-desk web-service, product newsletters, search tools allowing users to ask random questions and receive automatic responses from the knowledge repository, etc. The general model of internet complementary knowledge market is illustrated in figure 1.

The specific attribute of the subject market is the possibility of not only to offer the customer the specific kind of knowledge but also to develop it as a result of customer's contribution. The latter, if the customer appreciates functionality and quality of the offer may positively influence the brand image as well as may destroy it in case of opinions of actual or previous product's users contrary to what is stated by the enterprise. This risk should be seriously taken into account as to some extent the complementary knowledge market works beyond control of the firm. Independent discussion forums of more and more mature customers' communities actively shape the market tastes. In this sense, operating in the complementary knowledge market both gives the opportunity to enrich the enterprise's products with information component and supports customers' retention management. Market research shows that web-based services that transfer knowledge in positive way impact customers satisfaction and retention. That phenomenon intensifies along with gaining e-commerce experience (Rodgers, Solomon, 2007, pp. 117-122). There is no doubt that striving after increase of absolute number of customers despite of winning new ones enterprises are forced to constant recognition of the present. Having the above in mind this means that the development of information society will increase the significance of complementary knowledge market for market rivalry.

Figure 1. The concept of the internet complementary knowledge market



To sum up the former discussion, in the complementary knowledge market three general categories of knowledge can be offered:

- brand-related knowledge - characterizing the producer, it's competencies, experiences, values and other facts as well as general picture of available offer, which are aimed at building the positive brand image,
- product-related knowledge - concerning products properties and application, which helps potential customers to judge products value in comparison with those offered by market rivals,
- knowledge supporting post-sale services.

The above three-component framework was applied in this paper to answer the question, to what extent the Polish enterprises are present as suppliers in the internet complementary knowledge market? Such approach, assuming that observed supply to some degree reflects the demand, was utilized to assess the maturity of examined market, which is the scientific objective of the paper. The share of 50% of enterprises supplying their customers with the relevant knowledge was applied as a borderline between immature and mature markets. Observations focused on period between years 2005 and 2007, which was outlined by the first year after accession to EU and last year, which preceded economic slowdown. The subject of the analysis is a percentage of enterprises using their web sites (corporate internet portals) for the following three purposes:

- general promotion of products and services (corresponding with brand-related knowledge),
- making products catalogues and price lists available (corresponding with product-related knowledge),
- post-sale services delivery.

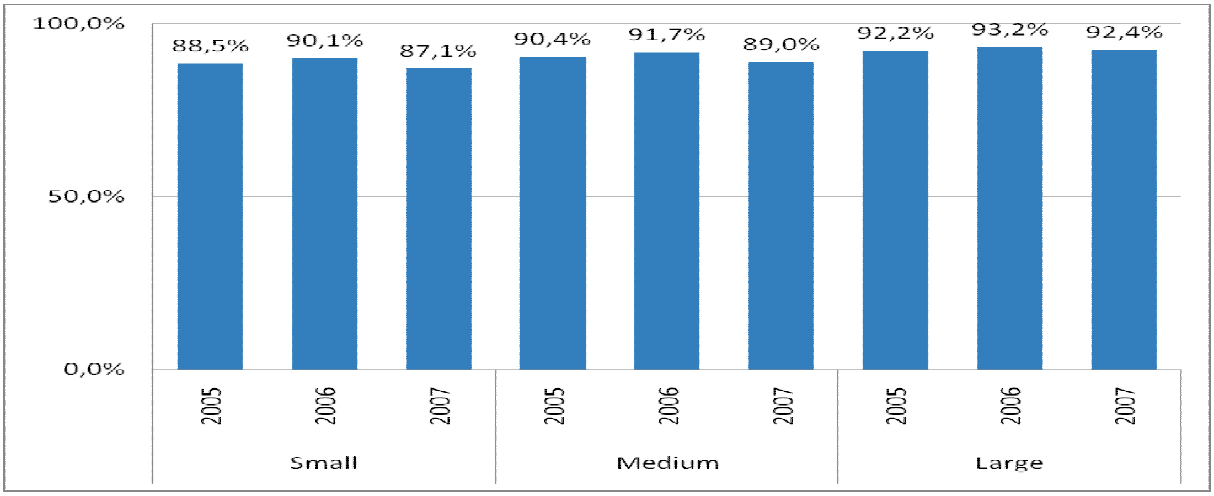
Annual reports of The Polish Central Statistical Office were used as primary data

sources for comparative analysis. Conclusion was formulated taking into account the size of enterprises, classified according to the number of employees, and seven sectorial sections. Amid the latter the following were examined: industry, construction, commerce and repairs, hotel business, transportation, storing and communication, immobilities' and firms' services as well as IT. Presented investigation bases on the hypothesis that the internet complementary knowledge market in Poland has still substantial potential for further development.

In the following sections the results of the research are demonstrated. Figures from 1 to 6 show the extent to what the Polish enterprises of seven important for economy sectors and of different size are present as suppliers in the internet complementary knowledge market.

Brand-related knowledge

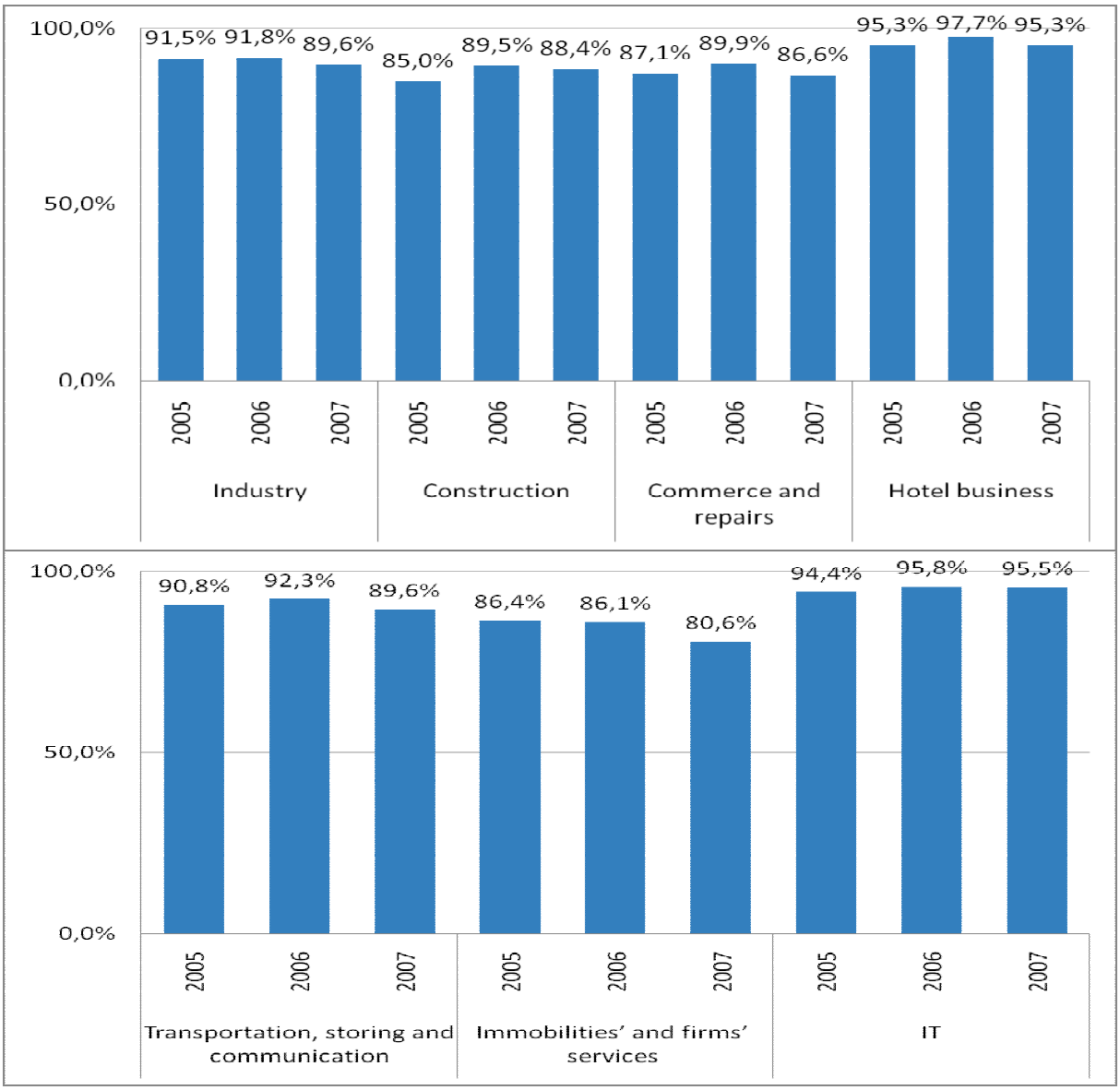
Figure 2. Utilization of enterprises web sites for general promotion of products and services with reference to small, medium and large enterprises



It's noticeable that utilization of web sites for general promotion of products and services is quite common among Polish enterprises (figure 2). This phenomenon slightly increase (roughly of 2%) with the size of an enterprise but in general one can say that nine out of ten enterprises, no matter how big they are, supply the internet complementary knowledge market with this kind of knowledge. From this perspective the examined market can be described as mature one, especially as no important differences between analyzed years in any of the three considered enterprises' groups were noticed.

Sectorial perspective provides a little bit deeper insight into the subject issue. With reference to brand-related knowledge in the internet complementary knowledge market the most active as suppliers are hotels and IT enterprises (figure 3). About 95% of them utilize their web sites for general promotion of products and services. It proves that internet is a main medium through which exchange of this kind of knowledge between them and their customers take place. For other sectors the examined market can be also characterised as mature one, although in some particular cases with slightly lower participation of enterprises as knowledge suppliers. Immobilities' and firms' services are characterised by the lowest values which decreased in the observed period from 86,4% to 80,6%.

Figure 3. Utilization of enterprises web sites for general promotion of products and services with reference to selected sectorial sections



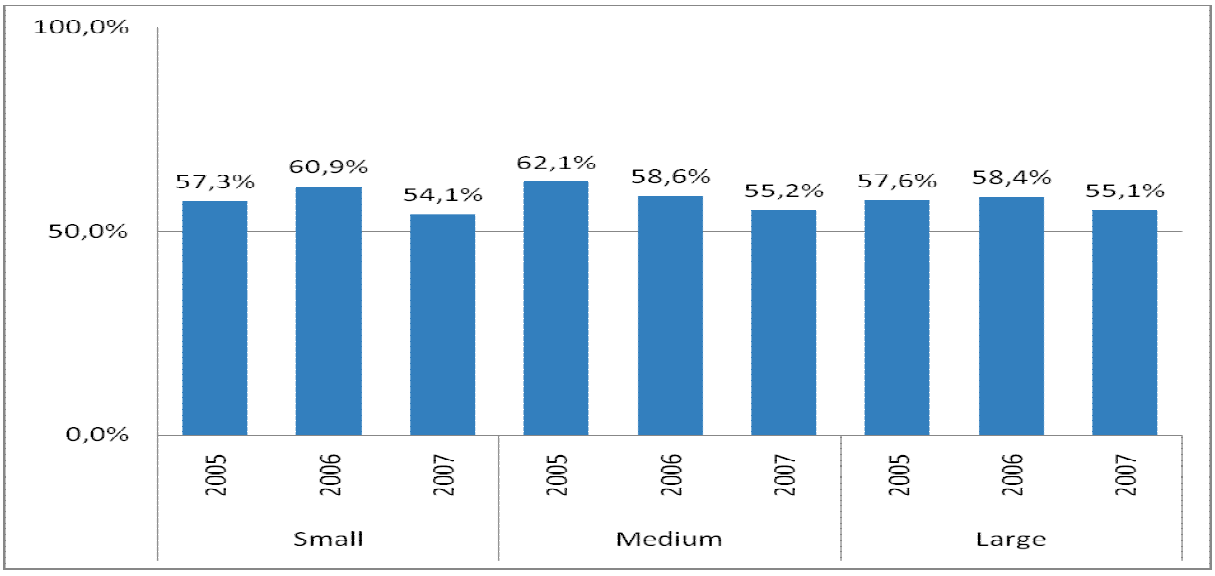
Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

The above observations prove strong interrelation between real and complementary markets. The scale of the phenomenon justifies the statement that the presence in the internet is crucial for brand promotion. As the latter usually involves activities which precede transactions in a real market one may conclude that absence in the internet with the knowledge aimed at building positive brand image may to significant extent affect selling and, as a result, incomes of enterprises. This also means that internet complementary knowledge market in this particular aspect characterizes very strong competition. For this reason the real challenge is not to be present in this market but to supply it with the knowledge, which successfully convinces potential customer to the brand.

Product-related knowledge

Significantly different situation is in the examined market if one considers product-related knowledge (figure 4). Only about half of the Polish enterprises use internet to provide their customers with products catalogues and price lists. This ratio is very similar among small, medium and large enterprises (in 2007 it was 54,1%, 55,2% and 55,1% respectively). Assuming that product-related knowledge have to be distributed among potential customers in some different way, internet market seems to be regarded as less effective one for this purpose. It is very likely especially when rich assortment or complicated pricing rules make the choice difficult without guidance of trained salesperson. Alternatively, some services may have no fixed prices and its value strongly depends on individually agreed final scope.

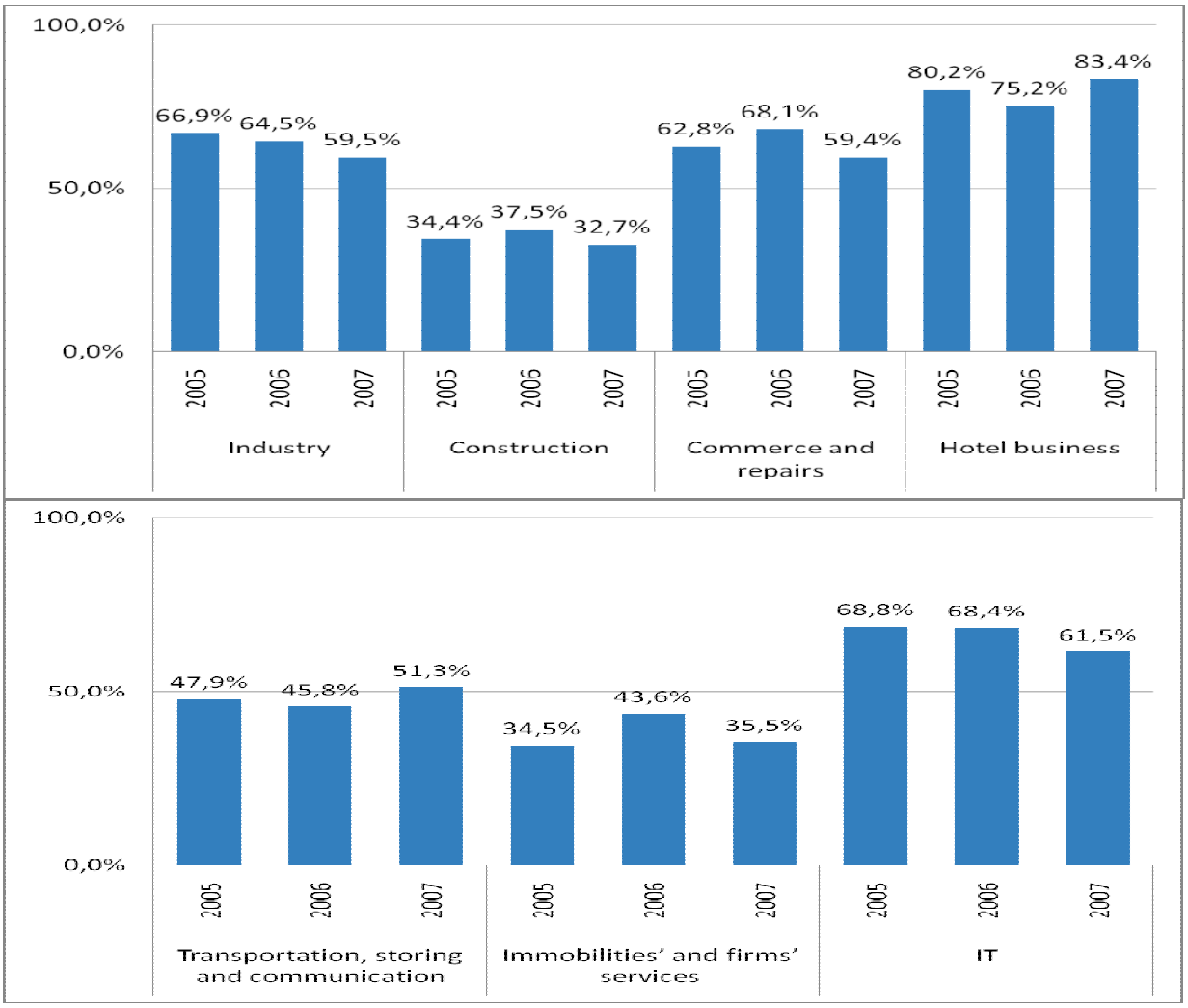
Figure 4. Utilization of enterprises web sites for making products catalogues and price lists available with reference to small, medium and large enterprises



Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

To some degree the observed phenomenon may also be connected with avoidance of possible escalation of price competition. Internet is widely available and comparison of prices and functional features of products with the offer of market rivals requires less effort than seeing through paper documents, in particular when there are many internet-based price comparators. Behaviour like this may suggest that enterprises on relatively large scale try to keep information asymmetry between producers and customers and achieve this way higher profit margins. As an argument which supports this statement it should be mentioned that in the examined period there was very good economic situation in Poland and enterprises increased their prices relatively often, what was especially visible in construction. This may explain why the percentage of enterprises supplying the internet knowledge market with products catalogues and price lists dropped in 2007 (the last year of booming economy) in comparison with previous years in all analyzed groups (in enterprises of medium size the drop was roughly 7% between years 2005 and 2007).

Figure 5. Utilization of enterprises web sites for making products catalogues and price lists available with reference to selected sectorial sections



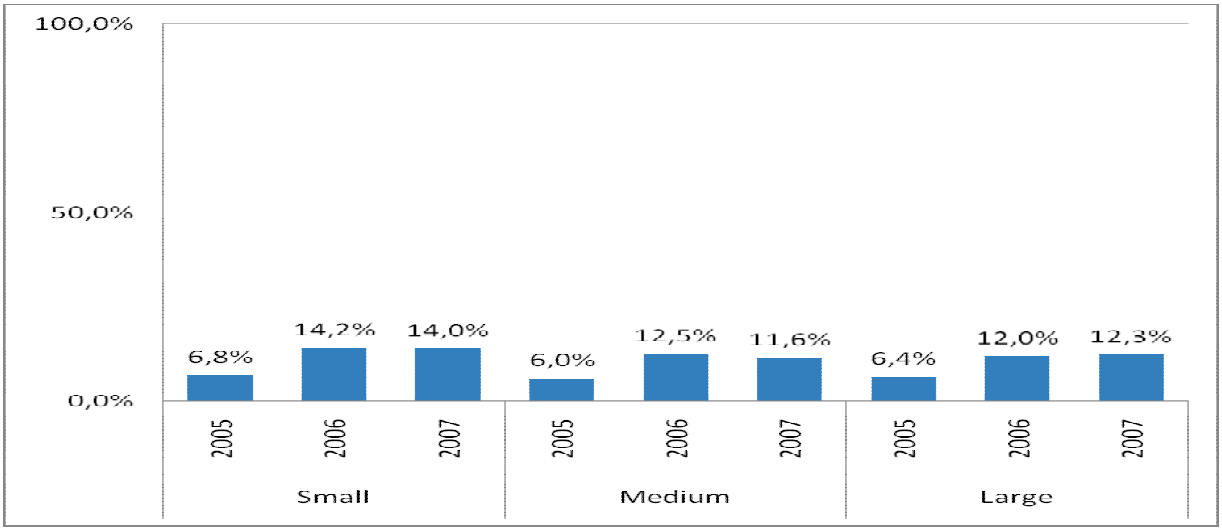
Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

Sectorial analysis shows significant differences between individual sections (figure 5). Supplying customers with products catalogues and price lists is the most common practice in hotel business. More than three fourth of hotels (in the examined period 80,2%, 75,2% and 83,4% respectively) regard it as a standard. Bearing in mind that their customers usually come from distant places in which case internet market is in fact the prime arena of competition this observation does not seem surprising. This example illustrates how important for real market transactions may be support given by knowledge exchange in the internet complementary knowledge market. The significance of the interrelationship of these two markets is also confirmed when one considers industry, commerce and repairs as well as IT. About two third of enterprises in these sectors are present in internet with product-related knowledge (the average share for them in analyzed years is respectively 63,6%, 63,4% and 66,2%). The opposite situation is observed in immobilities' and firms' services as well as in construction. For them internet complementary knowledge market is of less importance. Only one out of three enterprises in these sectors supply their customers with products catalogues and price lists via internet.

Taking dynamics into account it has to be noticed that visible changes of shares took place during the examined period. In general, despite their continuous decrease in industry and IT (from 66,9% to 59,5% and from 68,8% to 61,5%) in other sectors not clear trend is observed. One of the highest amplitude with its 8,7% characterizes commerce and repairs. Slightly less fluctuations are in hotel business (8,2%). In these cases, shares were at relatively high level, therefore such alterations no surprise as much as in immobilities' and firms' services, where the amplitude amounts to 9,1% with the highest and the lowest values 43,6% and 34,5% respectively. Dynamics like this may suggest possible changes of maturity level in this sector in the near future.

Post-sale services delivery

Figure 6. Utilization of enterprises web sites for post-sale services delivery with reference to small, medium and large enterprises

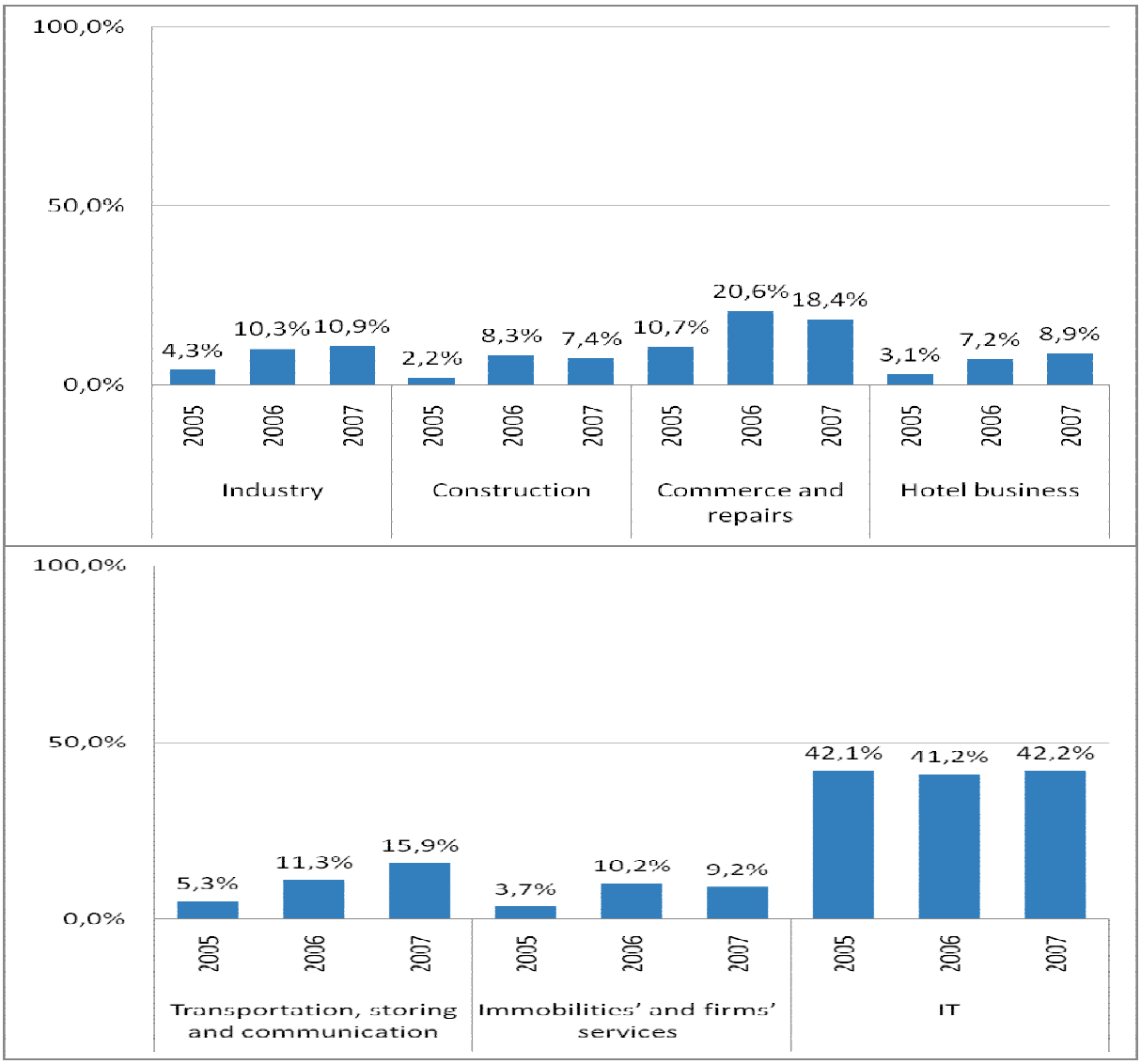


Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

In comparison with brand-related and product-related knowledge the Polish internet complementary knowledge market seems utterly immature when one takes into account post-sale services delivery (figure 6).

Although the number of enterprises supplying this kind of knowledge doubled between 2005 and 2006, it is still no more than one out of seven small enterprises which use the examined market for this purpose. In groups of medium and large size firms this share is even smaller with 11,6% and 12,3% of suppliers respectively. From this point of view, amazingly, small enterprises need to be seen as more active than their larger rivals. The reason may be a price. Undoubtedly delivery of post-sale services in alternative ways (eg. via telephone or service-points network) costs more, but it assures direct contact with the customer. Small enterprises quite often cannot afford it and then internet is a cheaper choice. On the other hand, market maturity is related not only to suppliers. Presented results may suggest that for internet post-sale services also demand is not stimulating enough. This relationship is clearly illustrated by diversification among analyzed sectors (figure 7).

Figure 7. Utilization of enterprises web sites for post-sale services delivery with reference to selected sectorial sections (1)



Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

There is no doubt that IT is a leader in delivering post-sale services via internet compared with others sectors. With its share of 42,2% in 2007 it is roughly four times more active in the internet complementary knowledge market than industry (10,9%). In case of hotel business (8,9%) or immobilities' and firms' services (9,2%) this difference is nearly fivefold. The examined ratio is the lowest in construction. Only one out of thirteen construction firms utilizes web sites for supporting their customers with post-sale services, although as positive aspect the dynamic increase of this phenomenon should be noticed. The number of enterprises supplying the analyzed knowledge market changed in this sector from 2,2% in 2005 to 7,4% two years later. Similar dynamics between years 2005 and 2007 characterizes also transportation, storing and communication (with a change from 5,3% to 15,9%), hotel business (from 3,1% to 8,9%), industry (from 4,3% to 10,9%) as well as immobilities' and firms' services (form 3,7% to 9,25%).

Internet access as the determinant of supply and demand in the internet complementary knowledge market

For the analysis of the internet complementary knowledge market its availability for market subjects is of crucial meaning. Looking at the percentage of enterprises having internet access (table 1) it is obvious that in analysed period there was almost no technical limitations on the supply side. Nearly all of the Polish medium and large enterprises had internet links. Quite optimistic situation was also observed with reference to small firms. In this group between 2005 and 2007 the percentage of those with internet access increased of 6% form 83,7% to 89,7%. Furthermore, it was a noticeable trend towards improving of the quality of internet links. In each subsequent year more and more enterprises used broadband links withdrawing themselves from exploitation of analogue modem connections (dial-up access). Among large firms 17,3% of them in 2005 and 24,7% in 2007 had at least two independent broadband links (in DLS technology and via persistent connection) assuring this way a high quality of web-services offered. Presented data suggest, that in B2B model, when customer is equated with other enterprise, the internet complementary knowledge market had no entry barriers both on the supply and the demand side.

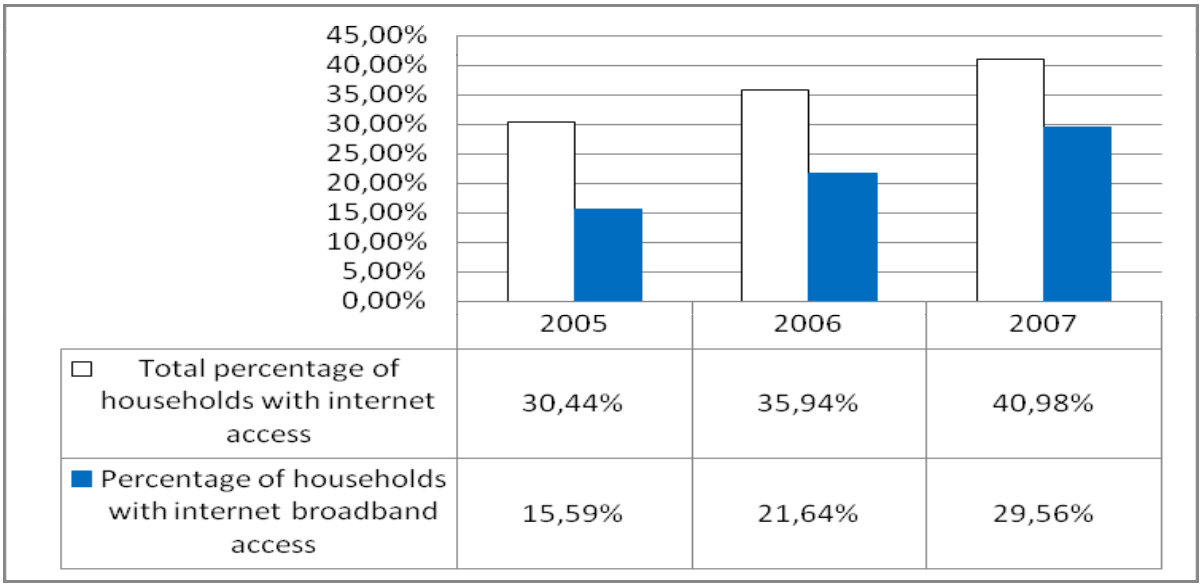
Table 1. Enterprises's access to the internet

		Total percentage of enterprises having internet access	In particular:		
			Dial-up access (phone line)	Broadband access in DSL technology	Broadband access via persistent connection
Small	2005	83,7%	40,5%	26,6%	11,6%
	2006	86,2%	32,8%	29,4%	11,5%
	2007	89,7%	29,9%	36,1%	12,5%
Medium	2005	98,0%	52,3%	58,4%	18,1%
	2006	99,0%	39,5%	57,2%	23,2%
	2007	99,2%	30,2%	64,5%	20,6%
Large	2005	99,2%	54,4%	92,0%	25,3%
	2006	99,4%	45,5%	71,9%	46,0%
	2007	99,7%	39,3%	74,8%	49,9%

Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

The situation is completely different when the demand is assessed not from B2B but from B2C perspective. Despite visible positive changes in the past, in 2007 only 40,98% of the Polish households had internet access and just one out of three of them used broadband links (figure 8). This proves that some web-services like chats, e-learning tutorials, virtual trips, products configurators or search tools might have not been available for two-thirds of potential customers because of poor quality links. To some degree it may explain immaturity of the Polish internet complementary knowledge market if one takes into account product-related knowledge and post-sale services delivery.

Figure 8. Households' access to the internet



	2005	2006	2007
Total percentage of households with internet access	30,44%	35,94%	40,98%
Percentage of households with internet broadband access	15,59%	21,64%	29,56%

Source: own compilation based on The Polish Central Statistical Office reports, (2005, 2006, 2007).

Conclusion

Summing up the analysis the following remarks with reference to maturity level of the Polish internet complementary knowledge market deserves in particular to be emphasized:

- there is visible maturity level diversification amid three analysed internet complementary knowledge market components;
- almost all enterprises, no matter how big they are or what sector represent, supply this market with brand-related knowledge; the dynamics of changes in observed period is relatively small what suggests that in this respect the market can be described as mature one and the accession to UE had not affected that state.
- when knowledge supporting post-sale services is taken into account, there is no doubt that it is still a lot of space for further development; even in IT sector, which is the most mature in comparison with others, less than 50% of firms supply the analyzed market; on the other hand, only IT remained uninfluenced by EU expansion, in the rest of examined sectors significant share increase of enterprises supplying the internet complementary knowledge market was observed especially between years 2005 and 2006;
- from the product-related knowledge perspective the market should be recognized as mature one in each group of enterprises' size, although when one examines this issue in sectorial sections the conclusion is not so definite; two (construction as well as immobilities' and firms' services) out of seven analyzed sectors are supplied with this knowledge via internet market by less than 50% of enterprises. In the case of transportation, storing and communication the share balances around the 50% borderline; as the changes from year to year have no clear general trend it is difficult to predict which way the market will shape in the near future, especially if one bears in mind that such a meaningful market change like EU expansion triggered no substantial reaction of enterprises.
- it seems quite likely that one of the most important barrier on demand side of the market is the poor quality of internet links used by the Polish households, which severely limits the access to some web-based services.

Relying on the above it should be noted that aside from brand-related knowledge with reference to two others components of the internet complementary knowledge market there is still in Poland substantial potential for further development, which statement confirms the hypothesis.

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