

**The diversity of research
at the Szeged Institute of Business
Studies**

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Edited by
Erzsébet Hetesi – Zsófia Kürtösi

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Preface

Within this volume, the reader receives an overview of the results of research done by the members of the Faculty of Economics and Business Administration at the University of Szeged. Established only twelve years ago, our faculty employs many young scholars still searching for their identity. This characteristic has also contributed to the fact that our institute does not have a dominant area of research, or workshops with isolated focus. When publishing a collection of articles, the intention is to provide an opportunity for readers – whether they are colleagues or students – to have an overview of research activity of our faculty in recent years. Some of the writings in this collection have already been presented at Hungarian or international conferences.

The articles in the volume reflect the various interests of our faculty members, but also show the directions of developing cooperation within the faculty. Historically in our institute, each researcher or team worked on their own field of expertise. Lately, however, our group started to look for the opportunity to collaborate between marketing, management, and economic psychology by using the synergies within the diverse group of people working under the same umbrella.

The following writings are not only different in their subject field, but also in their methodology. Theoretical articles and statistical problem-solving can be found, and most of them include both the theory related to the problem on hand and its analysis using empirical – qualitative and quantitative – methods. The works in the volume were selected by the research field – however, as the increasing amount of co-authored articles show, the bordering line between these fields is becoming less distinct; researchers working at our faculty are interested in each other's work.

The first chapter of the book focuses on certain special issues in the field of *marketing*. The article on pricing elaborates on the increasing role that prices play in theory, but the author also gives practical advice to different organizations, pointing out that the application of traditional pricing methods is insufficient in today's competitive environment. The following three writings discuss three specific applications of marketing in different fields. The first article is about the newly deregulated markets of utilities, relationship marketing and enhanced communication methods. The second presents the results of empirical research done by the authors in Hungary using lifestyle segmentation methods, with a detailed description of the resulting segments. The third article discusses collaborative filtering – a new method that focuses on customers with similar preferences instead of product features. This operates under the assumption that customers, whose purchase patterns have been similar in the past or whose opinion on certain products and services were similar, would be more likely to be interested in the same offers in the future.

In the field of *management* science, two writings analyse the increasing importance of relationships, though from a very different standpoint. The first is suggesting a new model to measure the performance of relationships between industry and academia, using the dimensions of processes, enablers, and results. The second piece is looking into the networking of small and medium sized enterprises, researching the motivations of cooperation using primary sources. In spite of their obvious differences, the two articles come to similar conclusions on the effectiveness of network relationships.

In the third chapter, there are two writings from economic psychologists with tight links to the fields of marketing and management. The first is an analysis of the communication in physician-patient relationships, with special attention to mutual interest of minimizing risks in the process. The authors consider risk communication as a possible means of reducing risks in healthcare services. The second study looks at patient cooperation in the same process, as one of the most important aspects of patient-centered communication, finding that in Hungary, the paternalistic communication style still seems to be the norm.

Our last chapter presents the results of different disciplines. A methodological study discusses a new modelling opportunity of multicollinearity during econometric analysis. Another article analyses the employment situation of recent university graduates, verifying the relationship between someone's success on the labour market and their opinion of their alma mater. A third writing studies employee attitudes toward trainings at multinational companies, confirming the high value of learning at these organizations, also identifying certain cultural limitations when it comes to the application of the acquired knowledge.

Given the diversity of subjects in this volume, there is anticipation by this faculty that something will provoke interest and be applied in betterment of individual and corporate work environments.

2011. Szeged, Hungary

Editors

The various facets of marketing

The increasing importance of pricing

Gábor Rekettye

There are clear economic and managerial trends which have a great influence on the pricing policy of companies in the emerging millennium. Variances can be found in the upper limit and lower limit of possible pricing decisions which move in opposite directions, giving a broader field for price considerations. Consideration should be taken with the possible distribution of this incremental value. In the latter part of this research paper, research gives insight on some new pricing techniques like: product line pricing, pricing of services, and the decreasing differences in international pricing. As a conclusion, it is recommended that company managers should dispense from using the old formula of “cost-plus-profit” pricing in favour of more profitable techniques.

Key words: price, pricing policy, customer value, costs, product line pricing, pricing of services, international pricing

1. Introduction

Prices play an important role in the functioning of market economies by providing a link between supply and demand of products and services (Emmond 1993). There is no doubt that pricing has also great importance in the operation of companies. Company revenue (and profit) is generated through prices, while all other functions produce costs (Kotler 1998). On the other hand, the price of a product is a major determinant of the buyers' purchasing decision. As a consequence, its level, compared to the products' performance and to the offering of competitors, influences the demand for and the sale of the given product or service. This contradicting feature is the reason why pricing may be one of the managers' biggest headaches (Dolan 1995). In spite of its high importance, pricing is surprisingly underrepresented in the management literature. Price theory is extensively discussed in the economic literature with lots of mathematics (Hirshleifer 1984, Wilson 1993, McEachern 1988, and others), which company managers mainly do not understand. Conversely, price application is usually only handled by one or two chapters of marketing text books typically only touching the surface of the subject. These may be part of the reasons why company managers' knowledge of pricing is rather low and prices have usually been set either by rule of thumb or by the old, and so many times criticized, formula of “cost-plus-mark-ups”. The objective of this paper is to summarize those trends of the world economy and business life which create new price pressures. Understanding these tendencies and applying them in the pricing

policy can strengthen companies' sustainable competitive advantage. Furthermore, ignoring these tendencies can result in a decrease of market shares and eventually force these companies to exit the market.

2. The broadening zone of pricing decisions

In the value structure of a product or service, three important parts can clearly be differentiated: (1) the total customer value, (2) the price the customers have to pay for it, and (3) the costs of its production (Shapiro 1998). According to this anatomy of value, the zone of possible pricing decisions is defined by the upper and lower limits i.e., the perceived customer value at the top end and the cost of manufacturing at the lower end of the scale. It is obvious that customers are not willing to pay more than the perceived value, and their willingness to buy grows parallel with the distance between the perceived value and perceived price. Conversely, manufacturing companies want to make profits, which are according to this scheme, the difference between the price and the total cost of manufacturing. Their endeavour is to maximize profit, i.e. to set price as far as possible from the total costs. The anatomy is not yet complete. By companies, it is meant those organizations that produce products or services. In most cases, these companies do not sell directly to their customers; intermediaries, traders, wholesalers, retailers and other members of the sales channels are included in the process. They also want to have their piece of the pie. For the sake of simplicity, analysis of the government is not included, who also mandates having a piece of pie by levying taxes and duties on products and companies.

2.1. The upper limit: the perceived customer value

A major tendency of current times is that in most cases the upper limit of pricing decisions by the perceived customer value is gradually and continuously moving upwards. Customer value is the complete set of benefits the product or service is offering to the customers. Customer value can be divided into four sub-components: (1) the performance value i.e., how the actual product is performing the core benefit it is used for. (2) The added value, which consists mainly of the augmentation of the core product, services and other additional benefits surrounding the product. (3) Distribution value, which is the measure of how easily customers can access the given product or service on the market, and (4) the emotional (image) value, which is created by branding and other forms of marketing communication.

Now, looking at the vast selection of products and services offered to market, it can be concluded that their value has significantly increased during the last decades. Technological development, new operational methods like flexible manufacturing, JIT, kanban system, lean production and other techniques have made it possible to increase the technical quality of products and, at the same time, they

can combine mass production with customization (Krajewsky–Ritzman 1999). A good example is the car industry. If a car of the same category produced at the end of the century is compared with that same type car produced 20 years earlier, it can be observed that the newer one offers a lot of new or upgraded features like: ABS, DSA, higher safety, lower gas-mileage, etc.

The same is true for the other sub-components of customer value: marketers always try to enhance their offering with additional services to gain momentum in the fierce competition (Levitt 1980). To stay in the car market, it is observed that car manufacturers are gradually prolonging the time of warranty, and they are also offering upgraded after-sale services.

Distribution has changed a lot in the past decades. New forms of distribution have emerged offering to consumers either cheaper or more efficient access to the options. It is enough to refer to the mass-retailers, or to the newly opened distribution channel of the Internet.

Emotional value is also becoming more important. The increasing number of products, as well as the amount of information carried by each of them, can overload and confuse consumers, who protect themselves against it by relying more and more on the image value of the brands. Successful companies try to reduce the number of brands and focus their marketing efforts to create and enhance the image value of their offering. The notion of mass-production and mass-customization is also applicable to the market communication process.

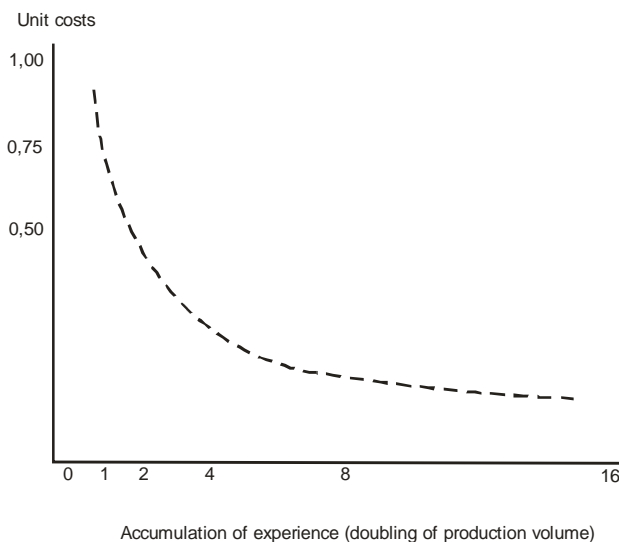
2.2. The lower limit: the changing cost structures

The prior paragraph clearly established that the upper limit of the zone of pricing decisions, i.e., the customer value has been moving upwards. In contrast, it is also determined that the lower limit, i.e., the costs of creating the customer value has moved in the opposite direction; it is going gradually and continuously downward. The reasons for this downward movement may be found: in the globalized competition, in the increasing efficiency of production, in the appearance of the cheap labour emerging countries, and in the falling raw material prices in the long run.

- As local competition is gradually transforming into global companies with entirely different cost structures, they meet each other face-to-face at the same marketplace. In this setting, customers obviously do not care about the individual cost structures. What they care about is the “best value for money”. They have developed a new buyer behaviour called “smart shoppers”. In the face-to-face competition of different cost structures, the winners are those who can reduce their unit costs and those who cannot, are forced to get out of the market.
- In this New World Order, a drastic improvement is witnessed in cost efficiency during production. This is especially true in the technology-

intensive sectors of the economy. As a result of economies of scale, the learning curve, and the experience curve to the unit cost of the products is decreasing. The effects of the experience curve are shown in Figure 1.

Figure 1. The effects of the experience curve



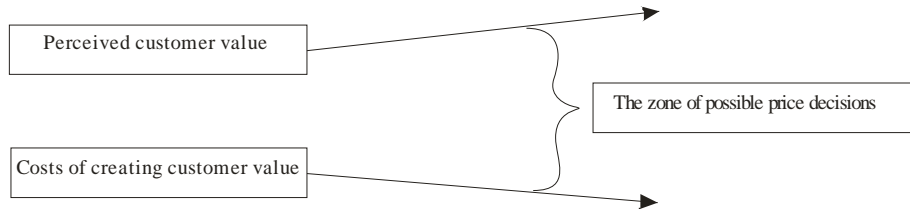
Source: own construction

- This tendency is strengthened by the fact that the prices of raw materials have shown a decreasing trend in the long run. (The price index of the basic raw materials – registered by the Economist – in 1990s was at 30 % level that of the starting base of 1840–1850.)

To prove the tendency of the declining prices, three comparable items were selected from the Hungarian price statistics: a color TV, an automatic washing machine, and synthetic washing powder. The retail prices of these items in 1998 were, calculated in real terms, compared to the prices of 1990, at 32.5 %, 52.9 % and at 77.4 % (Rekettye 1999, p. 94.).

By summarizing findings, it can be stated that the gap between costs and perceived value is gradually and continuously enlarging as shown in Figure 2.

Figure 2. The zone of possible price decisions



Source: Rekettye (1999, p. 89.)

2.3. Who are the beneficiaries of the broadening zone?

Theoretically, three parties can benefit from the broadening gap between the levels of customer value and costs: customers, trading companies and producing companies. The problem of actual distribution of this incremental value may be framed as a societal and a managerial question as well. In developed societies having good working market competition and well-articulated customer protection and customer movements, there is no doubt that final customers may be major beneficiaries. In a healthy economy, however, it will leave room also for companies to benefit from this improvement. Problems may arise in case if market structure is not well balanced, having one or the other parties a dominant power in the market. Monopolies or cooperating oligopolies may hurt the even distribution of this incremental value.

In transition economies like Hungary, two tendencies hurt the even (fair) distribution:

- Multinational manufacturers, entering these economies with FDI benefiting from the relative low-cost production resources, sometimes do not share the additional value with their partners.
- Multinational wholesalers and retailers (mass retailers) also moved in. On first observation, they offer a cheaper and more efficient channel for customers. Experiences of Western European countries (United Kingdom, first of all) warn, however, that after settling down, they will soon gain a dominant market share. After demolishing small competitors, they will be price leaders (forcing their business policies and trading conditions on manufacturers and consumers, as well) and will have an unbalanced bigger share from the broadening gap.

3. Some other tendencies and challenges of pricing policy in the New Millennium

In the latter part of this paper, attention is drawn to some important tendencies which impose challenges to company pricing policy. These are:

- Proliferation of product structures → importance of product line concept → importance of product line pricing
- Services → the new age of pricing
- Globalization → decreasing differences in international pricing.

Proliferation of product structure → the importance of product line concept → complicated price structures

Companies seldom produce or offer only one or a couple of products. Only small and some medium-sized companies can be listed as examples for such limited product mix. The product mix of the majority of organizations, especially medium and larger sized companies, consists of a larger number of products and/or services, which have either stronger or looser connection to each other. In the overall tendency of product structure proliferation, two major tendencies seem to emerge:

- 1) The emergence of a clear product line concept. Companies categorize their products into product lines. They develop special core competencies for each product lines. The same or similar engineering, production and marketing principles characterize the product line competence. In this new concept, the product lines, rather than the individual products, differentiate companies from competitors. The products belonging to the same line have similar design, features, etc. that add up to a distinguished, and differentiating line identity. Product lines are becoming more and more the centre of product development, and product management as well.
- 2) After the wave of diversification in the sixties and seventies, when huge company-empires with much diversified profiles were established, the end of the twentieth century is characterized by the endeavour to create company profiles based on consistency. The consistent company profile has favourable, synergy effects on the efficiency of product design, product development, manufacturing and marketing. Furthermore, a strong and clear corporate identity can be based on the consistency of similar product lines.

All of these tendencies impose strong requirement towards the price policy. The unique corporate identity and product line image must be reflected in their price structure as well. Special emphasis must be laid on the harmony of the quality and price level of product lines. Determining the differences between product lines, between items, and options within the product line, their expression in the pricing

requires a very sophisticated price management. New methods are used: price segmentation, price discrimination, determination of price thresholds, price-differential threshold, and price-bundling, different pricing methods for competitive, complementary, and substitute items of the product lines, etc. Modern computing technology helps a lot in supporting the price-decisions, and in maintaining and controlling the price application. This sophisticated price management would not be possible without the use of IT.

3.1. Services → the new age of pricing

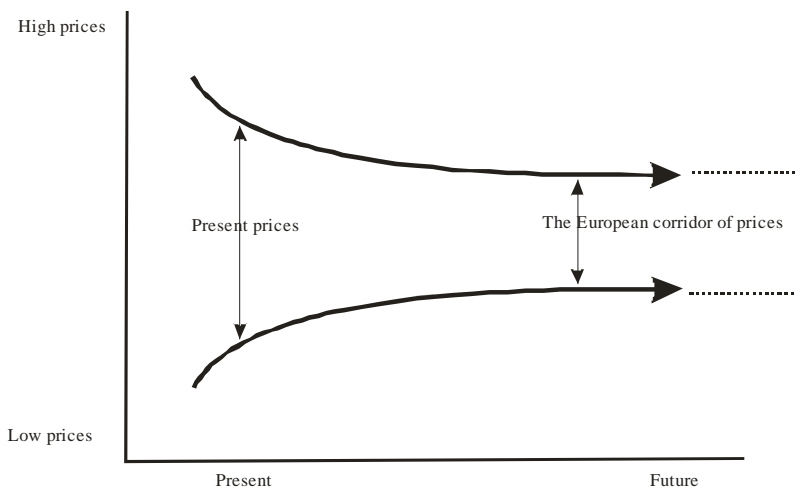
The contribution of services to GDP in most advanced countries exceeds the share of primary and processing industries. It has been so for many years. At the end of the twentieth century, nevertheless, there are some new tendencies that revolutionize the service sector and at the same time they influence all the economic activity including pricing:

- At the end of the twentieth century, a strong deregulation of major services was witnessed in almost all countries (banking, air industry, public utilities). Deregulation has been accompanied by privatization of these state-owned services. (Silverman 1994) Privatization and deregulation has brought about local, and soon after, international competition in the field of these formal monopolies. Prices have become the focus of the new competitions. Service providers soon realized that cost efficiency and market expansion are vital factors in acquiring sustainable competitive advantage. To maintain or expand market share, they needed to make market (and price) segmentation and needed to adjust their price policy accordingly. They invented new methods of price differentiation like nonlinear pricing, price bundling, one or two-tier block tariffs, bonus programs, yield management, etc. They were able to serve customers of different price sensitivity.
- At the end of the century, there was a definite shift from variable to fixed costs. Traditionally services, like hotel businesses, passenger transport, etc., have always been fix cost sensitive. The newly emerging and dominating sectors like telecommunication and other information-related services, however, are characterized by huge fix cost investments and by marginal costs sometimes nearing to zero. This radical shift in the cost structure makes it possible for the service providers to implement a very sophisticated and complicated price-customization. It is enough to refer to the price structure of a telephone company. It is already so complicated that most customers do not even have the time and energy to understand it.
- The new pricing practice of these modern services has a visible influence on pricing of tangible products as well (non-linear pricing, different discounts, bundling, etc.).

3.2. Globalization → decreasing differences in international pricing

Another major tendency of our times is the decrease of price level difference in international perspective. This is also a result of the intensified globalization. The world is getting “smaller” or as Ohmae (1991) said, it is getting “borderless”. Transportation costs are falling, tariff levels are decreasing, and information is available instantly all over the world. The tendency is especially true for an economic integration. European Union is a good example. There are no tariffs in the way of trade among member countries, tax levels are getting similar, and the monetary unit is getting the same. There is no economic rationale behind big price differences. Locally produced and culturally motivated products and services may make the exception. The tendency is well illustrated in Figure 3 (Simon–Wiese 1992). The decreasing price difference does not mean that company managers have to carry out the same price policy everywhere. Managers that use international pricing strategies must have a comprehensive understanding of the differences between customers from one country to another. This includes the culture, the legal regulations, and the structure of the economy, the competitive environment, the political structure, and the inflation/deflation trends in each market.

Figure 3. The decreasing difference in international price levels



Source: Simon–Wiese (1992)

4. Conclusions

The tendencies described suggest that companies must depart from the cost-oriented pricing approach that has been used in the twentieth century in many industries. The cost-oriented pricing has been popular for the following reasons: (1) the “cost-plus-mark-up” pricing was rather simple. It involved the calculation of all the costs that could be attributed to a product, and then adding to this figure a desirable mark-up, as determined by the management (Hanna–Dodge 1995). (2) Because of its simplicity, the price function could be easily delegated to lower levels of company organization. (3) Beside its simplicity, this method has been socially considered as a fair practice since price differences have been justified by the cost differences. In the new pricing environment, these reasons will lose their importance as it was discussed in this paper. Companies insisting to the old formula “cost-plus-profit” under these new conditions may make wrong pricing decisions. In the new millennium, it is an imperative for them to change thinking from the cost-oriented formula of “Costs > Profit > Price > Value > Customers” to the market-driven formula of “Customers > Value > Price > Costs > Profit”.

References

- Dolan, R. J. 1995: How Do You Know When the Price is Right? *Harvard Business Review*, Sept–Oct., pp. 4–11.
- Emmond, W. 1993: *Note on Pricing and Public Policy, Order*. Harvard Business School, pp. 1–15.
- Hanna, N. – Dodge, R. 1995: *Pricing - Policies and Procedures*. Macmillan Business.
- Hirschleifer, J. 1984: *Price Theory and Application*. Prentice-Hall, Inc., Englewood Cliffs, New York.
- Kotler, Ph. 1998: *Marketing Management*, Ninth Edition, Prentice-Hall, Inc., Englewood Cliffs, New York.
- Krajevsky, L. J. – Ritzman, L. P. 1999: *Operations Management*. Fifth edition, Reading, MA., Addison-Wesley.
- Levitt, Th., 1980: Marketing success through differentiation - of anything. *Harvard Business Review*, January–February, pp. 83–92.
- McEachern, W. A. 1988: *Economics*. South-Western Publishing Co., Cincinnati, Ohio.
- Ohmae, K. 1991: *The Borderless World*. New York, Harper Perennial.
- Reketye, G. 1999: *Az ár a marketingben. (Pricing in Marketing)*. Műszaki Könyvkiadó, Budapest.
- Shapiro, B. P. 1998: *Precision Pricing for Profit in the New World Order*. Harvard Business School, pp. 1–23.

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- Silverman, K. P. 1994: Electric power - the next generation. *The McKinsey Quarterly*, No. 3., pp. 57–61.
- Simon, H. – Wiese, C. 1992: “Europäische Preismanagement. *Marketing*, 14. Jahrgang, No. 4., pp. 246–257.
- Wilson, R. B. 1993: *Nonlinear Pricing*. Oxford University Press.

The role of relationship marketing and communication at public utility services in the process of market deregulation

Erzsébet Hetesi – Balázs Révész

In recent history, there were dramatic changes on the market of public utility services. Deregulation of these markets forced these organisations to re-think their former behaviour and the application of a marketing approach became necessary on the competitive market. This paper draws attention to the fact that this sector can be regarded as a public service with intensified appearance of its special characteristics, but the research emphasises the special role of certain marketing tools in the process of liberalisation. By analysing consumers' assessment of relationships and communication, this empirical research concluded that on the explored market, the above mentioned factors influence consumers' loyalty. Consequently, in order to build a future edge in the competition, the relationship with customers has to be strengthened. The newest solutions of communication and information technology can have a special significance in maintaining effective long-term relationships because these solutions offer more effective problem solving for directly addressing consumers.

Key words: public utilities, marketing communications, relationship marketing, loyalty, deregulation

1. Introduction

This paper is intended to analyse the marketing activities of public utility services on a market under deregulation, with special attention to relationship marketing and marketing communications. The analysis of public utility services is a rather unexplored field in publications. Theoretic questions of communal services' marketing activities are only touched upon in literature, while individual empirical research is very rare. The primary reason for this may be that in traditional approaches, only the characteristics of services and the consequent marketing results are regarded as important. In other words, they try to justify a general service marketing concept, while they implicitly acknowledge that the services are very heterogeneous and generalising has its limits. The other reason may be that public utility service providers all around the world have had a national or regional monopoly; hence they were not forced to apply a marketing-based approach. By now, the attitude of organisations operating on deregulated markets has changed and marketing has appeared in a field with special characteristics; the research of which

raises interesting questions. For example, in the United States, as a result of liberalisation of the energy market, public utility service providers started to develop their own marketing strategies.

In the explored market, there is a conflict due to state regulated prices and the monopoly of public utility services. Consumers have had affordable access to these services, but they have been defenceless against the service providers. Presently, the situation has changed with new circumstances where the companies still have partial monopoly, but have to face new challenges. Public utility service providers have realised that there is a competition on the market. This competition will become sharp, and with the accession to the EU, traditional methods will be useless on the market liberalised due to harmonisation.

2. Is public utility service a public service?

A major task of early writings in the field on non-business marketing was to re-think the concept and theory of marketing, taking into account the characteristics of profit-oriented companies and the public sector and the differing characteristics of products and services. Today, research dealing with service marketing distinguishes between business and non-business services. Furthermore, many publications deal with the application of the two sectors' marketing practices to each other. This is made characteristic as well by the fact that in many service fields, e.g.: higher education, public transport, public utility services; distinction between public and private, as well as between profit and non-profit, has its difficulty. Due to the uncertainties in defining and classifying services, denotation of public utility services is not an easy task. It is a problem to even name the activities being dealt with, as sources define them differently and there are various definitions for a category within a study as well. The term "public services" includes many activities, multicoloured organisational forms and ownership systems, which in many cases overlap each other. As a synonym for public services, literature often uses the terms public utility or utilities, non-profit, social, etc.

The legal definition in effect for the current explored market specifies that a public service is an activity which is regarded as public service, public objective service, public utility activity, public utility service or communal service by act, government decree or local government decree (Par. 10.§.c of the 1995 Act on Public Procurement). According to the Act, apart from public safety, healthcare, education etc., public utility services such as energy, water and public environment belong to this category.

Apart from legal regulation, it is very important to make a distinction from the consumers' side as well. Public utility services are basic services where the possibility of substitution is small, usage is broad and generally continuous, and it also has to be proved that the members of a community can have access to these

services with equal quality and price conditions. In this way, it is a field which is relevant to a large amount of the population because it is present in everyday life. These services are mundane and typical, and they are usually considered when they are not available e.g., when the bus does not come on time, when there is a power shortage, when there is no heating, when rubbish is over accumulated.

Based on these reasons, public utility services are considered as public services regardless of their profit or non-profit oriented nature.

3. Do public utility services have important characteristics from a marketing point of view?

Researchers have raised the question whether it is useful to pick a field or a branch for study or not. Furthermore, some of them questioned whether public utility services had such special characteristics at all, which makes the analysis of this sector reasonable. Although it is agreed that some basic principles of service marketing apply to public utility services, attention should be drawn to some differences which strengthens the view that the practice of public utility service marketing has its own characteristics. Introducing all the characteristics is not constructive, it is best to highlight those which strengthen the significance of relationship marketing and communication in this sphere.

First of all, it is practical to focus on the role of both back office and frontline in the case of public utility services because the basic model of service marketing can be well applied to public utility organisations. It is useless to think in terms of back office organisation in most person to person contact based services, but in the case of the public utility services, the situation is uniquely opposite. Based on the Eigler–Langeard servuction model (Eigler–Langeard 1991), the role of back office is significant in the case of public utility services. Consumers do not assess the work of background staff, as they are unseen and are not usually part of the service providing process; however, the result of the servicing activity depends on the work of the back office. There is no effective public utility service without the tools, equipment and operating staff and the application of relationship marketing is challenged by this fact.

Public utility services can be differentiated on the basis of their regression ability and their level of commitment. Using this approach, it can be said that the level of commitment is very high with the majority of public utility services. Often, in the case of piped services, there is total commitment because of the monopoly situation. When a consumer decides upon the usage of power, gas or water, the chance of withdrawal is limited because there is no possibility of choice. The ability to regress is also minimised in the case of public utility services, as it is almost impossible to re-create the original condition. The results of missing power, heating, water and telephone supply can only be, at best, partly restored.

There are even greater differences in terms of inseparability. In the majority of services, usage is of simultaneous nature. It needs the presence of both the consumer and the service provider, whether it is a machine or a person. In the case of public utilities, specifically piped services, the services are utilised with the consumer not actually being present, but taking an active role in the process. Participation takes place in a way that the service provider and the consumer do not meet each other; however, business will not commence without the consumer taking some kind of action. There is no personal interaction but continuous service is only working when the consumer is “present” by turning on the heating or the water tap or picking up the phone. This is a typical form of remote encounter. This paradox situation specialises relationship marketing and strengthens the fact that marketing activity of public utility service providers is different from other service providers; hence their special analysis is not useless.

Researchers find the intensity of the relationship between service provider and consumer as the criterion for distinction. Chase makes a distinction between services based on high and low direct consumer relationships. According to Chase, the level of relationship is the percentage of time a consumer has to be in the system compared to the total period of service (Chase 1978). The intensity of the relationship between service providers and consumers also distinguishes public utility services from other services. For example, in the case of wired and piped public utilities, the consumer is in continuous relationship with the service provider. In this way, interaction is almost constant, while the consumer is not even in the system. In the case of these services, the consumer is continuously present without even being present. The question is, in terms of Chase’s definition, what is the percentage of the relationship’s period?

A further characteristic of public utility services is that in the majority of services that they cause a change in the life of the consumer or an object. In the processes that have been examined, the changes are not directed towards a person or an object, rather they change the environment of the consumer. Special characteristics of public utilities in terms of development can also be found. Comparatively, it is very difficult to surprise consumers with innovations, but these monopolies carry out certain activities which makes it difficult to imitate each other’s developments.

The establishment of prices differs in the cases of services explored. Parts of them are state-subsidised services, while the other parts have established regulations forming price. When the prices of organisations in natural monopoly are not regulated, there is a greater possibility of realising higher profits than normally expected and the prices are more inflated than on a competitive market.

As the extension of public utility services is strongly regulated, it is often difficult for service providers to apply differentiating price strategies and to use prices as promotional devices. Even when price incentives are allowed, public utility

service providers rarely use these effectively with other elements of the marketing-mix or with effective segmentation programs (Lovelock–Weinberg 1990).

Apart from general problems, communication poses additional problems for public utility service providers. Where the time of interaction is high, and physical elements are dominantly present, the majority of promotion takes place on location as tangible factors communicate about the service. In the case of public utility services, this does not apply because the presence of consumers is minimal in the process and physical factors are only indirectly present for them. Although there are some initiatives for objectifying, the usage of these tools is limited in the communication activities of public utility service providers. As a result, the usage of the elements of the promotion mix is very much different from other participants of the service market.

4. The role of relationship and communication in consumer loyalty

Experiences show that, similarly to other organisations, the aim of public utility service providers is the establishment of consumer trust and loyalty. With regards to public utility service providers' limited possibilities of applying marketing tools, the questions are: what are the strategies by which they can make their consumers more satisfied and how can they increase loyalty with them?

The question of loyalty is strongly related to relationship marketing. According to representatives of relationship marketing, in the fight for consumer loyalty, those who are able to establish long-term relationship with their consumers will have a competitive advantage (Berry 1980, 1987, Grönroos 1992, Gumesson 1994). The definition of relationship marketing is not clear in professional literature, but the majority of researchers regard the establishment and development of long-term relationships as the guarantee for long-term profit. The consumer will be loyal if he or she values the service higher than the service of the competition; however, consumers generally need a personalised and strong relationship with the service provider (Parasuraman et al 1991). It is necessary for service providing organisations to determine not only short-term financial objectives, but they need to establish long-term “relationship-value” as well. The “relationship-value” paradigm (between consumer and worker, consumer and service provider, worker and service provider, etc.) is of higher importance than ever (Kandampully 1998), and in the current environment, relationships are more important than physical objects, both in business and private life (Albrecht–Zemke 1985). Despite the continuous relationship, the above mentioned cannot be applied to public utility service providers. Services are usually standardised and not personalised, and contrary to what it seems, the relationship between the organisations and consumers is considered rather loose.

The perception of excellent service is often associated with the personal interaction between the staff and consumers. The literature of service management emphasised the importance of human element from the beginning (Crosby–Stephens 1987, Parasuraman et al 1985, Kandampully 1998); and as excellency is an integrated part of any first-rate service, quality and relationships are not peripheries of added value, rather they touch upon the core of service providers' promises. At service providing companies, this relationship is an interactive process of helping, serving and fulfilling personal needs of consumers (Booms–Bitner 1981). Consumers often look for establishing and maintaining emotional relationships. In the majority of services, emotion is a part of the service process and has an important role in the consumer's perception of the service's quality. Emotional ties lead to repeated purchase (Butz–Goodstein 1996), and loyalty is a result of a continuous long-term relationship (Gummesson 1994). According to Levitt, the buyer-seller relationship is similar to a marriage, where the quality and period of this relationship depends on how effectively the company handles this relationship (Levitt 1983). Due to forced dependency and forced commitment, public utility service providers have little possibilities of establishing and maintaining emotional relationships.

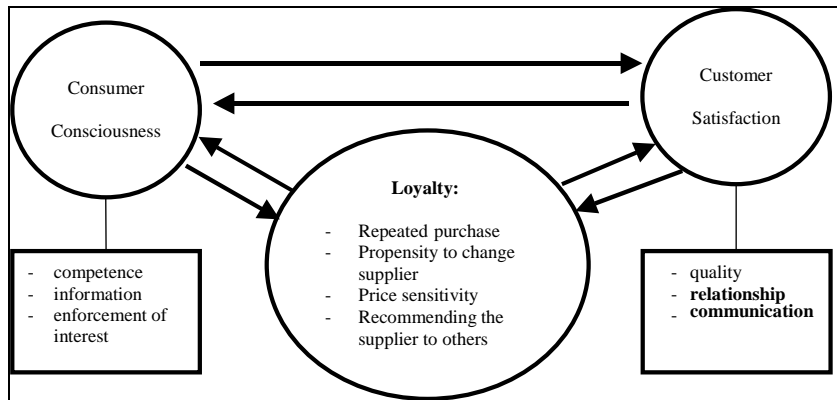
4.1. What do empirical researches show?

As already mentioned in the introduction, the characteristics of marketing activities of public utility services on a Hungarian public utility market that is undergoing deregulation has been analysed, with special attention to relationship marketing and communication. The analysis is based on several empirical researches and the circumstances of examinations are unique for two reasons. First, they were carried out in an environment where the sphere of public utility services always faces new challenges due to the constant changes and second, the models of methods for measuring loyalty approved in literature (Anderson et al 1994, Fornell 1999, Jones–Sasser 1995, Grönholdt et al 2000, Martensen et al 2000) were supplemented by dealing separately with the dimensions of relationship and communication. The starting model of empirical research is shown on Figure 1.

During the survey, 1000 individuals constituting a representative sample of the population living in the supply area of an electricity, gas, and water supplier in Hungary were asked to fill in a questionnaire. The sample was selected with the mechanical simple random method (method of each n). The questionnaires were tested beforehand and the interviewers – who visited households – were given the assistance of guidelines for answering the questions. The sample was found to be a good representative of the population by gender, age, education, job, and domicile.

The methods used for measuring consumer satisfaction were taken according to this model, and it was also assumed that satisfaction with the quality increases satisfaction in general which has a positive effect on loyalty.

Figure 1. The influence of customer relationships and communication on loyalty



Source: own construction

4.2. Relationship

Besides quality, the nature of the relationship between consumers and the company was also considered as a variable to be used in the measurement of consumer satisfaction. The reason is that, in Hungary, the way consumers are treated is of particular importance even in a competitive business, and the same is true for the companies enjoying a monopolistic position. The findings of a domestic research completed in 1999 also indicate that although consumers could experience some improvement in customer-orientation, in most cases there was little change for the better (Rekettye 2000).

The liberalisation of the public utilities market opens new dimensions in competition between companies. In general, there are three ways for a company to keep and increase its market share:

- get new consumers,
- make the existing circle of consumers purchase more,
- decrease the tendency of consumers turning away from the company.

In the field of services, and especially public utilities services, getting new consumers is very difficult because of its high costs. Another problem is that it is hard to do away with the feeling of risk of potential consumers due to the experience-trust base nature of the service product. This also means that during the liberalisation of the service, it is very hard to inform and persuade consumers about the possibility of choice between service providers. Thus, in this field, it seems more reasonable to concentrate on keeping existing consumers by developing the value of customer relations (Veres 1998, Payne–Frow 2000).

The essence of relationship marketing is that, "...the relationship between service provider and consumer has to be stabilised on the long-term as an old consumer is cheaper than getting a new consumer" (Veres 1998). So this branch of

marketing activities tries to keep consumers by building trust and strengthening consumer ties. This can only be effective if there is relevant, detailed information on the consumers and they are continuously informed about new possibilities and other news.

From a certain viewpoint, public utility service providers are in an advantageous position. Their advantage is that continuous relationship is not to be built now, as it more or less functions due to the characteristics of the billing system. However, the database on consumers only contains the data on billing information. There is no information that could further differentiate consumers (as for example size of households and families, per capita consumption, etc.), and through this the strength and directness of the relationship could be increased in order to ensure the adequate level of consumer trust and loyalty. A company operating in a competitive environment can only represent ownership interests adequately if they are able to realise the profitable market segments, and they are able to understand the values of particular groups of consumers so that their products and services can be developed accordingly (Tower 2000).

By understanding consumers' needs, value judgements and decision-making processes, the company will become able to change customer relationships processes from a routine, impersonalised nature to a more direct, personalised process representing higher added value, and in this way, make the best out of relationships with consumers.

Table 1. Basic questions of measuring customer relations' sensitivity

If customers are not satisfied the handling of their complaints is	
A) negative	B) positive
If a new product does not produce the planned sales volume than it is a	
A) failure	B) a step towards success
Market research is	
A) collecting data	B) a tool of preparation for decisions

Source: Tower (2000, p. 64.)

The problem of public utility service providing companies not knowing their customers shows strong resemblance with the problem of the banking sector in the 1980's. At the end of the 1980's, banks had huge databases about account holders, but they did not know anything about the expectations of customers in the field of complex services. They knew how many accounts customers held, but they did not know what the compositions of their customers were, what the ages of their customers were, or what the lifestyles their customers preferred were. By the 1990's, this started to change and banks started to collect and use the data on customers in personalised messages and communication campaigns. However, this needed the

change of the operating system and organisational culture as well (Payne–Frow 2000).

According to Tower, in order to make the best use of relationship marketing's possibilities, public utility service providing companies have to re-evaluate their former views on consumers (Tower 2000). It is a common problem of companies that they misinterpret the notion of market segmentation. Companies generally apply the categories of resident, trading and industrial consumers, or the categories of big-sized, medium-sized or small-sized consumers; however, these viewpoints can only be used to simplify business operations as they do not carry enough information for real segmentation. In order to segment instead of categorising, the characteristics that are important for the consumers have to be taken into consideration as well (e.g., purchasing behaviour, decision-making, consumer value-judgement), as these provide the company with well-grounded possibility of choice between consumer groups.

A further problem of public utility service providers is that they do not emphasise customer relations to the extent they should. At the assessment of their activities and effectiveness, they only concentrate on the reliability of service provision and continuous operation of their systems. However, in a competitive environment, good and reliable service only helps someone to stay in the competition; there is more needed to get an edge over the competition. The company has to know its customers and with this knowledge, it can predict their behaviour and shape its products and services to particular consumer expectations.

As a bottom line, it can be said that the task of a company is to understand its customers and to adopt customer-based thinking. It is not the duty of the customer to understand the service providers' excuses, but it is the service provider's duty to concentrate on satisfying consumer needs instead of echoing excuses and obstacles.

Due to the characteristics mentioned earlier, public utility service providers are in a disadvantageous position in fostering relationships, as they rarely meet their customers despite their continuous relationship. Despite, or even because of this, in the empirical survey, satisfaction indicators of Hungarian consumers are more or less positive.

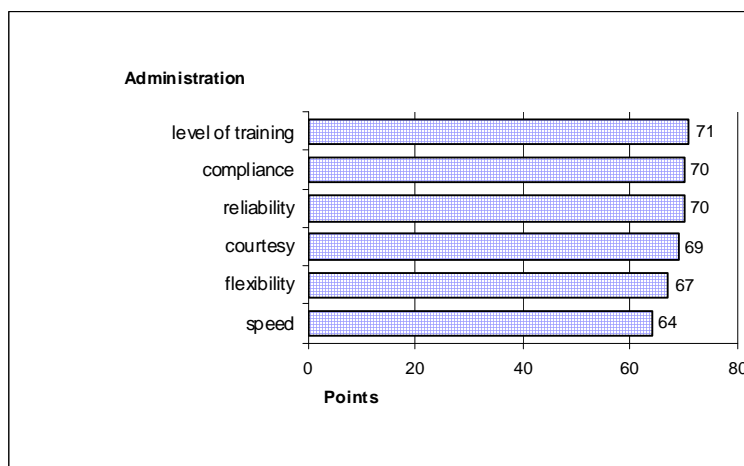
Table 2. Averages and standard deviations of operating relationship (measured on a five point scale)

Content of question	Average	Deviation
Billing is fair, understandable	3,23	0,90
Billing is detailed enough	3,56	0,91
Date of payment is adequate	3,79	0,91
Possibilities of reporting errors are adequate	3,94	0,81
Customer service offices are well accessible	3,86	0,83
Opening hours of the office is adequate	3,90	0,77
Period and speed of administration is adequate	3,60	0,90
Training level of administrators is adequate	3,87	0,76
Courtesy and patience of administrators is adequate	3,85	0,78
Compliance of administrators is adequate	3,84	0,77
Flexibility of administrators is adequate	3,69	0,79
Reliability of administration	3,85	0,78

Source: own construction

Transforming the indicators of satisfaction with customer services into a 100-point scale creates the following diagram:

Figure 2. Assessment of administration



Source: own construction

The factorial analysis of satisfaction variables regarding operating relationship had interesting results. The distinction of factorials is shown on Table 3.

Table 3. Factorial analysis of operating relationship dimension

Content of question	Factorials		
	1	2	3
Compliance of administrators is adequate	0,90	0,26	
Courtesy and patience of administrators is adequate	0,89	0,25	
Reliability of administration	0,88	0,27	
Flexibility of administrators is adequate	0,88		
Training level of administrators is adequate	0,82	0,33	0,20
Period and speed of administration is adequate	0,68	0,36	
Customer service offices are well accessible	0,21	0,83	
Opening hours of the office is adequate	0,28	0,80	
Possibilities of reporting errors are adequate	0,32	0,70	
Date of payment is adequate	0,29	0,62	0,35
Billing is fair, understandable			0,82
Billing is detailed enough	0,23	0,27	0,78

Source: own construction

Table 4. Variable variances of operating relationship

Factorials	Explained variance after rotation		
	Eigenvalue	Explained variance	Cumulated variance
1	4,65	38,71	38,71
2	2,75	22,92	61,62
3	1,57	13,10	74,71

Source: own construction

Based on factorial analysis, the scale of operating relationship is not one-dimensional as the items are grouped into three factorials. The items in the first factorial can be easily explained content-wise as this factorial contains the assessment of the quality of customer service administration. The second factorial contains accessibility items while the evaluation of billing constitutes a separate factorial.

The results show that in the minds of consumers, the latent variable of operating relationship is multi-dimensional and customers assess separately the work of office staff, the accessibility and the billing procedures. Factorials' total deviation of almost 75% can be regarded as strong.

4.3. Communication

Presently, the need for personalised consumer approach is growing. Companies have realised the value of long-term relationship with their customers, and in their choice of media they tend to turn to communication tools ensuring direct communication, while mass media are used for company image building.

After analysing the applied communication tools, it can be established that the role of *advertisement* in public utility services is small, as there are only a few factors that can provide customers with useful information on the process of service or its result. The picture of a transformer station or an electric wire cannot adequately introduce electric power supply; neither can a nice photo of the customer service office influence consumers. In the field of services, image advertisement can be regarded as effective as it prepares customers for the usage of the service and convinces them of its advantages. An important feature of image building is that, in the case of services, product image cannot be verbally expressed; rather there is company image that can be an important influencing factor in a purchase decision. As a result the occasional public and television advertisements can be categorised into this group. Newspaper advertisements are an important part of the promotion mix, although through the application of this tool, the “situational advantage” of telecommunication media is significant. Newspaper advertisements are usually of informative nature, however, sometimes they can be encouraging as well.

In the market explored, advertisements are not characteristic for public utility service providers; however, liberalisation of the market may boost this area. Experiences show that public utility service providing companies of regional monopoly have only turned towards marketing tools following deregulation as a competition started for consumers on a liberated market. However, this meant the exploration of and aiming at new possibilities and opening geographical areas, as service providers had to realise that their monopolistic service providing in a region became accessible to other service providers as well. This way, after the liberation of the market, companies had to make great efforts in both fields. They had to keep the highest possible number of customers and take into account the principles of economics of scale and profit-making, as well as keep an eye on getting new customers as well.

The liberalisation of markets caused problems for even those companies that have realised the importance of marketing. In most of the cases, they did not have the necessary resources and know-how to carry out effective marketing campaigns (Dibb–Simkin 2001). During the liberalisation of the energy market in the USA, one of the first companies realising the importance of marketing was Enron Corp., and even as early as 1997 they spent USD 30–40M on advertising their name. Before the opening of the market in California, they were the first to lead a campaign directed towards local residents (Snyder 1997, Kim 1998). In order to effectively influence the market, Enron had made an integrated

campaign where television and radio advertisements were used parallel to newspaper advertisements and direct-mail campaigns. The aggressive appearance of the company made local service providers react and consumers had a choice of many discount offers.

Sales promotion tools are not characteristic of public utility service providers either. Due to the nature of service and the regulations of the sector-only, a few tools out of the wide range of methods could be really effective. Telecommunication service may be the only exception here, as it effectively uses sales promotion (although its usage can be linked to the strengthened competition in the field of mobile phone services and to the well-developed state of market liberalisation, thus to the new market environment). Energy providers, however, only use these tools in a limited way. For them, the solution could be to strengthen the purchase of tools operated by the given energy source (this way indirectly increasing energy consumption).

With these types of services, an important tool of communication is *direct-mail*. The monthly bill provides an excellent possibility for this as it can be supplemented with the newsletter of the service providers (as banking service providers already do). This way, public utility service providers can maintain regular customer relationship and they can continuously inform their consumers of relevant changes or maintenance improvements.

One of the tools used most often by public utility service providers is *Public Relations*. The significance of this area is well represented by the fact that in the majority of cases, companies have their separate PR units within their organisational structure. For reasons previously introduced, the image of services is difficult to be established, so the organisations emphasise company image-building. Although newspaper advertisements or television spots are hardly seen, companies are often heard about in supporting events, sports competitions and clubs. Public relations articles are read in newspapers and interviews with similar objectives, because they are often present in the electronic media as well.

Based on the empirical survey, it is found that consumers are less satisfied with service providers' communication activities than with their customer services.

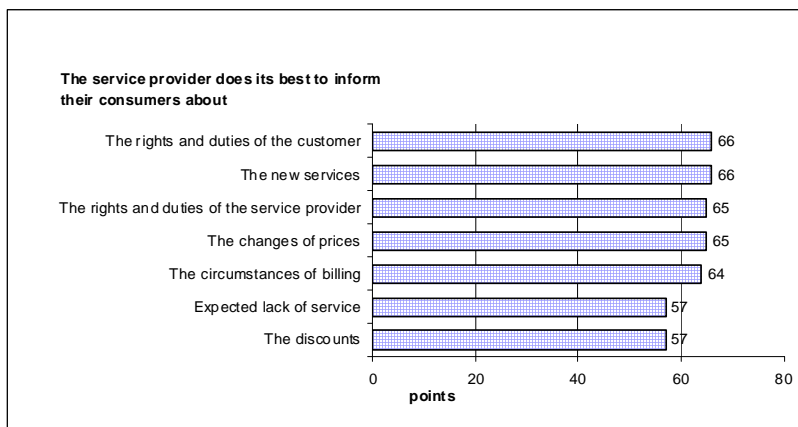
Table 5. Averages and standard deviations of communication and information service dimension (measured on a five point scale)

Content of question	Average	Deviation
The service provider does its best to inform their consumers about:		
The rights and duties of the service provider	3,67	0,86
The rights and duties of the customer	3,67	0,89
The new services	3,66	0,89
The changes of prices	3,62	0,98
The discounts	3,37	1,03
The circumstances of billing	3,57	1,03
Expected lack of service	3,32	1,01
I always read the letters of the service provider attached to the bills	3,61	0,85
I am always informed about the latest campaigns in the customer service office	3,04	1,06
Newsletters contain useful information	3,74	0,89
Advertisement is a good tool for influencing consumers	3,43	0,93
I read "Mindennap" [Everyday] magazine	2,39	1,20
I always read the articles about the service provider in the local newspaper	3,04	1,14
I keep in touch with the service provider by phone if I can	3,00	1,24
I keep in touch with the service provider personally if I can	3,10	1,07

Source: own construction

Transforming the consumers' assessment of information service into a weighed 100-point scale results in the following diagram:

Figure 3. Consumers' assessment of the service provider's information service



Source: own construction

It is significant that based on factorial analysis the two new dimensions included in the loyalty model have separated into four well-defined factorials.

The first factorial contains items about communication efforts; the second factorial contains items measuring the efficiency of information service activity, while in the third factorial the assessment of the importance of advertisements stands alone. The high factorial weight indicates that advertisements have an influence on the latent variable, but this element should be handled separately. The items of methods of communication constitute a separate factorial as well, while the explanation of opposite signs indicates that the interpretations of the two statements eliminate each other. The four factorials altogether represent 65% of the latent variable.

Further refinement of these dimensions could be useful for future research. At the moment, the consumers on the market explored are unaware of other communication possibilities besides personal and phone-based (e.g.: internet) and similarly, the advertisement tools dimension can be further differentiated in the future as well.

Table 6. Factorial analysis of communication and information service dimensions

Content of question	Factorials			
	1	2	3	4
The service provider informs about				
– new services	0,85			
– the customer’s rights and duties	0,81		0,21	
– discounts	0,80			
– changes of prices	0,80			
– service provider’s rights and duties	0,80		0,21	
– circumstances of billing	0,78	0,21		
– expected lack of service	0,46	0,39	–0,30	0,25
Newsletters contain useful information	0,46	0,67		
I am always informed about the latest campaigns in the customer service office	0,21	0,66		
I read ”Mindennap” [Everyday] magazine		0,65	–0,44	
I always read the articles about the service provider in the local newspaper		0,62		
I always read the letters by the service provider attached to the bills	0,28	0,60		
Advertisement is a good tool in influencing consumers		0,20	0,82	
I keep in touch with the service provider personally if I can		0,30		0,80
I keep in touch with the service provider by phone if I can		0,56		–0,60

Source: own construction

Table 7. Variances of communication and information service dimensions

Factorials	Explained variance after rotation		
	Eigenvalue	Explained variance	Cumulated variance
1	4,54	30,26	30,26
2	2,75	18,35	48,60
3	1,22	8,16	56,77
4	1,18	7,84	64,60

Source: own construction

5. Summary, conclusions

Despite the uncertainties in the field of defining and grouping services, it can be concluded that the sector that was examined is classified as public service by literature sources. The characteristics defined in the theory of service marketing have other special features in the field of public utility services which result from the nature of the service product and the regulated nature of the sector, regardless of the fact that the services are provided by private or public organisations.

The importance of back office, the level of commitment, the inseparable nature, the remote encounter nature, and the sectorial limits of price forming are elements which make the individual analysis of public utility service providers' marketing activities justifiable.

Due to the expected course of deregulation process, the public utility service providers on the explored market face serious challenges that affect former business practice, organisational structure and organisational culture. Besides real competition conditions, the companies have to examine their whole operation in the practice of service providing in order to find the factors that may constitute a long-term edge for them in the competition.

Following the liberalisation of markets, the main objective of public utility service providers all over the world will be to keep their consumers. Communication tools have a special role in building long-term relationships as communication is one of the most important tools for building trust.

Based on these facts and taking into account the characteristics of the sector and the liberalisation processes of the explored market, the methods for measurement of loyalty known from literature were supplemented. Within the empirical research, the consumers' assessment of relationship and communication were analysed as separate dimensions. The results show that both new factors have an effect on loyalty, thus further research is needed in these areas. It is significant that both measurement scales are multi-dimensional and the items are grouped into several factorials. On the explored market, the consumers' assessment of operating relationship (the work of customer service office staff, the accessibility of service

provider, and the billing activity) is better than the dimension of communication and information service; however, both fields have their shortcomings.

The results draw attention to the fact that traditional customer service activity is not suitable for deepening customer relationships. Consumers have to be approached by learning about them and using the information available for segmentation, for determining target groups and planning campaigns. The development of technology and especially information technology (e.g.: auto responder, interactive website, Internet-based billing system, automated read-off of meters, etc.) is a significant tool in deepening customer relationships, and public utility service providers should pay special attention to adopting these methods. By applying these tools, customer loyalty can be strengthened easily and in the majority of the cases, in a less expensive manner. It can be achieved so that the service provider serves the customer, and not the other way round.

With the generally increasing importance of information technology solutions, it becomes important to examine: whether consumers are really open to the reception of new technologies, in what time period will new information technology provide the edge in the competition for establishing loyalty and whether the cost of keeping consumers have their returns or not. These points should constitute the topic for future research.

References

- Albrecht, K. – Zemke, R. 1985: Instilling a service mentality: like teaching an elephant to dance. *International Management*, Nov., Vol. 40., n. 1., pp. 61–67.
- Anderson, E. W. – Fornell, C. – Lehmann, D. R. 1994: Customer satisfaction, market share, and profitability: finding from Sweden. *Journal of Marketing*, Vol. 58., pp. 53–66.
- Berry, L. L. 1980: Services Marketing is Different. *Business Magazine*, May–Jun., pp. 24–29.
- Berry, L. L. 1987: Big ideas in services marketing. *The Journal of Services Marketing*, Vol. 1., No. 1., pp. 5–9.
- Booms, B. H. – Bitner, M. J. 1981: Marketing Strategies and Organizational Structures for Services Firms. In Donnelly, J. H. – George, W. R. (eds): *Marketing of Services*. Chicago, AMA, pp. 47–51.
- Butz, H. E. Jr. – Goodstein, L. D. Jr. 1996: Measuring customer value: gaining the strategic advantage. *Organizational Dynamics*, Vol. 24., pp. 63–77.
- Chase, R. B. 1978: Where Does the Consumer Fit In a Service Operation? *Harvard Business Review*, Nov–Dec., No. 56., pp. 41–52.
- Crosby, L. A. – Stephens, N. 1987: Effects of relationship marketing on satisfaction, retention, and prices in the life insurance industry. *Journal of Marketing Research*, Vol. 24., pp. 404–411.

- Dibb, S. – Simkin, L. 2001: Market segmentation Diagnosing and Treating the Barriers. *Industrial Marketing Management*, Vol. 30., Issue 8., pp. 609–625.
- Eigler, P. – Langeard, E. 1991: *Servuction – Le marketing des services*. Paris, McGraw-Hill.
- Fornell, C. 1999: *Customer satisfaction and shareholder value*. Fourth World Congress for Total Quality Management, Sheffield, 28–30 June.
- Grönholdt, L. – Martensen, A. – Kristensen, K. 2000: The relationship between customer satisfaction and loyalty: cross-industry differences. *Total Quality Management*, Vol. 11., No. 4/5–6., pp. 509–514.
- Grönroos, C. 1992: *How quality came to service and where it is going*. Paper presented at the quality in Services conference. QUIS–3, University of Karlstad, Sweden.
- Gummesson, E. 1994: Making relationship marketing operational. *International Journal of Service Industry Management*, Vol. 5., No. 5., pp. 5–20.
- Jones, T. O. – Sasser, W. E. Jr. 1995: Why satisfied customer defect? *Harvard Business Review*, Vol. 73., Issue 6., Nov/Dec., pp.88–89.
- Kandampully, J. 1998: Service quality to service loyalty: A relationship which goes beyond customer services. *Total Quality Management*, Aug., Vol. 9., Issue 6., pp. 431–444.
- Kim, N. J. 1998: Utilities warming up to power of marketing. *Puget Sound Business Journal*, 02/13., Vol. 18., Issue 41., p. 8.
- Levitt, T. 1983: After the sale is over..., *Harvard Business Review*, Sept./Okt., pp. 87–93.
- Lovelock, C. H. – Weinberg, C. B 1990: Public & Nonprofit Marketing: Themes & Issues for the 1990s. In Lovelock, C. H. – Weinberg, C. B (eds): *Public & Nonprofit Marketing readings & cases*. San Francisco, The Scientific Press, pp. 3–15.
- Martensen, A. – Grönholdt, A. – Kristensen, K. 2000: The drivers of customer satisfaction and loyalty: cross industry findings from Denmark. *Total Quality Management*, Vol. 11., No. 4/5 – 6., pp. 544–553.
- Parasuraman, A. – Zeithalm, V. A. – Berry, L. L. 1985: A conceptual model of service quality and its implications for future research. *Journal of Marketing*, Vol. 49., pp. 41–50.
- Parasuraman, A. – Zeithalm, V. A. – Berry, L. L. 1991: Understanding customer expectation of service. *Sloan Management Review*, Spring, pp. 39–48.
- Payne, A. – Frow, P. 2000: Services Relationship marketing: A Sector Case Study. In Hennig-Thurau, T. – Hansen, U. (eds): *Relationship Marketing Gaining Competitive Advantage Through Customer satisfaction and Customer Retention*. Berlin, Springer, pp. 299–316.
- Reketye, G. 2000: Fogyasztói közérzet–2000. *Marketing & Menedzsment*, No. 6., 7–11. o.

- Snyder, B. 1997: Enron makes move on California as deregulation looms, *Advertising Age*, 10/27., Vol. 68., Issue 43., p. 5.
- Tower, T. N. 2000: Bloodstream marketing: A New Paradigm for Ensuring Competitive Advantage. *The Electricity Journal*, Vol. 13., Issue 3., pp. 63–68.
- Veres, Z. 1998: *Szolgáltatásmarketing*. Budapest, Műszaki Könyvkiadó.

Status based consumption in Hungary

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The intention of this research is to explore how much a special type of segmentation – lifestyle-based segmentation – can be used in a Hungarian market setting. The goal is to find the answers to the question of what explanatory force lifestyle typologies have and whether it is indeed outdated to analyse consumption patterns based on traditional socio-demographic and status characteristics in Hungary. The results of the qualitative part show that price and discretionary income very often constitute an important limitation to purchases. Quantitative findings – from cluster analysis – indicate that lifestyle-based segmentation is most useful when examining the consumption patterns of the middle class.

Keywords: segmentation, lifestyle, status, consumption

1. Introduction

Market segmentation has two general forms. One classifies consumers based on demographics, social class and psychology, whereas the other focuses on the product, as well as the value and utility, delivered by the product. The advantage of product-based segmentation is that it can better adapt to the characteristics of a particular product or a situation, but its application is limited by the need to segment differently by product categories. In contrast, people-based segmentation is more general, as it concentrates on the consumer as a complex entity who can be investigated while buying various products (Plummer 1974, Greenberg–Schwartz 1989, Bean–Ennis 1987).

In advanced North American and West European societies, lifestyle research has been carried out for several decades, pushing conventional approaches focusing on social status into the background. Around the turn of the millennium, lifestyle research appeared in Hungary, as well. It was a rather momentary segment, so no follow-up research was done based on it. However, there are certain lifestyle typologies that are continuously created and integrate into other research (e.g. TGI lifestyle research done by the Hungarian affiliate of the Kantar Media Group).

Lifestyle research in Hungary has been conducted relying on a great number of attitudes, product categories and brands. In spite of this, value orientation and the consumption concept of certain lifestyle groups is not clear enough. The transitions between the individual lifestyle groups are not known, nor is it known in which areas of consumption the differences between lifestyle groups are the most or the least conspicuous. The goal of this research is to explore how much a special type of

segmentation – lifestyle-based segmentation – can be used in a Hungarian market setting¹.

2. Background

Traditionally, marketing classifies individuals by demographic criteria. This technique can be easily quantified, but tells little about the factors or the motivation behind the consumption of group members. Its predictive capabilities can be improved by including groups-specific sociological and psychological factors in our investigations (Plummer 1974, Wells 1975, Veal 1993, Ritzer 1996, Corrigan 1997, Vyncke 2002). Research carried out in the USA and Western Europe place most emphasis on the significance of the involvement of psychological factors (Ziff 1971, Fenwick et al 1983, Edris–Meidan 1989, Fullerton–Dodge 1993, Morgan–Levy 2002).

The notion of lifestyle in marketing was introduced by William Lazer (1963), but the purposes of this research adopted the definition by Veal (1993, p. 247.). This defines lifestyle as “a distinctive pattern of personal and social behavior characteristics of an individual or a group”². In practice, it refers to how “the people live and spend their time and money” (Kaynak–Kara 2001). Lifestyle-based segmentation is also called psychographics (Demby 1974). It wishes to stress the importance of psychographic criteria as opposed to and besides purely demographic criteria in forming consumer groups (Ziff 1971, Wells 1975, Bean–Ennis 1987). Buying habits of individuals belonging to the same demographic or socio-economic category may differ. To explore these differences in more depth, it is worth investigating the people’s lifestyles. In addition, it might also be adequate to perform a psychographic analysis in such cases where among the segments set up based on demographic criteria relevant differences in consumption were found, because it can help to explore the reasons for such differences and to understand the group much better (Edris–Meidan 1989, Fullerton–Dodge 1993, Vyncke 2002). The more the target group is understood, the more effective the communication is with it and the more adaptive the positioning is to their needs (Plummer 1974, Hornik 1989, Chiagouris 1991).

Psychographic analysis can be classified into two types, depending on how complex the analysis of consumer lifestyles is. “One dimensional” analyses look at only specific key areas of a consumer’s lifestyle. In general, focus is on lifestyle elements of particular products. The other type is “multidimensional” which seeks to explore complexly defined general lifestyles that can have an explanatory force in other areas of consumption. The former has the definite advantage that it adapts better to the analysis of a product than a general lifestyle (Ziff 1971, Plummer 1974,

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² For further definitions see: Lazer 1963, Horley 1992, Chaney 1996.

Wells 1975, Van Auken 1978). But, since this particular research is exploratory and analyses broad lifestyle groups, it was decided not to investigate one-dimensional typologies.

Measuring lifestyle was always a great concern. One of the earliest forms of lifestyle measurements is conducted by Wells és Tigert (1971), who named AIO rating. AIO rating looks at how the people examined spend their time (Activities), what they place importance on in their immediate surroundings (Interests), how they view themselves and the world around them (Opinions). Then, some basic characteristics are added, such as stage in life cycle income, and where they live (Plummer 1974). Other methods were made up that took values into consideration, although these methods weren't suitable for the lifestyle segmentation per se (Rokeach 1973, Schwartz–Bilsky 1990). Values are “desirable, trans-situational goals, varying in importance, that serve as guiding principles in people's lives” (Vyncke 2002, p. 448.). Some of the best known value based methods are VALS made up by Arnold Mitchell, and its more popular redefined form VALS2, which deals with personality factors as well (Reece 1989, Shih 1986). Kahle's (1983) LOV (List of Values) – which cannot measure lifestyle per se – is an effective way of measuring values and it can be a useful contributor to psychographic measurement. Novak and MacEvoy (1990) found that if demographic variables are added to the LOV method, it proves to be a better choice. This calls attention to the fact that although methods containing psychological elements give a deeper insight into segments, this does not mean that efficiency of demographic criteria in a thorough research can be forgotten. Speaking of lifestyle-based segmentation methods, the Sinus Milieu model needs to be mentioned, which is primarily employed in Germany and Austria.

The practical application of lifestyle-based segmentation is especially suitable in marketing communication, the market of leisure activities, Internet advertising, apparel marketing and banking, and even in the non-profit sector – e.g. for museums. Knowing the lifestyle of the target group can assist marketing communication to approach consumers with appropriate messages through the channel that suits the segment the best (Edris–Meidan 1989, Vyncke 2002). In the leisure activities market (Green et al 2006), just as in banking (Peltier et al 2002), apparel marketing (Richards–Sturman 1977) or museum marketing (Todd–Lawson 2001), it is important to know the lifestyle of our target market, so that suitable recreational or cultural activities can be offered to them. Investigating e-commerce, Yang (2004) found that attitudes to online purchases – which a consumer's lifestyle may refer to – crucially influence the efficiency of marketing communication on the Internet.

Speaking of applicability of lifestyle research in Hungary, it needs to be briefly mentioned to what extent domestic conditions affect the applicability of the method. From a social viewpoint, Hungary differs from the above-mentioned more advanced countries since the rate of poor people is higher, the middle class is

smaller and less differentiated, and its standard of living is far behind that of the Western middle class. Compared to Western countries, the level of discretionary income is much lower. There is good reason to assume that these peculiarities of a transition economy are deepened by the recent crisis. Consequently, experience from previous research (Utasi 1984, Fábíán et al 1998, Hankiss 1999, Hankiss–Manchin 1996, Hofmeister-Tóth 2003, Hankiss 2005, Németh et al 2007) suggests that in many segments, price fundamentally influences consumer decisions; therefore the determining power of their means may distort or even suppress the effect of lifestyle characteristics on consumption. Under such circumstances, Hungarian lifestyle research did not primarily appear as a result of the need to explain domestic consumption trends, but due to international influence. Principally, research explored the relationship between social status and lifestyle. This alone raises the question of what explanatory force lifestyle typologies have and whether it is indeed outdated to analyse consumption patterns based on traditional socio-demographic characteristics in Hungary. Our research aims to investigate, with a scientifically valid method, to what extent and how lifestyle-based segmentation can be applied in this market.

3. Research

Research method. Considering the above antecedents and circumstances, the following research objectives have been set:

- reveal lifestyle segments,
- investigate the transitions between lifestyle groups,
- unfold the consumption-specific value orientation of lifestyle groups,
- examine the connection between the social status, the lifestyle and the consumption,
- investigate the role of brands in particular lifestyle groups – how much the social status of the groups relate to brand usage.

Basically, the goal is to find the answer to the question what explanatory force lifestyle typologies have and whether it is indeed outdated to analyse consumption patterns based on traditional socio-demographic and status characteristics in Hungary.

To answer the above questions, a two-step research pattern was launched. Kamakura and Wedel (1995) noted the problem of lengthy questionnaires, typical of lifestyle research. They suggest using the method of tailored interviewing as a solution. Therefore, in the first step, information was gathered through in-depth interviews on everyday activities and consumption of people belonging to a lifestyle group.

In the second step, using the findings of the qualitative phase, regionally representative research (with control sample from the capital) was conducted to identify the quantitative ratios of the correlations discovered.

3.1. Qualitative research

The in-depth interviews focused on five main areas: product and brand usage of consumer goods, cultural and leisure time activities, use of various services, use of higher education as a service, financial services and investment activities. Ten in-depth interviews were made in each of these groups.

The key question of the qualitative phase was to define and recruit the research target group. A recruitment questionnaire was devised which – based on education or product and brand usage – screened out poor people with very low incomes. In recruitment questionnaires, four questions in each group explored product and brand use as well as financial position.

The general structure of in-depth interviews was reorganized to take special features of the examined topic into consideration, which resulted in slightly different interview guidelines for each topic. The structure of in-depth interviews was the following:

1. Principles of way of life, personality.

Here, the subject talked about the goals s/he follows and the principles s/he adheres to in life.

2. Relationship between personality and the examined area (for example higher education).

The subject's opinion on how s/he judges the importance of supply elements of a given area. Supply had to be split into two groups. The first one included the elements which are naturally part of our everyday life, whereas the second included the ones that may give special pleasure and the feeling of success to the consumer. Finally, it was asked of each of them what difference they perceive between the joy from consuming products and the joy from making use of services.

3. Relationship between lifestyle characteristics and the examined area.

The sources of the elements of the examined area that are extremely important in the subject's life like products or services deemed important by the subject. It was investigated the role of environment in affecting decision-making and the dimensions of perceived risk and brand loyalty.

4. Description of a subject's own consumption for a given area.

The subject had to tell about each (about 20 in all) supply element of a given area, and how much a product or service plays an important part in his or her life. Then s/he had to classify him- or herself into one of the 5 consumer lifestyle segments explored by TGI Hungary's previous research (TGI 2006). Finally, the subject positioned his or her family on a four step scale based on their financial situation.

All the respondents in the in-depth interviews have a gainful occupation; the data on their age and education are illustrated in Table 1 below.

Table 1. Qualitative study sample

	Secondary level education	College or university degree
Women aged 26–35	6 people	4 people
Women aged 36–50	10 people	7 people
Men aged 26–35	5 people	8 people
Men aged 36–50	5 people	5 people

Source: own construction

Personality and consumption. The majority of the interviewees said that it is mainly personality and individual preferences that determine what criteria they consider when deciding on the importance of a product or service. Almost all the interviews explicitly showed that all these are greatly limited by discretionary income. They have to think through what they really need, and once they have purchased these and if they still have some remaining money to spend, they may begin to think what special things they long for. Then "...they choose from what they can afford". There is a wide array of special products and services that give the feeling of success: buying perfume, good food, trips (not necessarily abroad), hairdressing, consumer electronics, or a car. The responses include ones that say that a purchase gives the feeling of success when "I manage to buy a curtain at a rock-bottom price, or reupholster two armchairs that others would have already thrown away" – or among leisure time activities the special ones are those that require some extra preparation – theatre or camping. As for investment products, there was a respondent who categorized share purchase as special. Even though our recruitment questionnaire filtered out people with a limited income, "average" consumers also find their disposable income definitely limited.

Principles of way of life and personality. Apart from a home and a car, none of the respondents mentioned concrete material goods among their main goals. The most important lifestyle principles (and factors determining the quality of life) included founding a family or security for the family, success in job (regardless of age), health, material security (where they do not always have to think of when the their next salary arrives). Money "should be an instrument, not a purpose".

Relationship between lifestyle characteristics and the examined area. As for consumer goods, the overwhelming majority of our respondents said that the opinion of the environment have almost no impact on their choice, and they exclusively rely on their needs and taste ("I don't care what others buy") – which is greatly in contrast with the behaviour that, in our opinion, is most characteristic of a great part of society: ("that's the way we are... many people are like this: if others have it, I should have it as well.") Almost everybody thinks that "snobbery" and "showing

off' is only a characteristic of others. For making use of cultural and financial services or spending free time, it is admittedly more important what others think. The feeling of community with those who chose the same provider or product is not typical. As for brand loyalty, satisfaction is most important with the majority of respondents – satisfaction with a positive experience might be enough for loyal consumers to hold on to a brand. Price, however, plays a decisive role here as well because “when I switch a brand, price predominates definitely.” When satisfaction is lowered, the perceived risk of switching is not an important deterring factor, either from the point of view of products or service providers.

Description of subject's own consumption for a given area. There is a great variety of products/services where brands are important to the respondents – dairy products, household and chemical goods, hygiene products, perfumery, electronic goods, mobile phones, cars – currently no category can be highlighted. Interestingly enough, the majority of our respondents chose the same segment when asked to classify themselves into one of 5 lifestyle segments. The major characteristics of their lifestyles include that they are quality- but not brand- or fashion-oriented, family- and relationship-oriented; demanding of themselves and their surroundings; work is important to them; they love challenges but avoid risky situations; they are deliberate; have good money sense and reject traditional discrimination of male and female roles. This typical choice greatly supports what was concluded during the interviews, but also makes it difficult to explore the explanatory role of lifestyle groups.

3.2. Quantitative research

Based on the findings of the qualitative phase, quantitative research was conducted in the second step – using a sample from Southern Hungary and a control sample from Budapest. The quantitative research aimed to identify to what extent segmentation with lifestyle characteristics is more effective than conventional consumer segmentation based on socio-demographic factors.

In the questionnaire survey, the sample was selected from Southern Hungary (and a control sample from Budapest), ages between 18 and 75. The collective sample was selected from an address list using a systematic method and each subject was personally interviewed. All in all, 2,690 people answered, of which 58% were women and 42% were men. Respondents were asked to answer questions in three blocks using a Likert scale. The first block explored their attitude in relation to work and the way they usually spent their leisure time; the second block identified their consumption habits and the third one, their attitude to brands. In the first step, the goal was to reduce the number of variables through factor analysis. In the second step, eight segments with cluster analysis were distinguished by involving all the variables and factors.

A factor analysis was conducted for each of the three blocks mentioned above. The factors were chosen according to the eigenvalues (it should be above 1.0

for each factor) and to the total variance explained (it should be above 60%). As for work- and leisure time related variables, two factors could be distinguished that jointly explained 63.24% of the variance. The first factor (F1) includes variables for going out to a restaurant, travels abroad and holidays in exotic places – all these indicate a high standard of living, or, as it were, a “noble” lifestyle. Thus, this factor was called “upper middle class life”. The second factor (F2) examined listening to classical music, going to the theatre and an interest in arts, so it was termed “cultural interest”.

Within the questions regarding buying and consumption patterns, five factors were distinguished that explain 62.8% of the variance. The first factor (F3) correlates with hunting for low and special prices or bargains and with careful economizing on the money devoted to shopping. Therefore, it may be called “aspiration for economic effectiveness”. Unlike the previous one, the second factor (F4) implies a joyful buying experience and is characterized by impulsiveness and emotionality rather than a careful purchase. For this reason, this factor was labelled “impulsive purchase”. The third factor (F5) correlates with variables of branded product purchases, so this was called “brand purchase”. The fourth factor (F6) is “advice on purchase”, which means asking for and receiving advice before a purchase. The fifth factor correlates only with a single variable, thus handling this as a separate factor will not facilitate interpretation.

Within the brand choice block, 64% of the variance using three factors was explained. The first factor (F7) shows a relationship between the brand and the consumer’s personality, thus we called this “brand symbolism”. The second factor (F8) correlates with the statements according to which the quality of branded products is better than average. This is the so-called “brand quality” factor. The third one (F9) is “keeping up with fashion” involving the purchase of toiletries and the influence of fashion.

After the factor analysis, the sample was divided into segments using cluster analysis (for details see Table 2). When determining the number of segments, one important aspect was for them to be inwardly homogeneous – accordingly, several smaller but more unified groups should be created instead of some large “cover” segments. Also, the goal was to create a manageable number of markedly different clusters. According to the significance test, the differences between these clusters were significant.

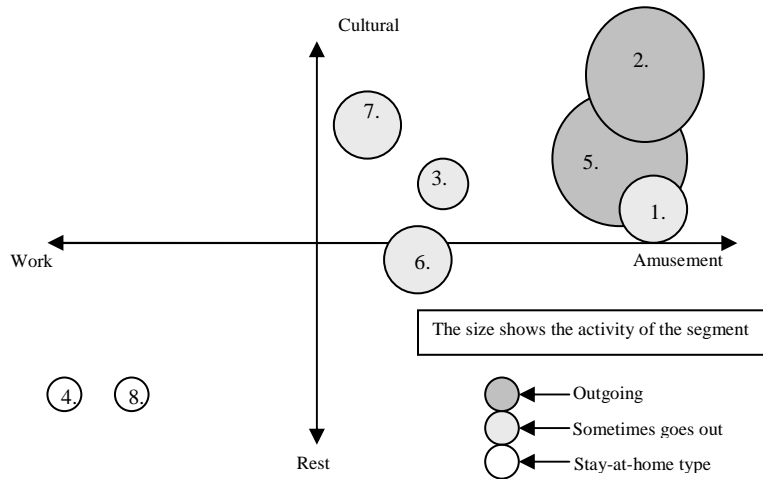
Table 2. Factors and the clusters (Mean of the five point Likert-scale)

Ward Method	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
Segment 1	1,68	3,12	1,57	2,36	2,04	2,32	2,33	2,34	3,18
Segment 2	2,19	3,26	2,23	2,86	2,72	2,78	2,96	3,72	3,50
Segment 3	2,61	3,23	1,95	3,04	2,33	2,90	2,66	2,15	3,09
Segment 4	2,05	3,17	1,62	3,46	2,32	2,70	2,62	2,09	2,56
Segment 5	3,40	3,49	3,18	2,86	3,28	3,54	2,78	4,09	3,26
Segment 6	3,00	3,25	2,34	2,93	2,71	3,14	3,34	3,23	2,87
Segment 7	3,49	3,67	2,10	3,22	2,48	3,91	3,29	2,61	3,19
Segment 8	1,48	2,58	1,29	3,62	1,90	1,67	2,40	1,40	2,15
Total	2,54	3,26	2,10	3,02	2,54	2,95	2,87	2,86	3,03

Source: own construction

Taking the above into consideration, eight segments were distinguished which can be characterized as follows (Maps were used to illustrate the differences between the characteristics of the segments. Figure 1 shows one example):

Figure 1. Lifestyle characteristics of the segments



Source: own construction

Segment 1: Those seeking inner harmony (8,4%)

They reject materialistic values. They do not work for money; they are not motivated by financial means and their lives are not driven by consumption. They find leisure time more important and focus on inner values. The consumption pattern

of this segment is very difficult to interpret in terms of socio-demographic characteristics. The group's value orientation is shown by lifestyle variables (emphasizing inner values) which can explain why they attach little importance to consumption, brands and their symbolic content.

Segment 2: Quality-oriented intellectuals (19,2%)

This is a quality-oriented intellectual group that endeavours to do well and decide well in most areas of life. They search for the best solution and high quality in their purchases. When doing so, they rely on their own value judgments and do not accept the quality suggested by the brand itself entirely. Owing to the high status of this segment, they are not forced to consider price as a primary factor; they can afford to choose a product based on their high expectations. But lifestyle characteristics are necessary to see the general quality orientation of this segment, which can be witnessed in all possible areas.

Segment 3: Those relying on their own values (13,3%)

This segment seeks to manage its – in many respects, limited – means as well as possible. They wish to fulfil themselves and follow their own values both in terms of their lifestyle and consumption patterns. They tend to stick to what works best for them and are not very open to new possibilities. The lower status of this segment explains their lower level of consumption, since they try to economize in all areas of life. Based on their lifestyle characteristics, this segment seems to be slightly closed and ethnocentric.

Segment 4: Lower status workers (14,9%)

This segment includes workers that struggle for a living and whose energies are almost entirely taken up by trying to maintain a moderate standard of living. Their needs have adapted to their means; they decide based on the price and are not really quality-conscious or functionally-minded. Most of all, their consumption can be construed based on their lower status.

Segment 5: Hedonistic youngsters (10,4%)

This is a group of active and open youngsters who enjoy life and try to make the most of it. They look upon their lives as a sort of adventure. They have taken advantage of their opportunities and reached a very high status that allows them to enjoy high quality consumption. They are interested in all areas of life; they are open to new things; they follow fashion and choose brands based on not only functional but also symbolic factors. They look for products that best suit their personality, thus realizing the uniqueness and creativity, which is so characteristic of them, through their consumption.

Segment 6: Categorizers (17,8%)

This is a group of consumers with a relatively high status who want to lead a quality life according to separate categories. This means that they work hard so that they can afford this high quality of life, while making sure that they can devote a sufficient amount of quality time to another category of life, like entertainment or leisure time. In the same way, they clearly separate shopping for food, which they find less important and boring, from purchasing articles that they consider more interesting; as these are mostly men, this category presumably comprises electronic goods. With the former, they do not care about the brand, whereas with the latter they find good quality products and well-known brands important and are happy to ask for advice before such purchases.

Segment 7: Those driven by outer values (10,4%)

This is a low status segment that wishes to emphasise that which is contrary in its consumption patterns. They are highly brand-oriented and prefer brands with a high prestige that can positively affect their otherwise moderate status. They make their decisions based on other people's opinions, and well-known brands provide them security both in terms of quality (being an important dimension of their lives) and through recognition from others. At first glance, the consumption and socio-demographic characterization of this segment seem wholly incompatible. Not even lifestyle characteristics can help this very much. By carrying this inconsistency further, their ostentatious consumption, being the most important feature of this segment, becomes clear. In this way, it is their status that explains their consumption pattern.

Segment 8: The seniors fallen behind (5,6%)

This is an elderly impoverished stratum living on the edge of the poverty line. They regard consumption purely as a means of subsistence. It is for them a constant battle for lower prices. They are closed and reject new things in both their lifestyle and their consumption. The consumption of this segment is clearly limited by its low status. Lifestyle characteristics add to this picture by shedding a light on the aversion of this segment to new things, which can also be witnessed in their consumption.

4. Conclusion

The results of this qualitative research point to the assumption that in an emerging economy, prices and discretionary income are very often a limitation for average or slightly above-average layers of society in choosing from products and services or brands. This factor, and the fact that classification into lifestyle typology yielded a remarkably homogeneous result, indicates that further exploratory research can contribute to a deeper understanding of the phenomena.

The analysis of the quantitative data leads to the conclusion that the eight clusters, even though they overlap in certain dimensions, clearly separate from one another and show an acceptable degree of inner homogeneity. However, it is important to note that these clusters can only be used for multidimensional interpretation, since it is through examining the whole that it can be identified how a cluster differs from those that are near within a dimension. There is an interdependent relationship between status, consumption and lifestyle. Well-founded results can be obtained when the three areas are jointly interpreted.

In certain segments, status has proven to be a dominant factor determining consumption. This is especially true for lower status, where the income limit largely determines consumption. In these cases, the influence of lifestyle is rather restricted. The influencing role of lifestyle has proved to be especially important when analysing the consumption of the middle class. This is in line with the international experiences on the possibilities of using lifestyle-based consumption in segmentation. In these cases, status draws a rather vague conclusion on consumption, while lifestyle has a good explanatory force. It must be noted that the middle class, being typically broad in advanced countries and which has called this kind of segmentation into life, is rather narrow in Hungary and, based on current trends, continuously shrinking. It poses the question again about what the main dilemma is of investigation.

5. Limitations and further research

When using lifestyle-based segmentation techniques, several limitations have to be considered. By employing this method, the goal is to obtain segments which are not only distinct, but also homogeneous within. These conditions cannot always be met by the psychographic method whose limitations have been explored by many authors (Wells 1975, Edris–Meidan 1989). Among the limitations of the method, Fenwick et al (1983) note that there are no standardized methods for developing psychographic items, thus, it is difficult to link different research and validation of the established lifestyle segments is problematic as well.

Research is still continuing on this aspect. Relying on in-depth analyses – including focus group discussions and further quantitative research – the goal is to give a more precise answer to the fundamental question on whether lifestyle-based segmentation can be applied at all in this country, and if yes, within what constraints. Or, as a result of the powerful limitations of discretionary income, is it more efficient to choose status as a criterion of segmentation?

References

- Bean, T. P. – Ennis, D. M. 1987: Marketing Segmentation: A Review. *European Journal of Marketing*, 21, 5, pp. 20–42.
- Chaney, D. 1996: *Lifestyles*. London, Routledge.
- Chiagouris, L. G. 1991: *The Personal Dynamics of the Decision Maker*. PhD dissertation, The City University of New York, Baruch Graduate School of Business, New York.
- Corrigan, P. 1997: *The Sociology of Consumption*. London, Sage.
- Demby, E. 1974: Psychographics and from Where it Came. In W. D. Wells (ed.): *Life Style and Psychographics*. Chicago, American Marketing Association, pp. 9–30.
- Edris, T. A. – Meidan, A. 1989: On the Reliability of Psychographic Research: Encouraging Signs for Measurement Accuracy and Methodology in Consumer Research. *European Journal of Marketing*, 24, 3, pp. 23–38.
- Fábián, Z. – Róbert, P. – Szívós, P. 1998: Anyagi-jóléti státuszcsoportok társadalmi miliói. (Social milieus of material-welfare status groups). In Kolosi, T. – Tóth, I. Gy. – Vukovich, Gy. (eds): *Társadalmi riport*. Budapest, TÁRKI.
- Fenwick, I. – Schellinck, D. A. – Kendall, K. W. 1983: Assessing the reliability of psychographic analyses. *Marketing Science*, Vol. 2., No.1., Winter, pp. 57–73.
- Fullerton, S. – Dodge, R. 1993: A reassessment of life style and benefits-based segmentation strategies. *The Journal of Marketing Management*, Fall/Winter, 1992–‘93, pp. 42–46.
- Green, G. T. – Gordell, H. K. – Betz, G. J. – DiStefano, G. 2006: Construction and Validation of the National Survey on Recreation and the Environment's Lifestyles Scale. *Journal of Leisure Research*, Vol. 38., No. 34, pp. 513–535.
- Greenberg, M. – Schwartz, M. S. 1989: Successful Needs/Benefits Segmentation: A User's Guide. *The Journal of Consumer Marketing*, 6, Summer, pp. 29–36.
- Hankiss, E. – Manchin, R. 1996: Szempontok az élet „minőségének” szociológiai vizsgálatához. (Criteria for a sociological analysis of the quality of life). *Valóság*, No. 6.
- Hankiss, E. 1999: *Proletár reneszánsz: tanulmányok az európai civilizációról és a magyar társadalomról*. (Proletarian renaissance: studies on European civilization and Hungarian society). Budapest, Helikon.
- Hankiss, E. 2005: *Az ezerarcú én*. (The protean me). Budapest, Osiris.
- Hofmeister-Tóth, Á. 2003: *Fogyasztói magatartás*. Budapest, Aula.
- Hornik, J. 1989: A Temporal and Lifestyle Typology to Model Consumers' Smoking Behavior. *Advances in Consumer Research*, 16, pp. 44–50.
- Horley, J. 1992: A longitudinal examination of lifestyles. *Social Indicators Research*, 26, pp. 205–221.

- Kahle, L. R. (ed.) 1983: *Social Values and Social Change: Adaptation to Life in America*. New York, Praeger.
- Kamakura, W. A. – Wedel, M. 1995: Life-Style Segmentation With Tailored Interviewing. *Journal of Marketing Research*, Vol. 32., August, pp. 308–317.
- Kaynak, E. – Kara, A. 2001: An Examination of the Relationship among Consumer Lifestyles, Ethnocentrism, Knowledge Structures, Attitudes and Behavioural Tendencies: A Comparative Study in Two CIS States. *International Journal of Advertising*, 20, 4, pp. 457–482.
- Lazer, W. 1963: Life Style Concepts and Marketing. Toward Scientific Marketing, In Stephen Greyser (ed.) *American Marketing Assn*, Chicago, pp. 35–42.
- Morgan, C. – Levy, D. 2002: Psychographic segmentation. *Communication World*, 20, 1, pp. 22–26.
- Németh, I. – Veres, Z – Kuba, P. 2007: Az életstílus és a pénzzel kapcsolatos beállítódás szerepe a hosszú távú, befektetés típusú vásárlásokban. (The role of lifestyle and attitudes to money in long term, investment-like purchases). *Marketing&Menedzsment*, Vol. XLI., No. 3., pp. 51–61.
- Novak, T. P. – Macevoy, B. 1990: On Comparing Alternative Segmentation Schemes: The List of Values (LOV) and Values and Life Styles (VALS). *Journal of Consumer Research*, Vol. 17., June, pp. 105–109.
- Peltier, J. W. – Scribrowsky, J. A. – Schultz, D. E. – Davis, J. 2002: Interactive Psychographics: Cross-Selling in the Banking Industry. *Journal of Advertising Research*, March–April, pp. 7–22.
- Plummer, J. T. 1974: The Concept and Application of Life Style Segmentation. *Journal of Marketing*, Vol. 3a., January, pp. 33–37.
- Reece, G. 1989: Psycho-selling. *Channels*, 9, 8, pp. 14–16.
- Richards, E. A. – Sturman, S. S. 1977: Life-style Segmentation in Apparel Marketing. *Journal of Marketing*, October, pp. 89–91.
- Ritzer, G. 1996: *The McDonaldisation of Society*. Pine Forge Press, Thousand Oaks.
- Rokeach, M. 1973: *The Nature of Human Values*. Free Press, New York.
- Schwartz, S. – Bilsky, W. 1990: Towards a Universal Psychological Structure of Human Values. *Journal of Personality and Social Psychology*, 53, pp. 550–562.
- Shih, D. 1986: VALS as a tool of tourism market research: The Pennsylvania experience. *Journal of Travel Research*, 24, 4, pp. 2–11.
- Sinus Sociovision GmbH 2002: *SINUS Milieus*, AGF Arbeitsgemeinschaft Fernsehforschung, Frankfurt/Main.
- Todd, S. – Lawson, R. 2001: Lifestyle segmentation and museum/gallery visiting behaviour. *International Journal of Nonprofit and Voluntary Sector Marketing*, Vol. 6., No. 3, pp. 269–277.

- Utasi, Á. 1984: *Életstílus-csoportok, fogyasztási preferenciák. Rétegződésmodell-vizsgálat. (Lifestyle groups, consumer preferences. An analysis of the stratification model)*. Budapest, Kossuth Könyvkiadó.
- Van Auken, S. 1978: General Versus Product-Specific Life Style Segmentations. *Journal of Advertising*, Vol. 7., Issue 4., pp. 31–36.
- Veal, A. J. 1993: The concept of lifestyle: A Review. *Leisure Studies*, 12, pp. 233–252.
- Vyncke, P. 2002: Lifestyle Segmentation: From Attitudes, Interests and Opinions, to Values, Aesthetic Styles, Life Visions and Media Preferences. *European Journal of Communication*, 17, 4, pp. 445–463.
- Wells, W. D. 1975: Psychographics: A Critical Review. *Journal of Marketing Research*, pp. 196–213.
- Wells, W. D. – Tigert, D. J. 1971: Activities, Interests, and Opinions. *Journal of Advertising Research*, 11, pp. 27–35.
- Yang, C. C. K. 2004: A comparison of attitudes towards Internet advertising among lifestyle segments in Taiwan. *Journal of Marketing Communications*, September, pp. 195–212.
- Ziff, R. 1971: Psychographics for Market Segmentation. *Journal of Advertising Research*, Vol. 11., No. 2., pp. 3–9.

The role of collaborative filtering in marketing

Zoltán Majó – Balázs Révész

In the past few years, there have been many lectures and articles about products that sell well via the Internet. Books, CD's, videos, computers and home electronic devices are among the items found on current bestseller lists and on the shelves of the largest online stores. There are tools available, as outlined in this paper, that can aid the efficient online marketing of these products and the sales of these can be supported using recommender systems. The collaborative filtering technique, also described in this research paper, has been employed by market leading US dotcom companies with great success in recent years. Because of said marketing success, the appearance of European recommendation systems can be anticipated very soon.

Keywords: collaborative filtering, recommendation systems, CRM, online marketing

1. Introduction

The theoretical foundations of recommender systems have been known for a long time in everyday business practice. An example of a common recommender system is “The Chef’s Favourites” on a restaurant menu or an expert’s article on services provided by car washes. It is customary to find recommendations on the covers of books while browsing through the shelves of a bookshop. In the literary works business, famous people (reviewers, analysts, journalists, editors, etc.) are often called upon to review a book, thereby helping or influencing customers in their choice. This recommender technique has been a generally applied marketing tool in the business world for a long time.

In addition to individual and expert recommendation techniques, community recommendation tools are also known in marketing practice (Nikolaeva–Sriram 2006). To be able to isolate and use these tools, a vast number of consumer preference data are quantified, systematized and then put into an easy-to-communicate form. Commonly speaking, this is the method of top lists or popularity ratings which are present in all channels of the media (films, books, sales and hit lists in music). These recommender techniques, either individual or community-based ones, are common tools of mass marketing. However, the question is how to formulate individual offers from individual preferences and whether it is possible to develop recommender techniques into recommender systems.

Perhaps one of the best known among the community sites using a web-based collaborative filtering process is MovieLens (www.movielens.org), a personal

movie recommender, which is a good illustration of how collaborative filtering works.

To be able to use this system, online registration is needed in which users have to rate films that they have previously seen (in this case a 5-grade scale is used). Then the system compares the ratings (i.e. a user's profile) with those of other users and tries to contrast the profiles. Basically, by using the movie ratings, the system looks for the closest neighbour who is most similar to that particular user's profile. Of course, for a comparison of profiles, a reliable scale is needed (Cosley et al 2003) in addition to a program that makes multivariable statistical calculations (correlation calculus, a cluster analysis with groups) (Goldberg et al 2001). In the case of several thousand users, significant computer resources are required to satisfy the needs of masses (Cho–Kim 2004), since it is necessary to calculate the coefficient of correlation in a large calculation capacity. In a collaborative filtering system, the data are compared in two dimensions. In this context, overlapping refers to the number of films that contrasting users evaluated, and correlation indicates how similarly those particular users rated those films that both had seen.

Ideally, if a particular system has a sufficient number of users, there will be user groups within which both correlation and overlapping are high. A high correlation value (~ 1) suggests that the same opinion is held. A high overlapping, on the other hand, means that same opinions are not incidental, considering that they are based on a large number of data.

2. Collaborative Filtering Solutions

Algorithms in collaborative filtering can be coupled with various IT solutions (McNee et al 2002). There are manual collaborative filtering systems, in which people make or ask for such recommendations, but the majority of commercial applications work as automated systems that collect, store and analyse customer preference data; they look for customers with a similar taste and recommend certain products using the obtained data.

Collaborative filtering systems depend on a single thing: customer preferences (Riedl et al 2002, Huang et al 2007). These customer preferences not only reflect the taste of individual customers but – indirectly – they also create the set of data needed to determine the closest neighbours. These data are transaction data gathered during shopping; besides basic sales data (like what is purchased or when or at what price), online sales are also concerned with how much time users spend on a webpage, what they view, what they print out, what they save or even how they rate certain products.

Once ratings and/or preferences for a particular consumer group have been obtained, collaborative filtering techniques can begin being used. Going back to the above example, the system can also give recommendations as to whether a given

film is worth being seen or not, but there also is choice for result in which recommendations can be obtained from the system without any intervention.

Taking these different approaches into consideration, John Riedl and Eric Vrooman identified three large groups of recommender systems, and based on their functions, they distinguished three different collaborative filtering techniques: pull-active CF, push-active CF and automated CF. Since the three systems generate different inputs, sometimes all three might be used at the same organisation or on the same website.

2.1. Pull-active CF

With pull-active collaborative filtering applications, the user is an active participant of the process in which the system creates recommendations (based on queries) according to his or her request. This recommender works by knowing other users' preferences or personal interests within a community, and while looking for a solution to a problem or task, a search is made for other people's suggestions and remarks.

The first, widely-known computerized collaborative filtering system was Tapestry. The primary goal of Tapestry, developed by Xerox PARC as a research project, was to set up workgroups to help find out which articles (mainly on electronic bulletin boards) are worth reading. Users of Tapestry could add remarks to an article and other users could make the system search for those texts that fulfilled certain criteria, e.g. key words of an article (using information retrieval and filtering), other people's remarks or what others did with a particular article.

2.2. Push-active CF

In typical business life, emails are often forwarded with nothing other than an abbreviation of FYI; to others that one might think would take an interest. Frequent internet users have undoubtedly been added to chain emails in which jokes are forwarded to friends and acquaintances that ideally have the same sense of humour as they do. PUSH-ACTIVE CF follows this principle, that with the help of a programme, users can simply recommend (push) the information to others if they find it interesting or useful. The first CF prototype of this kind was developed by David Maltz and Kate Ehrlich at Lotus Research.

2.3. Automated CF

The major difference between automated CF and PUSH and PULL active CF is that while the latter are applications requiring human intervention, automated CF gathers information on user preferences; it compares and analyses them and then sends them to users (Ahn 2006). A pioneer in automated CF technology was GroupLens.

3. Collaborative Filtering on the Internet

The Internet has opened up new possibilities for scientists, economists, politicians and any other users who can access the worldwide web. In this non-hierarchical network, more and more information is accumulated. Today, it is better not to type in the words “marketing conference” into the search field of a search engine because it might take more than a week to look through all the links (at the time this article was being written, Google showed about 5,040,000 links). Thus, there are two factors that must be coped with these days when using the Internet, the abundance and the reliability of information. Some years ago, the top management of a company was still able to read through a brochure compiled by a press-monitoring agency every day. Today it is a daunting task to try to process the contents on the Internet, no matter whether it is by keyword search or just product information. Even when time and energy are not at issue, there is still the problem of the quality or reliability of the information that is found on the web which is rather difficult, and sometimes even impossible, to control. For example, there is an industrial company employing several hundred people, on the website of which there has been a job announcement for a sales manager’s position for several months. In this case, it is fairly difficult to decide whether they have not yet managed to fill this position or they have just forgotten to update their site. What can we do to solve this problem of information filtering and retrieval? Where can we find help?

Collaborative filtering techniques might be useful in order to use not only keywords, but also topics, quality, taste or fields of interest to determine the theme of a website. One of the major advantages in doing business on the Internet is that there is a two-way interaction between the visitor and the website owner during every visit. While browsing the information published by a company, visitors constantly give information about themselves (Vandermerwe 2000), though not for the general public, but for the owner of the site. Information is obtained when a visitor asks questions, places orders, fills in a registration form or a questionnaire, or writes to the company or a discussion group about his or her opinion of a product or a particular situation. Additional information is obtained by making statistical analyses of visits (e.g. analysing the log file) which primarily helps form a logical structure of the website and measure its popularity.

To sum up, automated collaborative filtering is based on data obtained from former interactions between an individual and the system. In their simplest form, automated collaborative filtering systems keep track of every item that a user rated, including the fact of how much he or she liked it. Subsequently, based on the similarities in consumer tastes, the system calculates which consumers could “predict” others’ taste. Eventually, it tries to recommend new products using these predictors.

4. The Role of Collaborative Filtering in Marketing

With the help of group-based, information-filtering and recommender systems described in this article, the sale of particular products can be transferred to the Internet, not to mention the potential increase in sales volume through cross selling. Recommender systems can make sure (primarily if they are based on the technique of group-based information filtering) that visitors and customers not only consider buying products they originally planned to buy, but also have the option to shop for other - either closely or less closely related, or sometimes even unrelated - articles as well (Winoto–Tang 2008).

In the past few years, online sales and e-commerce have begun to develop very rapidly. Everybody interested knows that almost all fast moving consumer goods (FMCG) can be ordered on the Internet today. However, there are only a few business-to-consumer (B2C) solutions that care for a professional presentation of their products and services. Very often, photos are missing in web catalogues or the pictures of the articles are placed in a separate “picture gallery”. At the present level of development, it is difficult to find an online shop where, apart from an “Add to shopping cart” function, there are additional features that help customers in their shopping (e.g. detailed product descriptions, branding, warranty conditions, etc.).

For online marketing to become more efficient, it is important to make experts aware that the inputs on a webpage coming via the Internet are not just a set of data consisting of the binary combination of 0 and 1. They are not even just statistics or log files that are only valuable to IT experts and systems administrators, but rather an imprint of visitors’ and customers’ behaviour (Mild–Reutterer 2003). There are humans sitting at the other end of the net who have individual preferences and expectations. The conscious information supplying and gathering behaviour of visitors, as well as their self-expressing conduct, are interesting to us because by knowing these, a selection of the target group and positioning takes place and is a precondition to successful marketing activity. Information on the target group such as implicit inputs obtained from visitors’ and customers’ behaviour (e.g. statistics, log files) and explicit inputs (customer ratings, recommendations) is indispensable to formulate offers and to use various tools of promotion.

Yet, it is not only mass media offers that the Internet makes possible. Individual visitors can be targeted with personalized recommendations if there is sufficient data on their personal characteristics, purchase history, preferences and records of the behaviour of users who are similar to them.

The first step that separated sales and marketing as a company activity was the appearance of mass marketing. With such production and sales volumes, the mass media became the primary tools of promotion by persuading customers with advertisements to purchase a product at a later point of time. Due to the media explosion that occurred at the end of the 20th century, the tools of mass marketing could become more sophisticated as well as the economic cost/benefit principle

applied in marketing. Target group selection and segmentation according to demographic features (income level, age, sex, nationality, religion, place of residence, educational level) has become localized. Now an advertisement can be made for young women and it can appear in a magazine that they read, and a separate message can be sent to highly qualified men or large families can be reached through a film channel for the whole family. Segmentation has reached mailing lists on the Internet as well; different messages or offers can be sent to smaller groups. Instead of an initially generic message, people get messages that are suited to them better and closer to their actual preferences.

However, marketing based on demographical data has its limits. In reality, people cannot be clearly assigned to such simple categories. Almost simultaneously with the advance of technology, two things happened. Customer relationship management (CRM) software and computer databases made it possible for the tools of one-to-one marketing to evolve (Allen et al 2001, Kandikó 2009). This kind of marketing model was first presented in Peppers and Rogers' *The One to One Future* in 1993. In this book, they tried to treat customers individually by tracking and remembering their preferences and then, based on purchase transactions (see mass customisation), a company's range of products and its special offers, new recommendations can be made (Peppers–Rogers 1993, Peppers et al 1999). At the same time, in the second half of the 90s, the worldwide web and the advance of printing technology brought about cheaper delivery mechanisms. Unlike shops, the Internet is now able to present every user with a personalised interface and offer them customized products. Being that writing software and information technology itself involve relatively high fixed and low variable costs, it means that a new visitor to a website entails practically no extra costs. Using effective custom printing, every customer can be sent a more or less individualized catalogue, newsletter, voucher booklet or offer. Today's level of technology has been enabled to retrieve customer data (data mining, CRM, business intelligence) and to open up a customized channel of communication to users through the Internet (Newell 2000), so the only need is to know what specifically to recommend.

One-to-one marketing relies on data about individual customers found in databases and on human processing of product information. In order to define what offerings or products should show up to a customer, especially if there is a broad clientele, additional resources are required.

This is where automated recommender systems prove really useful as they can help attain the objectives of one-to-one marketing with their precisely customized methods (Kandikó 2009). Using recommender systems, a customized marketing campaign can be organized for even a customer base consisting of several hundred thousand people; no matter whether it is for web-based sales, cross selling by phone, an e-mail or a mailing campaign.

5. Inputs and Outputs in Collaborative Filtering

In their book, John Riedl and Eric Vrooman distinguished three input types (explicit, implicit and community) and four output types (suggestion, prediction, rating and review) of collaborative filtering. The model-like use of this classification and business intelligence systems can be a basis for a marketing management process.

5.1 Inputs types

Explicit and implicit

In this context, an input means that customers express their preferences. These inputs can be either explicit (inputs that require buyers' active co-operation) or implicit (inputs received from the natural behaviour of a customer as observed on a webpage). The most common explicit inputs are ratings, i.e. quantified or symbolic evaluations of a product; keywords/attributes, which refer to the expressed personal interest of a customer; and profiles i.e. personal data supplied by customers during registration. The most frequent inputs are purchase history and browsing data. From purchase history we learn which products a customer found valuable, whereas browsing data (including products and information viewed as well as goods put into the shopping cart) help identify the current interests of a visitor.

Community

The other inputs reflect the community. These include purchase history, the average and statistical indices of individual ratings, as well as reviews written by others. Products are often classified based on sales lists and ratings that are characteristic of the entire community (e.g. films or books according to genre). Popularity indices, such as ticket sales or bestseller lists, help customers see what a community appreciates.

5.2 Output types

Suggestion

The simplest output type is suggestion which involves mentioning or presenting a product without stressing that it actually is a sort of recommendation.

Prediction

In addition to simple suggestions, certain systems can predict in a quantitative or symbolic manner how much a customer will like a product (e.g. the movie recommender above).

Rating and review

Some systems even allow customers to view the ratings and reviews of other shoppers thus community inputs can turn into evaluations and reviews. This is especially common in such cases when several products have to be rated.

Amazon.com, for instance, encourages its customers to rate books and write reviews (explicit input). Then this information is made available to other customers as well. EBay asks sellers and buyers to critically evaluate each other (explicit input). Finally, these evaluations and reviews are summed up for those who wish to do business.

6. The Spread of Collaborative Filtering in the US and Europe

Among the flagships of online electronic retail, the American companies, eBay.com and Amazon.com, have used recommender techniques and algorithms of collaborative filtering for years. Both content providers have now become global players on the Internet, owning not just national and multilingual homepages – thereby making their services distinct – but have professionalized one of the crucial and fundamental ideas of collaborative filtering, the involvement of communities (turn communities into content) as well. We do not find such a ‘blockbuster’ in European business practice, although a number of companies and organisations have started employing collaborative filtering techniques (GUS, Deutsche Telecom, etc.).

Studying business practice in addition to the scientific and research-specific aspects of collaborative filtering on the Internet, conferences and studies dealing with this have been found as early as at the end of the 90s. From the point of view of recommender systems, this period is of historical importance since the first public academic application (GroupLens), also found in the book of the two American authors, and was officially launched in 1996 while the first business solution (GUS) was born in 1999. Simultaneously with US research at Berkeley and the University of Minnesota, development programmes were started in the European Union as well as financed by the 4th Development Framework Programme for Research and Technology of the European Union. In the form of international co-operation, the framework programme financed the development of complex, web-based software systems called Web4Groups which aided the work of teams. As a result of this, an experimental online voting system and a programme for evaluating online documents called SELECT were created.

The programme called SELECT, an article recommender system, developed that was similar to GroupLens. While with the development of GroupLens, recommending news and articles was in focus, the development of SELECT concentrated on evaluating webpages. At the beginning, GroupLens users could follow the ratings given by readers of current scientific articles. After a particular user had evaluated several articles, GroupLens was able to recommend him or her articles that he or she most likely would be interested in. Instead of scientific articles, SELECT, which is still available on the web, specialised in documents published on homepages and websites. Whenever a new site is visited, its contents can be rated on a 5 grade scale; other people’s ratings can be looked at and remarks

can be stored on a given web-based document. As a matter of fact, this system is the core of an online recommender system.

The method of GroupLens was used very soon on non-academic sites in the US like MovieLens, which became popular in the States and was followed by several sites, e.g. Zagat's restaurant guide. According to our research, no such direct business relationships can be derived from Select.

6.1. Online recommender systems in the consumer electronics branch

Examining the spread of the commercial use of online recommender systems, it seems an obvious solution to look for examples among the companies trading in consumer electronics products. Investigations have proved that the areas of recommender systems and collaborative filtering are rather varied. Through research, US and European sites are compared in e-commerce carrying similar product lines and analysed to the extent to which they use collaborative filtering. On these sites, it was primarily examined what input (implicit, explicit and community) and output (suggestion, prediction, ratings and reviews) items appear on particular pages. The subject of these examinations was leading companies with an extensive network.

One of the best known e-commerce sites of the world is www.ebay.com, and www.bestbuy.com is one of America's click-and-mortar store chains. With its chain stores (in the Czech Republic, Denmark, Finland, France, Greece, Hungary, Great Britain, Norway, Italy, Spain and Sweden), www.dixons.co.uk is the site of Europe's leading consumer electronics retailer; www.nitro-shopping.uk operates (in France, England, Germany, Italy, Norway, Spain and Sweden) as a dotcom company and www.fotexnet.hu is Hungary's leading e-commerce site.

While analysing the availability of recommender systems, we especially focused on the following aspects:

- Are there any special offers displayed to visitors on the entry page of the online store that function as recommenders for those customers who look for immediate discounts?
- Is there a New Products section on the main page serving as a recommender for those buyers who look for novelties?
- Is there a TOP section on the homepage (e.g. TOP electronics, TOP DVD's, TOP music) serving as the basis for collaborative filtering?
- Is there a rating scale for quantifying customer opinions?
- In addition to popularity indices, is there a section (e.g. "voice your opinion") for customers of certain products where they can write their opinion of these products?
- Do we find any services on the site that visitors can use to notify their friends about a product by e-mail so that visitors can become involved in selling the product?

- Are there any links to other brands or further offers which could help visitors in their choice or to compare products? Does the system support cross selling?

If we analyse homepages in terms of recommender systems, the results seem rather varied. All dotcom companies in our survey use recommender systems but in the case of click-and-mortar companies, functions suggesting the use of recommender systems are minimal. The following table shows the availability of those elements that are important from the point of view of recommender systems.

Table 1. Inputs and Outputs of collaborative filtering at popular online stores

Store	Bestbuy (USA)	Dixons (EU)	eBay (USA)	Nitro shopping (EU)	Fotexnet (Hu)
Inputs					
Implicit*	Registration, history of orders	Registration, history of orders	Registration, history of orders	Registration, history of orders	Registration, history of orders
Explicit	None	None	Positive and negative and neutral rating, short comments	Quick rate 1 to 10, consumer reviews	Quick rate 1 to 5, consumer comments
Community*	No data	No data	Feedback score	Compare prices	Number of visits
Outputs					
Suggestion	Hot offers, accessories of products, e-mail to friends	Top sellers, deal of the day, deal of the week, e-mail to friends	Featured items, spotlights on, e-mail to friends	Most popular, e-mail to friends	Best-selling articles of the past 7 days, popular products
Prediction	None	None	Most-wanted-item notifications	Estate agent	Average popularity index
Evaluations and reviews	None	None	Seller and buyer information, feedback information	Rating, reviews	Customer opinions

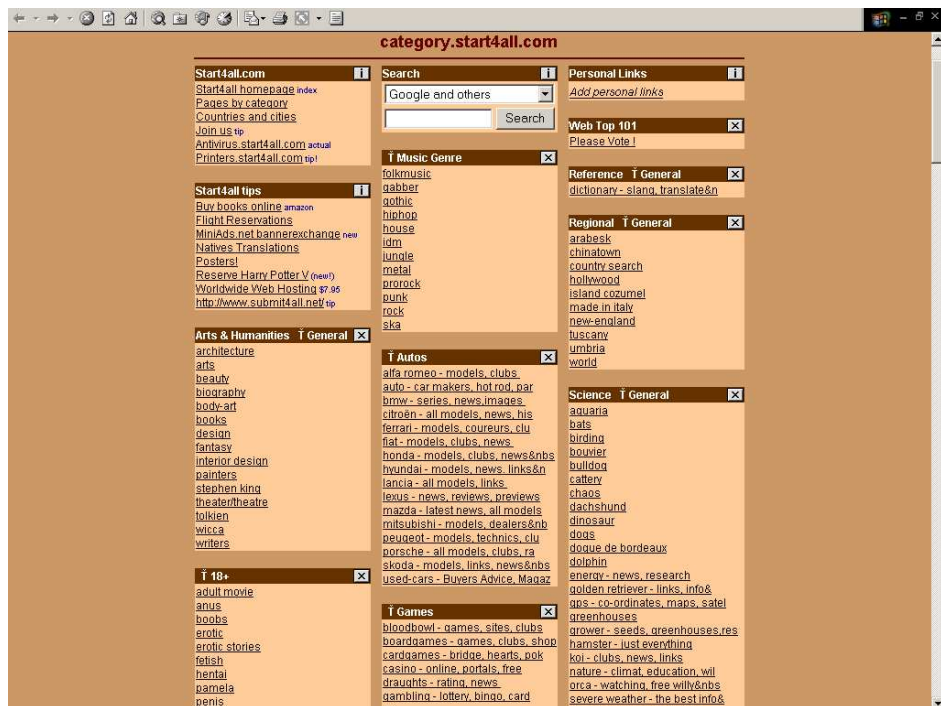
Note: *Conclusions could only be reach on applied implicit and community inputs from observed outputs.

Source: own construction

7. Power of Communities – Added Value in Collaborative Filtering

As already described in this paper, collaborative filtering involves processing the information (interactions, ratings and reviews) received from users, finding the closest neighbours and generating recommendations from the above. Subsequently, these user interactions might even develop into independent contents and the Internet users themselves may become “algorithms” of collaborative filtering. In this way the basis for a new business opportunity is created which is illustrated by the initiative of a Dutch site called start4all.com.

Figure 1. Start4all.com – online knowledge base and recommendation system



Source: <http://category.start4all.com>

Downloaded: 2 Dec. 2007.

If there is desire to buy a second hand car and the words “second hand car” or “car dealer” are typed into Google, the search engine shows several hundred thousand hits. In such a case, it seems more hopeful to go and visit the dealers than to visit their websites. This is where digital catalogues can help in the retrieving and filtering of information. Therefore, obviously these catalogues have rapidly gained lots of users. Although these start pages do not have independent contents, they have become major starting pages in a number of countries worldwide.

The system itself is made up of simple boxes: the start page usually consists of a single page containing several boxes. Each box contains 5 to 15 links in a given topic. From the News box you get to the most important news pages while in the Telephone Directory box you find online phone book editors. In the Timetables box both local and international bus, coach and railway timetables are available. Each and every topic is located in a separate box.

Today start4all.com is like a global online editorial office with start pages coming to life in more and more countries of the world. In Europe, 23 countries have their own start page. Among them, Hungary's page has more than a thousand topics operated by a thousand "amateur" page editors. Some of them are fanatics (u2.start4all.com), and many consider this their hobby (modelcar.start4all.com) while others hope to earn some money in this way (business.start4all.com) or just want to tell the world about their job (antivirus.start4all.com). Although motivating factors are different, one thing is for certain; they intend to tell the world about their community or field of interests and show their own contribution to the worldwide web. By now, start4all.com's system has grown into a full-fledged online knowledge base with an editorial staff, editing principles and sales policy.

8. Summary

Using recommender techniques in online marketing can only bring success in selling top books, CD's, videos and home electronics goods online. This marketing technique could be a successful model for every web-based store including such products as wine, chocolate or clothing. Recommender techniques make it possible for click-and-mortar companies to formulate community recommendations (top lists such as Wine of the Week) using the purchase data at their disposal, and after analysing user profiles, they can design personal offers (using the method of closest neighbours) for their customers.

Collaborative filtering techniques do have their own problems. Quantifying consumer preferences, designing suitable algorithms and privacy concerns raise a number of questions where marketing still needs to find answers.

References:

- Ahn, H. 2006: Utilizing popularity characteristics for product recommendation. *International Journal of Electronic Commerce*, Vol. 11., No. 2., pp. 59–80.
- Allen, C. – Kania, D. – Yaeckel, B. 2001: *One-to-One Web Marketing*. New York, John Wiley & Sons, Inc.
- Cho, Y. H. – Kim, Y. K. 2004: Application of Web usage mining and product taxonomy to collaborative recommendations in e-commerce. *Expert Systems with Applications*, Vol. 26., Issue 2., pp. 233–246.

- Cosley, D. – Lam, S. K. – Albert, I. – Konstan, J. A. – Riedl, J. 2003: *Is seeing believing? How recommender interfaces affect users' opinions*. CHI 2003, April 5–10., Lauderdale, Florida.
- Goldberg, K. – Roeder, T. – Gupta, D. – Perkins, C. 2001: Eigentaste: A constant time collaborative filtering algorithm. *Information Retrieval Journal*, Vol. 4., No. 2., pp. 133–151.
- Huang, Z. – Zeng, D. D. – Chen, H. 2007: Analysing consumer – product graphs: empirical findings and applications in recommender systems. *Management Science*, Vol. 53., No. 7., pp. 1146–1164.
- Kandikó, J. 2009: Kódolt vásárló – behálózott fogyasztói. *Magyar Tudomány*, Vol. 170., No. 6., pp. 691–696.
- McNee, S. M. – Albert, I. – Cosley, D. – Gopalkrishnan, P. – Lam, S. K. – Rashid, A. M. – Konstan, J. A. – Riedl, J. 2002: *On the recommending of citations for research paper*. CSCW'02, November 16–20, New Orleans, Louisiana, USA.
- Mild, A. – Reutterer, T. 2003: An improved collaborative filtering approach for predicting cross-category purchases based on binary market basket data. *Journal of Retailing and Consumer Services*, Vol. 10., Issue 3., pp. 123–133.
- Newell, F. 2000: *Loyalty.com, Customer Relationship Management in the New Era of Internet Marketing*. McGraw-Hill, USA.
- Nikolaeva, R. – Sriram, S. 2006: The moderating role of consumer and product characteristics on the value of customized on-line recommendations. *International Journal of Electronic Commerce*, Vol. 11., No. 2., pp. 101–123.
- Peppers, D. – Rogers, M. 1993: *The one to one future*. Doubleday, New York.
- Peppers, D. – Rogers, M. – Dorf, B. 1999: Is your company ready for one-to-one marketing? *Harvard Business Review*, 77/1999, pp. 151–156.
- Riedl, J. – Konstan, J. – Vrooman, E. 2002: *Word of Mouse, The Marketing Power of Collaborative Filtering*. Warner Books, New York.
- Vandermerwe, S. 2000: How increasing value to costumers improves business results. *Sloan Management Review*, Vol. 42., pp. 27–37.
- Winoto, P. – Tang, T. 2008: If you like the Devil wears Prada the book, will you also enjoy the Devil wears Prada the movie? A study of cross-domain recommendations. *New Generation Computing*, Vol. 26., pp. 209–225.

**New challenges in management
science – the role of relationships and
networks**

The relationship performance in the field of university– industrial R&D cooperation

Márton Vilmányi

To provide the long term success of the relationships between innovative institutions – like universities, firms and bridging institutions – it is of key importance that regional developments be focused on the dynamisation of knowledge centres and increasing competitiveness. One of the elementary pillars is the long term co-operation between innovative institutions. In this case, focus is placed upon the success of co-operation and two questions are asked: How can the projects within the co-operation be successfully managed and how can a co-operation containing different ranges of projects be managed? Research conclusions are still ongoing with the latter question. The economic results and benefits from the university-industrial R&D co-operation are clearly explored and presented. Therefore, the approaches which describe the performance of the university-industrial co-operations, highlighted by the discrepancy of the different approaches are analysed. On the basis of qualitative research, a motion is made of the adaptability of the discrepancy resolving performance model.

Keywords: university-industrial co-operations, relationship performance

1. Introduction

The capacity and manageability of relations between universities and industries has special significance in the age of heightened support for such co-operative research and development (R&D). Relationship performance – as the economic advantage of co-operation between organisations – appears as a concept enjoying rather large interest in the concerning literature. Relationship performance appeared as the “by-product” of relationship marketing and management analyses in the 1990s, while at the time of the millennium, results of analyses targeting factors impacting the capacity of relationships started sprouting everywhere.

The objective of this paper is to present the specialities, along which performance relationship can be characterised in the field of vertical university-industrial R&D co-operation³, and what factors can describe it; in other words, what

³ For the purposes of this study, hereinafter, vertical R&D co-operation realised in relation of university and industrial actors will be regarded as all series of interaction including a line of development projects regulated by contract and realised between a university unit and corporate partner where central results and the private goods and the relation and position of various projects are clarified in the research co-ordination of the university.

advantages derive in the field from maintaining the relationship itself? The article explores the aforementioned problem along three main thought-lines. The initial part features the main approaches to the profitability and effectiveness of vertical university-industrial co-operation both from universities and industries perspectives, pointing out the problems of the approaches that have been identified. In the second part, the results of the qualitative analysis initiated to resolve those problems have been described. While in the final part, relying partly on analytical results, a model is presented that is capable of describing the performance of vertical university-industrial co-operation.

2. Interpreting relationship performance during university-industrial vertical R&D co-operation

Focusing on the performance of R&D co-operation during examination, a field that is difficult to manage is identified. In R&D co-operation (primarily in the case of vertical co-operation), the concept and relation of service provider and user is valid and observable. However, if that which is in a non business-business relationship system is interpreted, significantly different interests and expectations can be identified, which make the evaluation of the performance of the co-operation complicated.

University and academic research traditionally targets the creation and deepening of basic knowledge and its integration into the general educational order. The academic sphere focuses primarily on new scientific fields not yet covered, which are useful in providing a long-term aspect in the topics of basic and applied research and which serve as a basis for training future scientists, experts and researchers (Santoro 2000). Requirements towards co-operation on the public side can be summarized as revenue production, widening the political base, maximizing prestige, research-educational overflow, increasing reference and reputation, acquiring human resource capacity, increasing its exploitation, acquiring tools, etc... (Slaughter–Leslie 1999). In contrast, business partners are interested in selling research results and the applied solution of problems, which are capable of maximizing profitability and the wealth of stakeholders, reducing risks, increasing market share, revenues or the economies of scale (Hagedoorn et al 2000, Santoro 2000, Barnes et al 2002, Tijssen 2001, Okamuro 2007, Harabi 2002).

Omta and de Leeuw (1997) attempted to resolve the problem by starting out from a buyer-oriented approach during the definition period of the co-operation performance of the two parties. According to the authors, performance – in this context – is the most efficient combination of resources used by all participants of the suppliers' network so that it leads to high quality and a cost-efficient buyer-service. This means that the organizations must ensure that they provide good services to their buyers in the given time and in good quality. On the other hand, it

also means that they must be able to increase efficiency (good things are to be done well). Therefore, returning back to the traditional approach to performance, the latter compares the output with the invested input and with the visible use of the output gained by the buyer. While the input invested in co-operation is easy to describe as the output of R&D co-operation, there is a fundamental differentiation between output focused on an academic community (research performance) and output focused on industrial and governmental users (users' performance). Regarding output focused on industrial partners, the intellectual value (patent, licence, etc.) that was created as a result of the co-operation (innovative performance) and the process-performance provided during the co-operation as efficiency, which includes maintaining the preliminarily stipulated cost and time frame (industrial performance) are evaluated as performance.

At the same time, performance management experience shows that performance cannot be regarded as a homogenous concept, that would be an exaggerated (although during research, in many cases, practical) simplification to limit it to the results. Barnes et al (2002), while examining the relationship system of Warwick University and the Warwick Manufacturing Group with qualitative tools, emphasizes that results (which the authors define as owners' profit, technological innovation, continuous support of research programs, submission of publications and patents, the realization of students' projects and the strengthening of students' recruitment), project management, ensuring equality and monitoring (which are enforceable through the management of objectives and resources, communication, balanced power relations and stability), and general success factors (which include factors like learning, or good personal relationships) can be accounted for as central factors of the success of co-operation. This logic suggests that the result-process-abilities approach applicable to the description of the performance of supplier-buyer relationships is also valid in an R&D environment, which is underlined by Daniel et al (2002), which, as a result of a quantitative examination of 58 American co-operation research centres, describes co-operation performance with that logic. In this latter model, result is modelled with satisfaction and commitment, while processes with technology transfer behaviour. Abilities are defined as research capacities.

If, therefore, the applicability of the result-process-ability approach is accepted, it is worth reviewing what factors influence it based upon research done so far, and which factors constitute an integral part of the performance of vertical R&D co-operation.

Branstetter and Sakakibara (1998) provides a pronounced proposal for the result-side evaluation of the performance of R&D co-operation, stating that research productivity can be defined as co-operative R&D performance, manifesting in the number of patents created from it. This performance can primarily be defined as the technological performance of R&D co-operation, which although, the argument goes, only presents part of the acquired economic profit, at the same time, the

various co-operations and branches of industry become comparable due to the construction (Branstetter–Sakakibara 2002). Revilla et al (2000), however, present arguments in favour of the technical and economic dimensions having to be evaluated during the evaluation of the results of co-operative R&D. The authors' performance definition relies on simple and well applicable logic: (1) performance is relative; its size significantly depends on starting conditions, against whom the relative size and adequacy of output can be measured; (2) both technological and economic performance must be considered during its evaluation. They apply three input and three output variables to describe performance in their analytical model. As input variables, they define the total revenues of the company, the number of employees (at the company) and the total R&D budget, while output variables include the number of patents deriving from co-operation, the number of those employed due to co-operation and total revenues generated by co-operation. Miotti and Sachwald (2003) got a similar result, also describing the efficiency of R&D co-operation with two variables, patent productivity and the proportion of innovative products within total revenues. During defining, the authors start out from the fact that the productivity of R&D activities can be described along two factors: first, technological productivity (that is, whether during R&D any result has been achieved that constitutes a technological novelty) and second, the success of market enforcement, which, separated from the former is evaluated more as the success of production and/or marketing. The same definitional result forms the starting point of Okamuro (2007) with a supplement, according to which technological success is grasped as a patentable or a subjectively valuable result (and not merely evaluating the established patents, but shifts towards a value-based approach). The author also extends business success and defines it to the extent of which co-operative R&D contributes to the increase of sales.

Among the approaches pointing beyond the evaluation of results, Brinkerhoff (2002) is to be highlighted. According to which, performance cannot be narrowed down to financial performance, but the processes that bring it about must also come in focus. The author also states that performance cannot be approached exclusively from the side of the achieved results in the case of public institutions either. In his analogy, he shows that although price/value ratio of the created products and services is also an important aspect in the case of the private sector, investors are, at the same time, interested in the effectiveness and efficiency of their creation as well. Song et al (1997) also provides an examination along the lines of that approach, as pertaining to the effects of internal and external factors and inter-functional communication on the development performance of a new product in the case of cross-functional co-operation. The analysis from our aspect is important regarding grasping performance which is described with product quality, product development speed, conjunction of product development objectives and the success of the program. According to the authors' aspect, the real value of cross-functional co-operation is the potential that can increase the performance of the company on the

market, which can be displayed in many indices (product quality evaluation; development of cycle time; cost decrease; profit from projects, sales or market share). According to the authors, cross-functional co-operation primarily supports the conclusion of development projects in time, within the budget and in accordance with preliminary plans. Therefore, quality and the time factor are to be highlighted, since they result in a tangible competitive advantage, while other economic factors are described by the success of the program and the fulfilment of the objectives. Harabi (2002) also analyses a model managing both results and processes where during the analysis, the efficiency of R&D co-operation is modelled with 6 fundamental variables: patent protection, planning schedule, discretion, the complexity of product design, the running time of products and the long-term employment of qualified staff. In contrast, the author deals with the success of R&D co-operation separately, as described by achieving objectives. He deals with the following objectives as variables from the aspect of vertical R&D co-operation: first, objectives concerning cost decrease, second, objectives serving expansion on global markets, and third, objectives serving the creation of new local markets. During his analysis, however, Harabi touches upon a further intriguing question: how can it be evaluated what values the source of innovation carries in the case of co-operation among two parties? This question leads to the interpretation of co-operational abilities.

The joint interpretation of results, processes and abilities (Barnes et al 2002, Daniel et al 2002) has already been mentioned. Besides the aforementioned, it also must be taken into account the approach of Belderbos et al (2004), according to which the performance of co-operative R&D can be grasped in: risk and cost sharing, shortening the development cycle, exploiting economic advantages, like economies of scale, synergic effects or a more efficient utilisation of the resources of participants, learning realized through monitoring technologies, market development, and an increased access to governmental subsidies.

As a result of the literary survey, it may be summarized that the performance of R&D co-operation at the level of results can be defined as technical and economic performance. It can be defined at the level of processes as the shortening of development time, the success of planning and realization, the success of communication and as a fulfilment of other specific processes. While in the aspect of abilities, learning, personal relationships and research capacities can be defined.

At the same time, the analyses of public-private R&D co-operation show a very controversial image. Omta and de Leeuw (1997), for instance, state that the control of the processes of co-operation between research institutions and businesses has no significant impact on results, while Daniel et al (2002) concludes that processes (in their model, communicational behaviour) have a decisive impact on satisfaction. On the other hand, Miotti and Sachwald (2003) found empirical evidence that in the case of co-operation with public-type institutions technological performance was high (beside a lower level of economic performance), and the

quantitative analysis of Okamuro (2007) leads the author to conclude that co-operation with universities has a negative impact on economic performance, while no significant impact on technological performance. Belderbos et al (2004), at the same time, finds that university-industrial co-operation has a positive impact on the productivity of innovative sales (economic performance). Upon interpreting the various approaches, two problems emerge during the evaluation of the performance of R&D co-operation. First, during the evaluation of the performance of R&D co-operation the performance of projects and the performance of co-operation are not separated. That is a problem because, if the two concepts were separated, it would become clear that the performance of co-operation has an impact on the performance of projects. Also, the lack of interpreting network relationships can also be identified as a problem. The various interpretations attempt to define the performance of co-operation separately (focusing on dyads), while at the same time, especially in the case of scientific and technological co-operation, network relationships can be decisive. In that aspect, Tijssen (1998) is very clear in stating that public-private R&D relationships manifest in an industrial contractual research in a network implemented by the research institutions. The inputs, interim results and outputs of such a network are extremely diverse. They depend on human resources, codified scientific knowledge and the connected hidden knowledge to manifest technological results like patents, technological designs, tools, parts, and prototypes. Such technological networks play a key role in inter-sectorial communication and in the interaction of knowledge-intensive fields and industrial branches.

In order to resolve these two problems, within a qualitative analysis, the model of the performance of vertical university-industrial co-operation has been prepared.

3. The performance of vertical R&D co-operation: findings of the qualitative analysis

3.1. The background of the analysis

The topic of the qualitative, interview examination was the specialties alongside which relationship performance could be described in the field of R&D co-operation and the factors it could be described with. In other words, what advantages derived in this field from the maintenance of the relationship itself? The research objective was designated so as to define the possible factors of the concept, from a perspective considering both the service provider, as the supplier, and the user of the service, as buyer, based upon the result-process-ability approach identifiable from the literary analysis of relationship performance. The research methodology approach is qualitative and exploratory. In order to establish the model, in-depth interviews were made with both service providers and users in the field of their R&D co-operation in

a total of 20 cases. The subjects were corporate and/or research institute contact persons of a given co-operation and experts assuming a bridge building role in the field (R&D consultants and technology transfer experts). When selecting contact person subjects, it was a condition that the subject had fulfilled the role of contact person or project manager of at least one co-operation that contained at least two already concluded projects. While in the case of expert subjects, it was a condition that the subject had participated in the development of at least three co-operations in the past three years that contained at least two concluded projects. The analysis witnessed eight corporate, eight university and four expert queries concerning Szeged and its surroundings and Düsseldorf and its surroundings. Topics of the expert interviews were the following:

- a/ interpreting the meaning of relationship performance
- b/ financially decisive and financially less interpretable factors of relationship performance
- c/ impact on relationship performance by third parties (the network aspect of relationship performance)

The interpretation and factors of performance were explored along four aspects during interviews:

1. Profitability of relationship-building and its conditions (see Medlin 2003, Medlin et al 2005, Leuthesser–Kohli 1995).
2. Changes in the expenditure and advantages of developing and maintaining co-operation during the course of time (see Storbacka 1997, Heide–Stump 1995, Kalwani–Narayandas 1995).
3. Analysing the advantages and expenditure of co-operation in a way that the service provided/used within the co-operation was compared with a similar service provided/used without any partnership (see Joseph et al 1995, Brinkerhoff 2002).
4. Analysing the advantages and expenditure of co-operation through comparison of a productive and successful and a productive but problematic co-operation.

3.2. Key responder results

3.2.1. Profitability of relationship–building and its conditions

Research institute responders regarded establishing and maintaining a co-operation profitable if it resulted in continuous and predictable revenues, decreased alternative partner-seeking costs (emerging separately in the case of individual projects), provided foreseeable capacity utilisation (labour force and labs) and also offered (publishable) scientific results beyond fulfilling the project. The co-operation could also be found profitable if there were financially tangible advantages like revenues, the predictability of capacity utilisation, and decreasing purchasing costs. Exceeding the expenditures of developing in maintaining the co-operation were things such as

labour costs, travel and accommodation costs, conference costs, representational costs, communicational costs, and the costs of submitting applications. Advantages of co-operation mentioned that are not directly in financial terms are flexibility emerging between the partners, providing services adapting to the demands of the partner, the development of a partner-oriented approach, project generating in many fields, multi-field support of each others' activities, the creation of patents and preparing publications and references.

“Two fundamental productivity requirements must be highlighted in the case of every co-operation...first, the co-operation must contain projects that generate revenues...second, a scientific ‘delicacy’, a novelty must emerge from the co-operation, because there is no capacity for scientific content to be separated from industrial projects... The co-operation is worth developing, if the combination of the results created in the two fields is more valuable than the expenditure of the development and maintenance of the relationship.” (One of the university respondents.)

The corporate side saw the condition of the profitability of co-operation primarily in increasing or the possibility to increase the tightness of the relationship. According to corporate co-operators, the performance of a good relationship appears in the fact that project objectives are defined jointly and, as a result, answers to emerging problems can be found at a lower expenditure rate. The co-operation is profitable if the financially tangible advantages like lawyers', communicational, travel, telephone and representational costs, personnel expenditure invested in the development of the relationship, the costs of the development and maintenance of control mechanisms and reputational costs emerging within the company during proving the necessity of co-operation are lower than what the revenues deriving from the co-operation, the shortening of development time, savings on recruitment costs and, possible, sales of other products of the company constitute. As part of the financially intangible advantages of co-operation, companies mentioned the deeper familiarisation with each other's demands and competences, joint individual and group level learning, the development of individual relationship capital and expert relationship net, and, due to R&D relationships, the development and expansion of the acknowledgement of the company.

“Basically the advantages deriving from getting to know each other's demands and competences can be highlighted from the relationship system. The common learning process and satisfaction deriving from useful products and services are important.”(Respondent from one of the companies)

According to experts, the development of co-operation primarily means expenditure where partners are motivated either by communication (work time) or financial motivation. Returns for all that are to be covered by other projects initiated in the co-operation. Expert interviews emphasised informal advantages as *“...providing a position for each other, ...providing information, providing access to own acknowledgement, providing vouchers for other rights, ...access to other*

resources” as non-financial advantages of co-operation, highlighting the role of references and recommendations.

3.2.2. Changes in the expenditure and advantages of developing and maintaining co-operation during the course of time

During the examination of the changes in returns and expenditure of co-operation in time, research institute responders underlined that an inverse relation could be observed during the course of the appearance of expenditure and revenues. *“The life-curve is interpretable here too ...initially, interaction is very frequent, then – with the increase of confidence and the knowledge of each other’s demands – it decreases”*. Accounted advantages appear in later phases. In the case of financially less-tangible advantages, research institute actors experienced continuous growth during the development of the co-operation. They emphasised the increase of flexibility, the improvement of planning punctuality, the emergence of other fields of development growing out of the co-operation, a partner-oriented development of the academic way of thinking, and the realisation of common learning.

“A central budget research location is rather rigid, and it is invaded by a completely different logic, or approach. The result of that is that the rigid, academic way of thinking gradually eases ...Learning also appears as a significant profit. It is obviously mutual, but I can only comment on what I have learnt: for instance, how to create a good application, and also various economic skills, how the partner company operates, what magnitude and type of efforts are required in its maintenance, what their processes are like, what is important to them...” (One of the university respondents)

According to corporate findings, following the phase of the establishment of the co-operation, personnel expenditure demanded by a single project decreases, while the number of projects increases. Corporate participants highlighted the increase in the acknowledgement and reputation of the company and the realisation of common learning among financially intangible factors during the development of the co-operation.

“The increase of advantages can be explained by the increase in the number of projects. Acknowledgement within the company has significantly grown ...however, to what extent university co-operation contributed to that, is an exciting question.” (One of the company respondents)

According to expert responders, the advantage of co-operation can be grasped in the decrease of formality with the assertion of the dimension of time. They believe that the decrease of formality results in the decrease of transaction costs. Simultaneously, willingness of payment by the user increases and the buyer uncertainty decreases towards the received service, so there is disposition to pay a higher price. Nonetheless, expert interviews also pointed out that this cannot be evaluated as a linear process, since the position of the partners is modified by external or internal environmental changes, which can trigger crises in the co-

operation and once again point towards formalisation and the increase of transaction costs. Responding experts highlighted the development of control and the shortening of informational paths among financially intangible factors during the development of the co-operation. They believe that the underlying reason for this is that if “...*co-operation works well, the star-shape – initially optimised to persons – turns into a network format ...*”, and the understanding of each other’s demands and opportunities quickens, communication improves; outputs appear sooner, deadlines are more easily kept and it becomes possible to integrate into the partner organisation better and more easily.

3.2.3. *Analysing the advantages and expenditure of co-operation and service providing without co-operation*

Research institute responders seldom identified new factors in the case of this item, with the exception of one. They did, however, underline the already mentioned expert opinion that states the decrease of the sense of risk of the user results in higher project revenues and is an important advantage of co-operation. Beyond the aforementioned, better predictability, scientific and publication proceeds and a higher flexibility of the project management appeared as important advantages of co-operation. “*It is not worth it without co-operation. There are no publication proceeds; while the cost and time spent on a routine examination is high ...It is difficult to enforce the loss of time in the price.*” The possibility of accessing new markets and new customers appeared as a new factor among the advantages of co-operation.

It was primarily corporate responders who unveiled new factors in the case of this item. They emphasised that co-operation, contrary to its non-existence, led to routines that could decrease organising, legal and control costs. “*...routine tasks can be delegated, but they would consume high organising and legal costs; responsibility would be difficult to enforce and the cost of control would be high.*” Besides that, as advantages of co-operation, they highlighted factors difficult to grasp financially, like a deeper understanding of corporate problems, getting to know each other’s demands, and realising co-operation based upon confidence.

“*...it is fundamentally satisfaction and a utilisable output meeting demands that easily emerges from a long-term relationship.*” (One of the company respondents)

Responding experts highlighted the confidence laid in R&D services, which they defined in a way that it “*...brings value into a relationship, opportunities, information, PR and results*”.

3.2.4. Analysing the advantages and expenditure of co-operation through comparison of productive and successful and problematic co-operations

Responders practically summarized their previous experiences along this item, which provided an interesting contrast of the expectations of the parties towards each other that the well performing co-operation was capable of managing. The parameters of successful co-operation, through the eyes of research institute participants, were the following: it had a clear definition of problems, clear objectives, good communication, good planning, a capability of following organisational changes of participating parties, good task sharing, a clear interest on behalf of parties and basic professional consensus.

“...A real-life example could be brought up when a large organisation was the co-operating partner. As opposed to successful co-operation, the problems there were due primarily to the fact that the co-operation was unable to follow the organisational transformation of the company, and the subject of co-operation, the conditions of evaluation, etc. were constantly changing...”(One of the university respondents)

(...)

“...In other cases, it can be problematic when the co-operating party knows what it wants, perhaps thinks it knows how to achieve it, but does not dig into the depth of the solution. It therefore constantly argues, and does not behave as a partner, but as a capacity using customer in a field where it otherwise has limited experience.”(One of the university respondents)

(...)

“Let us take, for example ... KFT. The industrial partner expected too much, the university partner promised too much. ...They did not fully clarify the objective, and their communication gradually went off track. The exciting part in all that was that after identifying the problem, the co-operation continued and the defined problem was solved.” (One of the university respondents)

The same topic on the side of corporate participants was worded as follows: *“...the partner is capable of facilitating the development project, it is not necessary to intervene, the level of conflict is lower”*. The results of expert queries successfully demonstrated the third side of the issue. Responding experts laid the emphasis on the relationship system of the parties under this item where they highlighted the following elements as characteristics of successful co-operation: *“...confidence + communication + willingness to co-operate ... + risk tolerating ability”*.

3.2.5. The impact of third parties on relationship performance

During the examination of the impact of third parties on relationship performance, three issues were fundamentally analysed: first, whether an R&D co-operation depended on third parties, second, what role third parties assumed and third, how strong the dependency was on third parties. Although the answers to the questions

could easily be anticipated in light of previous examinations, their analysis was important, since, from one point of view, a clearly negative answer given to either question could challenge the validity of modelling the network effect and, alternatively, it was the distinct objective to refine the already explored factor system of the network effect in accordance with the characteristics of the relationships.

As a result of the queries, it has become clear that R&D co-operations are definitely influenced by third parties. Among the latter, responders highlighted institutional administration, the public funder, the sponsor, consultants of the partners, other partners of the research institutes or the companies, the owners of the companies, the special utiliser and the user. The image presented by research institute participants identified rather diverse roles concerning the method of influence. Internal influencers had a primary impact on the creation of the framework conditions of the co-operation. The public funder either appeared as a potential supporter or obstructer due to the timely allocation of public funds. Corporate consultants or other institutions appeared as potential rivals or obstructing factors who were interested in acquiring projects feasible in the co-operation.

“If public funds appear in the project, the dependency on the third partner is very high. If we heed to the rules, these depending relationships are not decisive, but they do have an influence. The influence can be foreseen, it is a matter of decision, whether we want to exploit it. For instance, it is dangerous to constantly change the university regulatory environment, because that always results in new decision situations, concerning whether the parties wish to maintain the relationship alongside such conditions”. (One of the university respondents)

Corporate partners presented the role of third parties in a significantly simpler manner: the influencers provided a source, or could play the parties participating in the co-operation against each other. In concurrence with the aforementioned, responding experts identified both supporting and obstructing roles. Supporting roles appeared, if *“...third parties mediate, provide references, and the co-operation in many cases is not even established without them”*, while obstructing roles primarily shifted the interest of the parties from the jointly defined objective. Experiences were diverse concerning the strength of influence or dependency, which fundamentally had to be evaluated as case-specific. Research institute participants regarded the role of third parties as strong in the case of public funders, while in other cases, evaluated it as case-specific. Companies, as opposed to research institutes, were divided in the issue, partly regarded the role of third parties as insignificant, while some saw a decisive role designated to third parties concerning the result of the co-operation. Responding experts regarded the role of third parties manageable, that is, not having a decisive impact on co-operation. Based upon the aforementioned, it can be summarized that no strong dependence on third parties can be clearly assumed or discarded based upon this analysis.

3.3. The conclusion of qualitative findings

Table 1 provides a final summary of the findings of the qualitative analysis. During the course of preparing a model as the objective of the analysis, as an initial step, the features describing results were summarized and separated with the processes and abilities on the side of both the service provider and the user. That was followed by grouping factors describing similar phenomena within the main dimensions separately in the case of both the service provider and the user, based upon the conducted interviews.

The model was defined as reflecting the viewpoint of both the service provider and the user (considering from a common viewpoint) as a set of factors, mapping by dimension phenomena that had been written off in the case of both supplier and buyer. In order to filter out possible contradictions, or at least questionable results, a comparative analysis was realised between the result achieved that way and the results of the theoretical model relying only on the results of concerning literature.

As a result of the analysis, the success of the co-operation can be described by two factors:

- the economic productivity of the co-operation: economic productivity, due to a higher level of predictability of the projects of the relationship, includes a balance in the cash flow, a higher cost-efficiency of projects, and due to the informality of interactions, a decrease of relationship building and maintenance costs, and parallel to the increase of confidence, an increase in the volume of orders.
- the technical/technological productivity of the co-operation: the technical/technological productivity includes financially less tangible factors that nonetheless provide a good description of the economic results of the co-operation, such as the achievement of objectives, the quality of the provided/used services, and the creation of extra results not agreed upon preliminarily (or at least not denominated) during the project.

Table 1. The model of relationship performance concerning vertical R&D co-operation: the view of results

The field of relationship performance	The dimensions of performance			
	From the aspect of the SUPPLIER	From the aspect of the BUYER	From a COMMON aspect	The impact of the NETWORK
Results	Continuity of revenues		Predictability of revenues/expenditures	
	Predictability of revenues			
	Size of revenues per project	Expenditure demand of solving emerging problems	Cost-efficiency of projects realised in the co-operation	
	Decreasing partner seeking costs	Reputation costs within the company emerging during proving necessity	Decrease of relationship establishment costs	
	Cost of labour time used in order to establish relationship	Cost of labour time		
	Travel costs	Travel costs		
	Accommodation costs	Legal costs		
	Conference costs			
	Representational costs	Representational costs		
	Communication costs	Communication costs		
	Number of projects included in the co-operation	Number of projects included in the co-operation	Number of projects included in the co-operation	
	Service quality	Quality of service	Quality of service	
	Emergence of further development opportunities	Emergence of further development opportunities	Creation of intangible property of other utilisation	
	(publishable) Scientific novelty			
	Creation of patents			
	Achieving common objectives	Achieving common objectives	Achieving common objectives	
	Sources that can be used more freely	Revenues from the sales of other products		Strengthening PR
	Increasing the quality of education	Recruitment and selection costs		Reputation

Source: own construction

Table 2. The model of relationship performance concerning vertical R&D co-operation: the views of Processes and Capabilities

The field of relationship performance	The dimensions of performance			
	From the aspect of the SUPPLIER	From the aspect of the BUYER	From a COMMON aspect	The impact of the NETWORK
Processes	Good communication	Speed of information sharing	Success of communication	Acquiring market information
	Predictability of capacities mobilised for the sake of projects realised in the co-operation	Control costs	Success of planning and implementation	Providing access to acknowledgement
	Clearness of problems to be solved	A behaviour increasingly adapting to the partner organisation		Providing vouchers for rights
	Accuracy of planning			Profiting from each other's relationship system
	Predictability of management and organisational problems			Recommendations
	Professional consensus			Access to other sources (state)
	Good task division	Development of control, organising costs		Success of co-ordination
	Flexibility	Flexibility	Flexibility	
		Running time (development time)	Running time (development time)	
	Capabilities	Partner-oriented way of thinking	Willingness to co-operate	Willingness to co-operate
Getting to know each other's demands and competences		Getting to know each other's demands and competences	Getting to know each other's demands and competences	
Learning		Common individual and group level learning	Learning	
		Risk tolerating ability	Risk tolerating ability	

Source: own construction

The adequacy of the processes of the co-operation can be described by four factors according to the analyses:

- The adequacy of the communication applied during the co-operation, which means the adequacy of the information-flow among parties (the information reaches who and when necessary) and the speed of the information-flow.
- The adequacy of the management of co-operation, due to which the harmony of planning and implementation, and the coordination of co-operation improve during the co-operation.
- The flexibility of the co-operation, which describes the extent to which the parties can adapt their processes to each other.
- Development time realised during the co-operation, which describes the speed of the preliminarily defined R&D programs, compared to the experiences and demands of the partners.

Further developing capabilities created as a result of the co-operation are described by a further three factors:

- competence of co-operation, which describes co-operation willingness and the knowledge of the partner's organisation
- learning, which means acquiring professional and other skills during the co-operation with whose utilisation the partners are capable of increasing their own and their organisation's performance;
- Risk tolerating ability, which describes a higher level of confidence laid in the partner organisation.
- The applied factors and their definitions are summarized in Table 3.

Table 3. The summarised factors and their definitions: the view of results

Aspect	Applied factor	Factors describing factor	Definition of factor
Results	Economic productiveness of co-operation	Balance of cash-flow	a higher level of predictability of the schedule of revenues/expenditures
		Cost-efficiency of projects	cost-efficiency that the service provider senses in the decrease of the user’s price sensitivity, while the user experiences it through the decrease of the expenditure required to solve occurring problems (which include the price and extra costs)
		Costs of constructing/maintaining relationship	they manifest in the disappearance of partner seeking costs per project, the communicational cost savings of relations decreasing in frequency and/or becoming informal and the legal construction development cost-savings to be invested in order to deliver a given project
		Volume	it describes the increasing volume of commissions as a result co-operation
	Technical/technological productiveness of co-operation	Achieving common objectives	it describes the attachment of projects realised within the framework of co-operation to preliminarily agreed objectives as success
		Quality of service	it includes service results adapting to the demands of the parties
		Creation of intangible property of other utilisation	it means the creation of further development opportunities, patents, publications, or their basic idea that can be freely used by the partners

Source: own construction

Finally, the impact of the network can be described along the following factors, based upon the interview analysis:

- Strengthening PR, that is, the increase of the acknowledgement and value of the various partners towards third parties, due to the co-operation;
- Reputation, as the reference value of the co-operation for third parties;
- Acquiring market information, that is, the informational profit of the co-operation, which manifests in information conveyed on third parties through the partner or the partner’s behaviour;
- Profiting from each other’s relationship system, which manifests in a certain support function through access to each other’s acknowledgement, providing tools, databases, authorisations, etc, and through the advantages of recommendations towards third parties;
- Access to other sources, which primarily means better access to public funding or their utilisation.

Table 4. The summarised factors and their definitions: the views of Processes and Capabilities

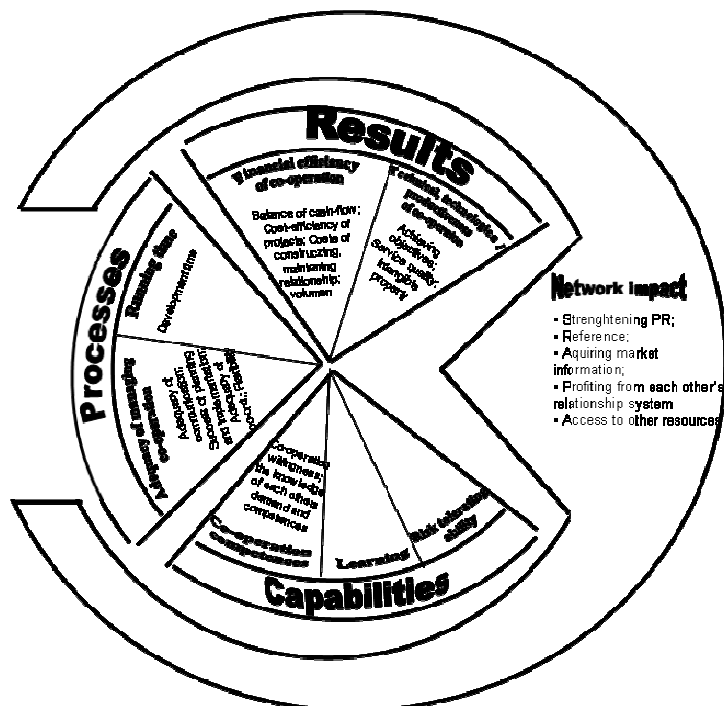
Aspect	Applied factor	Factors describing	Definition of factor
Processes	Adequacy of communication	Adequacy of communication	it means the adequacy of the information-flow between partners (information reach who and when necessary) and the speed of the information-flow
	Adequacy of managing co-operation	Success of planning and implementation	it describes a clear definition of problems, the accuracy of planning, increasing the predictability of emerging problems, the utilisation of capacities provided for realising the plan and simplified control mechanisms
		Adequacy of managing co-operation	it describes the improvement of task sharing and the improvement of the efficiency of control and organisation
	Flexibility of co-operation	Flexibility of co-operation	it describes to what extent parties are capable of adapting their operational processes
	Running time	development time	it describes the implementation time of preliminarily agreed development
Capabilities	Co-operation competence	Co-operation willingness	to what extent the partner can and is willing to think like the other partner and make proposals on solutions fitting for them
		Knowledge of each other's demands and competences	it shows the increase in the level of knowledge of the partner organisation with the passing of time
	Learning	Learning	it means acquiring professional and other skills during co-operation with whose utilisation the partners are capable of increasing their own and their organisation's performance
	Risk tolerating ability	Risk tolerating ability	it describes a higher level of confidence laid in the partner organisation

Source: own construction

4. Summary

To summarize the above mentioned results, the performance of the university-industrial co-operations can be described with the results from the consequences of ex post activities, with the process resulted from the existing co-operation and with the capabilities which provide the opportunity to co-operate in the future. Based on the researches and qualitative analysis, it can be established that co-operation has an intermediate role too, called network impact. The general model of the relationship performance is presented in Figure 1.

Figure 1. The model of the performance of university-industrial vertical co-operations



Source: own construction

The model suggests and discusses some “opened” questions: the relation between the several aspects of relationship performance; the relation between relationship success and relationship performance and the relation between network effect and relationship performance. To answer these questions requires a quantitative analysis with a larger sample. The exploration of the factors doesn't mean the solution of the problem, but it helps to get near to the two-sided utility maximization of the management of university-industrial co-operations.

References

- Barnes, T. – Pashby, I. – Gibbons, A. 2002: Effective University – Industry Interaction: A Multi-case Evaluation of collaborative R&D Projects. *European Management Journal*, 3, pp. 272–285.
- Belderbos, R. – Carree, M. – Lokshin, B. 2004: Cooperative R&D and firm performance. *Research Policy*, 33, pp. 1477–1492.

- Branstetter, L. G. – Sakakibara, M. 1998: Japanese Research Consortia: A Microeconomic analysis of industrial policy. *The Journal of Industrial Economics*, 2, pp. 207–233.
- Branstetter, L. G. – Sakakibara, M. 2002: When Do Research Consortia Work Well and Why? Evidence from Japanese Panel Data. *The American Economic Review*, 1, pp. 143–159.
- Brinkerhoff, J. M. 2002: Assessing and Improving partnership relationships and outcomes: a proposed framework. *Evaluation and Program Planning*, 25, 215–231. o.
- Daniel, H. Z. – Hempel, D. J. – Srinivasan, N. 2002: A model of value assessment in collaborative R&D programs. *Industrial Marketing Management*, 31, pp. 653–664.
- Hagedoorn, J. – Link, A. N. – Vonortas, N. S. 2000: Research partnerships. *Research Policy*, 29, pp. 567–586.
- Harabi, N. 2002: The impact of vertical R&D cooperation of firm innovation: an empirical investigation. *Economics of Innovation and New Technologies*, 11, pp. 93–108.
- Heide, J. B. – Stump, R. L. 1995: Performance implications of buyer – supplier relationships in industrial marketing - a transaction cost explanation. *Journal of Business Research*, 32, pp. 57–66.
- Joseph, W. B. – Gardner, J. T. – Thach, S. – Vernon, F. 1995: How Industrial Distributors View Distributor-Supplier Partnership Arrangements. *Industrial Marketing Management*, 24, pp. 27–36.
- Kalwani, M. U. – Narayandas, N. 1995: Long-Term Manufacturer-Supplier Relationships: Do They Pay Off for Supplier Firms? *Journal of Marketing*, 59, pp. 1–16.
- Leuthesser, L. – Kohli, A. K. 1995: Relational Behavior in Business Markets. Implikationen for Relationship Management. *Journal of Business Research*, 34, pp. 221–233.
- Medlin, C. J. 2003: *Relationship Performance: a Relationship Level Construct*. Competitive Paper, IMP Lugano, Switzerland.
- Medlin, C. J. – Aurifeille, J. – Quester, P. G. 2005: A collaborative interest model of relational coordination and empirical results, *Journal of Business Research*, 58, pp. 214–222.
- Miotti, L. – Sachwald, F. 2003: Co-operative R&D: why and with whom? An integrated framework of analysis. *Research Policy*, 32, pp. 1481–1499.
- Okamuro, H. 2007: Determinants of successful R&D cooperation in Japanese small business: The impact of organisational and contractual characteristics, *Research Policy*, December, Vol. 36., Issue 10., pp. 1529–1544.
- Omta, S. W. F. O. – de Leeuw, A. C. J. T. 1997: Management control, uncertainty, and performance in biomedical research in universities, institutes and

- companies. *Journal of Engineering and Technology Management*, 14, pp. 223–257.
- Revilla, E. – Sarkis, J. – Modrego, A. 2000: *An investigation public and private partnerships*. Academy of Management Best Papers Proceedings (Technology and Innovation Management), August, Toronto, Canada.
- Santoro, M. D. 2000: Success Breeds Success: The linkage between relationship intensity and tangible outcomes in industry-university collaborative ventures. *The Journal of High Technology Management Research*, 2, pp. 255–273.
- Slaughter, S. – Leslie, L. L. 1999: *Academic Capitalism. Politics, Policies and the Entrepreneurial University*. The John Hopkins University Press, Baltimore, Maryland.
- Song, X. M. – Montoya-Weiss, M. M. – Schmidt, J. B. 1997: Antecedents and Consequences of Cross-Functional Cooperation: A Comparison of R&D, Manufacturing, and Marketing Perspectives. *Journal of Product Innovation Management*, 14, pp. 35–47.
- Storbacka, K. 1997: Segmentation Based on Customer Profitability - Retrospective Analysis of Retail Bank Customer Bases. *Journal of Marketing Management*, 13, pp. 479–492.
- Tijssen, R. J. W. 1998: Quantitative assessment of large heterogeneous R&D networks: the case of process engineering in the Netherlands. *Research Policy*, 26, pp. 791–809.
- Tijssen, R. J. W. 2001: Global and domestic utilization of industrial relevant science: patent citation analysis of science–technology interactions and knowledge flows. *Research Policy*, 30, pp. 35–54.

Different motivations in the network co-operations of the small and medium enterprises

Szabolcs Imreh

It is well known that both small and medium-sized enterprises play significant roles in economic development. One of the main problems of these types of businesses stems from their size, which often causes serious difficulties like relatively high transaction costs and the inability to exploit the economies of scale. Possible ways to approach these challenges are in the different co-operation networks.

In recent research, the motivations that lead to networking are reviewed. There are several explanatory causes why certain enterprises seek the opportunity to cooperate with others. Generally, the main objective of the co-operation is to reach such benefits that can not be independently achieved, or ideally to achieve collective efficiency. The wide-ranging literature of the topic has been systematized to point out those factors that are most commonly mentioned as the benefits of co-operations. In most cases, if these causes arise as explanatory factors of co-operation, it can be assumed that they determine the peculiarities of networks.

The last part of the paper presents the results of two empirical surveys that were conducted in Szeged and its sub-region. They demonstrate the nature and the expected benefits of co-operations.

Keywords: networking, small and medium-sized enterprises, co-operation, motivations

1. Introduction

In today's economy, various networks, clusters and co-operations appear more frequently. In the "vast forest" of different co-operations, it is harder to find their method for both the practitioners and the theoretical experts. According to the simplest approach, the enterprise network can be defined as the system of relationships between companies (Kocsis 2000). The co-operation formed between enterprises can be categorized by the strength of the mutual trust and dependence, and by the impact on the competitiveness; separating several co-operation forms from the quite loose "alliance form" to the common production networks based on close relationships (Malecki 1997, p. 181.). In the real economic life, of course, there may be co-operations that show certain features of every characteristic.

Moreover, it is important to highlight that the network co-operations between enterprises in certain cases can be considered exactly as the antecedents of clustering. It has been observed that very successful clusters often develop on the basis of an operating network. According to the literature classification the network-based clusters form a distinct group (Imreh–Lengyel 2002).⁴

After the brief conceptual delimitation, the more detailed examination of the network relationships is touched upon. However, it has to be noted that a significant proportion of the subsequent findings applies to almost all the co-operation forms to a certain extent. This study focuses on the network-type co-operations because the current economic development level of Szeged and its surrounding area creates an opportunity, especially for such co-operations. The networks can be classified in many ways, but both the number and the organizing principle of the various classifications in literature are practically impossible to survey. In the literature analysis, thoughts are briefly synthesised related to the categorising of network motivations exclusively.

2. Basic types of network based on motivations

There are many explanations why certain enterprises seek the co-operation opportunities with other partners. It is a generalised statement that the main objective of enterprise co-operation is to attain benefits that cannot be achieved by individual efforts (Brito 2001), and more expressively, to attain some kind of collective efficiency (Schmitz 1995). This sphere of thought also includes the realization that in the network co-operation, the enterprises also can use such resources to reach their aims that they do not own individually (Szerb 2003). A similar definition of the enterprise network is that, in fact, it is the entirety of relationships in which the entrepreneur is involved in and which provides him/her with important resources (Drakopoulou et al 2002).

Clearly, the motivations are extremely significant in the creation of networks and in the development of their form and operating characteristic. From the divergent written background, attempts were made to take out the factors which are mentioned the most frequently, such as the advantages for the partners in the co-operation. The wording used in this case was made on the basis of the most often mentioned different motivations, since it is assumed that these causes come up most frequently as the motives of co-operation. The classification is quite similar to the

⁴ We hope that the networks of innovative small and medium enterprises organized around the University of Szeged will belong to exactly to this circle, which can be the forerunners of the subsequently developing clusters.

wording formulated by the DG Enterprise (DG ENTR 2004), with the modification that the advantages of decreasing the transaction and the transformation costs – as motivations – are managed in one group. Based on the several classifications in the written research, the following five, substantially different motivations can be separated which can stimulate small and medium enterprises to cooperate (own wording based on DG ENTR 2004, Johannisson 1997, Lechner–Dowling 2003, ADAPT 2001, OECD 2004):

- access to sources, loosening resource-barriers,
- gaining cost advantages,
- better access to the market,
- increasing “being accepted”, desire for recognition, and
- Acquiring some kind of new knowledge and understanding.

In addition, of course, there can be many other reasons for the co-operation of enterprises; however, these reasons for co-operation appear in case of almost all the co-operations with certain significance. In the course of the examination, the categories were interpreted in the widest sense; however, we focused on the most important characteristics in the theoretical overview. A more frequent cause, for example, is the “networking as the source of growth”, that is, the enterprises cooperate in the interest of their development (Lechner–Dowling 2003). It is basically not a special reason for networking, but one of the prime motivators of all profit-oriented activities. It is due to the desire for development, exactly, why the enterprises want to make use of the above mentioned possibilities; since all the activities, from loosening the resource-barriers to acquiring new knowledge, serve the development, and at least the survival, of the company.

The changing importance of motivations is extremely interesting. In the past, the so-called “hard” factors (the first three mentioned above) were given greater emphasis amongst the reasons for networking. By contrast, in the past few years, the “soft” advantages (which can be hardly or not at all quantified), like “the sense of belonging and the spread of knowledge in some way”, have been increasingly appreciated. Of course, it is largely dependent on any given small and medium enterprise and the unique characteristics of the network that specified significance can be attached to each motivation.

2.1. Loosening the barriers

Several studies indicate that the small and medium enterprises meet various barriers in almost all cases during their development. The development of networking is often aimed at breaking down the resource barriers. The networks based on “resource-links” are separated as a distinct type in the literature as well (Ford 2003). These barriers are interpreted in various ways, thus it can often be difficult to

determine what exactly the obstructive factor is the focus of the examination. In the present study, the examination is restricted to reviewing three fundamental “resource-types” which are essential for running successful enterprises. In the classification, these basic resource types in theoretical economics were because they are considered to be the bases of the entire business activity:

- Breaking down the barriers of “infrastructural character” may be one of the movers of the networking of small and medium enterprises.⁵
- One of the most serious problems in the life of small firms is overcoming financing problems, and obtaining especially the sources.⁶
- Finally, the so-called human-factors may be barriers in many cases in the operation of enterprises.⁷

In the national written research, it is an often mentioned factor, and it is outlined in the documents of great significance, that one of the most important objectives of co-operations is breaking down such barriers through sharing available resources (DG ENTR 2004, ADAPT 2001). Often, the fundamental problem is that the small and medium enterprises are not able to acquire the necessary capacities, and if they do manage to obtain them, they mostly cannot exploit them. (It is a general economic statement that the enterprises aim to make the best use of their capacities in any case; the unused capital means a very serious competitive disadvantage). The common use of capacities provides a good solution to both of these problems, because it is able to remedy such disadvantages of firms in both cases. Besides the regular forms of common capacity use (enterprises of similar size and strength use some kind of machine or equipment jointly), extremely interesting solutions have developed as the consequences of market processes. For example, an interesting form, a solution worked out by Furnitrio, is where a larger (integrator) enterprise provides the capital goods necessary for the operation of the smallest firms (Varamäki–Pihkala 1997).

Finally, human factors are included which are extremely important for co-operations. It is also a frequently claimed explanation that one of the greatest barriers of the more productive and more efficient operation of small and medium enterprises is the entrepreneur him/herself. He/she often makes inappropriate

⁵ In the research paper, the term “capital” is deliberately avoided since – as a consequence of inaccurate use – it can often lead to misunderstanding. The goal is to separate it clearly from the financing issues.

⁶ The issues related to financing significantly go beyond the frame of the study, thus they are not discussed

⁷ The human factors are interpreted here in a slightly different way compared to that of the theoretical economics, all the (human) factors are listed here from the professional knowledge to entrepreneurial skills.

decisions, does not have sufficient information about the market challenges, and lacks the necessary experience. Within the co-operations, especially with the help of informal networks, this disadvantage can be moderated. The small enterprise can benefit from the relationship capital existing within the network in several cases. It may help with the identification of business opportunities (Hills et al 1997, Singh et al 1999), and it can often be significant in supplementing the missing skills and capacities (Johannisson 1997). It is particularly important in the early stages of the company's life (Johannisson et al 2001), and there is an increasingly developed literature on the importance of the social networks in acquiring the necessary skills to start an enterprise (Hansen 2000).

2.2. Gaining cost advantages

Every enterprise operating in market circumstances is exposed to the competition. Therefore, it is difficult to imagine a situation in which reducing the costs would not be part of the business strategy. This finding is particularly true to the small and medium enterprise sector, since, for reasons of economies of scale, it is disadvantaged in comparison with the corporate sector. Consequently, it has to pay increased attention to minimizing the costs. The network co-operations implemented in appropriate forms are especially suitable to decrease costs (DG ENTR 2004). Within the reduction of the costs, it is worth separating the moderation of the transactional and the transformational costs, although there is no doubt that the co-operations are suitable for decreasing (saving) both kinds of costs (Mundim et al 2000).

In the life of the small and medium enterprises, the transactional costs are crucial (Kállay–Imreh 2004). These costs can be reduced during the co-operations, this is why, amongst other things, the economics of transactional costs have an important role in the theoretical establishment of the network co-operations (Varamäki 1996). With the help of the co-operations, these necessary costs can be significantly decreased (DG ENTR 2004). The reduction of the transformational costs is also essential for the small and medium enterprises. The network co-operation here is also an “outbreak point”, since it provides for the possibility of flexible specialization where everyone can contribute to the activity of the co-operation with the suitable core competence (Salmi et al 2001). This flexible specialization usually reduces the participants' costs because everyone does what they are the “strongest” in. However, it is at least just as important to note the fact that the suitable specialization can also help the cooperating partners to produce products and services of a higher quality. In this sense, it is not only suitable to gain cost advantages, but also there is a substantive competitive factor in networking through quality.

2.3. “Better access” to the market

The “better access” to the market motivation factor is the most complex and the most difficult to define in a precise way. Therefore, instead of specific limitation, the goal is to define the concept with the most important content elements. As a result, all the advantages that make the access to the market and/or remaining on the market easier may fall into this category; from the marketing co-operations to the higher added value that can be created jointly. The most important realizable advantages can be understood through different ways.

As a supplier, an enterprise faces demand that it would not meet otherwise. In this case, the coordination of the access to external markets is often implemented through the integrator firm (Gereffi 1999). The cooperating firms can exert more significant market power both on the demand and the supply side, that is, due to the co-operation, they can complete the purchases under such conditions and reach such markets which they could not attain on their own. In simpler terms, the market opportunities of the firms increase during the co-operation (Elfring–Hulsing 2003). It can receive considerably better and more useful market information. This factor is closely connected to the abovementioned; graphically it is placed between the “increasing opportunities” and the “acquired knowledge”. It is commonly known that the various co-operations are suitable for breaking down the information barriers (DG ENTR 2004, ADAPT 2001). During the co-operations, greater added value can be created, which contributes to achieving better market results through selling products of higher quality (Pietrobelli–Rabelotti 2004). The increase of added value through co-operations may be implemented from the product development to the developments created in the co-operations between different sectors (Humphrey–Schmitz 2002).

Consequently, gaining better market opportunities is one of the most important motivators of the co-operation between enterprises. Besides these directly realizable advantages, however, there are several other motivation types, based on so-called soft factors, which can be observed. In such cases, the firms profit from the co-operations in a more indirect way. In the following, the two most significant of these types are reviewed.

2.4. Increasing “being accepted”

It is an increasingly significant motivation factor for enterprises that being involved in networks can contribute to developing the image of the firm. Moreover, it is a more frequent opinion that belonging to “quality” co-operations is almost a brand, which means a positive message to the both potential partners and especially the customers. Particularly in the case of start-up enterprises, these types of the so-called

“reputation networks” appreciate. We have to note that these networks often overlap each other with the KIT-networks discussed later on (Knowledge, Innovation, Technology). In light of experience, they can greatly support the start-up enterprises in overcoming the initial difficulties. More expressively, if a certain firm does not have a high-ranking partner, it often has difficulty in surviving the initial period (Lechner–Dowling 2003). Its additional significance is the guarantee of quality by such partner(s), which is a great help with creating increased relationships for the participants. Such co-operations indicate to the others that a certain firm may be a reliable partner. Empirical surveys prove that the co-operations promote the enterprises attaining both the quality and the quantity possibilities; moreover the lack of such relationships may directly lead to the increase of obstacles (Lechner–Dowling 2003). Under similar considerations, the issue of networks “providing legitimacy” is discussed, which helps especially during the initial start-up for small and medium enterprises to gain recognition and acceptance. In the case of these firms, the co-operation with some kind of higher education institution or research institution provides the legitimacy needed for building additional relationships (Elfring–Hulsink 2003). Considering the nature of today’s rapidly changing economy and the practically infinite number of potential partners, the greatest significance of these network types is their help to overcome the completely natural barriers resulting from distrust.

2.5. Acquiring some kind of new knowledge and understanding

There are few areas of examining the co-operations between enterprises which have been emphasized in the research as much as the new knowledge acquirable by networking. Several different names are used in the national and international research literature, from the learning networks to the co-operations marked by the increasingly popular acronym KIT (Knowledge, Innovation, Technology). In the KIT-networks, the basic objective of developing a partnership is always acquiring or creating some kind of new knowledge, skill and competence (Lechner–Dowling 2003). Accordingly, these co-operations mostly develop between innovative enterprises, however, in a broader sense; all the co-operations aimed at acquiring new knowledge can be listed here.

The learning-flow of information processes within the co-operations is influenced by three closely related factors (Vilmányi 2004, Mäkinen 2002, Rickne 2001):

- the characteristics of the organizations involved in the co-operations, from the owned resources to the organization knowledge available,
- the characteristics of the co-operations (their content, innovative character, the closeness of the relationships, the “age” of co-operation),

- Effects on each other during the co-operations, interdependencies, realizable advantages.

Without a detailed discussion of the most important characteristics of learning networks, it is necessary to mention that for the networks, an interesting and quite unique solution is emphasized more frequently, for which perhaps the most appropriate name is the “learning through interactions” (Propis 2002).

After the probable expression of network motivations, the attitude of enterprises in the Szeged region to co-operations is examined in two different researches.

3. Networking in practice – two researches in Szeged

The applied primary researches are both partial subjects of one larger research project. The present study is confined only to selecting the narrowly interpreted relevant parts. These issues were not the central objective of the primary researches, so the findings may also be subject to reservations. In both cases, many interesting discoveries appeared during the evaluation, which provides a typical “snapshot” of existing and potential co-operations in the region of Szeged, and the issues of their stimulation. During research, questionnaires were sent to nearly 700 enterprises between July and October, 2004.⁸ In the selection of the enterprises interviewed, many aspects were taken into consideration for the basic objectives of the research. In some cases, the questionnaire was supplemented by a personal interview. In the midst of these interviews, discussion was held with a total of thirty firms on what they have experienced so far, and especially the future opportunities perceived by them. During other research, the questionnaire survey was conducted in 2006 and it studied the knowledge-intensive small enterprises in Szeged.⁹ The sample of 401 elements is representative of the local knowledge-intensive enterprise sector. In the limitation of the knowledge-intensive sector, the main activity of the given enterprise according to the TEÁOR and to the methodology of international studies was used. The examined sample was selected by random sampling from the given population of 2300 firms.

⁸ Based on empirical survey conducted in “The opportunities of the University of Szeged in the knowledge-based local economy development” titled research. Sincere thanks is offered to Prof. Dr. Lengyel Imre research leader, who involved this team in the research, and also to colleagues Bajmócy Zoltán and Deák Szabolcs, who provided other necessary information.

⁹ This research was conducted in the Regional Operative Program’s 3.3.1.–05/1.–2005–08–0002/34. Project.

3.1. On the willingness to networking

In the research of 2004, an overall picture was drawn of the enterprises operating in the region, including the examination of their innovation and their relation to business development services. Certain enterprises “acted quite similarly”, thus the in depth part of the empirical study included the identification of possible clusters. The goal was to provide the basic characteristics of the enterprises and the typical service demands within the developed clusters. First, 14 large enterprises were removed from the sample of 170, then those enterprises which had not answered a question were removed, forming the base of the cluster analysis. Thus, the work continued with a sample of 146 small and medium enterprises.

Two derivative variables were taken into consideration while forming the clusters: the innovativeness of the enterprise and whether it has ever used a business development service of a county organization qualified for it.¹⁰ Similarly, to the primary evaluation, an enterprise was regarded as innovative if at least one of the following points was fulfilled:

- it has an own R&D section,
- in the past year they gave an assignment to an external firm,
- They permanently cooperate with a foreign partner in product or technology development.

Table 1. Clusters on the base of innovation and participation of enterprise development services

			Cluster 1	Cluster 2	Cluster 3
			Interested	Innovative	Refusing
Does the enterprise innovative?	Yes	N	0	48	0
		%	0%	100%	0%
	No	N	38	0	60
		%	100%	0%	100%
Did the enterprise use enterprise development services earlier?	Yes	N	38	30	0
		%	100%	62,50%	0%
	No	N	0	18	60
		%	0%	37,50%	100%

Source: own construction

¹⁰ These are: the Chamber of Commerce and Industry of Csongrád County, the Progress Business Development Foundation, the DARFT Regional Development Agency, the ITDH, and other organizations providing business development services named by the respondent.

Those enterprises that were taken to the first cluster which are not innovative, but they had already used a business development service (Table 1.) were called “interested”. The 38 small and medium enterprises belonging in Cluster 1 are the 26% of the sample enterprises. The “innovative enterprises” were taken to the second cluster and make up the 33% of the sample (48 enterprises). The third cluster includes the firms which are not innovative and did not use a business development service earlier. They were labelled as “refusing” (60 enterprises, 41% of the sample). Of course, the distribution of the enterprises in the clusters refers only to the characteristics of the sample and not their proportion in the real economic structure. Knowing the clusters, the examination of the co-operations is divided into two parts. There was an attempt to map the formal and informal relationships of the enterprises, but inquiries were made to answer the question whether the enterprise cooperates with a partner in connection with introducing an innovation and how often it does so.

Table 2. Formal and informal co-operations

	Inter- ested %	Inno- vative %	Re- fusing %
Member of enterprise network	15,6	40,0	11,5
Subcontractor	35,3	48,9	53,7
Common marketing activity with other local enterprises on domestic market	16,2	10,6	3,5
Common marketing activity with other enterprises on foreign markets	11,4	9,3	1,9
Since 2000 participated some kind of network organization action	10,5	20,8	8,3
Major of leader colleagues graduated on SZTE	18,4	36,2	12,5
Regular professional connection with university teachers and researchers	32,4	39,6	15,8
Regularly have students from SZTE to practical traineeship	28,9	25,0	13,3
Some leader of the enterprise member of some local committee.	15,8	25,5	12,3

Source: own construction

The primary analysis of the primary data suggested that the innovative firms “have more tendencies” to various co-operations, and they appreciate the advantages of networking more than the average. That is, it is assumed that within the examined circle of enterprises the innovative firms are more interested in the advantages of networking. In this case, the expectations were unambiguously fulfilled; there is a strong indication that these firms may be more suitable for receiving network stimulation interventions. This fact is proven, amongst others, in that the 40% of the enterprises considered innovative reported to be a member of an enterprise group (Table 2). It seems that belonging to an enterprise group is an important source of

innovation, all the more so because the 60% of these firms are not in a strategy-making position in the enterprise group. It is confirmed by the fact that in the case of the two other clusters, considerably fewer enterprises belong to an enterprise group.

A surprisingly high percentage of the enterprises stated that they do participate in supplier activity. However, it does not definitely mean supplying an installable component or module, but rather refers to the existence of a regular buyer-supplier relationship. More than half of the refusing enterprises have these kind of relationships according to their statements, thus it can be assumed that a significant part of the buyer-supplier relationships unambiguously have an effect towards the refusal and against the innovation. As expected, the marketing-co-operations are rather sporadic in the case of every cluster. In the study, particular attention was paid to the university relationships since these kinds of relationships are probable, based on the economic structure of the region. It was already perceptible in the primary analysis that the expectations were not fulfilled. However, it can be assumed that for the innovative firms, this tendency is different. Expectations were only partially fulfilled because according to the data, the innovative firms did not connect too closely to the knowledge centre either. The formal and informal relationships with the university are not too intensive, according to the findings. These relationships of the innovative enterprises are intensive to some extent, while they are more occasional for the refusing cluster. About 40% of the enterprises of the sample that are considered innovative have a regular professional relationship with a university teacher or researcher, which indicates a relationship outside the region in about 20% of the cases. The formal relationships here can be credited to a small extent by personal relationships. This is indicated by the fact that quite a small percentage of the senior staff graduated in Szeged, which is evidence for the lack of a very important element of the local informal relationship network. In a part of the cases in both the refusing and the interested, the received assessments signify that there is lack of any senior staff having a university degree at the company. It is also indicates the lack of co-operation opportunities in that a relatively small percentage of firms are represented in the elected committees of boards¹¹ having a role in the local economic life. While in the case of the innovative cluster, this means a quarter of the enterprises, and in the other two clusters, the result is close to 10%.

It can be a critical area of the co-operations success if their goal is directed at developing some kind of innovation methodology in this arena. Innovative firms especially can be expected to show increased activity in this area, since their activity is already functionally connected to creating some sort of new knowledge. It was

¹¹ In the questionnaire the following organizations were presented: Chamber of Commerce and Industry of Csongrád County and the GYOSZ, the KIOSZ and the VOSZ organizations in Csongrád county.

examined in detail with whom the members of the clusters cooperate with in this area. Perhaps this was the most surprising area because the hypothesis was not justified or expected. Although certain co-operations may be observed, basically the regular co-operations related to the development of innovations are simply missing (Table 3).

Table 3. Regular co-operation with some organizations in working out of innovation

	Interested %	Innovatives %	Refusing %
Competitor	9,7	0,0	6,3
Customer	17,2	20,5	16,7
Advisory enterprise	12,9	4,4	2,2
Subcontractor	17,2	0,0	13,0
Higher education institution	6,7	13,6	4,3
Other research institute	0	9,1	2,2

Source: own construction

Based on the chart it can be stated that the enterprises (even the innovative firms) of the sample are not willing to cooperate regularly in the interest of creating an innovation. Only the relationship with the customer shows considerable value, and the highest value indicates only 20% which was among the innovative cluster. The co-operations with higher education institutes are rare, which confirms the earlier results in which the corporate relationships dominate in the co-operations of the university and the business sphere in Hungary.

3.2. The importance of the certain motivation types in the co-operations

In the research of 2006, it was directly asked specifically about the various network motivations. In the theoretical part, the most important characteristics of the networks in detail were examined, focusing in particular on the possible reasons of co-operations. The various co-operations are especially important for the examined knowledge-intensive small enterprises. For this survey, in accordance with the categories presented in the theoretical part, research was done for the answer to the question of what the firms' specific reasons for the tendency to cooperate.

Evaluations were done on a seven-point scale to what importance the respondent attributes to the realizable advantages of participation in a cooperative network. There are considerable differences between the values of the realizable advantages (Table 4).

Table 4. Motivation of participation in network (1–7 scale)

	1	2	3	4	5	6	7	Total	Mean
Enlargement of resource barriers	40,7	9,5	8,8	8,0	9,0	10,1	13,8	100	3,21
Obtain cost benefit	36,5	5,5	7,3	7,8	11,1	11,3	20,4	100	3,67
New ordering and supplying opportunities	20,4	3,0	7,8	6,3	11,3	13,6	37,5	100	4,76
Desire for recognition	19,1	2,3	5,8	10,3	13,9	15,9	32,7	100	4,76
Acquiring new knowledge, understanding	16,1	1,5	4,5	10,1	15,1	16,9	35,8	100	5,00

Source: own construction

The data show an instantaneous picture, in which several (established and not established) conclusions can be drawn. These conclusions were ignored, except it could be highlighted that a significant portion of the enterprises consider obtaining cost advantages and loosening the resource barriers as only slightly important. Reviewing the chart, it can be observed that an extremely sharp result that the “softer network motivations” appreciate. The processes described in the research literature appear also in the case of knowledge-intensive small enterprises. In the past, especially for traditional networks, the tangible advantages lead to co-operation. In the case of knowledge-based relationships, the softer categories appreciate. This is well demonstrated by the results (increasing being accepted, desire for recognition: 4,76; acquiring new knowledge, understanding: 5,00), which indicate the importance attributed to the factors well.

4. Conclusions

Unfortunately, the “snapshots” unequivocally showed that the co-operations experienced in the region are fragmented, unorganized and concern only a smaller portion of the enterprises. Thus, it would be definitely necessary to get familiar with the best practices and to consciously stimulate the co-operations. Because of the variance in types of co-operations, it is quite difficult to outline the individual characteristics. However, for the successful networks, in most cases certain specific features can be observed. The first success factor is the commitment levels and that the partners clearly articulate their objectives and expectations from the beginning of

the co-operation (ADAPT 2001). It is a common experience that in the form of network co-operation, the market view has to prevail. The second success factor is the usefulness of the co-operation is clear to all parties. Resources and knowledge are shared among all members of the co-operation, and this is difficult for many to overcome. Generally, fear of freeloaders and mutual distrust are the most significant obstacles in developing the co-operations. This is why the importance of informal networks in the success of the co-operations cannot be stressed too much (Kingsley–Malecki 2004). Emphasizing the common vision in the co-operation networks is also an important factor. The goal of the co-operation has to be defined clearly, and this objective has to be accepted by all participants. If there is no common goal realized, than there is difficulty in gaining knowledge from each other. Finally, it has to be emphasized that in most cases, there are more than profit-driven enterprises involved in these networks. Various higher education institutions and research institutions also have an important role in the co-operations. Experience shows that these co-operations have to be open to involving additional participants, even those who have to be diligently encouraged (ADAPT 2001). Examining the various motivation-types, it can be stated that basically almost all co-operations in some way, either directly or indirectly, aim at more cost-efficient solutions. The original motivator of co-operations is increasing the competitiveness through the reduction of different costs or through maximising the income. This finding is crucial in deeply understanding the intervention of economy development. The existence of appropriate trust is also essential for any co-operation (Patik 2004). Realizing this fact is a key point because networking has to be based on a relationship of trust. That is exactly why the most successful co-operations develop in an area where the willingness to cooperate is an important part of the entrepreneurial culture (Patik 2006). It is not accidental that the decisive proposals on network development almost always emphasize increasing commitment and building trust (Rosenfeld 2002, Huggins 2000). In the case of stimulating the enterprises' willingness to cooperate, it has to be highlighted that there are direct cost advantages that can be realized in the co-operations. In light of this, if the existence of networking within a group can be shown to be a fair advantage to all participants, then substantive and long-term and successful co-operations develop. Otherwise, it is probable that only the waste of sources dedicated to development happens. That is why it is important that during working out different network organizing activities, it is critical to be both aware of each person's expectations and to be clear on what types of advantages can be realized.

References

- ADAPT 2001: *Learning Networks. Small firms co-operating to compete*. ADAPT, Brussels.
- Brito, C. M. 2001: Towards an institutional theory of the dynamics of industrial networks. *Journal of Business & Industrial Marketing*, 3, pp. 150–166.
- DG ENTR 2004: *SMEs and co-operation*. DG ENTR, Brussels.
- Drakopoulou Dodd, S. – Patra, E. 2002: National differences in entrepreneurial networking. *Entrepreneurship and Regional Development*, 14, pp. 117–134.
- Elfring, T. – Hulsink, W. 2003: Networks in Entrepreneurship: The Case of High Technology Firms. *Small business Economics*, 21, pp. 409–422.
- Ford, D. 2003: *Business Marketing*. KJK–KERSZÖV, Budapest.
- Gereffi, G. 1999: International trade and industrial upgrading in the apparel commodity chain. *Journal of International Economics*, 48, pp. 37–70.
- Hancé, B. – Cieply, S. 1996: Bridging the Finance Gap for Small Firms. *Social Science Research Center*, Berlin.
- Hansen, E. L. 2000: Resource Acquisition as a Startup Process: Initial Stocks of Social capital and Organizational foundations. In Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research Wellesley*. MA, Babson College.
- Hills, G. E. – Lumpkin, G. T. – Singh R. P. 1997: Opportunity Recognition: Perceptions and Behaviors of Entrepreneurs. In Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research Wellesley*. MA, Babson College.
- Huggins, R. 2000: The success and failure of policy-implemented inter-firm network initiatives: motivations, processes and structure. *Entrepreneurship & Regional Development*, 12, pp. 111–135.
- Humphrey, J. – Schmitz, H. 2002: Developing Firms in the World Economy: Governance and Upgrading in Global Value chains. *INEF Report*, University of Duisburg, Duisburg.
- Imreh, Sz. – Lengyel, I. 2002: A kis- és középvállalkozások regionális hálózatainak főbb jellemzői. In Buzás, N. – Lengyel, I. (szerk.): *Az ipari parkok fejlődési lehetőségei*. SZTE GTK, JATE Press, Szeged, 154–174. o.
- Johannisson, B. 1997: The Dynamics of Entrepreneurial Networks. In Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research Wellesley*. MA, Babson College.
- Johannisson, B. – Ramirez - Pasillas, M. 2001: Networking for Entrepreneurship: Building a Topography Model Of Human, Social and Cultural Capital. In

- Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research* Wellesley, MA, Babson College.
- Kállay, L. – Imreh, Sz. 2004: *A kis- és középvállalkozás-fejlesztés gazdaságtana*. Aula, Budapest.
- Kingsley, G. – Malecki, E. J. 2004: Networking for Competitiveness. *Small Business Economics*, 23, pp. 71–84.
- Kocsis, É. 2000: Új szervezeti formák a modern kapitalizmusban. In Bara, Z. – Szabó, K. (szerk.): *Gazdasági rendszerek, országok, intézmények: bevezetés az összehasonlító gazdaságtanba*. Aula, Budapest, 467–515. o.
- Lechner, C. – Dowling, M. 2003: Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship and Regional Development*, 15, pp. 1–26.
- Malecki, E. J. 1997: *Technology and Economic Development: The Dynamics of local, regional and national competitiveness*. Longman, Edinburgh.
- Mäkinen, H. 2002: *The Genesis and Development of a New Innovation Network in Finland*. Turku School of Economics and Business Administration, Turku.
- Mundim, A. P. F. – Rossi, A. – Stocchetti A. 2000: SMEs in Global Market: Challenges, Opportunities and Threats. *Braslian Electronic Journal of Economics*.
- OECD 2004: *Networks, Partnerships, Clusters and Intellectual Property Rights: Opportunities and Challenges for Innovative SMEs in a Global Economy*. OECD, Paris.
- Patik, R. 2004: A társadalom és a kultúra hatása a hálózatosodásra. In Garai, L. – Czagány, L. (szerk.): *A szociális identitás, az információ és a piac*. JATEPress, Szeged. 165–168. o.
- Patik, R. 2006: „Látható kéz” és innováció – olasz iparági körzetek ma. *Vezetéstudomány*, 11, 22–32. o.
- Pietrobelli, C. – Rabelotti, R. 2004: *Competitiveness and Upgrading in Clusters and Value Chains*. The Case of Latin America. DTI/UNIDO Competitiveness Conference, Pretoria.
- Propis, L. 2002: Types of Innovation and Interfirm Co-operation. *Entrepreneurship & Regional Development*, 14, pp. 337–353.
- Rickne, A. 2001: Networking and Firm Performance. In Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research* Wellesley, MA, Babson College.
- Rosenfeld, S. A. 2002: *Creating Smart Systems. A guide to cluster strategies in less favoured regions*. EU DG for Regional Policy and Cohesion, Brussels.

- Salmi, P. – Blomqvist, K. – Ahola, J. – Kyläheiko, K. 2001: *Industrial districts and regional development: Towards a knowledge-based view*. Lappeenranta University of Technology.
- Schmitz, H. 1995: Collective efficiency: Growth path for small-scale industry. *Journal of Development Studies*, 31, pp. 529–566.
- Singh, R. P. – Hills, G. E. – Hybels, R. C. – Lumpkin, G. T. 1999: *Oppurtunity Recognition Through Social Network Characteristics of Entrepreneurs*.
- Szerb, L. 2003: The Changing Role of Entrepreneur and Entrepreneurship of Network Organisation. In Lengyel, I. (ed.): *Knowledge Transfer, Small and Medium-sized Enterprises, and Regional Development in Hungary*. JATEPress, Szeged, pp. 81–95.
- Varamäki, E. 1996: The development process of interfirm co-operation of SME's. In Reynolds, P. – Bygrave, W. – Birley, S. – Butler, J. – Davidsson, P. – Gartner, W. – McDougall, P. (eds): *Frontiers of Entrepreneurship Research Wellesley*. MA, Babson College.
- Varamäki, E. – Pihkala, T. 1997: A hotel of small firms - An oddity of SME-networking. *Journal of Best Papers Proceedings of ICSB Conference*, San Francisco, USA.
- Vilmányi, M. 2004: Szervezeti tanulás, hálózati kompetencia, bizalom. In Garai, L. – Czagány, L. (szerk.): *A szociális identitás, az információ és a piac*. JATEPress, Szeged, 186–200. o.

Bilateral risk perception in services

The contradictions of health service through reflection of the doctor-patient relationship

Péter Kuba – Éva Málovics

In spite of the fact that the concepts of marketing and competition are considered to be an unrelated trend in health provision, the medical community has been forced into the competition. This competition has even widened to the Hungarian Health Service to preserve basic working conditions such as devices, instruments, and the battle to overcome the lower wages (Lantos–Simon 2005).

The fact that it is worth taking marketing aspects into consideration when analyzing the doctor-patient relationship can be considered a relatively new matter of consideration. The independent parameter of the research model used is the putative competence of first the provider, and then the consumer. The providers of the services are typically experts, who estimate risks according to professional aspects and methods (or how they define tasks). The dependent parameter is the perceived risk which is bilateral concerning the service (Veres 2003). One of the arbitrating factors is trust, which can be considered as an inclination to risk-taking behaviour and the other is patient's putative competence.

The following conclusions were proven in this research paper:

- 1. In Hungary, the trust-level of the doctor-patient relationship is low; therefore the perceived risk is high.*
- 2. The level of trust in the system is also low concerning health service.*
- 3. Due to the above mentioned factors; both participants are dissatisfied with the level of communication, cooperation and of the partner's social competences.*

During this research, focus group interviews and semi-structured personal interviews were used to prepare quantitative analyses. The results of these qualitative investigations will also be presented.

The benefit of this research can be established, due to the fact that bilateral risk can be reduced by appropriate risk communication. Consequently, communication can be a risk-managing instrument if the participants of the transaction decide to take advantage of it.

Keywords: health service, doctor-patient relationship, risk perception, competence

1. Introduction

As members of a research team of the Institute of Business Studies at the University of Szeged, the chain of competence–risk–communication by a comparative research is examined. Three types of services are compared: health care, education and project engineering. In this study, the present results of the examination of medical services are summarized.

The goal of this paper is to discover and introduce characteristics of the perceived risk in the process of services, and also the opportunities of the reduction and treatment of this risk with the help of communication.

2. Different approaches concerning the research of risk

Defining risk is not easy because researchers use diverse definitions based on the research goals and scientific backgrounds. Commonly speaking, it can be derived that risk usually refers to an activity based on uncertainty. Uncertainty results from a state of insufficient knowledge. It can be stated that by enlarging the amount of obtainable information, the chance of success concerning certain activities can be increased.

According to often used definitions, risk is probability of the outcome of a potentially unfavourable event. Powell (1996) defines risk as the combination of an undesired and uncertain thing. This definition is sometimes expanded by saying that the probability of the event's outcome is multiplied by the rate of the caused damage. According to Emblemståg and Kjølstad (2002), risk is interpreted as a systematic method of how to fight with danger. Based on the above mentioned facts, the main point of the risk definition is the following:

- a) Either the possibility of the occurrence of some unfavourable event,
- b) Or the possible default of some favourable event.

Based on Renn's taxonomical approach, risk definitions can be ranked into four big groups.

- By risk, *technical approaching* researchers mean the failure of different devices and systems and they aim at treating their harmful physical, chemical and biological effects and these effects give the frame for their analysis and evaluation.
- While *economic approaches* use the dimension of negative consequences, satisfaction-dissatisfaction instead of the more objectively measured but more narrowly interpreted "damage" dimension.

- However *collective and social approaches* (sociological, social psychological, anthropological approaches) put emphasis on the role of the reference groups. When constructing the elements of reality, and therefore that of the risk, they widen the individual focus of the psychological approach (Renn 1992).
- *Cognitive psychological approaches* put emphasis on risk perception. Concerning the definition of risk, the significance of subjective judgement formation is huge. In the definition of risk, while taking subjective perceptions into consideration in addition to the predicted one-dimensional values, different quantitative and qualitative features are also taken into account and they interpret risk as a subjectively expected term (Slovic et al 1998).

Perceived risk in everyday life differs from specialists' opinion. People can overestimate certain dangers (flying), and underestimate others (driving).

The following factors play roles in perceived risk:

- a) Availability bias: the judgement of an event depends on how easily one can bring it to mind.
- b) Overconfidence: not realising the limits of one's own knowledge.
- c) Demanding certainty: reduction of exaggerated fear caused by uncertainty (Radnóti–Farágó 2005).

The representatives of the psychometric approach put an emphasis on the necessity of measuring risks. First of all, they analyzed risk perception in connection with modern technological devices, methods and activities. One of their main methods is using questionnaires because within the frame of psychometric paradigm, people have to make quantitative value judgements on the riskiness of different risk-bearers' existing and desired rates in addition to the ideal level of regulation. At this point, these judgements are related to other judgements concerning other features.

By cognitive psychological methods, they tried to reveal the risk attitudes and perceptions present in a society or culture and the drawing of their cognitive maps was also attempted.

Slovic (1987) carried on research about the characteristics of laypeople's risk perception, as he found lay interpretations of risk important. Some of his most important questions are:

- What are the defining factors of the perceived risk (conceptual features, the influential strength of emotional factors, and the adequate notion of methods)?
- How accurate is the perception of an average person? (Do distortions come from the insufficiency of information or from the fact that skills are limited?)
- What steps must be taken in order to develop explanatory attitude towards risk?

- How can experts appreciate where the limits of their competence are?

His results show that despite less information and the possible mistakes, lay knowledge concerning risk reflects a steady consideration that is typically missing from the experts' risk evaluation (Slovic 1987). These thoughts, in connection with risk perception and communication, play a crucial role in scientific literature (Table 1).

Table 1. Different aspects of risk perception concerning experts and lays

Experts	Lays
Control and predictability of risk	Risk valuation is based on previous experience only in small amount
Objective risk identification, evaluation and minimisation	Risk cannot be perceived by senses
Scientific approach	There are no data, no statistics, the usage of these is not evident for them
Efforts made for providing general rules	The role of assumptions and individual concepts is more significant – individual value judgement
It would serve as the basis of rational decision concerning risk	They do not rely on unambiguously mechanical or economical aspects
Probability risk predictions	Emphasis on qualitative risk features, significance of the role of subjectivity, fear
Risk comparisons	Mixed usage of the above mentioned aspects-the inconsistency of judgement and action

Source: own construction based on Haller (2003)

3. Why “healthcare” specifically?

State health provision could not follow the “price boom” in health service which was caused by the improvement of medical science and pharmaceutical industry and the rising public needs worldwide. Related to the rising prices, besides the costs of the direct health provision, the expenses of the following factors have also appeared:

- insurances companies and
- management.

In addition to the rising quality of the hospitals' accommodations – mostly based on the insurance system – and other types of protection, the consequences of malpractice suits have been reduced. During the 1970s in Hungary, as a result of falling rates of the economy and the indebtedness of the state, variance could be perceived between the “medically possible and the economically affordable” terms.

Citizens have claimed to be informed of the introduction of the new, although expensive, medically possible methods of treatments but have had no or lessened chances to attain them. It is an interesting and understandable paradox, that as a result of the present effect of the slogan: “free and high quality”, citizens do not connect the necessity of contribution payment with the expenses of health provision, or at the same time, payment of taxes with the spending on health care.

The developmental limits of the health provision system and the problems around its operation have appeared as political issues because if it is a state-run system. Therefore, it is not surprising that at the time of the change of the regime, the politically acceptable choice became the health service based on an individual insurance system. This change found its shape in an insurance system without consequence.

Health service is a huge system which defines the life of a society. It is the sum of those individual and social actions which aim to preserve and re-establish health and to provide its specifications. Its aim is to reach the best health state possible in the widest layer of the population.

The 3 main areas of health services:

- basic provision
- out-patient service
- in-patient service.

As a fourth factor, the pharmaceutical industry can also be listed here as an active participant. In our opinion, risk perception in health services has been outsized by the present “war psychosis” of health provision.

The interest towards the study of economics and management has risen dramatically among health services in comparison with the previous situation. Earlier, even economists dealt little with the economic problems of the health services, despite the fact that it is the founding member of the non-profit sector.

It is a global problem, even the most developed countries fight financial difficulties; the principle which says: “providing everything for everybody” has become unmaintainable (Égető 2002).

Doctors must possess a great deal of skills, abilities and professional knowledge in order to be good experts. Trust is more than necessary in health services; moreover, the rate of risk is also the biggest here in this sector (Hajdú-Bagi 2004).

Health care as a service sector seems an obvious area. The industrial era came to an end, and now lives the era of information. With reference to Garai (1997), in this new era, in the time of the second modernization "...we must take spiritual phenomena into consideration of economic factors." In the era of information, hastening is one of the most important features of people and society. Today, more qualification is possessed, but less intelligence; more knowledge, but less comprehension; there is more professionalism, but more problems arise; more medicine is available, but health conditions are lessened. People drink and smoke too much, they are too fat, they are stressed out, they watch television far too much and they do not exercise enough.

There are different active participants of health service who are the subjects of analyses. Their characteristics vary according to their concern in the health field.

1. *Doctors*: they must possess a great deal of skills, abilities, professional knowledge and competence. They have a "certificate" (medical degree) and they participate in continuous trainings (specialist examination, score collection), that is how they become qualified. Considering the present social (and within it, health care) conditions, it is established that they are overburdened, tired and exhausted.
2. *Patients*: They pay the Social Insurance without really knowing what is is, and still, health provision is not free. They feel defenceless, although they have guaranteed rights and health care representatives. They are constantly struggling with weight problems, they do not exercise enough and they eat in a very unhealthy way. They are afraid of treatments. They do not have complete trust in their doctors and make reports against the doctor if the 'broken part' cannot be replaced or fixed.
3. *Holistic health practitioners*: Most do not have degrees and their accreditation is not possible. This is an area overwhelmed by fraud, although, many of them have been proven skilful in their area of specialty. They do not cure the patient; only help the organism cure itself. Therefore, responsibility is not theirs either. They are often consulted when the client is desperate and hopeless and sometimes it has even become fashionable to visit a holistic health practitioner.

Taking into consideration the above mentioned facts, this is why the health system has been chosen as the focus of study. The health system is a high-risk sector, where everybody is affected and, therefore, deserves research.

4. Problem statement

The structure elements of the 19th, 20th and 21st century can be found in the present structure of the Hungarian Public Health. It is considered to be a relatively new aspect that it is worth taking marketing factors into consideration when analyzing the health care.

The notions of competition and marketing were not accepted in the public health of the USA until the 1980's. It was taken as a strange idea in the area of health care that business matters push their ways into the structure of public health and generate unworthy competition of healing.

According to Kotler, most institutions in the public health have no choice to avoid competition because there are institutions in the same field of supply and they have to compete with each other for demand. In his opinion, competition is forced not from outside, but it is formed inside of public health. Management methods and marketing tools can be used in this field, too.

Leisen and Hyman (2004) emphasize three elements in order to give a reason on the research based on marketing concerning the health services.

First of all, there has been a process lately, namely that the activity of doctors and other assisting organizations has been analysed along such statistics which were used only in business life before.

According to Peyser, the following statistics can be stressed:

- the behaviour of the consumers (patients)
- reputation or “good name”
- economic motivating factors (income, income over the wages)

The competition between services is getting progressively significant in the medical system; therefore, traditional marketing methods get increasingly more important roles in health services.

In addition, the doctor-patient relationship is a long-term relationship. Health services are essential from a personal aspect and they compel high rate commitment. Most consumers (patients) prefer continuous, long-term relationships with their doctors.

Moreover, trust is the crucial point of the doctor-patient relationship. The more expenses that accompany the damage caused by the incompetent service (for instance: malpractice suit), the bigger the role of trust is when evaluating the service. It becomes clear from research of Swan et al. (1999), that most patients are not experts in medical sciences; that is why they are obliged to believe that their doctors treat them well.

Based on the above-mentioned arguments, it can be stated that the doctor-patient relationship can be considered as an intense marketing relationship (Leisen–Hyman 2004).

Johnson and Grayson (2005) put an emphasis on the cognitive and affective dimension of trust in the relationship between services and consumers. By the consumer's cognitive aspect of trust, it is meant toward belief and deep conviction towards the competence of the service provider. The cognitive dimension of trust makes it possible to predict the probability rate of how the service provider will complete the promised engagements. On one hand, this knowledge originates from the observation of the supplier when acting in different situations. On the other hand, it is based on news coming from other services. Obviously, the consumer can never be absolutely sure concerning the result of the service, therefore trust in the competence of the provider always remains an important factor. This is particularly true concerning health systems.

The affective dimension of trust is based on those feelings which were arisen by the quality of the service and the interest experienced by the supplier. Certain pieces of information coming from others might influence the affective dimension of trust, but what counts considerably is personal experience towards the service. Besides information, it is based on emotions. As emotional raillery is getting deeper and deeper, the trust in the service provider may exceed the rate justified by the consumers' knowledge. Since emotions have such a considerable role, these relationships cannot be analysed well with the help on the economists' objective risk-evaluation models.

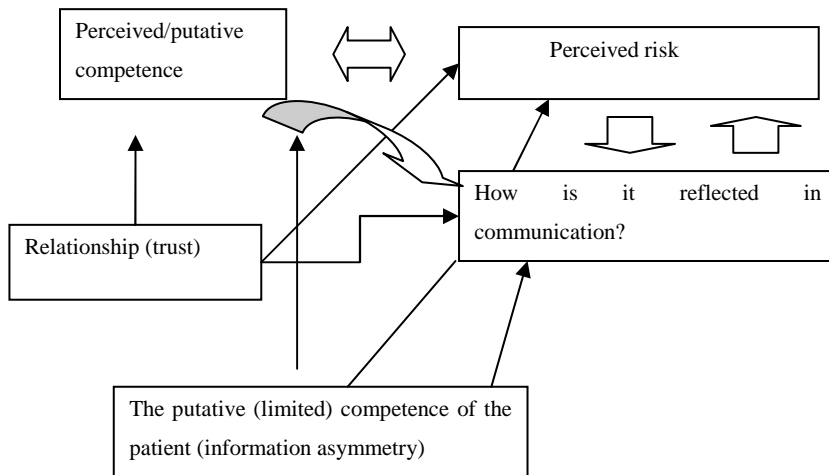
The public health system in Hungary has several special characteristics. The indexes of statistics concerning the Hungarian Public Health mainly meet the requirements of the development of the Hungarian economy. The expenses of Public Health in GDP in Hungary are almost equal to OECD average. However, expected life spans of people are lessened, risks of getting ill are increased, and chances of recovery are worse than most other developed countries.

It can be stated that there is competition for resources in the Hungarian Public Health. The main reason of this competition is the great lack of resources, and the main purpose of it is to ensure better circumstances for medical treatments. "This usually goes together with self exploitation, which reduces personal and organisational effectiveness. This kind of competition is basically not useful on a social level; but, at present, this ensures the working ability of the Public Health in Hungary" (Lantos–Simon 2005, p. 45.).

5. Research model

The independent parameter of this research is putative competence, which is the judgement about the savvy of, first, the provider, and then the client. The suppliers of the services are usually experts, who estimate risks according to professional aspects and methods (namely, how they define tasks).

Figure 1. Research model



Source: own construction

6. The results of focus group interviews

In this particular research, focus group interviews (three of them were prepared: one with doctors, one with holistic health practitioners and one with pharmacists – being “qualified patients”) and semi-structured personal interviews (with subjects who – as many members of our society – already had experiences in the Hungarian public health system: had been patients) were used to prepare the quantitative analysis. The main topics of the interviews are the following: perceived competences, perceived risk, and communication in the process of the health care service.

While defining the competence of a physician, important differences were found. Patients said that the main elements of the doctor’s competences are their social competences:

- the quality of the information
- the manifestation of the empathy of the doctors
- the personality of the doctors

However, in the doctor groups, the overall experience is that doctors consider the criteria of the profession when judging their own competence. The knowledge and the observance of the rules of the profession, the adequate expertise, the ability of making decisions, qualification, and firmness are all important aspects. The interviewed doctors are aware of the fact that “being nice and friendly means a lot to the patients; although, according to them, it has nothing to do with being professional”.

The doctors are much more aware of their informational superiority and often look down on the patients’ information resources (usually obtained through the media). This information is accepted only by certain parts of the patients’ history and experience.

The patients judged the medical interventions risky, because “a life is at stake”... they identified the following risks:

- improvement does not occur in the state of the patient
- the state of the patient deteriorates after the treatment
- malpractice
- Death.

Among competence factors reducing the perceived risk, other organizational aspects also appear concerning the patient groups, such as the reputation of the hospital and its equipment. Patients are highly influenced by good experiences and stories of other patients. Furthermore, the perceived competence of the healthcare staff also plays a significant role by means of primarily the communication and the judgement of their professional activity as determined by:

- the reputation of the doctor
- his medical costume or uniform
- the doctors ability to make contact with the patient and therefore helping the patient venture to make contact
- the expertise of the nurses and how much time they deal with the patients
- the superiority of the preparations before an operation

In the perception of the competence elements increasing risk, there was also difference between the two groups:

- The patient groups emphasized the lack of information concerning the doctors as one of the most important risk factors.
- As for the doctors, the lack of time, the uncertainty and the limits of risk communication (“all risks must be told beforehand otherwise we might be sued, but it is impossible to tell about all the risks”) were emphasized.

One question was presented on how to communicate the elements of the medical competence in different healthcare situations. According to certain research (Maryn 1998), most complaints concerning medical services are not in connection with clinical competences, but with communication problems. The most frequent complaint is that the doctor does not pay enough attention to the patient.

The two groups gave diverse answers concerning this question. Doctor groups put an emphasis on:

- education,
- direct interactions,
- the role of agreement declarations,
- And on an overall information.

As for the verbal and formal elements of the doctor-patient communication, the importance of the doctor-patient communication was in part appreciated by the physicians. Some of them recognised the significance of communication in the improvement of the doctor-patient relationship (“patients prefer being treated as partners”). What is more, informational asymmetry also appeared (“if the doctor informs the patient well, then the patient’s expectations are down-to-earth” “the doctor knows what to do in certain situations while the patient does not”).

Although, problems also occurred like lack of education (we have not been taught this) and doubts concerning the importance of communication.

Based on the interviews, the doctor-patient communication seems rather authoritarian. When doctors talk about patient compliance, they mean that patients should follow the doctors’ orders (“...He must go to see a doctor and he must take the doctors’ words”).

Compliance or adherence to health service provider recommendations is widely considered to be a remarkable factor in health outcomes, and several aspects of it are found to be affected by factors that evolve in the consulting room (Vajda 2009). However, according to the doctors interviewed, only patients are responsible for patient compliance. This statement was emphasised by all of them, and they all considered the level of the patient compliance low. This typical phenomenon could be sensed, and as for the doctors’ interpretation it seemed “...as if many devoted experts wanted to do good to the patients despite their willingness” (Lantos–Simon 2005, p. 47.). It is a pity that patients interpret it completely differently. How is it in reality according to the statistics? According to different surveys concerning different diseases, in every case, the long term treatment patient takes even less than half of the prescribed medicines. The worst results occurred in the treatment of asthma, where patients take only one in four pills (Lantos–Simon 2005, p. 48.).

A separate chapter is devoted in connection with the loss of trust. In the patient groups, the effects of the media and direct experience could be shown. The

media has a significant role in spreading bad examples and malpractices. Patients consider doctors incompetent based on their behaviour (“the doctor gives the same medicine for everything, my state is getting worse and worse... the doctor is not available when he is needed... and I have to wait far too much...”)

In the doctor groups, the following statements were made:

- the loss of trust is rooted in the circumstances of the treatment
- physical condition of the institute itself
- lack of attention towards the patient
- lack of the nurses’ activity

The doctors being exhausted and tired were mentioned in each and every interview (“to be on over-duty”) and as a result, they make mistakes. The question about who is responsible for this was raised, but was never answered.

According to the patients’ opinion, delineating the risks is the occupational duty of the doctor; whereas, they add that detailed information depends on the seriousness of the problem. Dentistry, family doctor’s services, dermatology, ophthalmology, and orthopaedics were appointed as a “less risky field”. They considered surgery and obstetrics risky and fields where prompt decisions have to be made and aggressive intervention is needed. They presume that the longer the medical intervention is, the higher risk there is. On the part of the patient, risk can be reduced by prevention, gathering information, trust, keeping to the instructions of the doctor, a positive approach and belief in the recovery, a solicitous choice of the doctor and collaborating with her/him. On the part of the doctor, risk can be reduced by: less acute patients, identifying diseases in time, empathy and due experience.

The service is considered successful by the patients, principally, if the recovery is univocal, although they see that it can be different depending on the seriousness of the problem. Secondary, but essential to the aspect of success is if: the treatment is rapid and effective, it is accompanied by less inconvenience, pain is minimal, there is scarce risk and the duration of their recovery fits to what they anticipated. According to some opinions, even the right diagnosis is an essential peculiarity of success – although it can’t be tested by the patient. If the patient meets with failure – lack of recovery – his/her attitude becomes distrustful with the doctor and his/her fear rises. Patients are content when: the treatment meets their expectations or it is even better, the doctor uses modern technology, the patient is recovered, they get fast, accurate and effective medical attendance, they see that the doctor does her/his best in order to promote the anticipated results. A participant noted that contentment depends on the seriousness of the disease. They consider more important to raise the quality of the service by improving the provision rather than the doctor. The staff should “handle patients as humans” and the equipment of

hospitals should be improved. Patients responded that feedback is still necessary when a patient is content because the experience of success reinforces the doctor.

7. Conclusions

To highlight the conclusion of this research, there are significant differences between doctors and patients in the expectations related to perceived competences, risk-perception and communication. The differences in these approaches contribute significantly to the fact that the level of confidence is low and the perceived risk is relatively high in the doctor-patient relationship; these reduce the patient compliance and the efficiency of the service. It is also clear to us that the evaluation of the quality of health care services is deeply influenced by the above mentioned variables. The communication between doctors and patients should contain the characteristics of the risk communication to raise the level of the trust and the satisfaction in the health service. Henceforth, results should be obtained by using quantitative methods. It is also illustrated in this research that the methods of service-marketing might contribute to enhancing quality of health care services effectively.

References

- Emblemsvåg, J. – Kjølstad, L. E. 2002: Strategic risk analysis - a field version. *Management Decision*, Vol. 40., No. 9., pp. 842–852.
- Égető, E. 2002: Az egészségügyi szolgáltatások gazdasági kérdéseinek oktatása és kutatása. In Hetesi E. (ed.): *A közszolgáltatások marketingje és menedzsmentje*. JATEPress, Szeged.
- Garai, L. 1997: *Általános gazdaságpszichológia*. JATEPress, Szeged.
- Hajdú, E. – Bagi, Zs. 2004: *Kompetencia és kockázatérzet az egészségügyben*. TDK dolgozat, SZTE – GTK.
- Haller, L. (hrsg.) 2003: *Risikowahrnehmung und Risikoeinschätzung*. Verlag Dr. Kovac, Hamburg.
- Johnson, D. – Grayson, K. 2005: Cognitive and affective trust in service relationships. *Journal of Business Research*, Vol. 58., No. 4., pp. 500–507.
- Lantos, Z. – Simon, J. 2005: Jól működő egészségügy: Értékkeremtő szolgáltatások szabályozott versenye, vagy irányított betegellátás? *Harvard Business Manager*, 9. sz., 44–51.o.

- Leisen, B. – Hyman, M. R. 2004: Antecedents and consequences of trust in a service provider: the case of primary care physicians. *Journal of Business Research*, 57, 9, pp. 990–999.
- Maryn, S. 1998: Improving doctor-patient communication. *British Medical Journal*, 316, pp. 1922–1930.
- Powell, D. 1996: *An introduction to risk communication and the perception of risk*. (Online). Available at www.foodsafetynetwork.ca/risk/risk-review/risk-review.htm (verified 3 Aug. 2004). Univ. of Guelph, Guelph, ON, Canada.
- Radnóti, I. – Faragó, K. 2005: A kockázatpercepció és a kockázatvállalás vizsgálata egy fegyveres testületnél. In Faragó K. – Kovács, Z. (eds): *Szervezeti látleletek – a szervezetpszichológia hazai kutatási irányzatai*. Budapest, Akadémiai Kiadó, 29–51. o.
- Renn, O. 1992: Concepts of risk: A Classification. In Krinsky, S. – Golding, D. (eds): *Social theories of risk*. Westport, CT, Praeger, pp. 53–82.
- Slovic, P. 1987: Perception of risk. *Science*, 236, pp. 280–285.
- Slovic, P. – Fischhoff, B. – Lichtenstein, S. 1998: Facts versus fears: Understanding perceived risk. In Kahneman, D. – Slovic, P. – Tversky A. (eds): *Judgement under uncertainty: Heuristics and biases*. Cambridge University Press.
- Swan, J. – Bowers, M. R. – Richardson, D. L. 1999: Customer Trust in the Salesperson: An Integrative Review and Meta-Analysis of the Empirical Literature. *Journal of Business Research*, Vol. 44., No. 2., pp. 93–107.
- Vajda B. 2009: *Az együttműködés fontossága az egészségügyi szolgáltatásoknál*. Marketing Oktatók Klubja – 15. Országos Konferencia MOK, Kaposvár.
- Veres, Z. 2003: *Szolgáltatásmarketing*, KJK–KERSZÖV, Budapest.

Compliance and health behaviour in medical services

Beáta Vajda

Compliance or adherence to health service provider recommendations is widely considered to be a remarkable factor in health outcomes. It is reported to be in relation not only with patient safety, but health system effectiveness, health costs and the health of populations as well. Although literature results suggest compliance rates to be quite low, results of empirical research show a relatively high compliance in a Hungarian setting. This may be due to the authoritarian characteristic of doctor-patient relationships, but also to the effect of measuring only intentions, not actual behaviour – which is a general problem of compliance-measurement methods.

Keywords: healthcare services, doctor-patient relationship, decision, compliance, health behaviour

1. Introduction

The nature of doctor-patient relationship has gone through remarkable changes in current times. From the healing aspect, a shift can be perceived from the biomedical model (most important characteristics of which are: emphasis on biological reasons of diseases and on biology-based treatments, reductionism in the practice of consultations, an estranged doctor-patient relationship, doctor-and illness-centeredness) to the bio-psycho-social model (the most important characteristic of which is that not only biological, but both social and psychological factors are taken into consideration in diagnosing diseases and treating patients). This means that doctors have to take this multi-faceted approach into consideration when planning therapies, which implies a more personal relationship with patients in which personality, behaviour and feelings of both sides are increasingly important (Molnár–Csabai 1994).

Concurrently, changes can be seen from an economic and marketing point of view as well. Economic considerations have come to the forefront due to financing problems of healthcare systems, amongst other problems, even in the most developed countries. Interest towards economic studies and management has increased among healthcare workers, and their conscience of costs has risen compared to proceedings (Vajda et al 2008). Medical attention is increasingly

considered to be a service, which results in a greater emphasis on marketing approach, consumer behaviour and satisfaction, personalized relationship management, and risk communication. A health care service is realized at a given place, according to specified technology, based on pronounced or not pronounced expectations, with a particular person, and usually cannot be repeated. That is why controlling service processes gains an increased importance (Hajnal 2005). The aim of healthcare services can be represented in different ways like assuring the activity of human resources (Kincses 2000) or as meeting the need for health, harmony, comfort, painlessness and adequate quality of life complemented with the need for acceptance (Pikó 2004).

Moreover, social trends increasingly affect the health-behaviour of people and, as a result of which, these trends are getting involved in the daily work of physicians. Töröcsik (2007) summarised trends affecting health care as the following:

1. A new interpretation of health. Besides the market for patients, the market for healthy people is gaining more ground and importance. The basic WHO definition of health (stating that it is the state of complete physical, mental a social well-being and not merely the absence of disease or infirmity – WHO, 1948), which is not limited to a biomedical definiteness of state of health, may predominate in more and more areas. Besides, globalisation is increasingly present.
2. The increasing numbers of regular customers on the health market, the demand for “buzz shopping”. Being free from complaints is not enough; people search for activity and happiness.
3. Media effects. The media piques the attendance towards different products, services and interventions.

The development of healthcare leads increasingly to wide-ranged choice alternatives, shared responsibility between patient and physician in case of health and treatment decisions, and a higher self-management of individuals (Sihota–Lennard 2004). Both areas of changing aspects incorporate the rise of the theory and practice of doctor-patient relationship and communication. Proper communication, a good doctor-patient relationship and the involvement of patients in the process of decision making about the therapy are increasingly considered as factors that may facilitate the success of the healing process and increase satisfaction.

However, economic sciences have not paid much attention to this issue. Despite the fact that more informed consumers, wishing to be involved actively into decisions, are very important subjects of investigations (Vick–Scott 1998). This naturally may be due to the fact that both supply and demand side of medical

services are different from those of profit-oriented services. As Kornai (1998, p. 45.) formulates: “there is a general agreement on healthcare being significantly different from other branches of social activity”. He also calls the attention to the following specific characteristics of medical care:

- As health has a value that is not like anything else, market forces may miscarry, and measuring costs and benefits is largely difficult.
- It is difficult to determine the rate of “basic needs”.
- Due to the special value, most people accept egalitarian views of the allocation of medical services – equal access becomes a moral principle.
- The supply side has more information about the subject of the transaction (information asymmetry); this is partly the reason of the asymmetry in the relationship between doctor and patient: doctors – independently from social systems and economic incentives – have control over patients.
- As a consequence of the shortage economy in healthcare, the lack of quality improvements and the defencelessness of consumers characterize this system.

One of the factors of doctor-patient relationship is patient compliance. It is not only one of the determinants of communication, but also a consequence of it. Communication style and process, attention, listening to their problems and getting adequate information about their illness and therapy may be the most important factors that influence patient compliance which then affects healing and satisfaction with doctors (Molnár–Csabai 1994). Nevertheless, the role of compliance in healthcare is important from several (social and economic) aspects.

2. The importance of compliance

The role of compliance (and that of non-compliance as well) is frequently mentioned in the literature regarding doctor-patient relationship and the success of the healing process. It is reported to be in relation not only with patient safety, but health system effectiveness, health costs and the health of populations as well (Sabaté WHO 2003). As the percentage of patients who do not adhere to the instructions varies between 20% and 80% (Paes et al 1998), it is evident that this problem is relevant and has to be dealt with.

2.1. Defining compliance

According to the literature, it is not evident how the concept “compliance” (in relation with health situations) can be interpreted. In addition, different ideas can be used for different health situations. In a survey about differentiating the concepts of

compliance and persistence, the authors determined the meaning of (medication) compliance as it “refers to the act of conforming to the recommendations made by the provider with respect to timing, dosage, and frequency of medication taking; therefore, medication compliance may be defined as the extent to which patient acts in accordance with the prescribed interval and dose of a dosing regimen” (Camer et al 2007, p. 3.). These authors have also stated that compliance is the synonym of the concept of adherence. Contrarily, the World Health Organization (WHO 2003), in its paper about adherence in long-term therapies draws attention to the fact that these two concepts are not necessarily the same. Regarding its definition of adherence, it is “the extent, to which a person’s behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider” (WHO 2003, p. 3.). The difference between adherence and compliance is the agreement: adherence refers to recommendations in connection to when there has been an agreement between doctor and patient; while the definition of compliance does not contain it (WHO 2003).

The concept that patients should be active partners with health professionals in their own care and that there should be an agreement about the therapy is universally agreed upon; however, meeting the expectations of medical recommendations is an important factor in the outcome mentioned above, regardless of the degree of a preliminary agreement. There will not be differentiation between compliance and adherence – however, naturally, it is acknowledged that the accordance on the therapy may have significant effects on subsequent compliance as well.

Therefore, when the term “compliance” is used, it is referring to “the extent, to which a person’s behaviour – taking medication, following a diet, and/or executing lifestyle changes corresponds with recommendations from a healthcare provider”, and considers agreement between doctor and patient as an important factor in the extent of actual compliance.

2.2. The role and effects of compliance

It has long been recognized that patients do not follow the recommendations and instructions for the use of their medications (Paes et al 1998). Problems of non-compliance (most frequently, but not always, in connection with medications) and measuring compliance have been an important issue for several decades – for example, a study in the 1970s dealt with the question of patients taking little of the treatments prescribed for them and claiming that non-compliance had been a subject of several reviews at that time (Chaput de Saintogne 1977).

There are several methods used to measure patient compliance, which results in quite different estimated degrees of compliance. There are direct measures, like

observation, biological assays and the use of markers, and indirect ones, like interview, pill counts, clinical response and use of medical monitors – but none of these methods is totally reliable and besides, they probably measure different kinds of behaviour. As mentioned above, the percentage of patients who do not adhere to the instructions varies on a large scale; according to WHO (2003) or Young and Oppenheimer (2006), in developed countries, adherence to long term therapies in the general population is around only 50% and is much lower in developing countries – this statement denotes that compliance is always measured for a more concrete situation (e.g., long term therapies or medication taking), but also indicates a high proportion of non-compliance, which is substantial if we consider its multiple impacts.

The lack of compliance with prescribed medication regimen results in rising health care costs and adverse clinical outcomes such as increased morbidity and mortality rates. In the United States, 125,000 deaths per year, 10% of hospital admissions, and up to 23% of nursing home admissions each year could be avoided if people took their medications as prescribed – it costs \$100 billion a year (Young–Oppenheimer 2006). In addition, this number would probably be much higher if we included other types of non-compliance (like not achieving recommended lifestyle changes, the proportion of which can even be higher, even the double of not taking medications - according to Molnár–Csabai 1994), but naturally, its effects are largely difficult to estimate.

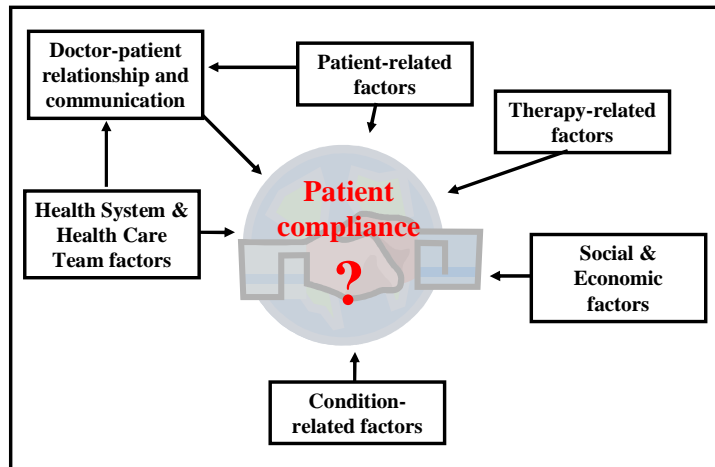
Accordingly, a higher degree of compliance not only has a positive impact on health status, but it confers economic benefits as well (direct savings generated by reduced use of sophisticated-end expensive health services needed in case of disease exacerbation, crisis or relapse; indirect savings attributable to the enhancement or preservation of the quality of life). Improving adherence also enhances patient safety through a decreased number of relapses, lower risk of dependence, abstinence and rebound effect, reduced risk of developing resistance to therapies, and decreased risk of toxicity. In addition, “increasing the effectiveness of adherence interventions might have a far greater impact on the health of the population than any improvement in specific medical treatments” (WHO 2003).

These arguments and substantiations support the fact that the role of compliance is remarkable in healthcare services, and that it is worthwhile examining through which factors a doctor-patient relationship and communication can contribute to an increased level of patient compliance with therapy decisions.

2.3. Factors determining compliance

Compliance is a multidimensional phenomenon; it can be determined by six factors (Figure 1).

Figure 1. The dimensions of compliance



Source: own construction on the basis of WHO (2003) and Molnár–Csabai (1994)

Social and economic factors (like poverty, illiteracy, low level of education, unemployment, high cost of medication or culture) have not consistently been found to be a predictor of adherence; their effect may be more essential in developing countries. As for health-care team and system-related factors, such as: knowledge and training for health care providers, overworked health providers, the level of incentives and feedback on performance, or the capacity of the system to educate patients and provide follow-up, little research has been made. Nonetheless, they are also considered to be factors that affect adherence. Condition-related factors include particular illness-related demands faced by the patient (severity of symptoms, level of disability, rate of progression), and their impact depends on how they influence patients' risk perception, the importance of following treatment and the priority placed on adherence. Under therapy-related factors, the complexity of medical regimen, duration of treatment, previous treatment failures, changes, the immediacy of beneficial effects and side effects can be understood. Patient-related factors represent the resources, knowledge, attitudes, beliefs, perceptions and expectations of the patient (WHO 2003). The concept of health behaviour belongs here as well, as the connection between behaviour and diseases is increasingly proven. Health-

related behaviour may be diverse: health-behaviour serves for observing health, namely prevention, while disease-behaviour shows how we search for treatment (Pikó 2003). Naturally, this distinction is only theoretical; in practise, these two types of behaviour are interlocked and based on the same beliefs and attitudes. Health-behaviour refers to, according to one of its definitions which is accepted as, “those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behaviour patterns, actions, and habits that relate to health maintenance, to health restoration, and to health improvement” (Gochman 1997). Health-behaviour is based on a specific order of values, the core of which is accepting health as a value, and consists of habits which enhance a harmonious unfolding, but do not endanger the soundness of the organism and the personality. Health-behaviour is composed of conscious and unconscious elements, these create the so-called health-consciousness, which is part on our self-knowledge and reflects to how we approach our own state of health. Maintaining health does not go spontaneously, it requires conscious activity and social responsibility (Szabó 2003).

According to Molnár and Csabai (1994), research show that compliance is not dependent from any stable personality factors – these rather determine patients’ general approach to health and illness or perceived control over their own health status. They claim the quality of the doctor-patient relationship and the patient’s satisfaction with it as the most important factors determining compliance. Placing these elements in the concept of the WHO is best realized if relationship and communication are considered to be a separate factor, depending both from the provider (provider behaviour being part of health care team factors) and patient-related factors.

Presenting risk information belongs to the unit of relationship and communication – it refers to how patients get information about adverse effects that may occur if adhering to the recommendations of the provider (side effects of medications, most importantly). According to a research on this topic, informing patients of actual percentages risk of adverse effects is associated with less fear about them, and a greater intent to comply with prescribed regimens, compared to verbal descriptions with semantic terminology (e.g., some people may experience...) (Young–Oppenheimer 2006). This phenomenon can be explained by the Prospect Theory, which establishes that people tend to give too much weight to small probabilities and too little weight to larger probabilities, which leads them to believe that the likelihood of an uncommon event is higher than it is actually. Besides framing, other factors and biases considerably affect perceived risk as well: representativeness, availability, attribution or whether the outcome “can happen to

me”. Trust in the one who communicates risks is also a key element in risk perception (Kahneman et al 1982).

As seen, several respects of patient compliance are affected by factors that evolve in the consulting room. Acknowledging the serious effects of non-compliance and also that compliance may be influenced by proper risk communication in addition to doctor-patient relationship supports the intention of examining this topic from a marketing-and-psychology point of view.

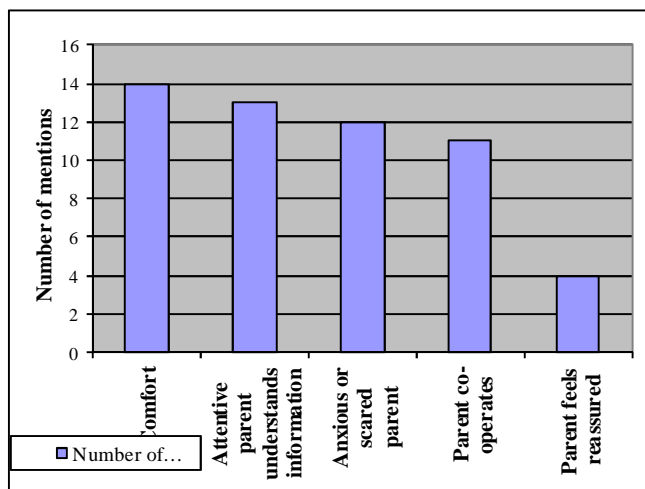
3. Empirical research and results

Research has been carried out in the subject of communication and decision making in the consulting room (see Vajda et al 2008 and Veres et al 2008) with both qualitative and quantitative methods. Semi-structured diaries (filled by 56 paediatricians and 70 parents of children attending them) and self-administered questionnaires were taken in the Dél-Alföld (a south-eastern) region of Hungary, with the intention to explore the realization of and preferences for doctor-patient communication and decision making about the therapy. Both modules have results concerning patient compliance, as the research model contained willingness for cooperation/compliance as an important factor in risk perception of both sides (patient and provider) and the way of communicating with the doctor.

Most of the results of the research have shown an authoritarian style of communication and decision-making being dominant in consultations-fulfilling not only the expectations of doctors, but often that of patients as well. A preference for being involved in decisions is not general at all among patients.

As for the signs of compliance in the results of diaries, it appeared in the recitals of doctors. According to the frequencies of the most often experienced feelings of doctors (Figure 2), their patients (here: the parents of the patients) showed attentiveness, and physicians felt the parents understood information and cooperated with them. Factors that were mentioned less frequently are not indicated in the diagram. As recitals of feelings and thoughts were only semi-guided (instructions only asked for not a professional, but a relationship-oriented approach), these results were considered as signals of a quite high intention of compliance. High compliance may be due to the “traditional” characteristic of doctor-patient relationship; doctors are often in a dominant, authority position, to which patients intend to fit.

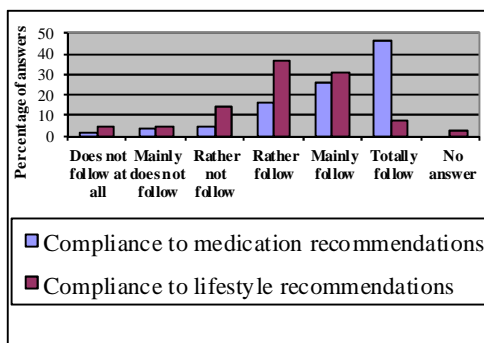
Figure 2. The most frequent feelings and thoughts of doctors during the consultations



Source: own construction

The results of questionnaires further reinforce this assumption. 436 respondents filled the questionnaire, and, as Figure 3 shows, most of them rather, mainly or totally follow the recommendations of their doctors. Although, a difference can be seen between compliance to medication and compliance to lifestyle recommendations, the latter is not so unambiguous, as expected.

Figure 3. The degree of following recommendations of doctors



Source: own construction

4. Conclusions

Compliance or adherence to health service provider recommendations is widely considered to be a remarkable factor in health outcomes. Although literature results suggest compliance rates to be quite low, our results of former empirical research show a relatively high compliance in a Hungarian setting. However, these results are only indications of this phenomenon; limitations of these results include that only intentions and feelings concerning cooperation were investigated; actual compliance was not measured.

On the basis of these forgoing, partial results, it seems that a good relationship between doctor and patient is needed for a better rate of compliance. This suggests that there is a need to take patients' concerns, feelings and preferences into consideration, and whenever possible, shape the communication process according to this.

Further research is planned to explore features of patient compliance within the scope of our research on doctor-patient communication, as it is considered an important tool in improving the quality of healthcare services and satisfaction of both patients as well as doctors.

References

- Chaput de Saintonge, D. M. 1977: Measuring patient compliance using single head hairs. *British Journal of Clinical Pharmacology*, 4, p. 699.
- Cramer, J. A. – Roy, A. – Burrell A. – Fairchild, C. J. – Fuldeore, M. J. – Ollendorf, D. A. – Wong, P. K. 2008: Medication compliance and persistence: terminology and definitions. *Value Health*, 11, pp. 44–47.
- Gochman, D. S. 1997: Handbook of health behaviour research: demography, development and diversity. *Plenum Press*, New York, pp. 179–198.
- Hajnal, M. P. 2005: Integrált irányítási rendszerek és modellek alkalmazási lehetőségei és buktatói az egészségügyben. *IME*, 9, 30–36. o.
- Kahneman, D. – Slovic, P. – Tversky, A. 1982: Judgement under uncertainty: Heuristics and biases. *Cambridge University Press*, New York.
- Kincses, Gy. 2000: Az egészségügy új szemlélete. *Egészségügyi menedzsment*, 2005/5, 91–94. o.
- Kornai, J. 1998: *Az egészségügy reformjáról*. KJK Kerszöv, Budapest.
- Molnár, P. – Csabai, M. 1994: A gyógyítás pszichológiája. *Springer Hungarica*, Budapest.

- Paes, A. H. P. – Bakker, A. – Soe-Agnie, C. J. 1998: Measurement of patient compliance. *Pharmacy World and Science*, Vol. 20., No. 2., pp. 73–77.
- Pikó, B. 2003: Magatartástudomány és prevenció: a preventív magatartásorvoslás jelentősége. *Magyar Tudomány*, 48, 11, 1390–1391. o.
- Pikó, B. 2004: A marketingkommunikáció orvosi vonatkozásai. In Pilling J. (szerk.): *Orvosi kommunikáció*. Medicina, Budapest, 471–494. o.
- Sabaté, E. 2003: Adherence to long-term therapies. *World Health Organization*, Switzerland.
- Sihota, S. – Lennard, L. 2004: Health Literacy: being able to make the most of health. National Consumer Council. Accessed 10 December 2007. <http://www.clingov.nscsha.nhs.uk/Default.aspx?aid=1806>.
- Szabó, B. 2003: *Erdélyi középiskolások egészségmagatartása*. Babes–Bolyai Tudományegyetem Kolozsvár, Románia. Downloaded from http://www.phd.hu/tavasz2003/tsz_2003/tudomanyosszekciok/tavasziszel2003_szabobela.htm, on 2007–07–17.
- Törőcsik, M. 2007: Életstílus–gyógyszerek. *Lege Artis Medicinae*, 2007/9.
- Vajda, B. – Kiss, G. – Málovics, É. – Kuba, P. 2008: *Preferences of communication and decision making in healthcare in Hungary – a quantitative study*. AIMPON Conference Proceedings.
- Veres, Z. – Vajda, B. – Pataki, M. 2008: *Characteristics of communication in the consulting room: Results of doctor and patient diaries*. AIMPON Conference Proceedings.
- Vick, S. – Scott, A. 1998: Agency in health care. Examining patients' preferences for attributes of the doctor-patient relationship. *Journal of Health Economics*, 17, pp. 587–605.
- Young, S. D. – Oppenheimer, D. M. 2006: Different Methods of Presenting Risk Information and Their Influence on Medication Compliance Intentions: Results of Three Studies. *Clinical Therapeutics*, Vol. 28., No. 1., pp. 129–139.

Methodology at the crossroads of disciplines

The elliptical model of multicollinearity and the Petres' Red indicator

Péter Kovács

One possible method for modelling multicollinearity is to examine the orthogonality of explanatory variables, which is the “stretching” of the space of explanatory variables. The question rightly arises whether multicollinearity can be modelled in a different way.

As a new approach, the elliptical model of multicollinearity can be formulated on the basis of Petres' Red indicator. Parallel with the increase in the extent of the mean correlation of the variables, the “possible eigenvalues” are situated on an m -dimensional sphere with a greater radius. The “possible eigenvalues” are situated on a segment of the m -dimensional sphere in such a way that with a fixed Red value they are located on an $(m-1)$ -dimensional ellipsoid.

Unfortunately, the higher the dimension number of the model, the more conditions have to be given for determining and studying the range of “possible eigenvalues”. Therefore, the detailed examination of this range and of the elliptical curves was carried out only for three explanatory variables.

Keywords: redundancy of databases; multicollinearity.

1. Introduction

In the current globalizing world, decision makers have an increased need for information. However, the great increase in the quantity of data is not automatically accompanied by an appropriate increase in information. Contrarily, the problem that decision makers have to face today is not the lack, but the abundance of information. This massive amount of present data frequently has little informational content, which means that redundancy is high. Redundancy means “superfluous” data which does not convey new or noteworthy information in terms of the examination. For this reason, the information content of metric data is an essential issue in empirical analyses. This is particularly true for the application of linear regression models. In the case of linear regression models, multicollinearity can be interpreted as a type of redundancy. With matrix algebraic notation this can be written in the form of $\tilde{\mathbf{y}} = \tilde{\mathbf{X}}\tilde{\boldsymbol{\beta}} + \tilde{\boldsymbol{\varepsilon}}$, where $\tilde{\mathbf{y}}$ is the n component column vector of the dependent variable;

$\tilde{\mathbf{X}}$ is the matrix of explanatory variables consisting of row n and column $(m+1)$, where the first column is always an $\tilde{\mathbf{x}}_0$ sum vector; $\tilde{\boldsymbol{\beta}}$ is the $(m+1)$ component column vector of the model parameters unknown to us; m is the number of explanatory variables (explanatory variables); $\tilde{\boldsymbol{\varepsilon}}$ is the n component column vector of the error term (Hajdu 2003).

The problems of multicollinearity are almost always encountered in the course of economic analyses. The concept of multicollinearity is apparently uniform in literature. Definitions usually differ from each other in one word, but this entails significant changes in content.

1.1. *Multicollinearity*

Multicollinearity as an expression was first used by Ragnar Frisch. He used it for the description of cases in which one variable was present in several relations. In his examinations he did not distinguish dependent variables from explanatory variables. He assumed that the measurement of all variables was erroneous; the correlation between the actual values of the variables had to be estimated on this basis (Kovács 2008).

It is considered superficial when multicollinearity is defined as the absence of the independence of explanatory variables. This definition is problematic because it is defined ambiguously without the independent meaning of the explanatory variables clarified. Does it mean their linear independence or possibly their independence in the statistical sense?

One of the primary conditions of the standard linear regression model is the linear independence of the explanatory variables (Kennedy 2003). Therefore in certain sources, multicollinearity is interpreted as the absence of the linear independence of explanatory variables. This approach can be regarded as a special case of multicollinearity, which is called extreme multicollinearity. This case does not pose special problems in practice as it is easily manageable.

In the course of empirical analyses, cases close to extreme multicollinearity are frequently encountered; when the variances of individual estimated parameters are considerably increased as compared to the variance of the error term. The great majority of literature on multicollinearity deals with this case. However, it is best to note that multicollinearity could mean a much more general phenomenon, namely the correlation of explanatory variables. Naturally, the special cases of this definition would convey the content meant by multicollinearity to everybody.

1.2. Red indicator

Petres' Red is one possibility for measuring the proportion of data with a useful content in respect of the estimator $\hat{\beta} = (\tilde{X}'\tilde{X})^{-1}\tilde{X}'\tilde{y}$. Petres' Red is a new possible indicator of redundancy and thus of multicollinearity. The Red indicator is defined by using the eigenvalues λ_j ($j=1,2,\dots,m$) of the correlation matrix R of the explanatory variables. The Red indicator is based on the following train of thought. If the database serving as the source of the explanatory variables is redundant in respect of estimator $\tilde{\beta}$, that is if the correlation of the data is considerable, not all the data will have a useful content. The smaller the proportion of the data with a useful content is, the greater the extent of redundancy will be. The greater the dispersion of the eigenvalues is, the greater the correlation of the explanatory variables in the database will be. There are two extreme cases, either all the eigenvalues are equal to each other (that is their value is one) or all the eigenvalues with the exception of one equal zero. The extent of dispersion can be quantified with the relative dispersion of the eigenvalues or with their dispersion (being equal in this case).

$$(1) \quad v_\lambda = \frac{\sigma_\lambda}{\bar{\lambda}} = \frac{\sqrt{\frac{\sum_{j=1}^m (\lambda_j - \bar{\lambda})^2}{m}}}{\frac{\sum_{j=1}^m \lambda_j}{m}} = \frac{\sqrt{\frac{\sum_{j=1}^m (\lambda_j - 1)^2}{m}}}{\frac{m}{m}} = \sigma_\lambda$$

In order to make the redundancy of various databases comparable, the above indicator has to be normalized. As the eigenvalues are nonnegative, normalization is carried out with value $\sqrt{m-1}$ because of the relationship $0 \leq v_\lambda \leq \sqrt{m-1}$ concerning relative dispersion.

The indicator obtained in this way can be used to quantify the extent of redundancy, and the Red indicator can be defined with its help as follows.

$$(2) \quad Red = \frac{v_\lambda}{\sqrt{m-1}}$$

In the case of the absence of redundancy, the value of the above indicator is zero or zero percent, while in the case of maximum redundancy, it is one or one hundred percent.

The Red indicator measures the redundancy of the examined database of the given size. When the redundancies of two or more databases of different sizes are compared, the Red indicators can only be used to determine how redundant individual databases are, but one cannot make a direct statement as to which of these has more useful data.

The Red indicator can be expressed without knowing the eigenvalues of the correlation matrix of the explanatory variables, merely as the quadratic mean of the correlation coefficients (Kovács et al 2005).

$$(3) \quad Red = \sqrt{\frac{\sum_{i=1}^m \sum_{\substack{j=1 \\ j \neq i}}^m r_{ij}^2}{m(m-1)}}.$$

This means that this indicator shows not only the proportion of the data with a useful content in respect of the estimator $\tilde{\beta}$, but also the mean correlation of the explanatory variables. It ensues from the definition of the indicator and from formula (3) that, as compared to other indicators based on eigenvalues, the advantage of this indicator is that it considers all the eigenvalues in such a way that its value is influenced by all the eigenvalues with the same weight. It also considers all the pair correlation of the explanatory variables, thus the Red indicator definitely represents an advance compared to the research of multicollinearity to date. Various cases of extreme multicollinearity can also be distinguished with the help of the indicator, as it can also be used when one of the eigenvalues is zero.

The correlation of the variable pairs and the correlation of the variable groups may pose a problem during the examination of multicollinearity. However, no detailed methodology has been worked out for this yet. A possible solution to the problem could be the use of canonical correlation analysis in conjunction with the redundancy index. It has been established that one special case of this can be measured with the Red indicator, while another special case with the help of the harmonic mean of the VIF_j values.

2. New modelling possibilities of multicollinearity

The question may arise how multicollinearity can be modelled. By plotting the explanatory variables as vectors, conjectures can be drawn up concerning the presence of multicollinearity.

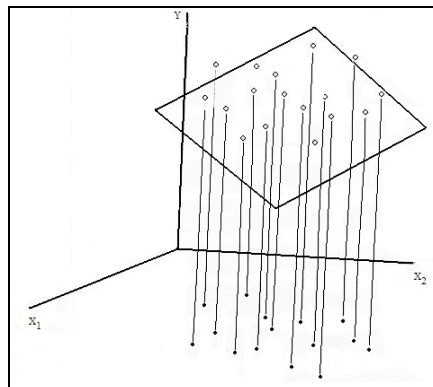
2.1. Orthogonality of variables

One of the most frequently mentioned possibilities for modelling is to examine the orthogonality of explanatory variables. If the vectors plotted are orthogonal, meaning that the space of explanatory variables is stretched maximally, there is no multicollinearity in the model. The smaller the stretching of the space, the greater the extent of multicollinearity there will be. The question rightly arises whether multicollinearity can be modelled in a different way.

2.2. Projection

Another possibility is to examine the projections of the regression plane, hyper plane, in each x_i - x_j plane projection. For instance, with two explanatory variables Figure 1 shows that – in the case of the statistically insignificant correlation of explanatory variables – the variance of the estimated parameters is considerably smaller compared to the variance calculated in the case of significant correlation. This is because, in the first case, the “cloud of points” of the data base is dispersed in the x_1 - x_2 plane projection in every dimension, and thus the fitted regression plane is stable (Tričković 1976).

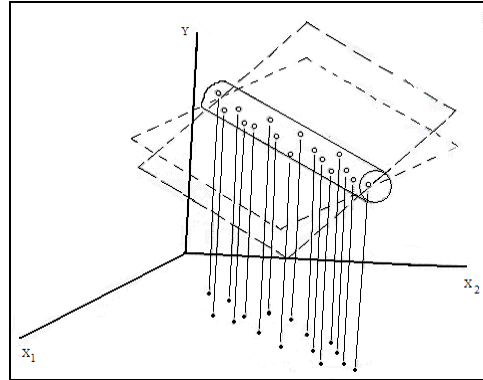
Figure 1. Stable regression plane in the case of the non-significant correlation of explanatory variables ($m=2$)



Source: Tričković (1976)

At any rate, the “cloud of points” in Figure 2 is not dispersed in the x_1 - x_2 plane projection in every dimension, thus the fitted plane is tilted easily and fitting becomes instable. This way of plotting is very work-intensive and only the pair correlation of the explanatory variables can be illustrated.

Figure 2. Instable regression plane in the case of significant multicollinearity ($m=2$)



Source: Tričković (1976)

2.3. The elliptical model of multicollinearity

Starting from the definition of the Red indicator, a different type of model for multicollinearity can also be given. The following relationship is obtained by rearranging formula (2) of the Red indicator.

$$(4) \quad \sum_{i=1}^m (\lambda_i - 1)^2 = (\sqrt{m(m-1)} \text{Red})^2$$

Equation (4) is the equation of a sphere the radius of which is $\sqrt{m(m-1)} \text{Red}$, and every coordinate of its centre point is one. If the mean correlation of the variables is zero, that is there is no correlation between the explanatory variables, then the sphere is reduced to the single point each coordinate of which is one. The greater the extent of the mean correlation of the variables is, the greater the radius of the sphere will be, and specifically the greater the “inflation” of the sphere will be.

If the mean correlation of the variables is one, that is the absolute value of the correlation coefficient between each explanatory variable pair is one, the radius of the sphere is $\sqrt{m(m-1)}$.

Naturally, not each point of the spheres represents an existing correlation structure. By definition, combinations of eigenvalues can also be found on the spheres which are not possible in the case of correlation matrixes. The question is which points of the spheres represent an existing correlation structure. In the following example, these eigenvalue combinations are going to be called “possible eigenvalues” for clarity purposes. In order to examine “possible eigenvalues”, the properties of the eigenvalues of the correlation matrix need to be considered. As the sum of eigenvalues equals the number of explanatory variables, or the dimension of the sphere, it is certain that “possible eigenvalues” are located on the intersections of equation (4) and of (5).

$$(5) \quad \sum_{i=1}^m \lambda_i = m$$

In the following, without restriction of generality, it can be assumed that:

$$\lambda_{\max} = \lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_m = \lambda_{\min}.$$

By calculating the smallest eigenvalue from formula (5) and by substituting it into equation (4), the following equation is obtained:

By rearranging the equation the following equation is obtained:

$$(6) \quad \sum_{i=1}^{m-1} \lambda_i^2 - m \sum_{i=1}^{m-1} \lambda_i + \sum_{i=1}^m \sum_{\substack{j=1 \\ j>i}}^{m-1} \lambda_i \lambda_j + \frac{m(m-1)}{2} = \frac{m(m-1)}{2} \text{Re } d^2$$

Equation (6) means that the “possible eigenvalues” – with a given Red indicator – are contained in an (m-1)-dimensional ellipsoid. In the special case of three explanatory variables, some points of the ellipses mean the “possible eigenvalues”. The elliptical name of the model ensues from the nature of the curves. It can be seen that on the basis of equation (6) the representation of the eigenvalues is obtained in a dimension lower by one compared to the number of the eigenvalues.

If the number of explanatory variables is three, equation (6) can be written in the following form:

$$(7) \quad \lambda_1^2 + \lambda_2^2 - 3\lambda_1 - 3\lambda_2 + \lambda_1\lambda_2 + 3 = 3 \operatorname{Re} d^2$$

In the case of three explanatory variables, the range of “possible eigenvalues” can be delimited – in addition to formula (5) – by giving three more conditions.

- With the consideration of the relation between the eigenvalues: .
- With the consideration of the relation between the eigenvalues:
 $\lambda_2 \geq \lambda_3 = 3 - \lambda_1 - \lambda_2$, therefore $\lambda_2 \geq \frac{3 - \lambda_1}{2}$.
- Moreover: $\lambda_1 + \lambda_2 \leq 3$. This condition already includes conditions $\lambda_1 + \lambda_3 \leq 3$ and $\lambda_2 + \lambda_3 \leq 3$.

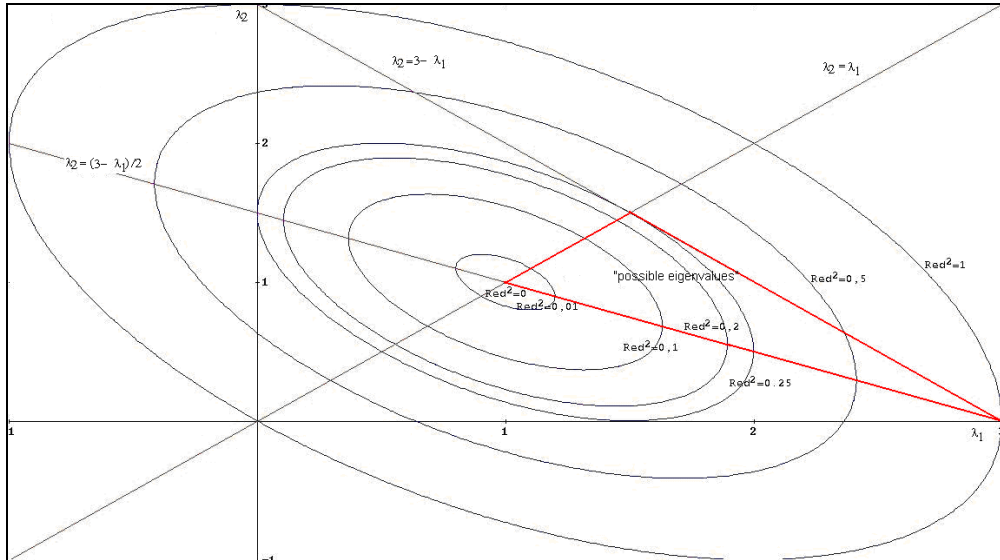
Some of the level lines with different Red values are illustrated in Figure 3. Plotting is made as the function of the two largest eigenvalues.

Thus, in the case of three dimensions, “possible eigenvalues” can be found in the triangle of Figure 3. The cases of extreme multicollinearity are given by the interceptions of the ellipses and line $\lambda_2 = 3 - \lambda_1$. This also shows that various cases of multicollinearity can also be distinguished with the help of the Red indicator.

In the case of higher dimensions – in line with the above train of thought – the great number of conditions makes it difficult to plot the “possible eigenvalues”. Therefore, in higher dimensions, all we can state for certain is that the radius of the examined m-dimensional sphere will increase with the increase of the mean correlation of the variables. Furthermore, with a fixed value of the Red indicator, the “possible eigenvalues” are located on the surface part of a (m-1)-dimensional ellipsoid.

A similar plotting exists in literature for linear correlation coefficients. These form an ellipsope (Bolla–Krámlí 2005). In higher dimensions such an approach to plotting is unhandy.

Figure 3. The elliptic model of multicollinearity in the case of three explanatory variables



Source: own construction

In the following I am going to present some characteristics of the ellipses in the case of three explanatory variables.

1. If the extent of the correlation of the explanatory variables is greater, the section of the ellipses falling into the “possible range” is shifted to the right.
2. Empirical experience shows that, with a given Red value, the increase of eigenvalue λ_1 is accompanied by a greater decrease of eigenvalue λ_2 , therefore the smallest eigenvalue will also increase as the sum of eigenvalues is three.
3. The correlation matrixes in which all the elements outside the diagonal are the same – in this case $\mathbf{Re}d = r = \mathbf{R}_{ij(i \neq j)}$ – are located on the lower boundary of the possible range. Then the determinant of the correlation matrix equals the value of the $1 - 3\text{Re}d^2 + 2\text{Re}d^3$.
4. Empirical experience shows that the product of eigenvalues decreases when moving upwards on a given ellipse, that is the determinant of the correlation matrix is becoming smaller and smaller. Thus, with a given

Red value, the determinant of the correlation matrix falls into the range of $[\max(1 - 3 \operatorname{Re} d^2 - 2 \operatorname{Re} d^3; 0); 1 - 3 \operatorname{Re} d^2 + 2 \operatorname{Re} d^3]$ on a fixed ellipse.

3. Conclusions

As a new approach, the elliptical model of multicollinearity has been formulated. Parallel with the increase in the extent of the mean correlation of the variables, the “possible eigenvalues” are situated on an m -dimensional sphere with a greater radius. The “possible eigenvalues” are situated on a segment of the m -dimensional sphere in such a way that with a fixed Red value they are located on an $(m-1)$ -dimensional ellipsoid. Unfortunately, the higher the dimension number of the model is, the more conditions have to be given for determining and studying the range of “possible eigenvalues”. Therefore, the detailed examination of this range and of the elliptical curves was carried out only for three explanatory variables.

References

- Bolla, M. – Krámli, A. 2005: *Statisztikai következtetések elmélete*. Typotex Kiadó, Budapest.
- Hajdu, O. 2003: *Többváltozós statisztikai számítások*, Központi Statisztikai Hivatal Budapest.
- Kennedy, P. 2003: *A Guide to econometrics*. 5. Edition, MIT, Cambridge.
- Kovács, P. – Petres, T. – Tóth, L. 2005: A new measure of multicollinearity in linear regression models. *International Statistical Review (ISR)*, Vol. 73., No. 3., Voorburg, The Netherlands, pp. 405–412.
- Kovács, P. 2008: A multikollinearitás vizsgálata lineáris regressziós modellekben. *Statisztikai szemle*, 86. évf., 1. sz., 38–67. o.
- Tričković, V. 1976: *Teorijski modeli i metodi kvantitativnog istraživanja tržišta*. Institut za ekonomiku industrije, Beograd.

What is the value of a Hungarian degree?

An analysis of the labour market position of students graduated from a Hungarian higher education institution

Erzsébet Hetesi – Zsófia Kürtösi

In the European Union, the reform of higher education institutions represented by the Bologna Process places its central focus on creating student and employee mobility, making education systems more flexible and turning higher education output in a direction that meets labour market demands. The present paper examines the labour market position of graduating students in a Hungarian higher education institution. The empirical research, based on questionnaires, introduces the employee groups that can be found in today's Hungary, specifically in the case of fresh graduates and describes the main characteristics of these clusters. The goal was to find an answer to how much higher education institutions prepare students for the world of work and how the graduates evaluate the usability of the acquired knowledge. The research described in the present studies has already been repeated and current plans include the regular completion of similar surveys in the future. The results and findings of the research may serve as a basis for comparing the opportunities of graduate students leaving Bologna-type training programs and the efficiency of the present ones, as well as the consequences of changes.

Keywords: higher education, student and employee mobility, labour market

1. Introduction

Financed from the tax payments of citizens, part of the state's task worldwide is education. Therefore, it is relevant whether this money is used in a profitable way. Relevancy can be determined by whether students leaving the education can utilize the knowledge they have obtained and meet the demands of the labour market. Hungarian researchers have been interested in higher education output and responses to labour market demands for decades, but the question of incongruence still represents an unsolved task (Veress 1999). The government strives to establish

harmony with the help of various regulations and employment forecasts, however, these efforts seem to reach only partial success.

The present paper analyses the market position of graduate students of a Hungarian higher education institution. For several years, the institution has engaged in surveys aiming to assess the needs of its active students and the degree of satisfaction related to the palette of the institution's educational and supplementary services, but the university has not yet conducted any research focusing on the labour market position of its fresh graduates, their relations with their parent institution and their judgment of its institutional services. Due to spatial limitations, only parts of our graduate follow-up research results will be discussed and will focus on the usability of knowledge acquired at the university and the labour market position of fresh graduates.

2. Theoretical background

2.1. Characteristics of education services

Education is a service where the fundamental features of services occur with different emphases and the special strategic tasks deriving from these also set special demands for the service provider. Out of the four basic features (intangibility, inseparability, heterogeneity and perishability) intangibility, inseparability and heterogeneity heavily influence the judgement of educational services:

- Services do not have parameters and features that could be inspected by senses; they can only be revealed empirically. In the sphere of education, the forecasting role of physical parameters is small, while future students can collect information about the service much more via communication, like the institution's promise and other people's experiences (word-of-mouth); consequently, tangible factors play hardly any role in their decision of choice and therefore, the sense of risk is especially high in the preceding process and in the course of services as well.
- Services are usually consumed the moment they are created; the provision and use of services usually happens in the same place and time and the user actively participates in the service process (Zeithaml et al 1985). Based on the intensity of the relationship between service provider and user, Chase distinguishes services based upon low and high direct consumer relations, where the interaction time is considered and believes that the longer the two parties deal with each other, the more the service process needs regulation (Chase 1978). Education is a service where the time that the two parties spend

in the “system” is very high; therefore, the process assumes special significance in how consumers evaluate service quality.

- The performance of service providers and the consumer evaluation of performance vary, are uncertain and, due to the human factor, quality is heterogeneous. In the case of educational services, fluctuating quality occurs more intensely, since here, on the one hand, standardizing is not logical, on the other hand, subjectivity of the parties has a stronger influence on the evaluation of quality due to the complexity of service dimensions.

Besides the specialities of the service process itself, providers have some special characteristics too. Institutions providing education services have a strong hierarchical structure and their organizational culture is mainly based on tradition. These organizations have numerous, deep-rooted traditions reaching back for centuries (e.g. the departmental structure based on academic fields, adherence to the faculties and rules), due to which they resist changes, and the market expectations that appear towards the students bear secondary significance to them (Harmon 1993, Sirvanci 2004).

The third problem in the case of educational services is defining the consumer group, since the identification of the consumer in higher education is much more complicated than in business life. Neither researchers dealing with higher education, nor institutions providing the service have reached any agreement on who can be regarded as consumers. While some only consider students as consumers, in other approaches, consumers appear in a much more differentiated way and, beyond students, include institutional colleagues, parents, former students, employers, the local community and society in the broader sense. Nevertheless, it can be seen that some of the aforementioned groups could be regarded as stakeholders rather than direct consumers. If the production model is applied where incoming students can be regarded as raw material, while outgoing graduates are the finished product; the opinion of the employers and fresh graduates is the most important factor for the institution.

2.2. Research background of the follow-up studies completed among graduate students

Starting from the 1980s, various studies emerged in the international literature that dealt with the labour market position of graduate students. The Bologna process made such analyses particularly important, therefore, international comparative research projects, like the CHEERS project in 2000¹² were also launched. Researchers mainly focused on the following subjects:

¹² Careers after Higher Education: a European Research Study

- How students' competences, the labour market conditions, employers' expectations and the dynamics of the transition mechanisms interact in determining the relationships between graduation and initial employment.
- How successful graduates are on the labour market where "success" is measured in multiple ways (e.g. remuneration, status, on-the-job utilisation of knowledge acquired during the course of study).
- What the links are between the competences acquired during the course of study and the actual work tasks as perceived by the graduates.
- How the study conditions and provisions the students experienced actually "matter" for their subsequent employment and work¹³.

In Hungary, not only the Bologna Process induced these studies but also the expansion in higher education that occurred in the 90s¹⁴. A large number of worried statements were published about the fact that Hungary is likely to experience a dramatic increase in unemployment among diploma-holders because the structure of education fails to follow the needs of the labour market and the emergence of the quantitative approach harms quality. Several researchers examined how big a threat lies in the deterioration of fresh graduates' situation on the labour market and in the increase of unemployment among people with secondary education (crowding-out effect). According to certain research, despite the great proportion of graduate inflow, unemployment among diploma-holders has not increased. This is partly due to the fact that 48% of the workplaces created after the economic shock in 1989 emerged in graduate positions and demands in terms of qualification also increased concerning the already existing workplaces. However, it is not possible to measure how successful or unsuccessful graduates prove by only using their chances of finding employment, but also with the help of benefits acquired in terms of their wages. The market can gain information concerning the measure of demand by observing changes in prices (in other words, relative wages). Various Hungarian and international research analyzed the "returns to higher education"¹⁵ deriving from schooling level. According to a survey conducted in ten European countries, Hungarian graduates' returns to higher education are considerably high. While Austrian males with higher education degrees earn 45% more than their companions

¹³ Schomburg, H. – U. Teichler 2004: Increasing Potentials of Alumni Research for Curriculum Reforms: Some Experiences from German Research Institute. Location: www.gradua2.org.mx/docs/bolonia/Schomburg.de

¹⁴ The number of full-time students admitted to higher education tripled within ten years and in 2001 full-time students taking part in higher education already represented one-fourth (24.7%) of the population with the given age (18–22) (Lannert et al 2004).

¹⁵ Economic gains an individual may make by investment in his/her education

with secondary level qualification, in Hungary, these figures reach 103% (Kertesi–Köllő 2005). Certain research proves that until 2001, the market considered over-schooling (if the employee completed more classes than necessary) more attractive than sufficient education.

The other direction of research projects in Hungary dealt with the evaluation of graduating students' skills, abilities and acquired knowledge. In the framework of a national empirical survey conducted at the beginning of 2007, the Research Institute of Economics and Enterprises interviewed the leaders and human resources managers of 1000 enterprises about the chances of fresh graduates to find workplaces, the expected changes in the demand and their satisfaction with these fresh graduates' skills and knowledge. The research results showed that in Hungary, employers consider precise work, aptitude to acquire new skills, ability to work independently, theoretical foundations in the profession, computer literacy, openness to work in a team and organizing competences highly important regardless of graduate students' actual profession (Kézdi et al 2004, Selmeczy 2007).

The above mentioned macro-sociological studies are quite important, but they are usually unable to describe the diversified nature of higher education institutions and their inhomogeneous "market performance". Unfortunately, the systematic institutional level researches are still rare. Although certain student researches are conducted periodically, the majority of Hungarian higher education institutions primarily focus on surveying the satisfaction level of their active students rather than the efficiency of education activities after students leave. However, in the long run, this approach cannot be maintained since the judgment of the market and employers will prove the determining factors (Barakonyi 2004).

3. Empirical research in a Hungarian institution

3.1. Defining the problem, research objectives

Alumnus research usually assumes a pragmatic approach and, deriving from their nature, does not address serious theoretical dilemmas. It simply examines how graduate students can utilize their knowledge, what types of successes or failures they experience on the labour market after their university years and how employers judge their acquired knowledge (Vámos 2000). Consequently, a theoretical model was not constructed for the empirical research either, but the goal was to merely find an answer to how the graduates of the institution manage on the labour market and, based on this, how they judge the years spent at the university. In line with this research concept, the following objectives were set:

- Students' satisfaction level with the university at the time of graduation, whether this changed in the light of experiences on the labour market, how they judge the institution's reputation compared to other Hungarian universities, whether they regard their acquired knowledge useful and how willing they feel to return to the institution.
- To determine how much the university prepared graduating students for the skills and knowledge (for example, knowledge of languages, solving practical problems) that the labour market appreciates, but is usually less emphasized in the traditional education structure.
- What the most important strengths of the institution were in different fields like education, complementary services or student life.
- To establish what kind of relationship graduating students have with their parent institution.
- How fresh graduates made the first steps on the labour market: how long it took them to find jobs, what were the most popular recruitment channels (how the university's job fairs helped in this), how many times they changed jobs, how their present employment circumstances are (e.g. wages, leaving the profession).
- How former students evaluate their own preparation level in the different work areas and in which scientific field and how they imagine updating their knowledge, acquiring new competences and whether they count on their Alma Mater in this.

The present paper introduces only some parts of the research results; it discusses the evaluation of the usability of knowledge students acquired in the institution and the satisfaction level of the graduate groups managing differently on the labour market with the institution, in general, and educational services, in particular.

3.2. Introduction of the population, the sample and the research method

The examined institution is Hungary's second largest university that celebrated its 85th anniversary last year. At the time of the survey, eleven faculties operated at the university and the number of its students exceeds thirty thousand. Based on the above said, the employment opportunities of the graduates leaving the institution that provides an unusually wide range of supply represent a highly important socio-economic question, since the students leaving the institution become the components of workforce supply not only in the region but also in the whole country.

The students regarded were those who graduated in 2002 and 2003 as the population, consequently, instead of school years, calendar years were used as a

basis. Based on this, the 11,305 students graduated in the examined years formed the population.

The sample was compiled to make it representative according to the year of graduation, faculties and attendance types. In the course of the research, self-administered questionnaires were used that were sent to a total of 3600 graduates via mail, so almost one-third (32%) of the students leaving the university was reached in the given period. A total of 566 questionnaires were returned. The 16% of response rate may be considered good; since no similar research in Hungary managed to reach 20% percent of response rate. The present paper introduces some sections of the survey that may carry important information for the institution's management and may also point out useful directions for the decision makers of the higher education scene.

3.3. The main results of the research

3.3.1. Usability of the knowledge provided by the institution

According to graduate students, the university mainly excels in transferring theoretical knowledge; this opinion was shared by almost two-thirds of the respondents, although the number of those respondents who could not acquire the theoretical background necessary for their profession exceeds 10% in this case too. The weakest point lies in foreign language education. The majority of higher education institutions suppose that secondary education solves transferring language competence successfully, therefore, they do not have the sufficient amount of capacities that would make it possible to satisfy the diversified needs (different languages and levels, professional specifications) of such a great mass of students.

The other weak point lies in the question of labour market expectations and finding employment. According to the respondents, the institution must improve its services in this area as well. At the same time, the fact cannot be forgotten that in the case of higher education services, users must also actively participate in the process, they themselves must collect information about the vendibility of the different professions and they must choose faculties and training forms accordingly. The Bologna system will perhaps ensure a greater degree of flexibility in terms of allowing students to modify their chosen training area in the course of their training period, and instead of specialization, emphasis will fall on general and more widely applicable knowledge. Naturally, the players of the user side – employers – must also change their formerly assumed role, since students with a general level of preparedness can only become competitive if companies and institutions offer them a chance to acquire the necessary special professional competences by ensuring participation in internship programs during their training period.

Table 1. Evaluation of the competences and skills obtainable at the university on a 5 point rating scale (where 1= not at all, 5= absolutely) in percentage of the respondents, mean, std. deviation.

How much the university prepared you for...	1	2	3	4	5	Mean	Std. deviation
Solving the theoretical problems related to your profession? (N=560)	4	8	24	41	23	3,73	1,021
Solving the practical problems related to your profession? (N=560)	13	27	30	22	8	2,87	1,145
Finding a job/labour market demands? (N=556)	32	27	23	13	5	2,33	1,200
Communication in foreign language? (N=554)	41	26	14	10	9	2,20	1,311
Teamwork? (N=557)	15	17	28	27	13	3,06	1,251
Applying modern technology? (N=556)	19	24	27	21	9	2,77	1,231
Solving problems of managing and organizing? (N=555)	22	24	26	22	6	2,66	1,221

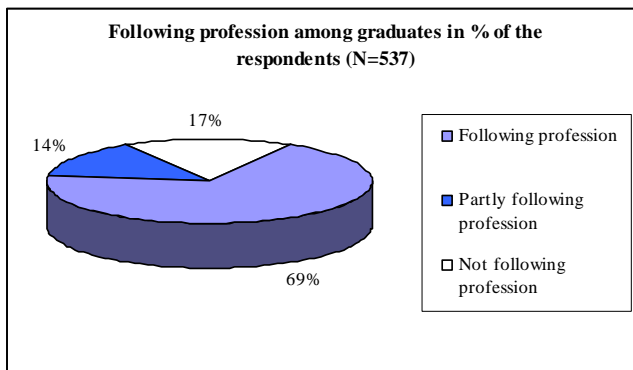
Source: own construction

Problems of managing and organizing prove problematic for 46% of the students. 43% of the respondents considered learning how to apply modern technology as a shortcoming, while almost one-third of them were satisfied of preparation offered by the university in this area. All together, students regarded preparation for solving practical problems to be weak and the average did not reach medium here either, since 40% of the respondents claimed that as fresh graduates, they were unable to solve practical questions relying on their knowledge gained at the university. 40% of the graduate students considered preparation for teamwork to be good; besides the transfer of theoretical knowledge, this was the other area that produced more satisfaction in the respondents.

3.3.2. Labour market position of graduate students

Presently, 89% of the students who graduated in the years of 2002/2003 conduct earning activities, their vast majority (62%) are employed at their first workplace while further 26% of them are active in their second job. 9% are employed in a third position and only 17 respondents changed jobs four-six times. More than two-thirds of the respondents are employed in their profession, while the percentage of those who left their profession reaches 17%. Almost all of them think that their qualification fits their work, but at the same time, over one-fifth of them (23%) have positions that could be filled in with lower qualification and 4% indicated that they would need higher qualification in order to perform their work adequately.

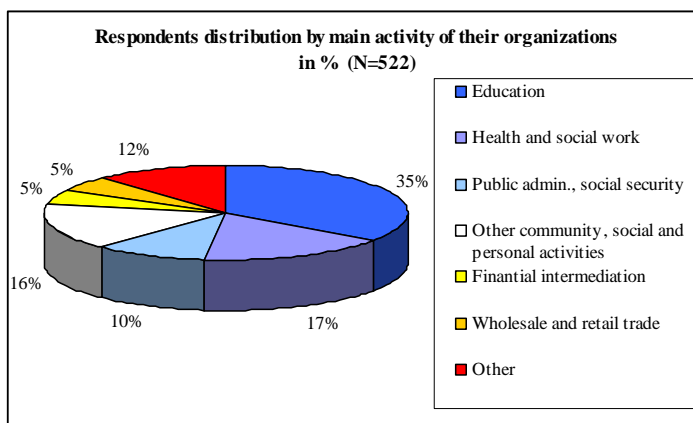
Figure 1. Following profession among graduates



Source: own construction

Most respondents (37%) consider the ethical recognition of their profession to be average, 35% regards it as good or very good, while 28% think that their learnt profession falls among the ones that qualify as badly or less recognized, while the average evaluation of ethical recognition reached 3.06. Respondents had less positive opinion about financial recognition (average=2.73): 39% of them think it is average, while 41% believe that their profession falls among badly or less recognized ones.

Figure 2. Respondents distribution by main activity of their organizations in percentage (N=522)



Source: own construction

Considerable part of the respondents (35%) work in education – owing to the graduating students of teacher training present in the sample in significant number –, but many respondents found employment in the health care (17%) and public administration (10%). 16% of them found jobs at organizations providing other social, community or personal services. Beside these, only financial activities and their complementary services and trade reach 5%, while less respondents work in other branches.

3.3.3. Characteristics of the groups of graduates according to their labour market position

Groups of graduates were formed based on the variables most characterizing their labour market position. The nine variables serving as the basis of grouping include the following: duration of job search for first job after graduation, how many times they changed jobs, how much their qualification corresponds to their job, how much their monthly net income is, in which county and for what size of organization they work, how is the ethical and financial recognition of their learned profession, whether they follow their profession or left it¹⁶. Clustering was done using the Ward method, and six larger groups were established. Table 3 contains the number of respondents in the different clusters.

Table 2. The number of respondents in the different clusters and their distribution

Clusters	N	%
Cluster 1	70	16
Cluster 2	95	21
Cluster 3	21	5
Cluster 4	92	20
Cluster 5	76	17
Cluster 6	96	21
Total	450	100

Source: own construction

Those who belong in the first group may be called the elite of the labour market. It is only true for this one of the created clusters that all of its group members found employment in the capital. None of them changed jobs more than three times (half of them are employed at their first workplace and slightly more

¹⁶ We tried several clustering methods and we also changed the group of variables creating the basis of clustering, however, this method offered the most suitable distribution. It should be noted, that various methods we tried led to similar results.

than one-fourth of them work in their second job), but compared to the sample, this group also includes a high rate of those (23%) who already have their third job. Most of them have jobs corresponding to their qualification and compared to the sample a smaller value indicative represents those (11%) who found jobs tied to lower qualification. There are few who do not at least partly work in their own profession (6%). The percentage of those who consider the ethical recognition of their work high is the largest in this group: 60% rated 4 or 5 and they are more satisfied with their financial recognition than others: 45% rated it to be good or outstanding. 37% of this group already worked at the time of graduating, 47% found employment within 1–3 months, but this does not mean considerable difference compared to the percentages of the sample.

The second group includes the losers of the labour market. This group has a relatively high percentage (18%) of those who found jobs after half a year, but the rate of respondents searching for employment for four to six months is also the highest here (12%). Most of them have their first or second job, 94% of them feel that their work could be performed with lower qualification as well. Although the majority works in the country, a relatively great percentage of them (20%) found employment in the capital. This group includes the highest percentage of those who work for small organizations with one to 20 employees. Over half of them (52%) failed to stay in their own profession, and among all of the groups, this one has the lowest rate of those who stayed in their profession (24%). A significant part of them think that their profession receives hardly any ethical recognition or none at all (42%). Only the members of the sixth group have a worse opinion than this. They consider their financial recognition to be average or low.

The third group is the smallest in number, only 21 respondents belong here. This is the group of people seeking their place. One of their major characteristics lies in changing jobs very often. While in other groups, members are not found who have changed jobs more than three times, each member of this group works at least in their third workplace, but almost half of them (10 people) already have their fourth job. It generally took those one to three months to find employment. A great part of them – 13 people out of the 21 – assume positions corresponding to their qualification, while six respondents have jobs that could also be performed with lower qualification. In terms of leaving their profession, the members of the group display a mixed picture: 11 out of the 21 respondents work in their profession, while eight of them changed their profession. Nine members of this group perceive their jobs as average, five people consider it to be badly reputed, while six of them tend to view it as well recognized. As for financial reward, they tend to be more pessimistic,

11 people categorize their learned profession as badly reputed and there is nobody who considers it as well or excellently recognized.

The fourth group consists of the middle class with good earnings. Here, the percentage of those who did not want to find employment after graduation is relatively high (11%), while the rate of those who had already worked at the time of leaving university is the smallest (20%). (This proportion is one-third in the sample.) The majority of them (96%) work in their first or second job; what is more, this is one of the groups with the highest rate of people in their first job (70%) and in this regard, only the fifth group exceeds this one where this figure is 84%. This group contains the highest rate of those who have jobs corresponding to their qualification (97%). Similarly to the members of the fifth and sixth group, none of them work in the capital. The proportion of respondents working for large organizations is the highest in this group, and in this respect they also come before the elite. 40% and 39% found employment in the two largest categories – workplaces with more than 500 employees and those employing 100–500 people. Many work (90%) in their original profession, and only two people changed their profession. The majority considers their own profession to receive good or at least average recognition (46–44%) and they have similar, although slightly less positive, opinion about their financial recognition.

The fifth group includes committed respondents. This is the group of those who were the quickest in finding employment: over half of them had already worked at the time of graduation and further 28% found employment in the first month. Those who fall in this group rarely change jobs: more than four-fifths of them (84%) work in their first job and 13% in the second one. Although 91% have jobs that correspond to their qualification, the percentage of those who think that their position would require higher qualifications is the highest in this group (9%). The majority have wages falling in the lower medium category (41–45%) just like the members of the third group. All of them found employment in the country; most of them (71%) have jobs in workplaces falling in the two smallest organization categories with one to 50 employees. The rate of those who found employment in their profession is the highest here (95%) and there is nobody among them who left his or her profession. In ethical terms, they are the ones who consider their profession the most recognized; 15% rated it excellent while 45% felt it was good. In financial aspects, they think that their profession falls in the category of medium and well recognized ones.

The sixth group is the one of people with little recognition. Most of them found employment in the first three months, one-third of them had already worked at the time of graduation. Thirty-five percent have already changed their job once, although 63% still work in their first job. Ninety-six percent believe that their qualification is in harmony with their job. This is the worst-earning group, all of its members found workplaces in the country and they primarily work for smaller organizations; there are only a few who are employed by organizations with more than 100 employees. The proportion of those following their profession is similar to the rates characterizing the sample: 77% work in their profession while 9% left it. Over half of the cluster members feel that their profession receives low (53%) or very low (9%) ethical recognition. The members of this group consider their profession to be the least recognized ethically. In financial terms, the situation is even worse: 12% think that their learned profession is the least recognized, while 55% feel it receives bad recognition.

3.3.4. Distribution of clusters based on branches

In terms of branches, those who work in financial areas and other communities, social and personal services are over-represented in the first group; while there are hardly any members employed in the education. The majority of the second group work in trade (22%) and other areas (18%), while people employed in the education are especially under-represented here. People seeking their place do not display any characteristics in terms of branches; their number is too little for this. In the fourth group, people employed in the administration are over-represented, although there are many of them who found work in the health care, while employees of the education branch are fewer in number compared to their proportion in the sample. A significant part of the fifth group (47%) are employed in the education, but the rate of those who work in the health care is also relatively high. 61% of people with little recognition found jobs in the area of education, while the other branches, especially administration, finance and trade are under-represented.

Table 3. Clusters according to branches

	Education	Health care	Public admin.	Other community etc. services	Finance	Trade	Other	Total
First group: elite of the labour market								
N	13	9	10	16	12	1	7	68
%	19	13	15	24	18	1	10	100
Second group: losers of the labour market								
N	14	14	8	13	7	20	17	93
%	15	15	9	14	8	22	18	100
Third group: people seeking their place								
N	8	4	0	5	1	1	2	21
%	38	19	0	24	5	5	10	100
Fourth group: middle class with good earnings								
N	28	21	18	7	3	0	13	90
%	31	23	20	8	3	0	14	100
Fifth group: committed people								
N	35	15	7	11	1	1	4	74
%	47	20	9	15	1	1	5	100
Sixth group: people with little recognition								
N	59	14	3	10	0	1	9	96
%	61	15	3	10	0	1	9	100
Total of the entire sample								
N	157	77	46	62	24	24	52	442
%	36	17	10	14	5	5	12	100

Note: *The values highlighted in the table show significant deviation compared to the proportions found in the entire sample.

Source: own construction

3.3.5. Satisfaction of the different labour market groups

In terms of satisfaction with the university, there is no significant difference among the clusters; the members of the fourth group are the most satisfied, while this rate is the lowest among the members of the third group. As far as reputation is concerned, the second group articulates the worst opinion (average=3.92); while there is no real difference in terms of the average displayed in the other groups. The expectations of the second and third group associated with training were realized to the least extent, but no significant difference in the cluster averages occurs here either. The only difference was found concerning the utility of knowledge acquired at the university; while the group of the losers of the labour market ranked this to be 2.87, many of

them left their profession and are forced to work in jobs demanding less qualification than they have, the fourth group of the middle class with good earnings produced the highest average (3.74) in this category. It is worth noting that the group assuming the best position on the labour market seems not particularly satisfied with the institution, the averages of this block of questions are situated in the middle section of the cluster averages. They probably attribute the achieved success to themselves rather than to the institution. At the same time, the group with the worst situation belongs to the ones least satisfied in several areas.

Table 4. Clusters' opinion about the university, means

	How satisfied were you with the institution at the time of graduation? (1=not at all, 7=absolutely)	The university's reputation compared to other institutions (1=very bad, 5=outstanding)	How much did education meet your previous expectations? (1= significantly worse, 5=significantly better)	How useful do you consider your knowledge acquired at the university in your present work? (1=not at all, 5=indispensable)
1. group: elite of the labour market	5,10	4,03	2,90	3,56
2. group: losers of the labour market	5,15	3,92	2,86	2,87
3. group: people seeking their place	4,90	4,14	2,86	3,00
4. group: middle class with good earnings	5,38	4,15	3,12	3,74
5. group: committed people	5,34	4,16	3,03	3,62
6. group: people with little recognition	5,32	4,12	3,07	3,53
Total	5,25	4,08	2,99	3,43

Source: own construction

Beyond general questions, the differences were examined in the satisfaction of the various clusters with education; representing the most important service area of the institution. In the four questions of the areas of education, the averages of the results show significant difference only in the case of recognized lecturers and professional practice. It is also important to note here that the group managing best on the labour market, proved the least satisfied with lecturers and professional practices; while the group of people with little recognition (cluster 6) gave the highest average of opinion in two questions and the second highest one concerning

two other issues. Besides those, the cluster of committed people proved to be the most satisfied.

Table 5. Clusters' satisfaction with education areas, cluster means (5 point rating scale where 1= not satisfied at all, 5= absolutely satisfied)

	Recog- nized lecturers	Activities tailored to personal needs	Up-to- date know- ledge	Suffi- cient practice
1. group: elite of the labour market	3,41	2,61	3,69	2,16
2. group: losers of the labour market	3,83	2,71	3,67	2,55
3. group: people seeking their place	3,71	2,86	3,57	2,45
4. group: middle class with good earnings	3,70	2,53	3,85	2,76
5. group: committed people	3,95	2,99	3,92	2,92
6. group: people with little recognition	3,91	2,92	3,98	2,95
Total	3,77	2,76	3,81	2,67

Source: own construction

Analysis also focused on whether there were differences among the clusters in questions most affecting the relations of the university and the labour market – that enquired about how much the institution prepared graduating students for the different practice-oriented areas (Table 6). Considering the averages, there is significant difference only in the first two cases, which are judging preparation for theoretical and practical problems and the field of applying modern technology. In three out of the seven questions – in the areas of preparation for theoretical and practical problems and applying modern technology – committed people seem to be the most satisfied and they also were one of the groups that felt most prepared for the expectations of the labour market. The group of people seeking their place was the least satisfied with the most areas; however, in two questions – in terms of the knowledge of foreign languages and expectations of the labour market – they considered themselves the most prepared ones. The groups of the losers of the labour market and people with little recognition could righteously feel that the institution had not prepared them for the world of work. The first group – just as in the case of the questions discussed so far – did not articulate either a positive or negative opinion; although in terms of the knowledge related to the labour market, they are not far behind the average of opinion in the most satisfied group, while they missed preparation for teamwork the most.

Table 6. How much the university prepared graduates for the different areas, cluster means (5 point rating scale where 1= not at all, 5= absolutely)

	Theoretical problems	Practical problems	Labour market	Knowledge languages	Team-work	Technology	Management
1. group: elite of the labour market	3,84	2,54	2,43	2,26	2,93	2,86	2,55
2. group: losers of the labour market	3,41	2,65	2,27	2,16	3,13	2,69	2,72
3. group: people seeking their place	3,2	2,45	2,45	2,5	3,15	2,6	2,3
4. group: middle class with good earnings	3,83	2,99	2,38	2,29	3,07	2,79	2,78
5. group: committed people	3,89	3,05	2,44	2,15	3	2,99	2,64
6. group: people with little recognition	3,87	2,94	2,26	2,41	3,18	2,87	2,67
Total	3,74	2,82	2,35	2,27	3,07	2,82	2,67

Source: own construction

4. Conclusion, possible research directions

One of the important achievements of this empirical research, completed among the graduating students of the examined institution, lies in the fact that the respondents highlighted some of the university's weak points. The improvement of which will become indispensable in the future in order to ensure that students leaving the institution succeed on the labour market and the university gains competitive advantages on Hungary's transforming higher education market. It is already certain

that instead of theoretical knowledge, emphasis must fall on practice-oriented training and students must be prepared for managerial and organizational competences that prove essential in the world of work, while the present system of language education must also be reconsidered.

The clusters of freshly graduated professionals introduced in connection to the research results indicate that the chances of students leaving the university to find employment, their experiences in the world of work and their labour market position are rather heterogeneous, and groups with different situations also judge the university and the usability of the acquired knowledge differently. No obvious connection between labour market position and satisfaction with the institution can be identified. Supposedly, respondents define satisfaction much more based on the institution's image and the quality of the years spent there instead of their labour market position. The distribution in the opinion of the different groups provided the university with useful information and it may serve as the basis of new directions for handling the educational problems of the different segments.

The survey also raises various methodological problems. Research results obviously indicate that assessing the present conditions is not enough and further surveys will be necessary. This research team has already started improving the survey by refining the questionnaire in greater parameters and modifying the interview method. In the long run, the harmonization of similar surveys would be necessary on the national and international level, and a broadly similar – even if not totally corresponding – model should be developed for alumni surveys.

References

- Barakonyi, K. 2004: Egyetemek rangsorolása és a teljesítményértékelés. *Vezetéstudomány*, Vol. 35., No. 6., 2–7. o.
- Careers after Higher Education: a European Research Study
- Chase, R. B. 1978: Where Does the Consumer Fit In a Service Operation. *Harvard Business Review*, Nov–Dec., pp. 41–52.
- Harmon, M. 1993: An interview with Dr. William Glasser. *Quality Digest*, Sept., pp. 44–47.
- Kertesi, G. – Köllő, J. 2005: Felsőoktatási expanzió, „diplomás munkanélküliség” és a diplomák piaci értéke. *Budapesti Munkagazdaságtani Füzetek*, BWP 3, 61. o.
- Kézdi, G. – Horváth, H. – Hudomiet, P. 2004: Munkaerő-piaci folyamatok, 2000–2003. In Kolosi, T. – Tóth, I. Gy. – Vukovich, Gy. (szerk.): *Társadalmi Riport*. 2004, TÁRKI, Budapest.

- Lannert, J. – Mártonfi, Gy. – Vágó, I. 2004: *Understanding social demand for schooling in Hungary*. Meeting of national experts, 20 & 21 September, 2004, Paris, Draft Country, Report, Hungary.
- Schomburg, H. – Teichler, U. 2004: Increasing Potentials of Alumni Research for Curriculum Reforms: Some Experiences from German Research Institute. Location: www.gradua2.org.mx/docs/bolonia/Schomburg.de
- Selmeczy, I. 2007: *Diplomás pályakezdek helyzete és kilátásai*. Gazdaság- és Vállalkozáselemző Intézet.
- Sirvanci, M. B. 1996: Are students the true customers of higher education? *Quality Progress*, No. 10., pp. 99–102.
- Sirvanci, M. B. 2004: Critical issues for TQM implementation in higher education. *The TQM Magazine*, No. 6., pp. 382–386.
- Vámos, D. 2000: A munkapiacra-diplomával. *Educatio*, 1, 62–78. o.
- Veress, G. 1999: *A felsőoktatási intézmények minőség-menedzsmentje*. Budapest, Műszaki Könyvkiadó.
- Zeithaml, V. A. – Parasuraman, A. – Berry, L. L. 1985: Problems and Strategies in Services Marketing. *Journal of Marketing*, No. 2., pp. 33–46.

Attitudes towards training in multinational companies

Éva Málovics – György Málovics

Researchers of many different fields have studied the questions of organizational learning and knowledge.

Foreign owned companies and joint ventures were observed in this paper, and the goal was to analyse the following topics:

- The opinion of organizational members about conditions of education (inhibitor and facilitating factors of learning)*
- Attitudes on the area of reception and utilization of knowledge*
- Attitudes and perceptions on sharing of knowledge*

The conclusion that has been established is that training and education are of important value and a part of strategy in the observed organizations. The general satisfaction with training is considered to be at an overall high and those people questioned regarded it as useful to their work. The perceived sharing of knowledge is also high. In the area of new ideas, only half of the sample thinks that the management facilitates them and, in the area of tolerating mistakes, similar characteristics were found. Concerning the appreciation of participation in training, the majority believe that it is not appreciated and awarded.

Keywords: learning, knowledge, organization, training, satisfaction

1. Introduction

Because the environment of companies is constantly changing, there must be flexibility for change to promote continued growth and existence. The resource-based approach, which focuses on the inner strategic resources of each company, can be the basis of long term competitive advantage and is gaining in significance. These competence-based company theories define each company in terms that clarify the sets of skills and abilities which influence the improvement and the strategic alternatives of organization (Szabó–Kocsis 2003).

This theory leads to the appreciation of the specific organizational learning, since this can form the basis of core competences which can be reached. Core competences do not derive solely from the performances of individuals, but collective learning processes are also needed for their development. As a consequence, experts believe that knowledge has become the central production

factor of the company. (Senge 1998, Hoványi 2005, Szabó–Kocsis 2003) Only companies which gradually create new knowledge and quickly share it within the whole organization can remain successful. The new knowledge is practical only if it results in a new product or service. In this manner, the management turns learning and knowledge management into increasing progression.

By developing these thoughts, the notion of knowledge management comes into being. The goal is to handle knowledge as a strategic resource. On the basis of the already mentioned theories and models, the flow of knowledge is promoted within the organization. The authors emphasize the importance of the personal and cultural approach in addition to the technical and informational approach, and they again consider the already mentioned cultural characteristics important in connection with the problem of conceivability and transferability of knowledge. (Sümeiginé 2002, Kováts 2003).

In this context, from a practical view, there are two main streams of thought. The first of them focuses on the importance of the human approach by drawing attention to the importance of the development and influence of the individual behaviour. The second view centres on the information technology approach to the storage and sharing of knowledge.

Foreign owned companies and joint ventures were examined extensively. Among experts, there are different views about the influx of foreign capital and knowledge. However, the majority of economists consider the involvement of foreigners in the economy a positive feature. Studies which try to evaluate mergers and acquisitions draw our attention to the high rate of failures. At the examined companies “profitability, efficiency and the increase of the turnover are far behind the expectations”. (Heidrich 2003) According to experts, a possible reason for this is inappropriate handling of differences between organizational cultures.

2. Learning processes in the organization

Researchers of many different fields have studied the questions of organizational learning and knowledge. They composed their ideas in the conceptual system of their respective scope of expertise. These different approaches express the different sides of these categories; however, there are some similarities in them.

Thus, it is vital to define what we mean by organizational learning. According to a widely accepted approach, organizational learning is the process of collective information processing which results in the growth of organizational set of knowledge. Learning takes place both on individual and collective levels.

The resource based organizational theories, such as the concept of organizational learning, the learning organization concept and the knowledge management concept focus on the questions mentioned above. The central question of these approaches is the creation of knowledge and its connection with learning. From the great amount of the special literature of the approaches, ideas and models are presented which are suitable to the analysis of the results of said investigations.

Learning requires the common activities of at least two participants. It cannot be interpreted in itself; it makes sense only through the relationship of the participants. This phenomenon is best described by the knowledge spiral of Nonaka (Krogh et al 2000):

- Socialization: existential, face to face, tacit→tacit
- Externalization: reflective, peer-to-peer, explicit→tacit
- Combination: systemic, collaborative, explicit→explicit
- Internalization: collective, on the site, explicit→tacit

There are three prerequisites to the creation of organizational knowledge (Krogh et al 2000).

The company as a whole is able to create new knowledge.

1. This common knowledge can be disseminated inside the organization based on communication processes.
2. New knowledge can be manifested either in a new product, a new service or in the structure of the organization.
3. The creation of knowledge is based on continuous interaction between explicit and tacit knowledge, which is called knowledge conversion.

Several factors induce these processes.

“Knowledge creation is supported by five enabling conditions:

- autonomy
- redundancy
- creative chaos
- Requisite variety and intention.” (Krogh et al 2000, p. 97.)

On this theoretical basis Kapás summarised the arts of organizational knowledge.

Table 1. Organizational knowledge

The arts of knowledge		
	Explicit knowledge	Implicit /tacit/ knowledge
individual knowledge	Embrained knowledge learning by studying	Embodied knowledge learning by doing
collective knowledge	Encoded knowledge information shared knowledge in the organization	Embedded knowledge Organic and dynamic path-dependent

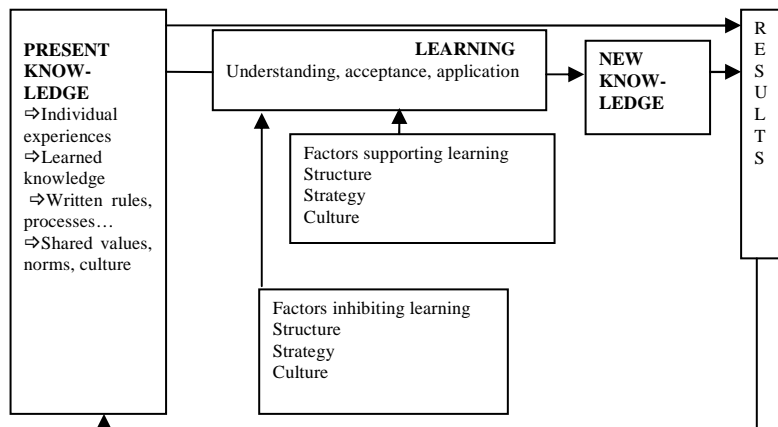
Source: Kapás (1999)

Many see a connection between the dominant type of knowledge inside the organization and organizational structure. Companies where explicit knowledge is dominant are usually characterised by a formal coordination and control structure. Where implicit knowledge is dominant, rather decentralised structure and informal coordination mechanism is characteristic. The conditions of mobilizing this knowledge are autonomy and commitment, without which knowledge remains latent (Kapás 1999).

The kinds of knowledge can be distinguished like this only in theory.

Based on the above mentioned models the framework of our research can be depicted as follows (Figure 2).

Figure 1. Factors inhibiting and supporting learning



Source: own construction

The goal of this paper is to analyse the following questions topics:

1. The opinion of organizational members about conditions of education (inhibitor and facilitating factor of learning)
2. Attitudes on the area of reception and utilization of knowledge
3. Attitudes and perceptions on sharing of knowledge

Answering these questions is very important for both members and for management because it adds useful information about application of means which were spent on education.

The structure of questionnaire:

The main question is the following: if the educations add to the raise of the level of working, and to the raise of efficiency in opinion of organizational members.

The main topics of the questionnaire:

1. Attitudes towards the educations
2. Perceived utility and expediency
3. Sharing of knowledge

3. The result of the empirical researches

3.1. The sample

The members of five Hungarian joint ventures which also operate in the Southern-Hungarian Region were asked to fill in a questionnaire. The sample contains 167 people who are, unfortunately, not evenly distributed within the five companies. All members of the Szeged branches of the above mentioned companies were given a questionnaire due to their different level of willingness to answer questions and the number of questionnaires returned from the different branches varied on a large scale ranging from 18–49.

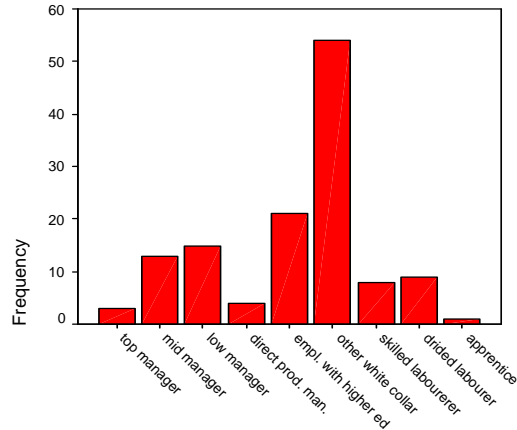
The composition of the sample:

About 25% managers of different levels

About 54% white collar employees not of managerial level

About 21% blue collar employees not of managerial level (Figure 1).

Figure 2. Status



Source: own construction

3.2. Participation in trainings

The majority, 77% of the sample, generally participate in trainings; while 20 % do not attend them (3% did not answer this question). This Research reveals that whether or not an employee participates in trainings is not necessarily dependent on his attitude, but rather on whether he is provided trainings by his company. This conclusion was reached because it was discovered that most of the participants are financed by their companies.

The majority of trainings took place in working hours; only eight employees attended them outside working hours. The amount of trainings depends on their position in the hierarchy of the company. 90% of managers, 84% of white collar employees and only 53 % of blue collar employees attend trainings. During the last two years, 39.4% of attendants took part in one to two; 37% in three to five and 23.6% in more than five training sessions. There is a significant connection between the trainings of the last two years and the position of the participants.

3.3. General satisfaction with trainings

Out of the 128 attendants, 118 answered the relevant questions. The questionnaire provided contains a five grade Likert scale; five representing completely satisfied, and one representing completely dissatisfied. 66% can be considered satisfied (4–5 grade) while 34% dissatisfied (1, 2, 3). A grade of three is considered negative, rather than positive.

There were not any significant differences found when the level of satisfaction was examined in the view of position, age, etc. However, the connection between satisfaction regarding position and qualification is worth pointing out. While 80% of managers and employees with higher education can be considered satisfied, the relevant percentage in the case of lower level employees is only 60%. This difference, however, is not significant statistically. The level of satisfaction was also different in the case of colleagues or experts from outside conducting the training. It was 55% and 70% respectively.

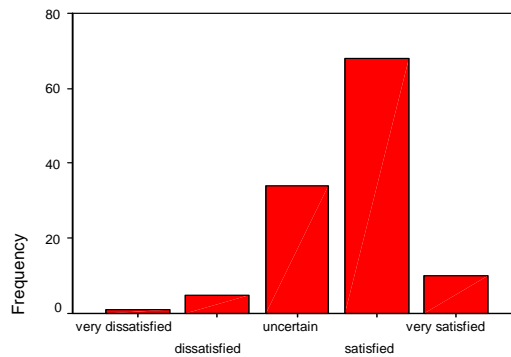
Table 2. Number of trainings in the last two years

Status		1-2	3-5	5+	Sum
	manager	8	17	12	37
	other white collar	29	28	17	74
	other labourer	13	2	1	16
	Sum	50	47	30	127

Source: own construction

General satisfaction with the trainings organized by the company.

Figure 2. Are you satisfied with the trainings organized by your company?

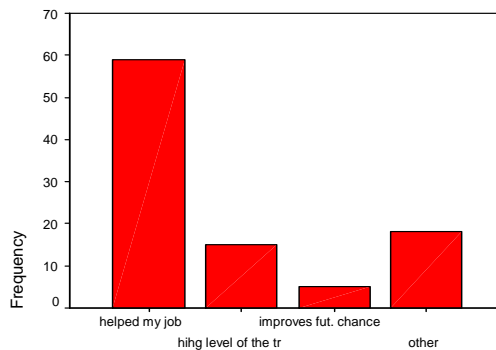


Source: own construction

3.4. Good and bad training sessions

Most are interested in what makes a training session good. So an open question was asked about what makes the best training they have ever had so good. 61% consider it a good training because it is practical and makes their work easier and necessary for their work. 16% judge the quality of trainings based on how the lecturer prepares for the sessions, the atmosphere and the level of organizing the lessons. 5 % find the training useful because it provides them with information which will increase their chances in the labour market (Figure 3).

Figure 3. What made your best training so far the best?



Source: own construction

Only 21% have taken part in bad training sessions, the reasons given were:

- Lack of qualification of lecturers
- Disorganization
- Badly conducted lectures
- Lectures not applicable

3.5. Organizational atmosphere

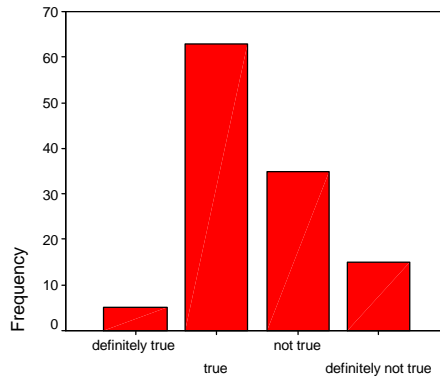
Concerning funding of the training, the attitude of the companies is considered positively by employees, since the majority of trainings are financed by the companies and they are held during working hours.

Other aspects that were considered:

A 4 grade Likert scale was applied; 1 representing absolutely typical, and 4 representing absolutely not typical. In the field of new ideas, 50% think the management facilitates them (and the other half think it does not). Similar results

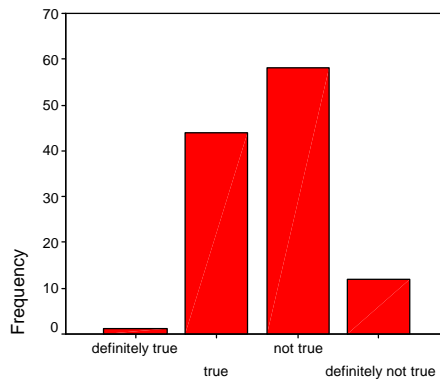
were found in situations concerning tolerating mistakes. The majority of employees draw attention to the lack of tolerance if their new ideas do not work. The situation is worsened concerning the appreciation of participating in trainings; since only 28% feel it is appreciated and rewarded. As a result, in many respects the organizational culture cannot be considered as an environment that is learning facilitating. However, 70% still share the new knowledge with their colleagues.

Figure 4. The management supports me in trying out my own ideas



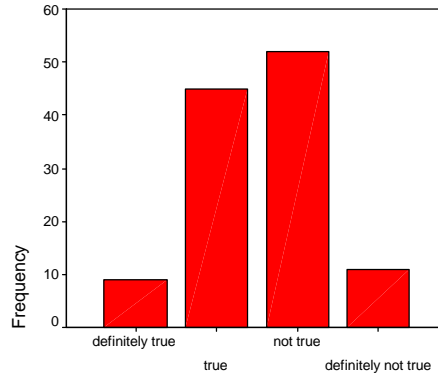
Source: own construction

Figure 5. The management is tolerant if my own ideas don't work



Source: own construction

Figure 6. Making a mistake has very negative consequences in our company



Source: own construction

Figure 7. The management appreciates me for taking part in training

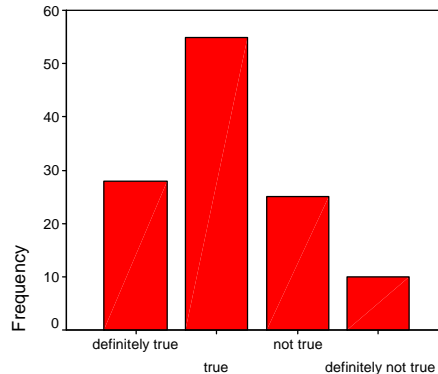


Source: own construction

Significant differences were not found between the demographic factors and the learning facilitating atmosphere of the companies. However, some interesting phenomena should be highlighted.

Higher level and senior employees are given more chances to try out their new ideas. As far as the failure of new ideas is concerned, the younger and newer employees perceive a higher level of tolerance. The lower an employee is situated in the hierarchy of the company, the worse he perceives the consequences of his mistakes, and the lower the level of knowledge transfer is.

Figure 8. I always discuss with colleagues what we heard in the training



Source: own construction

The same tendency concerning satisfaction with trainings and the level of facilitating new ideas was found.

4. Summary

The summary of conclusions reached is on the basis of research in specific cases of the questioned members of companies. The majority of the samples questioned generally participate in training and their companies provided the training. The training took place during working hours and companies financed them.

The conclusion reached is that training and learning are an important value in these organizations and a part of their operating strategy. The general satisfaction with the training can be considered high and questioned people regarded them as useful in their work. The perceived sharing of knowledge is also high. However, in the field of new ideas, only half of the sample thinks that the management facilitates them; and in the area of tolerating mistakes, similar characteristics were found. Concerning the appreciation of participation in trainings, the majority think that it is not appreciated and rewarded.

During the midst of research, the following important question emerged: in reflection of the above mentioned contradictions, does the position of the motivation have a crucial significance because the extrinsic motivators of the training are low and the intrinsic motivators gain greater significance in the efficiency of learning? This question determines that further research is needed in this topic.

References

- Heidrich, B. 2003: A vállalati akkulturációs folyamatok kihívásai. *Alkalmazott Pszichológia*, V. évf., 3–4. sz., 27–36. o.
- Hoványi, G. 2005: *Verseny és vezetés*. MEK, Budapest.
<http://mek.niif.hu/03200/03253/03253.pdf>. letöltve: 2010. 04. 12.
- Kapás, J. 1999: A vállalat tudása. *Vezetéstudomány*, XXX.évf., 6.sz., 2–11.o.
- Kováts, G. 2003: Új jelenségek a vállalati képzésben: a vállalati egyetem. *Vezetéstudomány*, XXXIV. évf., 2. sz., 25–38. o.
- Krogh, G. – Nonaka, I. – Nishiguchi, T. 2000: Fundamental Issues. In *Knowledge Creation. A Source of Value*. London, McMillen Press LTD.
- Senge, P. 1998: *Az 5. alapelv*. HVG RT. Kiadó, Budapest.
- Sümeгинé Dobrai, K. 2002: Tudástranszfer nemzetközi vállalatoknál. *Vezetéstudomány*, XXXIII. évf., 5. sz., 22–29. o.
- Szabó, K. – Kocsis, É. 2003: *Tanulás és felejtés vegyesvállaltokban*. Oktatási Minisztérium, Budapest.

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