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THE ROLE AND DETERMINANTS OF ELECTRONIC COMMERCE AND ON-LINE ADVERTISING WITHIN CORPORATE ACTIVITY

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The research focuses on the application of the Internet in three major areas: sales, purchasing and advertising, which, from a marketing point of view, are the most relevant activities in a company. It is argued that by the end of the 1990s in Hungary Internet-related business activities had become new and increasingly important areas of competition – and this observation holds even though the penetration of the Internet amongst the Hungarian population remains low, so that consumer fears are major obstacles to the more widespread use of this type of media. In this research, the "supply side" of business activities is investigated – that is, companies. In this article (which relies on a large-scale representative national survey carried out in 2000), there will first of all be provided an overview of the intensity of Internet usage among Hungarian companies in relation to marketing activity. Second, based on cutting-edge international literature, the possible factors in the model which determine Internet usage in companies' purchasing, sales and advertising activities will be outlined. Finally, there is an empirical testing of the given model on a representative sample of Hungarian companies.

Keywords: electronic commerce, online advertisement, marketing strategy, organisational capabilities

JEL classification index: M390

Topics such as electronic commerce, on-line advertising or e-business are ones often highlighted in both Hungarian and foreign business journals. Developments in the electronic communication industry – for example, the introduction of an online dealer store level browser and e-price quote information system by General Motors (*Wall Street Journal,* 21 March 2001) or the new offer of Generali-Providencia's website – a pioneering Hungarian insurance company – to provide online calculation of comprehensive insurance (*Népszabadság,* 21 May 2002), represent important instances of the great magnitude of *intensifying business activities* within this field.

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Yet there has only been a *marginal reflection* upon the developments of e-business in academic circles, so a well-informed understanding of such developments based on a firm theoretical background is a requirement. According to Wu *et al.* (2001), while general business innovation in relation to management, marketing and information technology has been a subject for a considerable amount of research, e-business – which can also be seen as a type of business innovation – has *not yet attracted the attention it deserves*.

This present article tries to reflect on the findings of international academic research on Internet, online advertising and e-business. It also aims to *bridge the gap* between the popularity of the phenomenon as practiced and the relatively low attention it has received in academic circles. Furthermore, the paper constitutes the attempt to *first* explore the relationship between organisational culture and company innovations with regard to e-business activity.

One is able to see that organisations in different industries, various organisational settings as regards marketing function and strategic goals differ significantly in their Internet usage. From the used, empirically tested model, we can see that the major factors (in order of importance) that determine the level of Internet use are the technological "turbulence" of the market, organisational market-led aggressiveness, a company's competitive position, degree of organisational innovation, the perceived successfulness of a company by managers and the organisational culture. In spite of the important role played by the technological turmoil of the market, market commotion generally (for example, the rapidly changing needs of customers) has no notable impact on internet usage – which fact supports previous findings connected with the band theorist regarding the links among organisational innovation, the level of market change in technology and customer needs.

1. THEORETICAL BACKGROUND OF THE RESEARCH

The research here builds itself on the findings of both Hungarian and international literature. In the first part of the paper the possible levels of use of electronic commerce and online advertising in connection with Hungarian companies is looked at – for which, of course, the relevant Hungarian literature is primarily relied upon; in the second section, factors relating to the differences in business usage of electronic commerce and online advertising are identified, taking into account international findings.

In Hungarian management literature of the past few years, several publications have discussed the role of the Internet and information technology (in a

wider sense) within corporate management. Bőgel (2000) examines the sets of conditions along with the competition's principal actors in the electronic economy; and while he introduces readers to the impressive world of "the new economy", he immediately goes on to express his concerns that the world still keeps revolving in accordance with its old rules. He additionally argues that the balloons set in motion by the novelty of e-business have to burst – and he supports this conviction with facts. Nevertheless, in line with Porter (2001) he claims that high information technology has to be considered part and parcel of most business processes nowadays. Nemeslaki and Duma (2002) call the new business environment the "network economy" and they examine the strategic success factors of electronic business models (the existence of which others question). Shapiro and Varian (2000) look at the economic foundations of the digital world by investigating the expected behavioural regularities/tendencies of the new information society; they argue that the results gained from earlier economic research are still effective analytical tools with which one can get an understanding of the new business environment – though only if completed with knowledge of the new economy's business processes. Bányai (2000) examines the role and opportunities of the Internet in marketing information systems, identifying the factors that might influence Internet usage in companies. Szirtes (1998) and Szilágyi (2001) also study the role of the Internet in relation to its implementation in a specific area: city-communication. The relationship between marketing information systems and information science is also evaluated by Halassy (1998) and Pálinkás (2000) who, applying their own theoretical approaches, lay down possible links between the two phenomena. Papp (2002) shows us the relationship between a specific group of companies – nationally-operating, small and medium-sized enterprises (SMEs) – and information technology via an analysis of empirical data. Concerning information systems and information science applications, Drótos and Szabó (2001) give an overview of the Hungarian situation in their series of surveys entitled "Competing with the World"; in this research they proceed by introducing a number of results related to the area of marketing and sales (e.g. the automation of sales functions for firms).

In the following, two major theoretical approaches in the analysis of the subject will be relied upon:

(1) *Innovation adaptation literature*. In this area, several publications have looked at the processes of innovation diffusion in connection with consumers and companies – and have made an identification of the factors which influence such business procedures. Gatignon and Robertson (1989), prominent representatives of this literature, have examined, for instance, the spread of laptops

in companies and have analysed illustrative factors going in hand with this phenomenon (such as competitive environment, organisation and the characteristics of decision-makers). Research has also been done to look at explanatory aspects of organisational themes – for example, organisational formalisation (Pierce and Delbecq 1977), centralisation (Thompson 1965), and the role played by resources in relation to technological knowledge (Dewar and Dutton 1986). This field of the literature is especially relevant from the point of view of this survey as the establishment of business "solutions" connected to e-business should also be seen as being technological/organisational innovations. In Swanson's (1994) opinion, innovations related to information systems cannot be handled separately from general organisational innovation. Thus, with our model here will be a reliance upon the works of such authors: Gatignon and Robertson (1989), Gatignon and Xuereb (1997) and Zaltman and Duncan (1973).

(2) *Marketing Management Decision Support Systems*. The roots of general literature connected with decision support systems date back to the 1970s (Lucas 1975; Schultz and Slevin 1975). In the marketing-related literature of this field there are several references to the successful implementation of decision support systems associated with the marketing function. Little (1970), for example, notes factors that have had a positive influence on the application of marketing models by business leaders. Lilien and Kotler (1992) illustrate the positive relationship that can evolve when there is support coming from top management, on one hand, and, on the other, user participation in the implementation processes and/or an intensity of usage of such systems. Wierenga and Ophuis (1997) lay down the factors that have an influence on the application of marketing management support systems. According to them, an intention to implement these systems connect primarily with organisational and environmental factors, while the *actual* application of decision support systems by business leaders depends mainly on the environment in which the decision is being made and on the characteristics of its users – which is important for our overview here, as a marketing-related application of e-business and the use of marketing management support systems have similarities with each other in a number of ways (Wu *et al.* 2001).

The study therefore aims to explore the factors which have influence on a company's decision-making as regards Internet usage in purchases, sales and advertising. So we shall examine firstly – in line with the findings of Wierenga and Ophuis (1997) – the effects of organisational and environment-related factors on such a model.

2. FEATURES OF INTERNET APPLICATION IN HUNGARY

2.1. The degree of Internet usage in purchases, sales and advertising in Hungarian companies

By the end of the 1990s Hungarian companies had also taken their first steps in order to establish the presence of the Internet. The most important research carried out in Hungary in relation to IT-application (before the present endeavour) was that of Drótos and Szabó (2001) *Competing with the World*.[1] According to their results 58% of the interviewed companies had Internet connection, 24% had website with basic information, while only 3.4% of their homepages actually enabled any business transactions to occur.

Our research, conducted in 2000, produced comparable findings to those of the previous research dispite of the differences in the sampling methods. This points to the fact of being fairly stable and robust results.[2] Generally speaking, use of the Internet in purchasing/sales activities and in advertising is not widespread among Hungarian companies. 3.5% of companies in the sample made use of the Internet to a relatively large extent in purchasing activities, 1% did so with sales and 7.8 for advertising.

Table 1

The use of the Internet in Hungary in purchases, sales and advertising

Field of Internet use	Range	Frequency							Mean	Standard deviation
		1	2	3	4	5	NA	Σ		
Purchases	1–5	254	226	49	15	5	23	572	1.70	0.81
Sales	1–4	326	194	27	4	0	21	572	1.47	0.62
Advertising	1–5	224	205	70	39	6	28	572	1.89	0.96

Notes: 1: no application of the Internet at all – 5: exclusive application of Internet

[1] The research programme *Competing with the World* started in 1995 under the lead of Prof. Attila Chikán and with the coordination of the Department of Business Management of Budapest University of Economic Sciences and Public Administration. The programme analysed the international competitiveness of Hungarian companies based on widespread empirical examinations. Several research studies were provided in the form of theoretical analyses, industrial relationships and corporate case studies. About 100-page-long questionnaires were completed by 325 and 302 companies in 1996 and 1999 respectively. Four respondents (top, financial, production and marketing/sales manager) participated from each company. The empirical results are extensively discussed by Chikán *et al.* (2002).

[2] We emphasise the sampling differences between the two surveys. First, the competitiveness study focused on the companies employing more than 50 people, while our survey focused on those with more than 20. Second, the competitiveness study surveyed mostly manufacturing/production companies, 72% in 1999, and 44% in 1996; while our survey aimed to achieve a national sample representing industries, where 25% of companies belonged to this sector.

Table 1 gives us evidence of Hungarian companies' Internet usage. Hungarian firms most often use the Internet in advertising, less frequently in purchasing, and most rarely in sales. However, in the three application areas put together the companies' average stays within "no application" parameters.

While there are firms who have brought purchasing activities to the web in their entirety and also utilise the Internet to a great extent for advertising, we did not find any company that arranges its sales activities exclusively via the Internet.

Therefore, in order to be able to evaluate *overall* use of the Internet by companies, we have created a *complex index* by arithmetically combining the three (sub)indices in each separate case (*Table 2*).

Table 2

Distribution of complex indices of the Internet usage in percentage

	Distribution of frequencies in a percentage														
Value	3	4	5	6	7	8	9	10	11	12	13	14	15	NA	S
Complex index	26.7	18.9	12.1	18.2	8.6	5.8	1.9	1.2	0.9	0.5	0.2	0	0	5	100

One can conclude from the above table that – on a scale with values from 3 to 15 – no company obtained either of the two highest values, 14 and 15. The mean of the scores is around 5, which refers to there being very low complex indices.

In the following section the interactions between the three different fields of application will be looked into.

Table 3

Interactions among applications of the Internet as a tool of purchasing, sales and/or advertising

Variable	Internet purchase	Internet sales	Internet advertising
Internet purchase	1.00		
Internet sales	0.63***	1.00	
Internet advertising	0.40***	0.47***	1.00

Notes: *** $p < 0.001$; two-tailed Pearson correlation

According to the correlation values in *Table 3*, there is a significant relationship among the three variables. In other words, the three fields of Internet application show certain relationships: for example if a company makes use of the

Internet in its purchasing activities, it is more likely to use the web for advertising, too – i.e., than would a firm which prefers the more traditional purchasing channels. Purchasing and sales have the strongest connection, which can be explained by the fact that the establishment of these basic functions in a company generally happens in line with the same principles; and the dominant role of the purchasing function over sales becomes obvious by considering the strategic role of supply chain management in the past few years. It is also a matter of logic that the link between Internet application in advertising and sales is stronger than one between advertising and purchasing.

Internet implementation is not only a function of technical circumstances, however: it is also related to the social and cultural attitudes of the society within which the company is operating. Thus, it is worth looking at the population's *general habits* as far as their use of the world-wide web is concerned. Eszes and Bányai (2002) have demonstrated that the ratio of Hungarian Internet-users in 2000 was considerably lower (at 10%) compared to, for example, the US (58%), which heads the list.

2.2. The characteristics of companies that use Internet in their purchasing, sales and advertising

According to our results, companies in different industries and with different organisational/marketing function configurations use the Internet to varying degrees in their business processes and for advertising.

Differences between industries

The research here examines Internet usage in business transactions in various marketplaces. Results gained with the variance analysis (providing for a standard deviation homogeneity) show us that there is a statistically significant ($p = 0.01$) difference between different markets. Firms in mining, agriculture, financial services, retail trading and in the manufacturing/production industry use the Internet to a lesser extent (with a mean of complex indices < 5). Means gained by retail trade and service companies were slightly higher, while firms operating in telecommunications are well above others (6.90). One surprise, however, was that companies involved in financial services were rather inactive regarding their Internet use in business processes; thus, their purchasing, sales and advertising activities were looked at separately, and results here show that this group have average (rather than small) values in connection with their advertising activity.

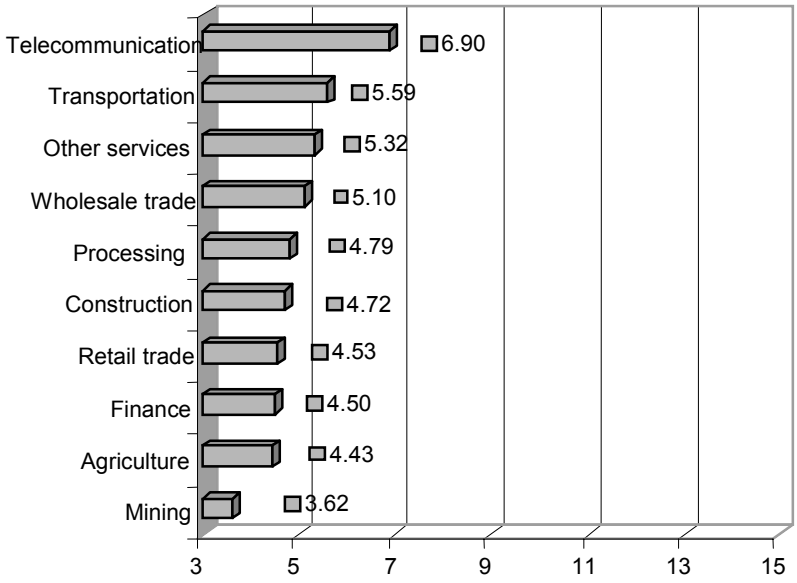

Figure 1. Application of the Internet in purchases, sales and advertising in different industries according to complex indices

Deviations in relation to the organisational configuration of the marketing function

We also examined at this point the differences among complex indices based on the organisational configuration of marketing function; and the variance analysis indicated noteworthy differences ($p = 0.001$) between companies with a separate marketing set-up ($N = 61$, Mean = 6.17) and firms without such independent departments ($N = 503$, Mean = 4.92).

Additionally discovered were relevant and significant ($p = 0.000$) differences between companies with an existing, separate marketing organisation. Firms ($N = 123$) with a product and/or brand manager make use of the Internet to a greater extent (5.56) in their business processes than do those who organise their marketing in a different way ($N = 441$, Mean = 4.74).

Differences in connection with strategic goals

The research also took into consideration Internet-based differences with regard to purchasing, sales and advertising in connection with the strategic goals of a company – and results gained show us that Internet application in the aforemen-

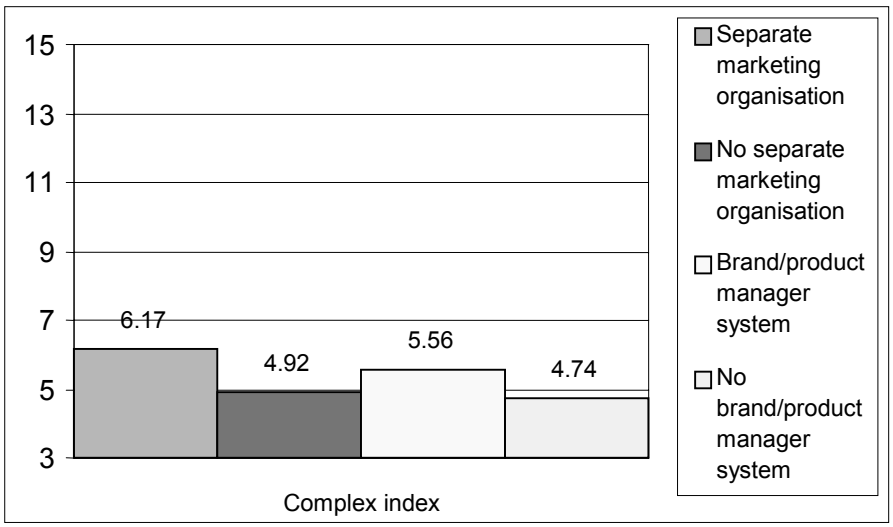

Figure 2. Differences in the usage of Internet in purchases, sales and advertising based on differences in the organisational configuration of the marketing function

tioned areas depends to a notable extent ($p = 0.000$) on such strategic goals. Companies aiming at survival are not able to concentrate on information technology, so the disadvantages they experience become greater. Yet (as shown in *Table 3*) companies with a strategic objective of long-term market expansion will be willing to save money for activities which are only likely to be fruitful in the future.

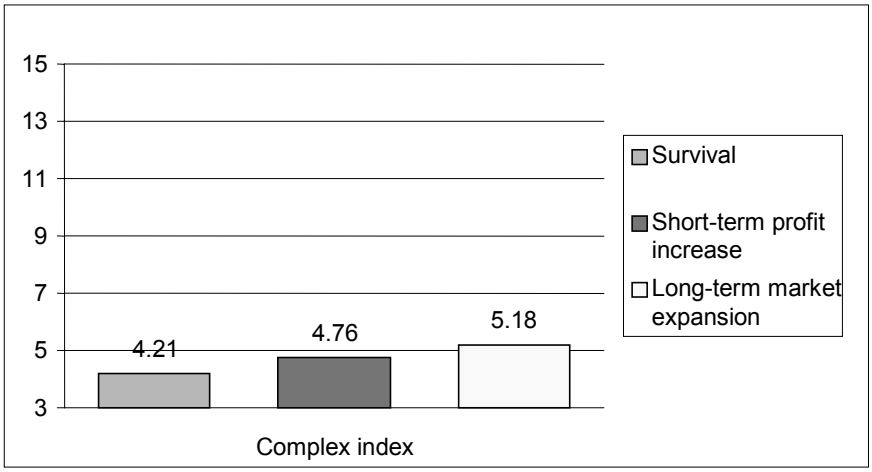

Figure 3. Differences in the application of the Internet in terms of purchasing, sales and advertising, in relation to strategic goals

Other analytical factors

An analysis was made of operational differences according to the number of employees in a firm and the ownership structure of a company, yet no significant differences of result could be seen in such regards.

3. FACTORS EXPLAINING DIFFERENCES IN INTERNET USAGE WITH REGARD TO PURCHASES, SALES AND ADVERTISING

Figure 4 depicts the determinants of Internet application in purchasing, sales and advertising. The assumption was that Internet use in business processes and advertising depends on three factors: (1) a company's operating environment; (2) the business/marketing strategy of the company; and (3) the character(istics) of the company/management. It will be supposed that the coexistence of such factors can be explained via the use of Porter's competition analysis model; while Porter (2001) also explicitly expresses the inevitable relationship between Internet and strategy. Jaworski and Kohli (1993) additionally suggest taking into consideration the technological and market-related instability of environmental variables as determinant factors. The substance of the third determinant – i.e., the characteristics of a company or its management – was decided on the basis of resource-based corporate theory.

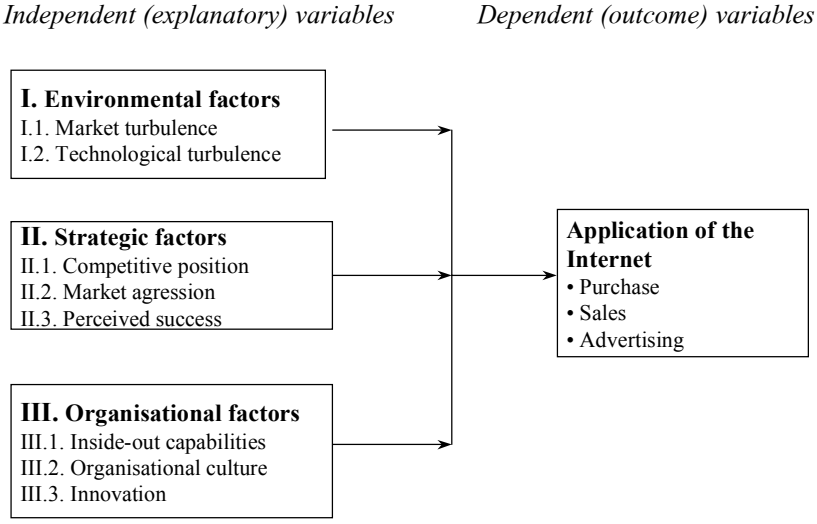

Figure 4. The theoretical model of the research

3.1. Measurement of the variables

Dependent variables

The dependent variable – Internet application in purchasing, sales and advertising – was measured using the above-described complex indices, and was computed by the non-weighted sum of the three variables.

Independent variables

A *factor analysis* was utilised for construction of the independent variables, results for which can be seen in *Table 4*. Since the database used in the research had been prepared for analysis in a more general survey – one with the objective of examining the marketing approach, strategy and performance of *Hungarian* companies – non-relevant questions and items had to be filtered out so that it suited the purpose of this present research. *Table 4* has in it all those items that were used for measurement in this particular study. Selection guidelines were decided upon the basis of certain aspects: factors that were explanatory variables according to specific references or those which we assumed to explain Internet use in the areas under discussion. 60% of the variance can be explained by factors involved in the analysis here; the value of the KMO index is 0.842.[3] *Table 4* shows us the variables that make up each factor and also the factor weightings of these variables.

Table 5 has basic statistics within it, pertaining to the factors involved in the model and also the values of the Cronbach Alpha reliability measurement.

The Cronbach Alpha[4] measurement is the average of all possible split-half coefficients coming from different divisions of the scale items; it indicates that the applied scale is absolutely reliable with only one exception, namely, market aggression (which has a lesser degree of reliability).

[3] Results of the Kaiser-Meyer-Olkin (KMO) test between 0.8–0.9 can be considered acceptable; high values indicate that factor analysis is a correct method to use (Malhotra 2001).

[4] The value of Cronbach Alpha lies between 0 and 1, a value of less than 0.6 shows that internal consistency reliability is low (Malhotra 2001).

Table 4

Analysis of explanatory factors regarding use of the Internet in purchases, sales and advertising

Factor	Explanatory power (%)	Factor weight
I. ENVIRONMENTAL FACTORS	13	
I. 1. Market turbulence	7	
Competition is intense and rapid		0.773
There is increasing customer choice		0.730
I. 2. Technological turbulence	6	
Technological change is becoming even more rapid		0.739
The Internet and the electronic commerce is having a major impact on business practices		0.738
The continual appearance of new products on the market		0.553
II. STRATEGIC FACTORS	19	
II. 1. Competitive position	8	
It has taken a long time to build our competitive advantages, and it is hard for our competitors to copy them		0.785
Our competitors could not afford to acquire the managerial skills relating to our competitive advantages		0.780
Our employees are the source of our competitive advantage and we will ensure that we don't lose them to competitors		0.720
II. 2. Market aggression	6	
We seek to make an attack on the whole market		0.775
We protect our advantages legally through copyrights and patents		0.562
Our main focus has been on winning a market share from competitors		0.511
II. 3. Perceived success	5	
Our main strategic priority over the last few years has been to survive		–0.828
We offer competitive salaries		0.674

Table 4 (cont.)

Factor	Explanatory power (%)	Factor weight
III. ORGANISATIONAL FACTORS	28	
III. 1. Inside-out capabilities	9	
Effective human resource management		0.874
Strong financial management		0.855
Good operations management expertise		0.843
III. 2. Organisational culture	7	
My organisation is a very dynamic and entrepreneurial place; people are willing to stick their necks out and take risks		0.776
The head of my organisation is generally considered to be an entrepreneur, an innovator or a risk taker		0.755
The glue that holds my organisation together is a commitment to innovation and development		0.541
III. 3. Innovation	12	
We are more innovative than our competitors in initiating new procedures or information systems		0.825
We are more innovative than our competitors in setting targets and objectives		0.824
We are more innovative than our competitors in shaping the scope of activities of new employees or in implementing new HR methodologies		0.750
We are more innovative than our competitors in setting targets and objectives		0.744

Notes: Principal component method, Varimax rotation.

Table 5

Basic statistics of the explanatory factors and their reliability measurements

Factors	Number of items	Range of scale	Mean	Std. Deviation	Cronbach Alpha
Factors related to the market					
Market turbulence	2	1–5	3.91	0.89	0.60
Technological turbulence	3	1–5	3.11	1.01	0.65
Factors related to strategy					
Competitive position	3	1–5	2.82	1.02	0.75
Market aggression	3	1–5	2.43	1.00	0.50
Perceived excellence	2	1–5	2.94	1.17	–[a]
Factors related to the company					
Managerial capacities	3	1–6	3.75	1.32	0.86
Organisational culture	3	1–10	3.38	5.84	0.61
Degree of innovation	4	1–5	3.11	0.88	0.87

[a] the two variables are coded in opposite directions, so Cronbach Alpha is not used for assessment.

3.2. The model's introduction – comparing the international references and the results obtained in the research

Our model shown in *Figure 4* was tested with a linear regression analysis (see *Table 6*). The value of the coefficient of determination (*R* square) was 0.34, which means that the independent variables involved in the research explained 34% of the variation in the e-business usage of firms (the dependent variable). The technological turbulence of the given market, its competitive position and its degree of innovation were the independent variables in the study (in a descending order), which serves to explain to a great extent the degree of application of e-business in purchasing, sales and advertising; market turbulence and inside-out managerial capabilities did not prove to be significant factors, however.

In the following section all variables will be identified.

Factors related to the environment (Indication of the variable in Table 6*) (I)*

Market turbulence (I.1). Market turbulence was measured via the use of two variables *(Table 4)*, both of which connect with the nature of demand, i.e., when consumer choice is increasing and competition is intense and more rapid; these two

Table 6

Results from the regression analysis

Independent variables	Coefficient of regression	Standardised coefficient of beta	*T*-value
Value of constant	5.141		59.960
I. Environmental Factors			
I.1. Market turbulence	0.069	0.035	0.813
I.2. Technological turbulence	0.651	0.325	7.585***
II. Strategic Factors			
II.1. Competitive position	0.462	0.231	5.388***
II.2. Market aggression	0.617	0.308	7.192***
II.3. Perceived success	0.263	0.131	3.064**
III. Organisational Factors			
III.1. Inside-out capabilities	0.133	0.066	1.546
III.2. Organisational culture	0.235	0.117	2.736**
III.3. Innovation	0.434	0.217	5.056***
Total *R* square = 0.34			

Notes: ***p < 0.01; **p < 0.05

variables also express the degree of pressure on companies originating from changes on the demand side.

The literature on the topic often refers, in addition, to the relationship between demand-side pressures coming from the increasing choice of customers and the adaptation of technological changes. Christensen and Bower (1996) have looked at the connections between demand-side pressures and organisational investment into high-level technology, and they saw a positive relationship. According to them, the wider the amount of customer choice in a specific market, the more companies in the same market can afford to invest in new, more modern technologies. Earlier studies also highlight the great influence of demand-side pressures on management decisions regarding innovation (Cooper and Schendel 1976). Nevertheless, results gained in research carried out by Wu *et al.* (2001) – focusing on four information-intensive sectors (telecommunications, hardware production, semiconductor production and industrial production machines) – do not entirely support the previous claims. According to them, demand-side pressures – also induced by consumer choice – do *not* show any connections with the establishment of technology (electronic purchases, e-procurement) as linked to cus-

tomers. However, the greater the amount of demand-side pressure, the more likely is inside communication to be intensively supported by IT-applications.

The results of this survey are in line with the statements of Wu *et al.* (2001): market turmoil and demand-side pressure alone do *not* lead to higher levels of implementation of e-business.

According to Kohli and Jaworski (1990) market-oriented companies look towards and have proactive reactions to – and also seek to shape – market demands. At the same time, though, reaction to demand-side pressures and market turbulence are more often characteristic of a follower company or a reactive type of behaviour, i.e., which is not typical of a proactive market-oriented firm. Indeed, it could be worth examining in the future whether market orientation moderates the relationship between market turbulence and e-business usage. The following query thus arises: can one assume that this relationship is positive for a market-oriented organisation – namely, that greater market unrest suggests higher levels of e-business application – while with firms with a smaller amount of market orientation there is no noteworthy relationship between the two, as in the case of the population overall? (As said, this issue might be a topic for further research.)

Technological turbulence (I.2). We examined technological turbulence in a company's environment with the help of three variables: the effects of the Internet on business processes, rapid technological change, and new product appearance.

Low and Mohr (2001) describe the technological environment as a modelling of factors determining information distribution within a company. According to them, the more technologically intense a company's market is, the greater will be the distribution of market information among employees. In the opinion of March and Olsen (1976), Tolbert and Zucker (1983) and Abrahamson and Rosenkopf (1990), in the case of high normative pressures – which also point to connections with the technological environment – companies do not decide on innovations on the grounds of their potential to innovate and/or an expected rate of return – instead, their decision will depend on the application of given technology within companies operating in their respective environment (the Bandwagon theory). In view of the Bandwagon theory supporters, the fact that firms functioning in one's own area of operations make use of more advanced technologies, delivers a far stronger argument for one's investing in new technology than would an argument for doing so based upon purely economic and financial reasons. In the opinion of Wu *et al.* (2001), the Bandwagon theory's effect is especially strong when it comes to innovations linked to the Internet economy.

This survey's teachings support the statements made by the above-cited researchers. Accordingly, technological turmoil within a company's business environment generally represents the strongest determinant of any company's e-busi-

ness usage – i.e., if the appearance of novelty in relation to technology is more typical of a specific business environment, a company operating within it is more likely to apply Internet in its purchasing, sales and advertising activities.

Strategic factors (II)

Competitive position (II.1). The competitive position aspect has variables within it, expressing the result of a comparison of factors such as employee retention, managerial capabilities and/or opportunities to emulate competitive advantages with regard to competitors existing in the same types of situation.

In the opinion of Han and Kim (1998), firms with a strong competitive position and competitive orientation tend to be continuously assessing their strengths and weaknesses with regard to their competitors. Day and Wensley (1988) explain that a strong competitive position and a competitor-geared orientation make it possible for such organisations to shape the competitive environment. Moreover, a strong competitive position also enables companies to decide in favour of innovation even if the market itself is less competitive or the rate of return on innovation will not be outstandingly high (Gatignon and Xuereb 1997).

Exactly the same is true with regard to investments in e-business. At the moment there are only a few people in Hungary doing their shopping on the Internet, and the size of the online advertising market is also quite small – though it is growing rapidly. According to a survey carried out by Carnation Consulting in 2001, the turnover of the Hungarian B2C market is expected to be more than double by 2002 compared to 2001 – as is the case with the Hungarian online advertising industry, which is predicted to reach a turnover of 2,300 million HUF following the 1,380 million in 2001 (Carnation Consulting Report 2001).

The results of the research here underpin the findings of previous projects and strengthen the reliability of the hypothesis laid down; so the stronger the market position of a company compared to its competitors, the more it is likely to rely upon e-business.

Market aggression (II.2). One of the most well-known strategies existing in the field of competitive theory is linked to the name of Porter (1993). A cornerstone of this is the question of whether a company is aiming to attack an entire sector or market or whether it choosing only a given segment of the market. According to Porter (1993), companies of the latter type have a "focusing" strategy. Companies wishing to dominate the whole market, with the strength of their differentiation coming from something that customers consider a speciality, pursue a strategy of "differentiation"; while those who also make an attack on the entire mar-

ket but who endeavour to become the lowest cost producers are, in the opinion of Porter (1993), pursuers of the so-called "overall cost leadership" strategy.

It is clear from Porter's methodology, too, that companies with the objective of dominating the whole market and firms selecting only a specific segment possess different strategic priorities. Similarly, we cannot consider companies attacking the market as a whole as a homogeneous group as they are willing to make sacrifices to a different extent in order to attract customers from competitors. Thus, this survey also looked at the effects of this market aggression on company decision-making when resorting to e-business usage – and we can see that e-business "solutions" are relevant from a strategic point of view, since the elements they have actually form a segment where a new type of competition is taking place at an increasing pace.

An assumption has to be made that companies who have domination of the whole market among their strategic objectives will be necessarily willing to invest more in innovations related to e-business. Even though, for the time being, the volume of this market is quite small. In the future – when its size has become more noteworthy – such companies will be able to have advantages in new markets and to get new customers. Our research here also supports this assumption: the more aggressive the market strategy a company has chosen, the more intensively it will make use of the Internet in purchasing, sales and advertising.

Perceived excellence (II.3). The evaluation of a company's performance in most marketing research is expressed by the effects of its market orientation and managerial use of market information with regard to business success.

Jaworski and Kohli (1993) made an attempt, by examining questions of market orientation, to understand the input of such market orientation concerning the success of business performance. According to them, although a marketplace direction can contribute to successful business performance, there is no connection between this orientation and the market share of a company. However, the authors did find a positive relationship between a more subjective judgement of a company's market performance – i.e., its perceived excellence – and market orientation.

Wu *et al.* (2001) came to the conclusion – by examining the effects of e-business applications – that electronic business contributes to a company's perceived excellence and performance, as measured on subjective scales.

This research also aimed to answer the same question in reverse: contrary to the case of earlier surveys, the aim here was to reveal the extent to which the seeming excellence of a company makes a contribution to Internet usage in its purchases, sales and advertising. The assumption we made was that the more successful a company is, the greater its investments in e-business will be. The

difficulties in making estimations regarding e-business investment returns were also taken into consideration and – as these being consequences of the novelty of the market – we concluded that this type of investment (alongside financial resources) also necessitates a certain degree of market optimism.

Results gained in this survey in the end strengthened the power of our assumption: the more managers see their company as being successful, the more they will be willing to invest in e-business methods.

Organisational Factors (III)

Inside-out capabilities (III.1). Inside-out capabilities have variables within them linked to the top management, and this points to their suitability compared to that of competitors. In the present survey, inside-out capacities were examined in the areas of human resources, finance and production.

According to Kohli and Jaworski (1990), top management plays a vital role in the formation of organisational strategy, so one must assume that when it comes to a question of e-business implementation – which can also be considered as a strategic tool – the role played by top management is also beyond question. Adaptation of e-business methods of operation could well lead to further changes, too, affecting, for example, the balance of power within the organisation. According to Dess and Origer (1987), top management possesses the necessary tools and powers to take pressure off these inside conflicts and to put forward the process changes linked with the implementation of e-business.

No important relationships existing between aspects of inside-out managerial capacities were made note of in the areas of human resources, finance and production, and the degree of Internet application in this research – i.e., further examinations would be needed in this area. However, Wu *et al.* (2001) saw a strong and significant relationship coming with the fact of top management support regarding e-business, that is, not with regard to managerial capacity. In their opinion, top manager support is one of the most vital factors influencing the decision-making of a company regarding the implementation of the Internet in business transactions. Results obtained with the earlier-mentioned *Competing with the World* survey told us that expertise in information technology was, both in 1996 and 1999, the least relevant factor in making an assessment of managerial capabilities, thereby indicating the non-significant role of the Internet in Hungary at those times. This result also provides an explanation as to the lack of any notable relationship between managerial capabilities in connection with such functional areas and Internet application.

Organisational culture (III.2). This survey has relied upon the organisational methodology most used in marketing research, as introduced by Deshpandé and Webster (1989). They identified four basic types of organisational culture: clan, adhocracy, hierarchy and market *(Table 7).* Since these categories are ideal constructions, they are able to coexist simultaneously. Research has examined the extent to which the four components are characteristic of organisations.

Table 7

Organisational typology of Deshpandé and Webster

	Clan	Adhocracy	Hierarchy	Market
Organisational characteristics	• Human • Similar to a large family • People sharing many things	• Dynamic and company-centred • Employees are willing to take risks	• Formalised and structured • Work organised by procedures	• Production oriented • Lack of personal references in work
Characteristics of the organisational leader	• Advisor • Parent-type	• Entrepreneur • Innovator • Risk taker	• Coordinator • Organiser • Administrator	• Production- or technology-oriented
What glues the company together?	• Loyalty • Tradition • Commitment to the company	• Innovation • A struggle for priorities	• Formal rules • Corporate policy • Operation without disagreements are important	• Tasks given • Goals set • Orientated towards production
What is important for the company?	• Human resources • Unity • Morality	• Growth • Acquisition of new resources • Meeting new challenges	• Steadiness • Stability • Effective and smooth operations	• Competitive activity • Outcomes • Measurable objectives that can be expressed numerically

Source: Deshpandé and Webster (1989).

The relationship between organisational culture and the degree of innovation of companies regarding information science and e-business has not been examined before – so the research here presented represents the first attempt to bind the two.

By examining the link between marketing information systems and organisational culture, Moorman (1995) concluded that companies with a so-called "clan culture" are more sensitive as regards market information. According to

his results, the more a company resembles a "large family", the more its employees are likely to share market information within the company – and they are also more likely to take such data into consideration in their marketing management activity. Yet the effects of organisational culture on business information systems are controversial – and this has received less attention in comparison with other organisation-related factors influencing market information usage (Keszey 2002).

According to our research, an "adhocracy" culture also has connections with the amount of e-business application in a company. The more characteristic "adhocracy" is within a company culture, the greater will be its willingness to use the Internet in purchasing, sales and/or advertising.

Degree of innovation (III.3). The application of Internet in purchase, sales and advertising can be regarded as a type of organisational/technological innovation, too. In the opinion of Swanson (1994), innovation connected to information systems cannot be discussed separately from the literature of general organisational advances. Consequently – in line with references in the field of marketing innovations (Gatignon and Robertson 1989; Zaltman and Duncan 1973) – we need to assume that a company's degree of innovation is by and large related to its willingness to utilise the Internet within purchasing, sales and advertising. And one discovery made here was that the greater the amount of organisational innovation, the more likely such an organisation will be to make use of the Internet in its purchasing, sales and advertising activities.

4. THE METHODOLOGY OF THE RESEARCH

4.1. Construction and testing of the measurement instruments

The study was based on the database of a research supported by OTKA,[5] which has looked at the marketing attitudes of Hungarian companies, their strategies and performance. Both Hungarian and international measurement scales were applied.

Prior to the large-scale research undertaken, the measurements were tested – following the advice of Churchill (1979) – in order to filter out any possible errors. A source of possible errors lies in the interpretation and formulation of questions, for their relevance is important (individually and taken all together) as one needs to ask pertinent questions that can be answered by all companies.

[5] OTKA is the abbreviation of the Foundation for Hungarian Scientific Research Programmes (Országos Tudományos Kutatási Alap).

In the test phase we put questions to twenty managers, with the method of personal interviews. After a common interpretation of all of questions in the questionnaire, we asked persons to note any topics which had *not* been included, had been unnecessary or had been easily misunderstood. The questions used in this study as a result of the above processing can be seen in *Table 4*.

4.2. Collection of data

The research "population" consisted of business enterprises operating in Hungary, independent of ownership or legal form. The sample was taken from the database of "Infoselect", which includes 70% of the companies registered in the Hungarian Central Statistical Office (KSH). The research only took into account firms with more than twenty employees. Our planned sample – consisting of 3000 companies – was representative of the company structure as published by KSH as far as number of employees and economic sector proportions are concerned. The questionnaire – sent out by post in September 2000, in three turns, each turn consisting of 1,000 questionnaires – was returned by 572 managers (response rate: 19%); and in order to accelerate the pace of returns we phoned companies who had been on two occasions late in answering.

Although there were slight differences in our final sample of companies from the planned one – especially in the case of the construction industry, the manufacturing/production industry and in the "other" category –, the final results coincided, generally speaking, with the plans laid out. Yet the final sample did indicate considerable differences from the plans regarding company size, since bigger companies were keener to return the questionnaire and, due to this, the ratio of small companies was smaller in our sample than in the population as a whole. So as to obtain a statistically acceptable size of this section of the sample, some "distortion" was deliberately taken into consideration.

4.3. Transcription and analysis of the data

The data has been transcribed and cleaned with the help of the statistical programme package SPSS, in order to eliminate any possible sources of error. In the subsequent control phase, every tenth (10%) questionnaire was checked against the data in our database, though we did not find any systematic errors here. Data analysis was done also with the SPSS statistical software package.

5. CONCLUSIONS

Although Hungarian companies have taken their first steps towards the general application of the Internet, for the time being few companies are making use of it to support their purchases, sales or advertising activities. We are thus able to conclude here that notable and relevant differences prevail between the Internet usage of companies as far as industry classification/type, organisational configuration of marketing function and strategic goals are concerned. Companies who have already incorporated Internet use into their business practices within either purchasing, sales or advertising, are more likely to make use of electronic commerce or online advertising in other areas, too. The specific character of a company's market operations, its strategic/business goals and the characteristics of the company in itself account for one-third of the differences in Internet applications within company functions.

The empirically tested model utilised in the study tells us that it is the technological turbulence of the market within which a firm is operating that most influences Internet application. This is also true in the eyes of the supporters of the Bandwagon Theory, who are convinced that a company will be willing to invest – even without prospect of gaining a return – if it wants to overcome the advantages had by its competitors. In this research we can see that only an increasing consumer choice – how animated and vigourous the marketplace is – and ever-changing tendencies will *not* make a business resort to e-business ways of operating – which statement is also in line with current research being carried out in the United States of America by Wu *et al*. (2001).

Application of Internet in purchasing, sales and advertising is influenced to a great extent by the market aggression shown by a company, its competitive position, the amount of innovation it can claim, its perceived excellence and its organisational culture.

6. LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

The study here has focused on the use of e-business in business purchasing, sales and advertising. At present, however, there are no widespread, reliable or valid instruments for measurement of the application and usage of e-business (Wu *et al.* 2001). Internet application in this study was examined in each of the three areas with only one item, which thereby weakens the validity of results obtained.

A further limitation to this study is that the authors did not specifically examine the role of Intranet, and did not explicitly differentiate between the Internet and Intranet – even though many companies do undertake purchasing via Intranet.

Here, the item used for measurement was: "We carry out our purchasing activity based on the web". Such a single item does not allow one to get a many-sided view of a company's level of Internet application within purchasing activities – and our respondents might have given a high score to this item even if the Internet was not utilised at all, but rather the Intranet.

Where our respondents "belonged" in their organisation might have further limited the validity of results gained. Persons involved were top-managers or marketing managers, that is, people who did not necessarily have the greatest amount of insight within the company into the (technical) details of electronic "solutions" resorted to by the company. Even though the items used to measure the components of the dependent variable were quite concrete, we could well assume that those are biased in managerial perceptions of Internet usage in these particular areas. However, the authors do believe that the parallel existing here with the results of the *Competing with the World* research (where the respondents were IT experts) is a good test of the data's relevance.

Another limitation to our research was that the applied database was not originally constructed for the answering of questions related to e-business, so we were not able to measure some important determinants. Nevertheless, the topic's literature does refer to elements such as the commitment of top managers to e-business or the existence of a project "champion" within the company – someone who is responsible for the introduction of e-business – which can contribute to a great extent to the successful implementation of e-business operations. One can assume that the results here will keep their validity until 2002, although the research was done in 2000. (This is also backed up by the fact that the results of the 1999 *Competing with the World* survey were consistent with our own results from 2000, in spite of the one year having passed since publication of the first study.) Yet it is, of course, worth repeating this survey soon, given the dynamic changes and fast growth rate of the phenomenon under discussion (Carnation Consulting Report 2001).

The role of trust existing within organisational settings has recently been receiving increased academic attention (Dirks and Ferrin 2001; Kiesler 2001; Adler 2001; Moorman and Deshpandé 2001). As mentioned in the abstract, consumer fears and lack of trust represent great obstacles to the more widespread use of Internet – and it might also be interesting to evaluate the role played by managerial trust in Internet usage, i.e., as a factor possibly influencing the phenomena of electronic commerce and online advertising in a business-to-business setting.

Additionally, it could be of interest to test the model's "fit" or suitability in sub-samples. Wierenga and Ophuis (1997) suggest – after looking at information-giving instruments analysing management activity – that explanatory vari-

ables might have different effects on specific phenomena in various sectors of the economy.

The contribution made by Internet application in the three areas to business performance was not examined in this study. However, we do have partial results indicating that advertising is, first of all, a characteristic of the successful company. The model taken as a whole should, though, provide a basis for a more extensive research here.

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