The Impact Of Design Characteristics And Support Services On The Effectiveness Of Marketing Information Systems: An Empirical Investigation

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ABSTRACT

Based on empirical data, the impact of five specific variables, namely: a) system quality, b) information quality, c) quality of the Marketing Information System (MrkIS) technical support, d) the MrkIs compatibility, and lastly e) the MrkIs flexibility, on the effectiveness of MrkIS were investigated. The effectiveness measurement is based on the Competing Value Model (CVM) model which allows the definition of effectiveness on four basic dimensions. The results define the positive impact of these factors on the several dimensions of the effectiveness. Implications for practice, study limitations, and directions for future research are discussed.

INTRODUCTION

A great number of companies today are confronted with a continuously changing and highly competitive environment. As a result, the value of information increases since it becomes one of the most valuable assets in ranking the competitive rivalry of the modern markets. This, in turn, calls for a systematic organization and development of MkIS which can effectively collect, process and diffuse the necessary information available both to the internal and external levels (Talvinen, 1995).

However, although the development and the organization of the company's MrkIS has received considerable attention, particularly during the 1990's (e.g. Proctor, 1991, Kotler, 1994, Marshall and La Motte, 1992, Sisodia, 1992, Talvinen, 1995, Li, 1995, Van Bruggen et al., 1996, Wierenga and Ophurs, 1997, Wierenga et al., 1999) the scope has been limited to four main groups: a) the definition of MkIS, b) the possibility to classify in specific and distinctive types of MkIS, c) the match between the demand side (the decision processes to be supported) and the supply side (the functionality of MrkIS employed) and finally d) the importance in strategic planning and day-to-day operations

These efforts have, undoubtedly, advanced our understanding regarding MkIS but, on the other hand, have missed an area of crucial importance: That of MrkIS's effectiveness. Efforts towards this direction are sporadic (e.g. (Sääksjärvi and Talvinen, 1993, Panigyrakis and Chatzipanagiotou, 2003) and a lot of work is further required.

Having identified a significant gap in the existing body of knowledge, the aim of this study is to initiate an attempt to bridge it and to help managers and researchers understand the meaning of the MrkIS effectiveness and specifically the impact of five of its variables, namely: a) system quality, b) information quality, c) quality of the MrkIS technical support, d) the MrkIS compatibility, and finally e) the MrkIS flexibility.

The rest of this paper is organised as follows. Firstly, the relevant literature review and associated research hypotheses that address the relationships between the MrkIS effectiveness and the five specific factors under investigation are studied. The sample and measures employed in the study are then discussed, followed by the results

and the discussion section. Finally, some limitations of the study are highlighted and suggestions for future research are proposed.

LITERATURE REVIEW

Defining The Effectiveness Of MrkIS

A great number of studies have attempted to assess the effectiveness of IS, especially in the general IS field. The majority of the research on the IS effectiveness is limited to the financial indices measurement, such as ROI, ROA, etc (Qing and Plant, 2001, Krishnan and Sriram, 2000, Ryan and Harrison, 2000, Thatcher and Oliver 2001), the market share and the cost study (Gurbaxani and Mendelson, 1990, Railing and Housel, 1990), the productivity analysis (Qing and Plant, 2001, Hitt et al., 2002, Grover et al.,1998), the profitability (King 1998, Hitt and Brynjolfsson, 1996).

According to Grover et al. (1996), all the studies of IS effectiveness could be classified into four groups: a) Criteria demonstration research, b) Measurement research, c) Criteria relationship research, d) Antecedents of IS Effectiveness research. The first group includes criteria demonstration studies, namely the theoretical development and justification of effectiveness criteria, which are mainly financially oriented (e.g. Matlin 1979, Money et al. 1988). The second group is comprised of studies aiming at statistically developing and evaluating measures for assessing the IS effectiveness (e.g. Baroudi et al. 1986, Davis, 1989, Galeta and Lederer 1989), while the third group is composed of studies that attempt a linking between theory and statistical evaluation of various instruments employed for assessing the IS effectiveness (Ein-Dor et al. 1981, Sabherwal and Kirs 1994). Finally, the fourth group is comprised of studies that focus on the antecedents of the company's IS effectiveness (e.g. Montazemi 1988, Raymond 1990). Interestingly enough, an extensive examination of subsequent studies in IS effectiveness shows that the four pillars identified by Grover et al. (1996) remain as the dominant logic of scholar inquiry on effectiveness. For instance, the work of Qing and Plant (2001) as well as of Krishnan and Sriram (2000) take a financial perspective on IS effectiveness, the studies by Dishaw and Strong (1999), Mahmood and Mann (2000), and Jiang et al. (2002) focus on developing financial measures for assessing IS effectiveness, whereas Jiang et al. (2001), and Negash et al. (2003) attempt to link the development of specific measures with the underlie theory on effectiveness. Finally, Ragowsky et al. (2000), Tallon et al. (2000), and Heo and Han (2003) attempted to investigate the antecedents and the consequences of the IS effectiveness.

Nevertheless, despite the fact that the IS effectiveness has become the object of many empirical researches; it remains still one of the most important "unknown" issues in the literature. A possible explanation for this may be the lack of an empirically derived, reliable and integrated measure for assessing the effectiveness of IS. In fact, while most of the studies focus on assessing the effectiveness of the company's Management Information Systems (MIS), its Decision Support System (DSS) or its Executive Information Systems (EIS), no particular attention has been drawn on the Marketing Information System (MrkIS) and its effectiveness.

A rather interesting exception to that can be found in Sääksjärvi and Talvinen (1993), who use the *Competing Values Model* for the MrkIS effectiveness measurement.
The Competing Values Model (CVM) appears to be a particularly attractive framework for assessing the effectiveness of the company's MrkIS. It is based upon the notion that "effectiveness" is a construct which is composed by a number of partial meanings such as the efficiency, the productivity, the information management, the flexibility, etc (Cameron, 1978).

Following the CVM (1983), a company can be placed along three axes: a) focus, b) structure, and c) means-ends (Figure 1). These three dimensions allow the definition of four basic models regarding the priorities pursued by the company: the *Human Relations Model*, the *Open System Model*, the *Internal Process Model* and the *Rational Goal Model*.

According to the CVM, effectiveness, at the macro-level, is associated with well performance on all four models-priorities (Quinn and Rohrbaugh 1983).

The selection of CVM for the MrkIS effectiveness measurement is adopted in the present article since the said model is integrated and totally comprising all the types of measurement valid in the literature, according to the theoretical model of Grover et al. (1996) (Figure 2).

Figure 1: **CVM Fits With All Evaluation Types In The Literature**
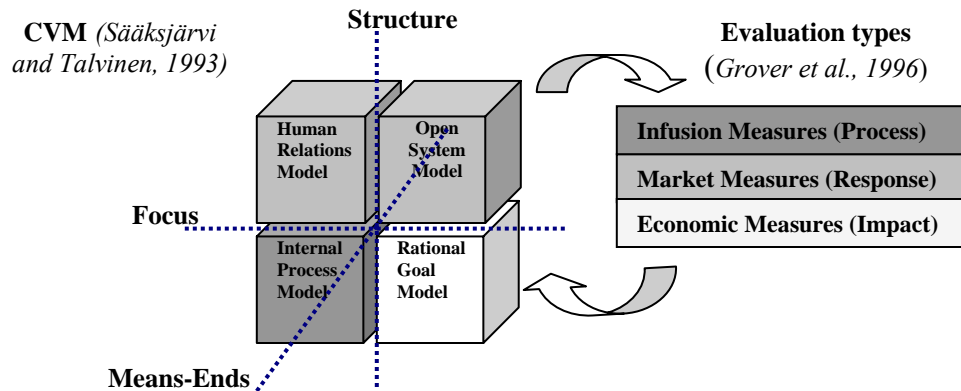
This is because it includes a) indicators of effectiveness with regard to the processes, and more specifically to the effectiveness of the information management, the internal communication, etc. (Internal Process Model~ Infusion Measures), b) indicators of effectiveness regarding the response the enterprise encounters   from both its human resources (Human Relation Model ~ Market Measures) and customers, competitors (Open System Model ~Market Measures) and, finally c) indicators with regard to the effect the MrkIS has on economical magnitudes, such as productivity, efficiency, etc. (Rational Goal Model ~ Economic Measures).

The Factors Effects Mrkis Effectiveness And Research Hypotheses

One common element in most studies (Shannon and Weaver, 1949; Mason, 1978; Wierenga and Ophuis, 1997; Seddon 1997; Garrity and Sanders, 1998; Wierenga et al. 1999; DeLone and McLean, 1992; 2003) is that effectiveness has been conceived as a function influenced by multiple variables.
In evaluating the contribution of information systems to the organization, a strong research stream has focused on the processing system itself. Within this framework, most measures tap engineering-oriented performance characteristics such as the usefulness of specific functions (Hiltz and Turoff, 1981), the stored record error rate (Morey, 1982), the response time (Belardo, Karwan and Wallace 1982), its flexibility (Mahmood, 1987), the convenience of access, (Bailey and Pearson, 1983). Furthermore, Adams et al. (1992) underline the ease in using the system as a system quality measurement variable by making known issues regarding the use facility the users anticipate (Franz and Robey, 1986) and its friendly working environment (Doll and Torkzadeh 1988, Hendrickson et al., 1993, Chin and Todd, 1995, Seddon, 1997).

They suggest that an information system containing state-of-the-art technology and software along with functional features such as accuracy, process speed, high responding time, easy access, easy use, friendly working environment, is the base of an effective functional information system.

The importance of information quality has been recognized by many researchers as a key ingredient in evaluating a successful system. It concerns the dimensions of the information in particular, as suggested by Bailey and Pearson (1983), the accuracy, format (Magal 1991; Rainer and Watson, 1995; Myers et al. 1998), currency, timeliness (Mahmood, 1987), precision, completeness, conciseness, reliability, relevance.

Those two variables, system quality and information quality seem to be among others the design characteristics of the system that determine the MrkIS effectiveness in organizational level (Wierenga et al., 1999).

Furthermore, Pitt et al. (1995), state that the IS effectiveness is highly dependant on the information quality the Information Systems Department provides to users.

They underline the fact that the role of the department has been continually developed from one of the Product Developer to the Services Provider. This can be concluded by the fact that their role is no longer limited to the installation of new software programs or the settlement of technical problems only. The introduction of personal computers in a company and their diffusion to nearly every department results in the almost daily communication, of the users with the information systems support department as they wish to ask for both relative information and services.

Subsequently, many researchers (Kettinger and Lee, 1997, Li, 1997, Wilkin and Hewitt, 1999, DeLone and McLean, 2003) agreed on the fact that the quality of the services rendered by the IS support department should be the main objective in the pursuit of measuring the information systems' effectiveness. This is due to the fact that the support the users receive is of a vital meaning to the way they could : a) get acquainted with the information systems, b) integrate them in their business concept, and, lastly, c) transform the potential benefits they entail into personal ones and, consequently, into business benefits.

Nevertheless, despite all the relevant important disputes and arguments, the majority of the above mentioned researchers converge on the fact that the major variables affecting the information systems effectiveness, are: a) the system quality, b) the information quality and c) the technical support services' quality.

Based on the above discussion and state on the fact that MrkIS is a specific type of an Information System it was hypothesized that:

H1: The system quality, the information quality and the support service quality have a positive impact on the MrkIS Effectiveness

Moreover, Wierenga et al.(1999) note that the system integration is another design characteristic which affects the MrkIS system effectiveness. Also, another interesting research of Sääksjärvi and Talvinen (1993) mentions the need for the MkIS integration. They divide the MkIS integration in two axes, namely: a) the *technical integration* by defining it as the need for all of the IS existing in a company to work, from the technical point of view, harmonically and effectively together, b) the *functional integration*, as the need for a systematic redesign of several functions a MkIS entails.

They support the ascertainment that the functional integration in an effort of radical processes' re-definition attuned with the technical integration results in the MrkIS effectiveness increases. The benefits deriving from the MrkIS integration are important and they are mentioned on many levels, such as: the improvement of targeting potential customers and already existing ones, the enhancement of service quality rendered both to the personnel (internal) and the customers (external), the successful anticipation of sales as well as their increase, and lastly, cost reduction (Graham, 1987, Townend 1989, Burns and Ross, 1991).

The MrkIS compatibility with the rest of the information systems of a company as well as the MrkIS flexibility of adapting to the marketing departments future needs are the basic factors regarding the MrkIS (Sääksjärvi and Talvinen, 1993) effectiveness definition.

The compatibility and the communication with the rest of the IS that either exist or pre-exist in a company (e.g. *Transaction Processing System, Management Information System, Decision Support Systems, Executive Information Systems* e.t.c) are vital presuppositions in order for the issues the marketing executives are called to respond to, present a better and more integrated picture. For instance, *Transaction Processing Systems* are used for the automation of daily repeated transactions, but nevertheless they could also be characterized as a source of information

for the rest of the marketing informational system's sub-systems, as for the data Marketing Reports Systems, for example.

Furthermore, the flexibility of adapting to the marketing departments needs constitutes a fundamental variable of defining the systems' effectiveness. The company's needs, and in particular those of the marketing department are continuously re-defined. This actually reflects the constantly changing competitive environment in which the companies are currently operating. Therefore, the MrkIS flexibility is an important object of research with reference to the effort of responding to the marketing executives needs.

Based on the above discussion, the research hypotheses are as following:

H2: The more MrkIS compatibility with the rest of IS in the company, the more the MrkIS effectiveness increased
H3: The more MrkIS flexibility of adapting in the marketing department future needs, the more MrkIS Effectiveness increased.

RESEARCH METHODOLOGY

Data Collection

Data was collected from five star hotels in Greece. The selection of the tourist field was based on the fact that in this field information is of a vital meaning, which justifies the IS extended use and application on behalf of every interested party, namely the tourist services' providers and consumers. Prior to being posted, the questionnaire was "pilot- examined" in order to increase the content validity of the research instrument. For this purpose, 50 personal interviews were conducted with managers who agreed not only to fill in the questionnaire but also to comment on the scales employed.

Of the 780 questionnaires that were eventually administered (including the 50 pilot personal interviews), 307 were returned. However, 53 were empty, due to various reasons (address unknown, temporary shut down because of expansions, refurbishment, etc), which reduced the effective sample to 254 and the population to 727 (Response rate 35%).

Variables Measurement

Marketing Information Systems Effectiveness

The MrkIs effectiveness scale was based on the *CVM* model and on the work of Sääksjärvi and Talvinen (1993), in particular. The CVM model reflects all the levels in which a company seeks its improvement through the MrkIS.

Nevertheless, according to the suggestions of executives' who helped in the development of the research instrument, the scales were enriched with items aiming to capture the MrkIs effectiveness in relation to certain dimensions of the marketing mix, such as promotion, communication, pricing, etc. The scale included 28 items and the respondents were asked to answer on a 7-point scale (1="I strongly disagree" to 7'= "I strongly agree").

Table I: Exploratory Factor Analysis Of The Marketing Information Systems Effectiveness Dimensions			
Factors Produced by the Analysis (Varimax Method)	**Items Loading in Each Factor**	**Loadings**	**Cronbach's Alpha Coefficients**
Factor 1: ***Internal Process Model*** (Explaining 27 % of total variance)	Improved control	*0.894*	0,835
	Improved marketing planning	*0.681*	
	Improved marketing reporting	*0.896*	
	Improved decision making	*0.684*	
Factor 2: ***Human Relation Model*** (Explaining 26% of total variance)	Time saving, lower level of routine work	*0.747*	0,831
	Improved sales work and customer service	*0.986*	
	Improved internal communication	*0.663*	
Factor 3: ***Open Systems Model*** (Explaining 22% of total variance)	Improved market sensitivity	*0.657*	0,925
	Improved customer satisfaction	*0.592*	
	Improved sales	*0.597*	
	Improved customer knowledge	*0.824*	
Factor 4: ***Rational Goal Model*** (Explaining 7% of total variance)	Marketing programmes cost savings	*0.712*	0,937
	Quickest development of new services in the market	*0.758*	
	Improved sales promotion activities	*0.794*	
	Direct and more effective marketing research	*0.864*	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.896, Bartlett's Test of Sphericity: $X^2 = 4210,84$ significant 0.000 Total Variance explained: 83%			

Next, Exploratory Factor Analysis was employed in order to investigate possible dimensions underling the original 28 items. This analysis produced a 4- factors solution, namely Internal Process Model, Human Relations Model, Open System Model, and finally, Rational Goal Model that accumulatively interpreted the 82.6% of the total variance in the initial variables (Table I). As these 4-factors are perfectly in line with the dimensions of organizational effectiveness suggested by Quinn and Rohrbaugh (1983) additive scales for each factor were developed and employed in subsequent analysis since when checked for reliability using Cronbach's Alpha they all well exceeded the suggest all threshold (α coefficients ranging from at least 0,83 to 0,93 at most).

System Quality

The System Quality was measured through the criteria used by Bailey & Pearson (1983) and Hendrickson (1993). To be more specific, the scale included questions (items) with reference to the functional features, such as: accuracy, processing speed, time of response, easy access, easy use, friendly working environment, as well as the one corresponding to the query whether the MrkIS includes hardware and software of the latest technology. The respondents were called to indicate their agreement with each item using a 7-point agreement scale. An acceptable level of Cronbach Alpha (α=0,788) allowed us to create an additive scale which was used in subsequent analysis.

Information Quality

Information quality was measured using the scale developed by Bailey and Pearson (1983). Respondents were again asked to indicate their agreement with each item using a 7-point agreement scale. An acceptable level of Cronbach Alpha (α=0,909) allowed us to create an additive scale which was used in subsequent analysis.

Support Service Quality

Despite the fact that the SERVQUAL model is used in the majority of researches for the quality measurement, the extensive literature review (Babakus and Boller 1992, Carman 1990, Cronin Taylor 1992, 1994,

Teas 1993, Dyke, Kappelman and Prybutok, 1997), led to the conclusion that the SERVQUAL usage as the IS support services quality measurement instrument has many problems, both methodological and practical.

In this study, in order to measure the technical support services quality a different approach was adopted. This, due to the fact that the greatest part of the IS support services are not provided by a specific department operating within the company, but by external companies which take over both the IS planning and implementation along with their support (Caldwell 1996, Lacity and Willcocks, 1998, McLellan et al. 1995, Palvia 1995). This outsourcing choice is based on the fact that the IS evolution requires a high level know-how, adaptability, something difficult and costly, therefore unadvisable when supported by a company's specific department (Chen and Soliman, 2002). Thus, the IS support services are considered as industrial ones and they should be evaluated as such.

Based on the aforesaid conclusions, this study makes use of the INDSERV (Gounaris S. and Venetis K., 2002), an industrial services quality evaluating model.

According to this instrument, perceived support quality is comprised of five basic elements: 1) *Hard Quality* (what is being performed during the service process) 2) *Soft Quality* (how the service is performed during the service process) 3) *Potential Quality* (the perception of the customer, regarding the ability of the provider to meet his needs 4) *Immediate Outcome Quality* (success of the provider to provide the client with a solution to a problem) and 5) *Final Outcome Quality (*the effects that the solution created for the client). Respondents were then asked to use a 7-point scale to assess the performance 7= "excellent", 1= "Poor".

For the verification of the scale's reliability the Cronbach's alpha reliability coefficient was used, which showed that the scales for the corresponding dimensions are internal consistent, and in particular: *Hard Quality (α=0,880), Soft Quality (α=0,859), Potential Quality (α=0,816), Immediate Outcome Quality (α=0,905), Final Outcome Quality (α=0,820).*

Compatibility and Flexibility of the MrkIS

For the measurement of the MrkIS's compatibility and flexibility, the respondents were called to answer two questions on the whole, which defined the MrkIS total compatibility and flexibility.

Table II: Four Regressions Coefficients Of Support Quality, System Quality And Information Quality With Each Of The 4 Models Of Marketing Information Systems Effectiveness As Dependent Variable				
Method (ENTER)	**1) Multiple Regression Rational Goal Model**	**2) Multiple Regression Open System Model**	**3) Multiple Regression Internal Process Model**	**4) Multiple Regression Human Relations Model**
	Stand. Beta	**Stand. Beta**	**Stand. Beta**	**Stand. Beta**
(Constant)	0,663	0,441	1,999	2,067
Support Quality	0,505*	0,438*	0,562*	0,391*
System Quality	0,554*	0,363*	0,218*	0,71*
Information Quality	0,716*	0,595*	0,387*	0,275*
Adjusted R Square	0,512**	0,441**	0,484**	0,289**
*p<0,05, **p<0,01				

FINDINGS

For the H1 examination, 4 analyses of multiple regressions with dependent variable every partial model of the MrkIS effectiveness, and independent variables the system quality, the information quality and the support services quality were run. It should be noted that prior to each one of the multiple regression analysis conducted, a control was made to examine whether the relations between the one dependent and the rest of independent variables were efficient for the linearity case with the use of scatter diagrams, that showed that there weren't any intense non-linear relations.

Another important issue that should be examined was the multicollinearity, namely the existence of high correlations amongst the independent variables. Nevertheless, the highest correlation noticed, does not exceed the 0,536 (*Pearson Correlation Coefficient)* which is much below the acceptable limit of 0,90 (Hair et al. 1995).

Having successfully passed these two initial tests, the regressions were run. The results are shown in Table II. As shown from the results of our research, the system quality, the information quality, the support systems quality, are statistically significant (p=0.000), which leads us to the acceptance of H1.The results of the multiple regressions are shown in Table II.

On the other hand, the Adjusted R Square high percentages indicate the crucial meaning of the three factors in the interpretation of the MrkIS effectiveness.

The H2 hypothesis was examined through the *t* test conduct (independent samples t-test), a test for the average rates statistic importance and the four dimensions of the effectiveness in the cases where the MrkIS are compatible with the rest of the company's IS and in the cases where such does not exist. The results of this analysis are shown in the following Table III.

Table III: The Result Of The *T* Test Analysis For The Effectiveness Of Compatible And Not Compatible Systems				
	Means		Levene's Test for Equality of Variances	
	Compatible (N=179)	Not Compatible (N=75)	t-value	Sig.
Internal Process Model	6,01	5,38	5,927	**0.000****
Improved control	6,07	5,39	4,020	**0,000****
Improved marketing planning	5,88	4,97	6,660	**0,000****
Improved marketing reporting	6,08	5,76	3,076	**0,002****
Improved decision making	6,04	5,40	5,398	**0,000****
Human Relations Model	5,683	4,897	7,060	**0,000****
Time saving, lower level of routine work	6,03	5,35	6,066	**0,000****
Improved sales work and customer service	5,73	4,95	5,402	**0,000****
Improved internal communication	5,29	4,40	7,478	**0,000****
Open System Model	5,98	5,23	5,981	**0,000****
Improved market sensitivity	5,93	5,23	7,463	**0,000****
Improved customer satisfaction	6,04	5,43	4,775	**0,000****
Improved sales	5,83	5,07	5,302	**0,000****
Improved customer knowledge	6,11	5,47	3,977	**0,000****
Rational Goal Model	5,73	3,84	9,599	**0,000****
Marketing programmes cost savings	5,85	4,80	5,094	**0,000****
Quickest development of new services in the market	5,72	3,75	9,075	**0,000****
Improved sales promotion activities	5,86	3,61	9,921	**0,000****
Direct and more effective marketing research	5,53	3,20	10,644	**0,000****
*p<0,05, **p<0,01				

The Table III results show us that the MrkIS compatibility with the rest of the IS that exists in a company effects positively the MrkIS effectiveness, a fact that leads us to the H2 hypothesis acceptance.

Finally, for the H3 research hypothesis control, a *t test* was conducted (independent samples t-test) to define the statistic importance of the average rates, and the four dimensions of the effectiveness, in which the MrkIS are flexible to adapt to the marketing department future needs, and in the cases where no such flexibility exists. The results of this analysis are presented in the following Table IV.

CONCLUSIONS

Currently, researches have headed towards the IS measurement of effectiveness in general, without a relevant documentation through empirical research regarding their conclusions and without proving the application of these conclusions on specific type systems, such as the MrkIS. The results of the research give us empirical data regarding the issue of the MrkIS effectiveness.

The results of the analyses make evident that the partial variables, while being of a statistical significant to all the levels of effectiveness, play a different role in the goals achievement that every dimension of the effectiveness defines (Human Relations Model, Open System Model, Internal Process Model and the Rational Goal Model).

Although, information quality is of crucial importance for the four effectiveness dimensions, it seems to be a key factor for increased effectiveness of: a) Rational Goal Model (marketing programs cost savings, quickest development of new services, improved sales promotion activities, direct and more effective marketing research), b) Open System Model (improve market sensitivity, improve customer satisfaction, improve sales, improve customer knowledge).

On the other hand, service's support quality has a stronger impact on effectiveness dimensions, especially when they are related to internal company's processes (Internal Process Model). This seems justified from the continuously changing environment which imposes the company to reexamination and reformulation of some of its process.

The strongest impact of the system quality is on the Human Relations Model, its improvement permits employees to have more time to spend on the improvement of their job. However, Adjusted R square indicates that the influence of independent variables is lesser to the Human Relations Model than to the other models examined. Furthermore, the results of the analyses show that the MrkIS co-operation and flexibility in adapting to the company's and the marketing department's needs constitute fundamental factors for an effective MrkIS.

The spreading of information amidst the departments / functions of the company is attained with the harmonious co-operation of the company's IS. The high quality of the said information actually leads the marketing executives to locate all the possible parameters of an issue. Subsequently, helping them to make the right decision both in the stage of marketing programs planning and development and in the stage of the control and adjusting actions required.

The co-operation amidst the departments / functions developed through the IS, as well as the MrkIS adapting flexibility leads the enterprise to well defined targets where the proper information functions in favor of the right source disposal and their effective management. This fact contributes to the reduction of the cost required for the marketing programs implementation and to the effective marketing activities management such as the new products creating process, the sales promotion process, and the market research process. This co-operation along with the MrkIS adapting flexibility, results also in the fact that the company attains the harmonization of the marketing programs with the total of its strategy, a detail that renders the successful marketing strategy more effective.

Table IV: The Result Of The *T* Test Analysis For The Effectiveness Of Flexible And Not Flexible Systems				
	Means		Levene's Test For Equality Of Variances	
	Flexible (N=204)	Not Flexible (N=50)	t-value	Sig.
Internal Process Model	6,05	4,91	10,311	0,000**
Improved control	6,27	4,24	12,983	0,000**
Improved marketing planning	5,94	4,26	12,787	0,000**
Improved marketing reporting	6,04	5,74	2,547	0,011*
Improved decision making	5,96	5,42	3,843	0,000**
Human Relations Model	5,67	4,55	9,267	0,000**
Time saving, lower level of routine work	6,00	5,12	6,945	0,000**
Improved sales work and customer service	5,76	4,42	8,747	0,000**
Improved internal communication	5,25	4,12	8,484	0,000**
Open System Model	6,04	4,59	11,652	0,000**
Improved market sensitivity	5,94	4,44	10,967	0,000**
Improved customer satisfaction	6,04	5,10	6,664	0,000**
Improved sales	5,90	4,40	10,251	0,000**
Improved customer knowledge	6,28	4,44	12,081	0,000**
Rational Goal Model	5,76	2,78	15,971	0,000**
Marketing programmes cost savings	5,96	3,82	10,278	0,000**
Quickest development of new services in the market	5,75	2,60	15,274	0,000**
Improved sales promotion activities	5,74	3,24	13,743	0,000**
Direct and more effective marketing research	5,50	2,18	15,153	0,000**
p<0,05, **p<0,01				

Furthermore, these process adjustments actually reflect the marketing executives' needs and are often correlated to the co-operation amidst partial projects. Thus, promoting the communication among the marketing department people and the communication amidst the several departments. The promotion of the communication and the definition of the proper processes improve the daily repeated procedures and the services to the customer.

The definition of the following five factors: a) the system quality, b) the information quality, c) the support services quality, d) the compatibility, and e) the MrkIS flexibility of adapting to the marketing department needs helps marketing executives to: a) evaluate the existing MrkIS, b) make decisions for the necessary adjusting actions, c) manage the MrkIS in the aim of better serving their employees and customers, d) be awakened to the opportunities the use of these systems produces and make effective advantage of them, and lastly, e) harmonize the MrkIS investment with the total strategy of the company.

Alas, this study is not free of limitations. However, without diminishing its contribution, future research may easily address them. One first limitation is the national context which may pose, constrains on the ability to generalize the findings in the context of other national frameworks. A second limitation pertains to the structure of the sample. This study focused on a single industry. Thus, a possible direction for future research which would be particularly welcome is to examine the relationships that this study has identified along a wider sample comprised of companies from different industries.

This study looked at the MrkIS effectiveness of a company at one moment in time. However, MrkIS develop over time, both as a result of experience with MrkIS in companies and the fast development of MrkIS technology. It will be interesting to carry out observations at the same companies at different moments in time. However, because no such empirical evidence has yet been produced, future research in this direction would be more than welcome.

REFERENCES

1.   Adams, D.A. and Nelson, R.R. (1992), Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication, *MIS Quarterly*, Vol. 16, No. 2, pp. 227-247.
2.   Babakus, E. and Boller, G. W. (1992), An Empirical Assessment of the SERVQUAL Scale, *Journal of Business Research*, Vol. 24, No. 3, pp. 253-268.
3.   Bailey, James E. and Pearson Sammy W.(1983), Development of a Tool for Measuring and Analyzing Computer User Satisfaction, *Management Science*, Vol. 29, No. 5, pp. 530-545.
4.   Baroudi, J. J., M. H. Olson, and Ives B. (1986), An empirical study of the impact of user involvement on system usage and information satisfaction, *Communication of the ACM*, Vol. 29, No. 3, pp. 232-238.
5.   Belardo, Salvatore, Kirk R. Karwan, and William A. Wallace, (1982), DSS Component Design through Field Experimentation. An Application to Emergency Management, Proceedings of the Third International Conference on Information Systems, pp. 93-108.
6.   Bruggen, G.H. van, A. Smidts, and B. Wierenga (1996). The impact of the quality of a marketing decision support system: An experimental study. *International Journal of Research in Marketing*, 13 (1996) 331-343.
7.   Bums, D.H. and Ross, E.R., (1991), Developing Data Bases, *Bank Management*, Vol.10, pp. 49-51.
8.   Caldwell, B. (1996), The new outsourcing partnership: vendors want to provide more than just services, *Information Week*, Vol. 24, pp. 50-64.
9.   Cameron, Kim S. (1978), Measuring organizational effectiveness in institutions of higher education, *Administrative Science Quarterly*, Vol. 23, No.4, pp. 604-632.
10.   Carman, J. M. (1990), Consumer Perceptions of Service Quality: An Assessment of the SERVQUAL Dimensions, *Journal of Retailing*, Vol. 66, No. 1, pp. 33-55.
11.   Chen, L. and Soliman K. S. (2002), Managing IT outsourcing: a value – driven approach to outsourcing using application service providers, *Logistics Information Management*, Vol. 15, No. 3, pp. 180-191.
12.   Chin, W.W. and Todd P.A. (1995), On the use, usefulness, and ease of use of structural equation modeling in MIS research: a note of caution, *MIS Quarterly*, Vol. 19, No. 2, pp. 237-247.
13.   Cronin, J. J. and Taylor, S. A. (1992), Measuring Service Quality: A Reexamination and Extension, *Journal of Marketing*, Vol. 56, No. 3, pp. 55-68.
14.   Davis, Fred D. (1989), Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, Vol. 13, No. 3, pp. 319-340.
15.   DeLone, W. H. and E. R. McLean, (1992), Information Systems Success: The Quest for the Dependent Variable, *Information Systems Research*, Vol. 3, No. 1, pp. 60-95.
16.   DeLone, W. H., and McLean, E. R. (2003), The DeLone and McLean Model of Information Systems Success: A Ten-Year Update, *Journal of Management Information Systems*, Vol. 19, No. 4, pp. 9-22.
17.   Dishaw, Mark T. and Strong, Diane M., (1999), Extending The Technology Acceptance Model With Task-Technology Fit Constructs, *Information & Management*, Vol. 36, No. 1, pp. 9-22.
18.   Doll, W. J. and Torkzadeh, G.(1988), The measurement of end-user computing satisfaction, *MIS Quarterly*, Vol. 12, No. 2, pp. 259-274.
19.   Ein-Dor, Phillip, Ei Segev, and Abraham, Steinfeld, (1981), Use of Management Information Systems: An empirical study Proceedings of the Second International Conference on Information Systems, pp. 215-228.
20.   Franz, Charles R. and Daniel Robey, (1986), Organizational Context, User Involvement and the Usefulness of Information Systems, *Decision Sciences*, Vol. 17, No. 3, pp. 329-356.
21.   Garrity, E.J. and Sanders, G. L.(1998), *Information Systems Success Measurement*, Idea Group Publishing, Hershey, PA.
22.   Gounaris, S. and Venetis, K. (2002), Trust in Industrial Service Relationships: Behavioral Consequences, Antecedents and the Moderating Effect of the Duration of the Relationship, *Journal of Services Marketing*, Vol. 16, No. 7, pp. 636 – 655.
23.   Graham, J., (1987), The World's Largest Automated Sales Force, *Industrial Marketing Digest*, Vol. 14 No. 3, pp. 93-101.
24.   Grover V., Jeong S., and Segars A. (1996), Information Systems Effectiveness: The construct space and patterns of applications, *Information & Management*, Vol. 31, No. 4, pp. 177-191.

25.　　Grover, Varun, James Teng, Albert H. Segars, and Kirk Fiedler, (1998), The influence of information technology diffusion and business process change on perceived productivity: The IS executive's perspective, *Information & Management*, Vol. 34, No. 3, pp. 141-159.

26.　　Gurbaxani, Vijay and Mendelson, Haim, (1990), An Integrative Model of Information Systems Spending Growth, *Information Systems Research*, Vol. 1, No. 1, pp. 23-46.

27.　　Hair J., Anderson R., Tatham R., and Black William, (1995), *Multivariate Data Analysis*, 5th Edition, Prentice Hall.

28.　　Hendrickson, A.R, Massey, P.D, and Cronan, T.P. (1993), On the test-retest reliability of perceived usefulness and perceived ease of use scales *MIS Quarterly*, Vol. 17, No.2, pp. 247-230.

29.　　Heo, Jaeho and Han, Ingoo, (2003), Performance measure of information systems (IS) in evolving computing environments: an empirical investigation, *Information & Management*, Vol. 40, No.4, pp. 243–256.

30.　　Hiltz, Starr and Roxanne Murray Turoff, (1981), The Evolution of User Behavior in a Computerized Conferencing System, *Communication of the ACM*, Vol. 24, No. 11, pp. 739-751.

31.　　Hitt, L.M and Brynjilfsson, E. (1996), Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value, *MIS Quarterly*, Vol. 20, No. 2, pp. 121-143.

32.　　Hitt, L. M., Wu, D.J., and Xiaoge Zhou, (2002), Investment in Enterprise Resource Planning: Business Impact and Productivity Measures, *Journal of MIS*, Vol. 19, No. 1, pp. 71-99.

33.　　Jiang J., Klein G., Roan J., and Lin J. (2001), IS service performance: self-perceptions and user perceptions, *Information & Management*, Vol. 38, No.3, pp. 499-506.

34.　　Jiang ,J., Klein, G., and Carr, C. (2002), Measuring Information System Service Quality: SERVQUAL from the other side, *MIS Quarterly*, Vol. 26, No. 2, pp. 145-165.

35.　　Kettinger, W., and Lee, C. (1997),Pragmatic Perspectives on the measurement of Information Systems Service Quality', *MIS Quarterly*, Vol.21, No. 2, pp. 223-240.

36.　　King, William R. (1998), IT-enhanced productivity and profitability, *Information Systems Management*, Vol. 15, No. 3, pp. 70-73.

37.　　Kotler, P. (1994), *Marketing Management - Analysis, Planning, Implementation and Control*, 9th ed., Prentice-Hall International, London.

38.　　Krishnan, Gopal V. and Sriram, Ram S. (2000), An Examination Of The Effect Of IT Investments On Firm Value: The Case Of Y2K-Compliance Costs, *Journal of Information Systems*, Vol. 14, Vol. 2, pp. 95-109.

39.　　Lacity, M. and Willcocks, L. (1998), An empirical investigation of information technology sourcing practices: lessons from experience, *MIS Quarterly*, Vol. 22, No. 3, pp. 363-408.

40.　　Li, E.Y. (1995), Marketing Information in the Top U.S. Companies: A Longitudinal Analysis, *Information & Management*, Vol . 28, No. 1, pp. 13-31.

41.　　Li, E.Y. (1997), Marketing Information Systems in Small Companies, *Information Resources Management Journal* (U.S.A.), Vol. 10, No. 1, pp. 27-35.

42.　　Magal, S.R. (1991), A model for evaluating information center success, *Management Information Systems*, Vol. 8, No. 1, pp. 91-106.

43.　　Mahmood, Mo Adam and Mann, G. (2000), Special Issue: Impacts on Information Technology Investment on Organizational Performance, *Journal of MIS*, Vol. 17, No. 1, pp. 3-10.

44.　　Mahmood, Mo A. (1987), Systems Development Methods – A Comparative Investigation, *MIS Quarterly*, Vol. 11, No. 3, pp. 293-311.

45.　　Marshall, K.P. and La Motte, S. W. (1992), Marketing Information Systems: A Marriage of Systems Analysis and Marketing Management, *Journal of Applied Business Research*, Vol. 8, No. 3, pp. 61-73.

46.　　Mason, R. O. (1978) Measuring Information Output: A Communication Systems Approach, *Information & Management*, Vol. 1, No. 5, pp. 219-234.

47.　　Matlin, Gerald L., (1979), What Is The Value Of Investment In Information Systems, *MIS Quarterly*, Vol. 3, No. 3, pp.5- 34.

48.　　McLellan K., Marcolin, B., and Beamish, P. (1995), Financial and strategic motivations behind IS outsourcing, *Journal of Information Technology*, Vol. 10, No. 4, pp. 299-321.

49.　　Money, A.H., Tromp, D., and Wegner, T., (1988), The quantification of decision support benefits within the context of value analysis, *MIS Quarterly* Vol.12, No. 2, pp. 223-236.

50.　　Montazemi, A.R. (1988), Factors affecting information satisfaction in the context of the small business environment, *MIS Quarterly*, Vol. 12, No. 2, pp. 239–256.

51.   Morey, Richard C. (1982), Estimating and Improving the Quality of Information in A MIS, *Communications of the ACM*, Vol. 25, No. 5, pp. 337-342.

52.   Myers, B. L., Kappelman, L.A., and Prybutok, V.R. (1998), A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems Function: Toward a Theory for Information Systems Assessment, in Garrity, E.J. and G. L. Sanders (Eds.), *Information Systems Success Measuremen*t, Chapter 6, pp. 94-121.

53.   Negasha, Solomon, Ryanb, Terry and Igbaria, Magid, (2003), Quality and effectiveness in Web-based customer support systems, *Information & Management*, Vol. 40, No. 8, pp. 757–768.

54.   Palvia, P.C. (1995), A dialectic view of information systems outsourcing: pros and cons, Vol. 29, No. 59, pp. 265-275.

55.   Panigyrakis, G. and Chatzipanagiotou, K., (2004), Key factors for Marketing Information Systems Effectiveness, EMAC Conference 18-21 May in Murcia, Spain.

56.   Pitt, L.F, Watson, R.T and Kavan, C.B. (1995), Service quality: a measure of information systems effectiveness, *MIS Quarterly*, Vol. 19, No. 2, pp. 173-185

57.   Proctor, R.A. (1991), Marketing information systems, *Management Decisions*, Vol. 29, No. 4, pp. 55-60.

58.   Qing, Hu and Plant, Robert, (2001), An Empirical Study of the Causal Relationship Between IT Investment and Firm Performance, *Information Resources Management Journal*, Vol. 14,Vol. 3, pp. 12-15.

59.   Quinn, R.E. and Rohrbaugh, J. (1983), A spatial model of effectiveness criteria: towards a competing values approach to organizational analysis, *Management Science*, Vol. 29, No. 3, pp. 363-77.

60.   R. Sabherwal and P. Kirs,(1994), The Alignment between Organizational Critical Success Factors and Information Technology Capability in Academic Institutions, *Decision Sciences*, Vol. 25, No.2, pp. 301-330.

61.   Ragowsky, A., Stern M., and Adams, D. (2000), Relating Benefits from Using Information Systems to an Organization's Operating Characteristics: Interpreting Results from To Countries, *Journal of MIS*, Vol. 16, No. 4, pp. 175-194.

62.   Railing, Larry and Housel, Tom, (1990), A network infrastructure to contain costs and enable fast response: The TRW process, *MIS Quarterly*, Vol. 14, No. 4, pp. 405-420.

63.   Rainer Jr., R. Kelly and Watson, Hugh J. (1995), The Keys to Executive Information Systems Success, *Journal of Management Information Systems*, Vol. 12, No. 2, pp. 83-98

64.   Raymond, L. (1990), Organizational context and information systems success: a contingency approach, *Journal of MIS*, Vol. 6, No. 4, pp. 5–20.

65.   Ryan, Sherry, D. and Harrison, David A. (2000), Considering Social Subsystem Costs and Benefits in Information Technology Investment Decisions: A View From The Field On Anticipated Payoffs, *Journal of MIS*, Vol. 16, No. 4, pp. 30-41.

66.   Sääksjärvi, Markku V.T. and Talvinen, Jari M. (1993), Integration and Effectiveness of Marketing Information Systems, *European Journal of Marketing*, Vol. 27, No. 1, pp. 64-77.

67.   Seddon, Peter B. (1997) A Respecification and Extension of the DeLone and McLean Model of IS Success, *Information Systems Research*, Vol. 8, No. 3, pp. 240-253.

68.   Shannon, C. E. and W. Weaver, (1949), *The Mathematical Theory of Communication*, University of Illinois Press, Urbana, IL.

69.   Sisodia, R.S. (1992), Marketing information and decision support systems for services, *The Journal of Services Marketing*, Vol. 6, No. 1, pp. 51-64.

70.   Tallon, P., Kraemer K., and Gurbaxani, V., (2000), Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach, *Journal of MIS*, Vol.16, No. 4, pp. 145-173.

71.   Talvinen, J.M. (1995), Information Systems in Marketing. Identifying Opportunities for New Applications, *European Journal of Marketing*, Vol. 29, No. 1, pp. 8-26.

72.   Teas, R. K. (1993), Expectations, Performance Evaluation and Consumer's Perception of Quality, *Journal of Marketing*, Vol. 57, No. 4, pp. 18-34.

73.   Thatcher, Matt E. and Oliver, Jim R. (2001), The Impact of Technology Investments on a Firm's Production Efficiency, Product Quality, and Productivity, *Journal of MIS*, Vol. 18, No. 2, pp. 17-46.

74.   Townend, R., (1989), How BICC Turned a Deluge of Replies into Worthwhile Leads, *Industrial Marketing Digest*, Second Quarter, Vol. 14, No. 2, pp. 37-42.

75.　　Van Dyke, Thomas P., Kappelman, Leon, and Prybutok, Victor R. (1997), A Measuring information systems service quality: Concerns on the use of the SERVQUAL questionnaire, *MIS Quarterly*, Vol. 21, No. 2, pp. 195-207.
76.　　Wierenga B. Gerrit Van Bruggen and R. Staelin, (1999),The success of Marketing Management Support Systems, *Marketing Science*, Vol. 18, No.3, pp.196-207.
77.　　Wierenga, B. and P.A.M. Oude Ophuis, (1997), Marketing Decision Support Systems: Adoption, Use and Satisfaction, *International Journal of Research in Marketing*, Vol 14, No. 3 (July), p. 275-290.
78.　　Wilkin, C. and Hewitt, B. (1999), Quality in a respecification of DeLone and McLean's IS success model, In Mehdi Khozrowpoar (ed). Proceedings of 1999 IRMA International Conference, Heshey, PA: Idea Group Publishing, pp. 663-672.

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