

LEGAL FORM OF AN ENTERPRISE AS A FACTOR DISCRIMINATING IMPACT OF IT SYSTEMS ON ENTERPRISE COMPETITIVENESS

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Abstract

Outcomes an enterprise generates on application of information technologies have major impact on functioning and management of entire enterprises, since information technologies contribute to reorganisation and simplification of routine activities, freeing of resources, increasing revenue, and development of new products and services, as a result of which competitiveness of enterprises improves.

The aim of this paper is to examine effects of information systems on enterprise competitiveness with regard to legal form of enterprises.

Impact of information systems on competitiveness has been measured in the four perspectives of the Balanced Scorecard, i.e. the perspective of customer, development, internal processes, and finances.

Results of the authors' research into 213 SME enterprises operating in the Polish economy are presented. The study utilised the method of CAWI (Computer-Assisted Web Interview) and was anonymous. Analysis of the results indicated the legal form of an enterprise discriminates impact of information system implementations on competitiveness from the four perspectives of the Balanced Scorecard.

A critical review of the literature concerning enterprise competitiveness is presented in the theoretical part of this paper, whereas the empirical section employs descriptive statistical metrics and Kruskal-Wallis analysis.

Key words: legal form, information systems, competitiveness, enterprise

JEL Code: D22, M15

Introduction

Competition accompanies man in every area of activity, while its idea boils down to rivalry for achievement of the same goal among a number of groups or individuals (Komarkova et al., 2014; Manole et al., 2014). The notion is associated with competitiveness, which means

more effective manufacturing and supply of products and services than competitors (Marakova et al., 2016), ability to continue delivering added value to enterprise stakeholders (Dwyer, Kim, 2003), being profitable and maintaining a dominant market standing (Lombana, 2006). Competitiveness is frequently associated with innovation (Duda, Gąsior, 2014), price, product quality, human capital (Szczepańska- Woszczyzna, 2015) and reporting of non-financial information (Lament, 2018), that is, factors that provide for competitive advantage of an enterprise.

The aim of this paper is to examine effects of information systems on enterprise competitiveness with regard to legal form of enterprises.

The following research hypothesis is advanced: legal form of an enterprise discriminates impact of IT system implementation on competitiveness from the four perspectives of the Balanced Scorecard.

A critical review of specialist literature is presented in the theoretical part of this paper, whereas the empirical section employs descriptive statistical metrics and Kruskal-Wallis test.

1 IT systems as sources of enterprise competitive advantage

Specialist literature defines competitive advantage as something which lets a firm gain better results or simply do something better than its competitors (Aaker, 1989), ability to realise a strategy current and future competitors are unable to realise (implement) (Barney, 1991), or effects of correctly realised enterprise strategies that reflect enterprise strengths (Nițu, Nițu, 2013).

Key sources of enterprises' competitive advantage have changed in recent years. Intangible resources, which largely decide market standing and provide foundations for creating potential for intellectual capital, are increasingly important. Although tangible resources remain major parts of assets, it is primarily intellectual capital that creates added value to customers in a knowledge economy, becoming a substantial component of market value. Intangible resources, arising from staff, become prominent, therefore. Employees take advantage of their knowledge, skills, and competences and affect customer relations. Intangible factors with specially important roles include: contacts with business, local authorities, and stakeholders, as well as Corporate Social Responsibility, defined as voluntary consideration of social interests and environment protection in enterprise strategies (Wolak-Tuzimek, 2014). Ability to realise strategies, leadership and management style, honesty,

reliability, and trust, as well as image, reputation, prestige, and brand are some more of the major intangible values in an enterprise. High quality of these resources can be assured by knowledge, intellectual capital, key competences, and corporate culture. These, coupled with production processes and research, help an enterprise to supply innovative products and services to the market.

Intangible values are created by functional systems of enterprises, including information systems. Integrated information technology systems are defined as the most substantially and technologically advanced class of IT systems supporting holistic management of enterprises and institutions. They optimise both internal processes and those in the immediate environment by offering ready-made solutions for automated data exchange among an enterprise's functions and other businesses in its environment (e.g. suppliers, clients, banks) (Kulińska, Rut, 2013). Chief characteristics of integrated information technology systems comprise: functional complexity, integration of data and procedures, functional and structural flexibility, substantial and technological sophistication, and openness (Kulińska, Rut, 2011).

An IT ecosystem of an e-enterprise should be based on advanced ERP (Enterprise Resource Planning) solutions. Traditional ERP systems, understood as solutions integrating IT infrastructure of an enterprise, are no longer sufficient. Their basic functionality has been extended with CRM (Customer Relationship Management) systems, SRM (Supplier Relationship Management), SCM (Supply Chain Management), and PLM (Product Lifecycle Management) systems. In parallel, development of ERP systems has stimulated demand for IT solutions known as Business Intelligence. These refer to support for decision-making processes based on the so-called business analysis. The latter encompasses tools and applications for analysis, monitoring, modelling, presentation, and reporting of data to support decision-making. To this end, data warehouses, operational analysis of supply chains, analytical CRM and SRM systems, financial analysis, and performance indicators are employed.

2 Methods

The survey was designed to analyse effects of information technologies on competitiveness of SMEs. The sample was selected at random. The analysis applied to Polish enterprises operating in the subregion of Radom and involved 240 small and medium-sized enterprises. 213 correctly completed survey questionnaires were obtained and analysed further.

Both CAWI (Computer-Assisted Web Interview) and the traditional methods were used. The survey was anonymous and conducted in the period 11.01.2016 – 31.03.2017. Such a method was chosen owing to: low costs, short time of data generation, absence of error resulting from impact of a survey administrator, technical advantages of an Internet form, respondents' sense of anonymity, quick access to selected individuals, ease of inputting data into a spreadsheet.

An original survey questionnaire was used in the empirical part. It consisted of particulars and contents. The former contained five objective (or close to objective) criteria characterising the sample and 13 criteria describing IT systems in place at an enterprise and their functionalities. The other part of the survey addressed two issues: impact of IT systems utilised by firms on competitiveness and assessment of benefits from implementation of information technology systems. Effects of IT systems on enterprises' competitiveness were measured from the four perspectives of the Balanced Scorecard, i.e. the perspective of customer, development, internal processes, and finances, defined by means of 13 observable variables (table 1).

Tab. 1: Perspectives of the Balanced Scorecard and their corresponding observable variables

Perspective	Observable variables
Customer perspective	Market share
	Customer retention
	Customer acquisition
	Customer satisfaction
	Customer profitability
Development perspective	Staffing potential
	Capabilities of IT systems
	Staff motivation and commitment to realisation of strategy
Perspective of internal processes	Innovation processes
	Operational processes
Financial perspective	Revenue
	Costs
	Utilisation of assets

Source: The authors' own compilation.

The observable variables were recorded on 10-point ordinal scales, where 1 stood for little and 10 for large impact. 27 variables selected following on the literature review were employed to examine benefits from implementation of information technology systems. Their values were also noted on 10-point ordinal scales, with 1 meaning high and 10 low benefits.

More than 40% of the surveyed enterprises were self-employed individuals (86). Limited liability companies constituted the second largest grouping of 64 entities, or 30% of all those queried. Shares of general and private partnerships accounted for 15.5% and 7.5% of the sample, respectively, with joint-stock companies and limited partnerships comprising the minimum shares of 0.5% each. 1.9% of the enterprises had other forms of organisation.

Kruskal–Wallis test served to test effects of IT systems on competitiveness of enterprises with various organisational forms.

p , based on test statistics, is compared to the significance level α :

If $p \leq \alpha \Rightarrow H_0$ is rejected and H_1 is accepted,

If $p > \alpha \Rightarrow$ there are no reasons for rejecting H_0 .

Acceptance of H_0 implies levels of a factor tested have no significant effect on results noted. Rejection of H_0 entails levels of a factor have a significant impact on results. A given factor discriminates results then. The significance level of $\alpha=0.05$ was adopted. The observable level of significance p was analysed based on results compiled by means of *Statistica 12*. The level represents a decreasing reliability of a result. Its values help to assess likelihood of a given result assuming H_0 is true. p should be greater than the set α .

3 Results

Maximum effects of information technologies on competitiveness were felt by joint-stock companies, limited partnerships, and limited liability companies. In respect of the customer perspective, the average values in those enterprise groups were 9.20, 7.60, and 6.69, respectively. They amounted to 8.67, 6.67, and 6.31 for the finance perspective. In the case of the development perspective, the averages for these groups were 9.33, 7.67, and 6.64, respectively. With regard to the internal processes perspective of selected legal forms of enterprises, these values were: 8.00, 4.50, 5.67.

Minimum ratings, on the other hand, were awarded by: other, unspecified businesses and self-employed individuals. With reference to the customer perspective, they equalled 3.65 and 5.00, respectively. For the financial perspective, in turn, they amounted to 3.42 and 4.34. Evaluation of effects of information technologies in these enterprise groups were 2.75 and 3.44. Finally, with regard to the perspective of internal processes, average assessments by the selected enterprises totalled 8.00, 4.50, and 5.67. The situation is summarised in Table 2.

Tab. 2: Averages and standard deviations for the four perspectives concerning impact of information technologies on enterprise competitiveness depending on legal form

Legal form of enterprise	Customer perspective		Finance perspective		Development perspective		Perspective of internal processes	
	I	II	I	II	I	II	I	II
Self-employed individual	5.00	1.86	4.34	1.71	4.47	1.93	3.44	1.90
Ltd. liability co.	6.69	1.21	6.31	1.09	6.64	1.31	5.67	1.38
Professional partnership	4.93	0.81	4.08	0.85	5.13	1.21	3.25	0.97
Private partnership	5.33	1.86	4.52	1.51	5.17	1.62	3.78	1.69
Limited partnership	7.60	0.00	6.67	0.00	7.67	0.00	4.50	0.00
General partnership	6.03	1.91	5.46	1.80	5.87	2.10	5.05	2.06
Joint-stock company	9.20	0.00	8.67	0.00	9.33	0.00	8.00	0.00
Other	3.65	1.65	3.42	1.79	3.67	2.04	2.75	1.15

I- Average value

II- Standard deviation

Source: The authors' own compilation.

As far as the customer perspective is concerned, which measures benefits from use of information technologies depending on legal form of enterprises, the assessments were most varied in the case of general and private partnerships and self-employed individuals. These evaluations amounted to 1.91, 1.86, and 1.86, respectively. In respect of the finance perspective, determining effects of information technologies, maximum diversity was noted for general partnerships, other, unspecified firms, and self-employed individuals: 1.80, 1.79, and 1.71, respectively. In the case of the development perspective, the evaluations varied the most for other, unspecified enterprises (2.04), general partnerships (2.10), and self-employed individuals (1.93). With regard to the perspective of internal processes, variability was maximum for general partnerships and reached 2.06, followed by self-employed individuals (1.90), and private partnerships (1.69).

The minimum variability of responses for all the perspectives, i.e. of customer, finance, development, and internal processes, namely, 0.00, applied to limited partnerships and joint-stock companies.

It was then tested if the discrimination described above can be generalised to the SME population of Radom subregion. Since the discriminant variable had more than two codes, Kruskal–Wallis test was employed.

Two hypotheses were postulated:

H0: Distribution of information technologies' impact on the particular perspectives (customer, finance, development, internal processes) is identical for the variable category of enterprise legal form.

H1: Distribution of information technologies' impact on the particular perspectives (customer, finance, development, internal processes) is not identical for the variable category of enterprise legal form.

The test results for impact of information technologies on enterprise competitiveness with regard to legal form are contained in Table 3.

Tab. 3: Results of Kruskal-Wallis test for impact of information technologies on enterprise competitiveness by legal form

No.	Zero hypothesis	Test	Significance	Decision
1	Distribution of information technologies' impact on the customer perspective is identical for the variable category of enterprise legal form	Kruskal-Wallis test	0.000	Reject the zero hypothesis
2	Distribution of information technologies' impact on the financial perspective is identical for the variable category of enterprise legal form		0.000	Reject the zero hypothesis
3	Distribution of information technologies' impact on the development perspective is identical for the variable category of enterprise legal form		0.000	Reject the zero hypothesis
4	Distribution of information technologies' impact on the perspective of internal processes is identical for the variable category of enterprise legal form		0.000	Reject the zero hypothesis

Source: The authors' own compilation.

According to the conditions set for all the perspectives, the zero hypothesis should be rejected, since the boundary probabilities are lower than the level of significance accepted ($\alpha=0.05$). Thus, all the discriminations found are statistically significant. The discrimination for all the four perspectives can be generalised to SMEs of Radom subregion, therefore. This means legal form of enterprises discriminates effects of IT systems implemented on competitiveness.

Conclusion

Economic application of IT systems is a major factor in streamlining enterprise operations. A range of applications of diverse properties are created to this end. A number, which essentially realise models of enterprise operation, are used in the contemporary economy. Growing economic importance of small and medium-sized enterprises is fostering high demand for supporting their management processes with functional IT systems.

Enterprises that have implemented IT systems regard these actions as sources of their competitive advantage. The survey of 213 small and medium-sized enterprise in the subregion of Radom affirms a dependence between implementation of IT systems and enterprise

competitiveness. The results suggest joint-stock companies rated this dependence the highest. Average values of the four perspectives regarding impact of information technologies on enterprise competitiveness range $\langle 8.00; 9.33 \rangle$ for these businesses. Variability of responses for all the perspectives (i.e. customer, development, internal processes, and finances) was minimum, that is, 0.00, in the case of limited partnerships.

The analysis of effects of IT systems on enterprise competitiveness as dependent on their legal form by means of Kruskal-Wallis test concluded the boundary probabilities for each zero hypothesis are lower than the assumed level of significance ($\alpha=0.05$). This means legal form of an enterprise discriminates impact of IT systems implemented on competitiveness. The results corroborate the research hypothesis posited.

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