

# Competitiveness based on IT for Small and Medium Enterprises

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**Abstract.** *This paper examines the achievement of competitiveness based on IT for small and medium enterprises. For this purpose we defined the thematic concept of external environment - strategic management - evaluation. The following strategies were determined: strategic positioning, resource based model, dynamic capabilities and innovation. They were analyzed with respect to the environment, strategic direction and restrictions. IT capabilities and innovation appeared as important IT factors in achieving competitiveness. Methods of evaluation can be conducted on the basis of Critical success factors and Balanced Scorecard.*

**Keywords.** IT, competitiveness, SME, factors, evaluation

## 1 Introduction

Small and Medium Enterprises (SME) apply IT operations in order to achieve better business results, profitability, productivity and competitiveness.

Based on the Croatian Accounting Act [22], enterprises are classified as small, medium and large ones. The SME group comprises all firms with the following two indicators: the number of employees is less than 250, total assets of 130,000,000.00 kuna and 260,000,000.00 kuna income. According to the data of the Croatian Chamber of Commerce [20] in 2008 it is evident that the SME is an important business factor in Croatia.

At the level of enterprises, competitiveness denotes their ability of consistent and profitable

delivering products or services that customers are willing to buy in respect to those of competitors [16], and at the national level, it is the ability of a country to achieve faster economic growth than other countries, to increase welfare by changing the economic structure and to adjust to the movement of international trade [30].

Under the term IT in this paper we understand information technology, information systems and digital communication.

The reasons for introducing and applying IT in SME can be seen in: improving response time to customer [19], [26] increasing productivity [19], improving time cycles and reducing costs [35], [26] creating value [52] and increasing competitiveness [1], [28], [19]. At the national level, countries with their strategies [23], [21] and recommendations [33] focus SME to the application of IT in order to achieve competitiveness.

The introduction and application of IT in SME can be problematic, the problems stem from difficulties in financing and maintaining IT [12], the cost, lack of skills of the owner or manager, lack of resources [19], higher levels of uncertainty and risk [42].

The aim of this paper is to identify the elements and factors that influence the achievement of competitiveness of SME and to establish evaluation procedures.

The paper is structured as follows. The second chapter offers the definition of the framework. The third chapter is related to the analysis of: competitive environment, strategic management,

strategy and factors. The fourth chapter is related to the evaluation and indicators of competitiveness. Finally, the conclusion and possibilities for further research are given.

## 2 Research framework

The first decade of the 2000s can be viewed in the context of developing Internet, services and the accessibility of IT to any company. This period is characterized by the approach in which the possession of IT technology alone is no longer sufficient to achieve competitiveness [49], [9], [5] or it alone is not sufficient [34]. Competitiveness can be achieved through connecting with customers and suppliers [24], [42]; through production differentiation [24], [49]; through strategic management and IT strategic planning [10], [49], [27].

Webb and Schlemmer [53] and Levy and Powell [29] suggest achieving competitiveness through strategic management. Flodström [15] explains the role of strategic management through activities of identifying the competitive environment, identifying and developing competitive strategies, identifying competitive factors, managing changes and strategic alignment.

The importance of environment in achieving competitiveness based on IT is indicated in articles [3], [47], [15], [49]. For the purpose of this paper we defined the thematic concept shown in the figure Nr. 1.

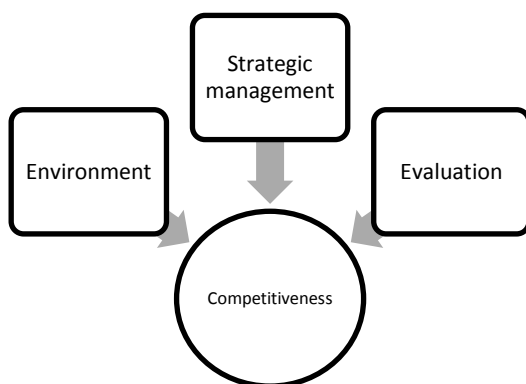


Figure 1: Thematic concept

This thematic concept was chosen because previous research has shown that competitive environment and strategic management are important elements for achieving competitiveness. The element of evaluation was

added so that SME could determine whether their goals are being achieved.

## 3 Analysis

### 3.1 Competitive environment

Factors that create an environment for companies in achieving competitive advantage according to Vrček et al. [49] are empowered customers, lower barriers to entry to the market, rapid technological development, extreme capacity of production, deregulation and globalization. Wagner and Hollenbeck [50] name 5 environmental factors that influence the enterprise: changes (static or dynamic) that influence work and work activities, complexity, uncertainty arising from lack of information-related activities, sensitivity refers to the degree to which a company can monitor the achievement of set goals and diversity, which indicates the number of different areas where the company operates.

The importance of time in which changes happen is emphasized in [15], and it creates a dynamic factor for the strategy.

SME have very little impact on the environment in which they operate [32].

### 3.2. Strategic management

Strategic management is associated with the highest level within a company and suggests ways of planning business. The traditional approach to strategic management by Beccera [4] can be linked to defining relationships between the company's internal resources and external conditions. If there is a match, it can lead to consistent strategies whose potential allows competitive advantage. Strategy refers to an adaptive response to the external environment, and critical changes happen with it.

This approach can be supplemented with the approach by Levy and Powell [29] who talk about a dynamic connection between strategies, where insights from the environment lead to recognizing the competitive changes and also the needs for checking the business strategy and business processes or changes in all strategies.

Dodgson et al. [11] discuss the importance of strategic management and assume that for its realization it is essential to involve all stakeholders in the process of understanding and defining the distinctive competences of companies. They see the goal in defining

company activities that have a clear identification and purpose. Strategy is explained through determining to what extent the company is ready to take the risk of investing.

Research articles in this area argue that SME have a different approach to the strategic management. The diversity results from uncertainty and risk present on the market. Strategy is linked with short time periods [29] and according to [8] it can be described as an informal, inexplicit, intuitive and incremental, orientated more operatively than strategically. Kyobe [27] states in his article that SME have little probability for developing IT strategy because they have limited resources, weak planning and lack of expertise.

If SME stays on the operative level and plans to achieve competitiveness based on IT, then there is a problem with time periods. Operative decisions are usually connected with time periods from a few days till a few months, which is insufficient time for obtaining any effects from IT and achieving competitiveness.

### 3.2.1 Competitive strategies

Research in this area shows that the following strategies are used by enterprises in order to achieve competitiveness: strategic positioning, resource based model, dynamic capabilities and innovation. We analyzed these strategies with respect to the impact from the environment, focus on strategic directions and restrictions related to the implementation of the strategy.

Table 1. Results of strategy analysis

	Area	Results
Strategic positioning	Environment	Industrial perspective [43]
	Strategic directions	Lowering costs and diversification [43]; Resources support the existing strategy
	Restrictions	Diversification leads to increased expenditure for IT [46]; Standardisation or mass production is necessary [37]; Globalized market [38]
Theory of resources	Environment	Environment is not taken into consideration[48]
	Strategic directions	IT is viewed as a group of resources; Heterogeneity and immovability of resources [43]; Resources must be valuable, rare (unique), difficult to imitate and

Dynamic capabilities		irreplaceable
	Restrictions	IT cannot fulfill all requests connected to resources [34]
	Environment	Dynamism follows from change sin environment [51]
Dynamic capabilities	Strategic directions	Internal processes and routines, and capabilities are knowledge and skills [51]; capabilities come from learning mechanisms, experience and knowledge articulation [17]; Business processes [47]
	Restrictions	This approach has obstacles if processes are fragmented and autonomous. Their standardisation and consistency are necessary [31]
Innovations	Environment	Strategic integration with buyers and suppliers [11]
	Strategic direction	There are three types of innovations: basic innovations, developing innovations, innovations of system and innovations of services [36]; resources and capabilities (internal competitiveness) and product innovations (external competitiveness) [7]; There are three types of innovations based on IT [7]: based on function of IT, at the level of user or group and at the organizational level; factors that influence the application of the innovation strategy [11]: <ul style="list-style-type: none"> <li>- accumulated technological competences</li> <li>- external orientation</li> <li>- organisational specialization</li> <li>- strategic cohesion</li> <li>- managing skills</li> </ul>
	Restrictions	Economic factors (expenses); process of accepting innovation depends on technical characteristics and social factors [11]; innovation based on products is easy to imitate [7]

If SME want to achieve a sustainable competitive advantage, then that advantage must result from the applying several strategies, with

the focus on internal capabilities (knowledge, skills), business processes and innovations. Innovations based on products enable achieving competitive advantage, and innovations based on services can provide a sustainable competitive advantage.

### 3.3 IT as a factor of competitiveness

In order to identify opportunities to use IT as a factor in competitiveness, according to [25] it is necessary to see how information intensive is the enterprise. High level of information in activities increases the probability that the company will identify an opportunity to use IT for competitive advantage. Walter [52] speaks of competitiveness based on the "information rich strategy", which focuses on the acquisition, distribution and use of information. We can conclude that IT becomes a competitive factor at that moment when it gives value to the activities of enterprises.

Competitive factors can be identified using Porter's Five Forces Model or Value Chain. The importance of the Value Chain as a tool for identification of competitiveness can be seen in articles [41], [43], [40], [11], [14].

Flodström [15] states that these methods have a drawback when competitiveness is realized on the basis of IT. Shortcomings in the Five Forces Model are in the orientation of the method (to the industry), identification of suppliers and competitors. Deficiencies in the Value Chain are seen in the problem of identifying activities and selecting competitive factors because of globalization that has increased the level of complexity, reduced time of selecting factors of competitiveness due to rapid changes and difficulties in separating products from services.

According to the research by Dehning and Stratopoulos [9], manager IT skills, technical IT skills and IT infrastructure are important for achieving competitiveness, but technical IT skills and IT infrastructure no longer provide a longer competitive advantage. Chan and Chao [6] conducted research of SME in relation to knowledge management. They took knowledge management as a means of competition. Knowledge is described as a strategic factor, which has a value, and competitors imitate it with difficulty. The research found that SME, due to limited financial resources, are inadequate level of funding the management of IT knowledge. According to them, in order for SME to manage knowledge effectively, they must

coordinate and develop infrastructure and processing capabilities systematically.

## 4 Indicators of competitiveness

Indicators related to competitiveness based on IT can be divided into two main groups. The first group would be linked to indicators at the enterprise level in order to evaluate the contribution of IT competitiveness, and the second group would be linked to indicators at the national or global level, such as the Global Competitiveness Index and the Network Readiness index, where IT is one of the elements that contribute to the achievement of competitiveness.

Enterprises continuously evaluate the success of their business. At the enterprise level, according to Depperi and Cerrato [10], indicators of competitiveness are linked to *financial or market indicators* (profits, costs, productivity, market share), *innovation and quality*, and *social* (ethical attitudes, social responsibility, working conditions of employees). According to Garelli [16], competitiveness cannot be expressed only on the basis of profit or productivity.

The evaluation of IT is complex because it includes the evaluation of various causes and effects, as well as different perspectives of evaluation. The evaluation gives qualitative and quantitative meaning of value and is implemented in order to justify the funds invested [29]. Bannister et al. [2] argue the following: if IT does not provide a competitive advantage, and becomes only the infrastructure (cost), then the need for its evaluation is disputable. The first attempt related to linking IT with business goals and strategies, according to Shimiz et al. [45], starts in the 70-s of the last century with Rockart and Critical Success Factor. A more systematic approach for measuring the activities and their compliance with the strategy is the Balanced Scorecard (BSC).

John F. Rockart [44, p.111] defines the critical success factors (CSF) as a "*limited number of areas in which results, if they are satisfactory, will ensure successful competitive characteristics of the organization. Those are a few key areas where "things must go right" for business growth.*"

Peffer et al. [39] state that there is no unique methodology and procedure for the determination of CSF. They point to the

importance of internal factors of the enterprise as well as defining different "information richines". They define critical success chain (CSC) for the purpose of linking IT attributes to the CSF with specific enterprise objectives.

Kaplan and Norton suggested the BSC method in order to evaluate the development of large enterprises with regard to the 4 different perspectives: financial perspective, internal process perspective, customer perspective, learning and growth perspective (innovation). According to [18] Kaplan and Norton's idea was to complement the traditional financial indicators (eg ROI) with the operational measures (indicators) that relate to customer satisfaction, internal processes and ability to innovate. These three measures will ensure the future financial results and will be the driving force of the organization towards strategic objectives and holding all four perspectives in balance.

Fernandes et al. [13] ask a crucial question in their paper: Can BSC be implemented in manufacturing SME as a structured method with limited resources of management? They did a research based on a case studies of SME. The result of the research is that SME can apply the BSC, and the authors emphasize the importance of defining the key performance indicator. As a negativity they state high demands in introducing the method in SME.

## 5 Conclusion

Competitiveness of SME has a double meaning: the first is related to achieving or maintaining competitiveness for the purpose of further business process, while the second refers to the contribution in achieving the national competitiveness.

The external environment and strategic management are important elements for achieving competitiveness based on IT. SME have a small impact on the external environment and are strategically more oriented to shorter periods of time.

The analysis of research articles showed that the following strategies can be used by SME to achieve competitiveness: strategic positioning, the theory of resources, dynamic capabilities and innovations. To achieve sustainable competitive advantage it is not enough to use just one strategy but several must be used along with a focus on internal capacity (knowledge, skills), business processes and innovations.

SME can look for the source of competitiveness based on IT as long as they are information intensive. The Value Chain and Competitive Factors Framework can be used for the analysis of IT as a competitive factor.

Indicators of competitiveness can be viewed on the enterprise level and the national (global) level. On the enterprise level, evaluating the competitiveness can be viewed with financial or market indicators, innovation, quality. Indicators that can be related to IT, refer to Critical success factors and the Balanced Scorecard.

Further research in this area should be concentrated to developing IT capabilities and procedures of their evaluation for the purpose of achieving competitiveness.

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