Managerial Economics
2015, vol. 16, no. 2, pp. 137–148
http://dx.doi.org/10.7494/manage.2015.16.2.137

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Assessing the relationship between business strategy and knowledge acquisition in Polish Manufacturing Enterprises

1. Introduction

Companies that have achieved a certain level of knowledge growth are able to capitalize on the knowledge to improve their results (Tiwana, 2002). Enterprises can obtain their competitive advantages by acquiring useful knowledge. The knowledge acquisition process can take place both in the context of the internal relationships of the firms and of the external relationships with customers, suppliers, and competitors. Dyer and Singh (1998) suggested that external knowledge acquisition becomes critical for firms, and Nonaka (1994) formulated that this is important in value creation for firms. Moreover, Yli-Renko et al. (2001) stated, that external knowledge acquisition provides opportunities for creating new knowledge in firms.

Due to the opinion that knowledge is a key strategic resource, enterprises strive to develop a maximum amount of knowledge in order to improve the success of their business strategy implementation (Drucker, 1993; Bhatt et al., 2005).

This study adapted the concept of knowledge management to analyze which external knowledge acquired in a manufacturing company could contribute most to the achievement of the set strategic goals. Generally speaking, knowledge can be classified either as tacit or explicit knowledge, and information technology (IT) is essentially regarded as a natural medium for managing knowledge (Borghoff and Pareschi, 1997; Lev, 2009). External knowledge acquisition refers to the degree of obtaining both external explicit knowledge (such as work reports and

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official documents from business partners) and external tacit knowledge (such as experiences, ideas, and expertise from the employees of business partners).

Tacit knowledge is not easily codified or articulated (Nonaka, 1994), and explicit knowledge is easily expressed and communicated in the form of written documents (Nonaka and Takeuchi, 1995). Tacit knowledge is more indistinct stickier than explicit knowledge (Von Hippel, 1994). Moreover, Reychav and Weisberg (2009) suggested that explicit and tacit knowledge have different economic values.

The proposed research model (which was based on data gathered from 119 Polish manufacturing companies) can enable management staff to analyze the progress of strategy realization over time as the effects of the types of knowledge that is acquired in a company. In this study, the effect of knowledge acquisition in a manufacturing company is investigated via simulation of a model using the Group Method of Data Handling.

This paper provides an empirical analysis of the roles of the types of knowledge acquisition for the implementation of business strategies. The aim of this paper is to empirically test these theoretical arguments in a common empirical setting. The analysis in the paper shows that some kind of knowledge acquisition seems to play a superior role in the implementation of business strategies. The rest of the paper is organized as follows: Section 2 presents a theoretical background of the study; Section 3 presents the dataset and methodology followed in the empirical analysis; Section 4 presents the main findings of the paper; Section 5 summarizes and concludes.

2. Theoretical background

According to Karlsson and Johansson (2006), knowledge is classified as scientific knowledge, technological knowledge, and entrepreneurial knowledge. I argue with Edvinsson (1997) and Lee et al. (2005) that non-financial measures (such as customers) have become increasingly important for company development. Cotora (2007) suggest that it needs to identify the relationships and conversion processes among knowledge and situations, competencies, and partnerships in the companies and their business partners for improving the success of business strategy implementation. Leonard-Barton (1995) stated that a company's growth is possible by absorbing knowledge from another enterprises. Firms must absorb and transform external knowledge into their own knowledge according to employee experiences, values, and cultures (Cockburn and Henderson, 1998). I argue with Su et al. (2006) that external knowledge can be defined as knowledge about business partners, including product, customer, supplier, industry, operations, and competitor knowledge.

It is interesting to explore the role of external knowledge in manufacturing companies. Firms are capable of acquiring relevant knowledge, both tacit and explicit. Spender suggests that tacit knowledge is referred to as unarticulated, implicit, uncodifiable, or procedural knowledge (Spender, 1994). Explicit knowledge is the specific knowledge that can be formalized, recorded, or codified. This type of knowledge tends to be found in books, manuals, files, or databases. Explicit knowledge is generally viewed as knowledge that has been made explicit via a documentation process. I argue with Chin et al. (2011) that tacit knowledge typically contributes more value to the organization when compared to explicit knowledge, but I try to formulate how external knowledge acquisition (both tacit and explicit) improves the implementation of a business strategy.

The major contribution of this study is that it proposes the exploitation of the potentially useful acquisition of external knowledge that can efficiently provide users the necessary support in the process of business strategy implementation in a manufacturing company.

I adopted the acquisition of measuring knowledge of the organization from Maula et al. (2003). I suggest the following types of external knowledge in the company:

External explicit knowledge about:

– shareholder's finance (F),
– shareholder's IT (IT),
– shareholder's technical resources and infrastructure (TRI),
– shareholder's human resources (HR).

External tacit knowledge about:

– shareholder's core competencies (CC),
– shareholder's products and services (PS),
– shareholder's technology (T),
– shareholder's market share (MS),
– shareholder's customers (C),
– shareholder's development strategy (DS).

An effective implementation of business strategies should integrate a company's structure, human resources and company policy (Bolman and Deal, 2003). The implementation of a strategic process is defined as complete when the expected results in companies have been at least 70% achieved after a period time of five years after adopting a document that details a strategic plan.

As presented in Figure 1, the research model posits (from the preceding argument) that both tacit and explicit external knowledge acquisition in Polish

manufacturing enterprises will have an influence on the implementation of business strategies.

The aim of this study is to explore the impact of defined types of the knowledge that is acquired upon the implementation of business strategies in Polish manufacturing enterprises.

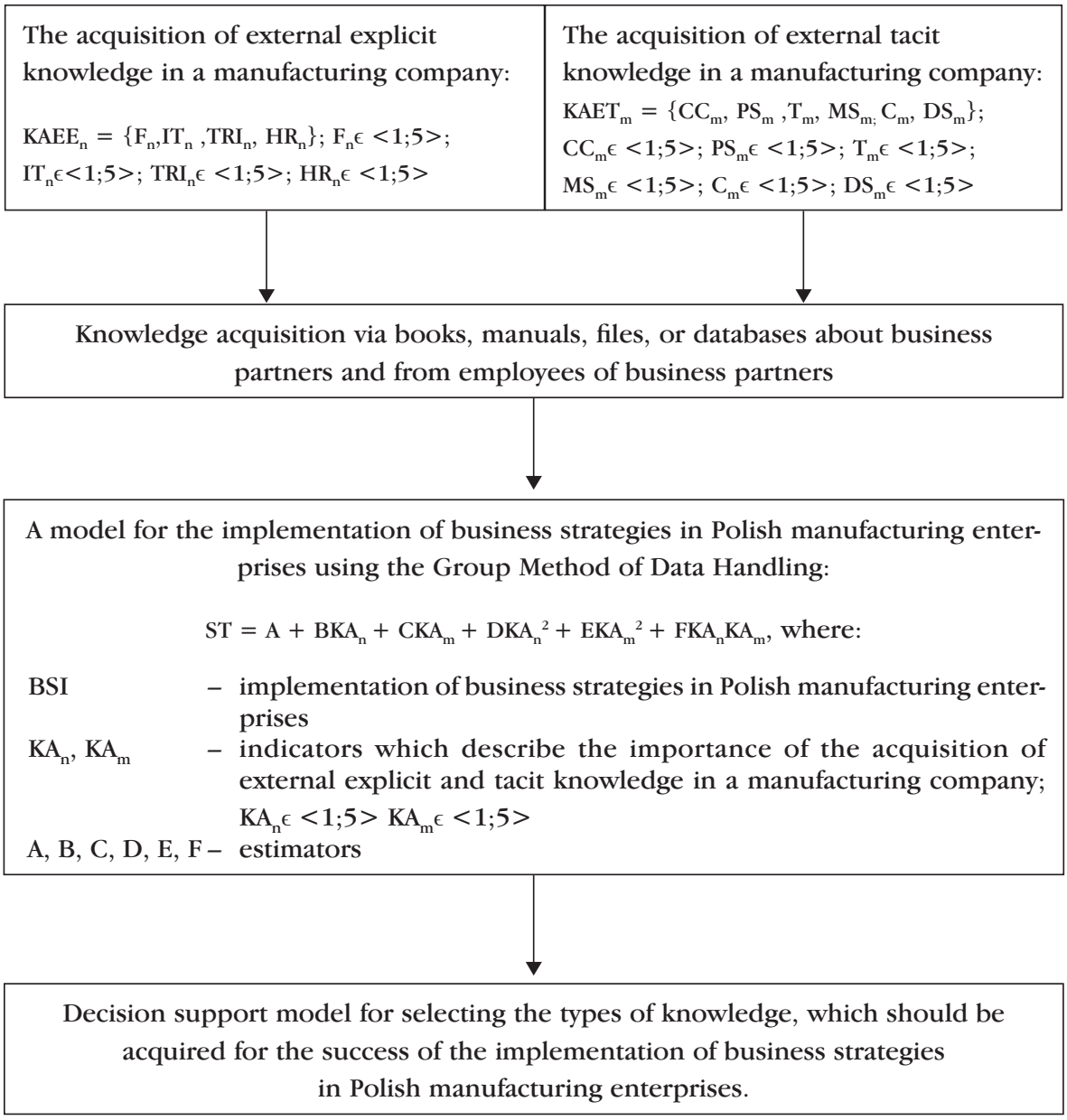

Figure 1. A research model

3. Research model

In order to facilitate the Group Method of Data Handling of the defined model, the process of the implementation of strategies (ST) is represented by a set of indicators, noted as:

$$ST = \begin{bmatrix} ST_1 \\ ST_2 \\ \dots \\ ST_n \end{bmatrix}, \text{ where } n \in N$$

In this definition, ST_i is the i-th ST, and also included in the matrix are indicators that describe the process of the implementation of strategies in each of the 119 Polish manufacturing companies examined in this study.

Each ST_i is associated with indicators that describe the types of external knowledge acquisition. A matrix KA is provided to show the relationship between external knowledge acquisition in a manufacturing company and the outcome of realized business strategies.

Therefore, external explicit and tacit knowledge acquisition in a manufacturing company provides a set of indicators, noted as:

$$KA = \begin{bmatrix} F_1 & IT_1 & TRI_1 & HR_1 & CC_1 & PS_1 & T_1 & MS_1 & C_1 & DS_1 \\ F_2 & IT_2 & TRI_2 & HR_2 & CC_2 & PS_2 & T_2 & MS_2 & C_2 & DS_2 \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ F_n & IT_n & TRI_n & HR_n & CC_n & PS_n & T_n & MS_n & C_n & DS_n \end{bmatrix}$$

where n, m $\in$ N and

F – shareholder's finance;
IT – shareholder's IT;
TRI – shareholder's technical resources and infrastructure;
HR – shareholder's human resources;
CC – shareholder's core competencies,
PS – shareholder's products and services,
T – shareholder's technology;
MS – shareholder's market share;
C – shareholder's customers;
DS – shareholder's development strategy.

In this definition, F_i, IT_i ,TRI_i, HR_i ,CC_i, PS_i ,T_i, MS_i, C_i, and DS_i are the i-th KA, and they are indicators that describe the importance of knowledge acquisition in each of the 119 Polish manufacturing companies.

A model for selecting the types of knowledge that should be acquired for the success of the implementation of business strategies in Polish manufacturing enterprises was built using the Group Method of Data Handling. The multilevel GMDH allows for an optimized synthesis of a mathematical model for a given class of regression functions, and it can be used in both evaluating criteria and quality assessment (Farlow, 1984), (Patalas-Maliszewska, 2013). Both elements of the algorithm are arbitrarily defined by the author. In this study, the elements are defined as:

– the importance of the types of knowledge that should be acquired for the success of the implementation of business strategies in each of the 119 Polish manufacturing companies involved in the study;
– a statement of the completion of the process of implementing a strategy.

4. Decision support model for the implementation of business strategies in Polish manufacturing enterprises using the Group Method of Data Handling

Before the survey was carried out, the respondents were asked if they were able to describe and state if the process of the implementation of a strategy is complete or not. The level of completion of the process of implementing a business strategy was described as the expected results from the realization of a business strategy in a company has been at least 70% achieved after a period of time of five years from the adoption of the strategy (1 point – if you agree / 0 points if you do not agree).

When employees who collaborate with each other within a manufacturing company and its business partners receive useful external knowledge, they feel more motivated to realize a business strategy. The factors relating to the importance of acquiring external tacit knowledge in a manufacturing company were based on feedback surveys and their sources are listed here:

An importance of acquiring external tacit knowledge: The degree of contact between employees by which one employee can help to transform the knowledge and skills of another (Lin, 2007) and may facilitate the realization of a business strategy:

– KAET-factor1: I receive know-how gained from working with colleagues from my business partners infrequently;
– KAET-factor2: I receive know-how gained from working with colleagues from my business partners rarely frequently;

– KAET-factor3: I receive know-how gained from working with colleagues from my business partners marginally frequently;
– KAET-factor4: I receive know-how gained from working with colleagues from my business partners frequently;
– KAET-factor5: I receive know-how gained from working with colleagues from my business partners quite frequently.

The importance of acquiring external explicit knowledge: the degree, that knowledge about business partners is easily expressed and communicated in the form of written documents (Nonaka and Takeuchi, 1995) and may facilitate the realization of a business strategy:

– KAEE-factor1: I receive knowledge in the form of written documents from working with colleagues from my business partners infrequently.
– KAEE-factor2: I receive knowledge in the form of written documents from working with colleagues from my business partners rarely frequently.
– KAEE-factor3: I receive knowledge in the form of written documents from working with colleagues from my business partners marginally frequently.
– KAEE-factor4: I receive knowledge in the form of written documents from working with colleagues from my business partners frequently.
– KAEE-factor5: I receive knowledge in the form of written documents from working with colleagues from my business partners quite frequently.

The data for this study was collected from 119 Polish manufacturing companies between January and September of 2014 (see Table 1).

Table 1

Profile of companies and respondents

	Items	**Frequency (N = 119)**
Manufacturing companies	industry	88 (74%)
	construction	16 (13%)
	others	15 (13%)
Department of the company in which the respondent works	management	95 (80%)
	sales and marketing	24 (20%)

This study presents the possibility of defining a decision support model for selecting the types of knowledge that should be acquired for the success of implementing business strategies in Polish manufacturing enterprises. Finding a forecast value for the statement of completing the process of implementing

a strategy (as expressed by the defined types of external knowledge acquisition) is part of the decision-making model.

The data was received from 119 Polish manufacturing companies, and the variations of the GMDH algorithms (Fig. 2) (Farlow, 1984) were investigated in the author's Consulting IT computer software system (Patalas-Maliszewska, 2013).

Figure 2. GMDH usage in the Consulting IT computer software system
Source: Own elaboration

As a result, the best-possible polynomial was obtained (the algorithm evolution process was completed on the second iteration): a decision-support model for selecting the types of knowledge that should be acquired for the success of implementing business strategies in Polish manufacturing enterprises:

$$ST = 25.95 - 48.20PS - 9.04T + 31.74PS^2 + 2.87T^2 + 0.39PS \times T$$

where:

ST – the statement of completing the process of implementing a strategy;
PS – the importance of the type of knowledge: external tacit knowledge about shareholder products and services that should be acquired for the success of implementing business strategies in each of the 119 Polish manufacturing companies involved in the study;
T – the importance of the type of knowledge: external tacit knowledge about shareholder technology that should be acquired for the success of implementing business strategies in each of the 119 Polish manufacturing companies involved in the study.

The results of this study validate the existence of a direct effect on the implementation of business strategies in Polish manufacturing enterprises in the context of the acquisition of external tacit knowledge about business partners, especially knowledge about shareholder products, services, and technology.

The results show that the acquisition of external tacit knowledge about partners has an influence on the completion of processing the implementation of a strategy. However, it is very interesting to note that if a worker within a Polish manufacturing company transfers knowledge about his/her products, services, and technology, this facilitates the completion of the process of implementing a strategy in the manufacturing company.

So, by using the proposed ST model, it is possible to forecast the completion of the process of implementing a strategy in a manufacturing company (as presented in Figure 3).

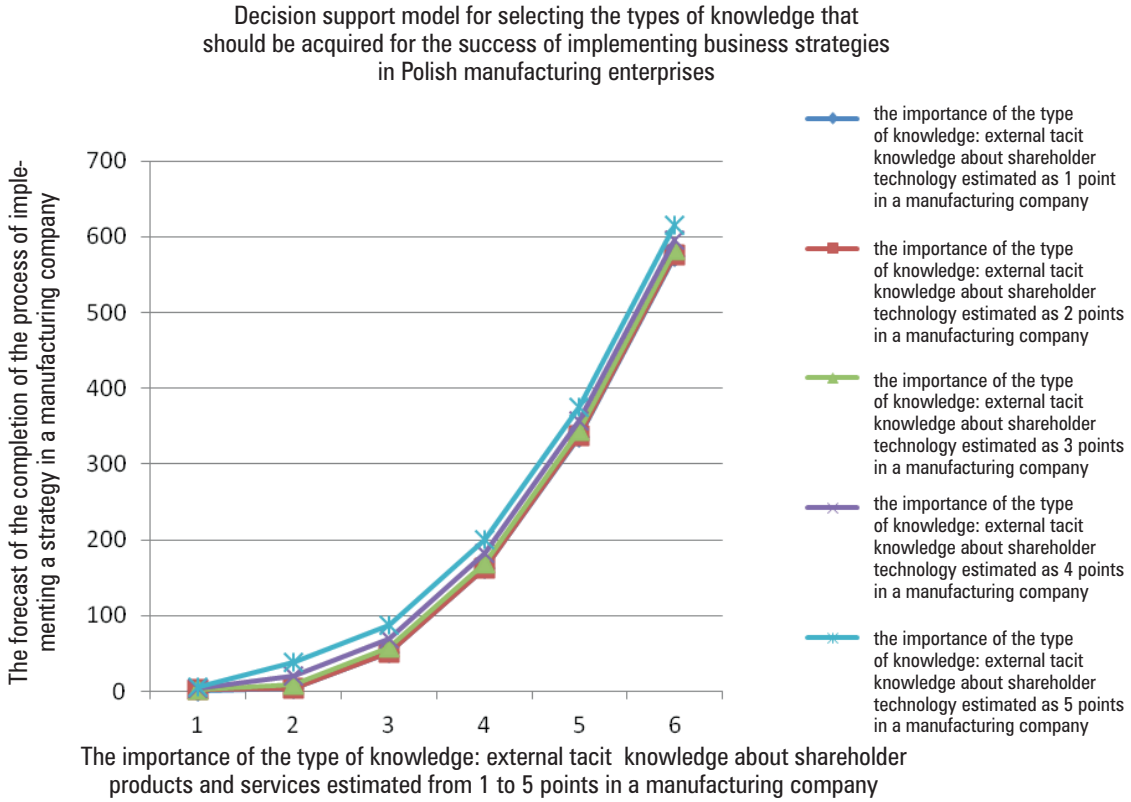

Figure 3. Decision support model for the implementation of business strategies in Polish manufacturing enterprises using the Group Method of Data Handling

Thus, in this manufacturing company, is it possible to assess the significance of acquiring tacit external knowledge by defining a five-point scale. According to the formulated model, the estimated values of completing the process of implementing a strategy in a manufacturing company are:

– 3.71 if the importance of the type of knowledge: external tacit knowledge about shareholder products and services (which should be acquired is assessed by 1 point) and the importance of the type of knowledge: external tacit knowledge about shareholder technology (which should be acquired by 1 point);
– 3.67 if the importance of the type of knowledge: external tacit knowledge about shareholder products and services (which should be acquired is assessed by 1 point) and the importance of the type of knowledge: external tacit knowledge about shareholder technology (which should be acquired by 2 points);
– 9.37 if the importance of the type of knowledge: external tacit knowledge about shareholder products and services (which should be acquired is assessed by 1 point) and the importance of the type of knowledge: external tacit knowledge about shareholder technology (which should be acquired by 3 points);
– 20.81 if the importance of the type of knowledge: external tacit knowledge about shareholder products and services (which should be acquired is assessed by 1 point) and the importance of the type of knowledge: external tacit knowledge about shareholder technology (which should be acquired by 4 points);
– 37.99 if the importance of the type of knowledge: external tacit knowledge about shareholder products and services (which should be acquired is assessed by 1 point) and the importance of the type of knowledge: external tacit knowledge about shareholder technology (which should be acquired by 5 points).

Consequently, if both types of knowledge that should be acquired: external tacit knowledge about shareholder products and services as well as external tacit knowledge about shareholder technology are equally important by 5 points, then the value of the outcome of a realized business strategy is defined as 614.75. So, the highest values of the outcome of a realized business strategy in a manufacturing company can be achieved if the importance of the acquisition external tacit knowledge is very high (5 points).

So, it is clearly noted that the acquisition of tacit external knowledge has a positive impact on the achievement of strategic objectives. On the other hand, if the importance of external tacit knowledge acquisition in a manufacturing company is higher, then the chance of completing the process of implementing a strategy in a manufacturing company is higher as well.

This study was motivated by the actual needs of managers of Polish manufacturing companies who have a strong desire to implement a business strategy.

A theoretical model was developed and tested; however, it was evident that external tacit knowledge acquisition can play a critical role in completing the implementation of business strategies.

5. Conclusions

The results of this study demonstrate the positive effect of the acquisition of external tacit knowledge in a manufacturing company on the achievement of a strategy. The results were based on research data gathered from 119 Polish manufacturing companies. I believe that the results point out the obvious; namely, in most cases, the acquisition of external tacit knowledge about a partner's products, services, and technology can improve the process of implementing business strategies in firms that cooperate with each other. This study suggests that the acquisition of external tacit knowledge in a manufacturing company may be an effective way to achieve strategic results. However, it is hoped that the findings will be valuable for future research on the subject of knowledge acquisition of manufacturing companies.

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