

Strategic Knowledge Bases in the Context of Discovering and Creating Business Opportunities

Aleksandra Sus¹ and Edmund Pawlowski²

¹General Tadeusz Kosciuszko Military University of Land Forces, Wroclaw, Poland

²Faculty of Engineering Management, Poznan University of Technology, Poznan, Poland

aleksandra.sus@awl.edu.pl

edmund.pawlowski@put.poznan.pl

Abstract: Due to the level of interdisciplinarity and complexity, knowledge management processes in organizations need to be considered from different points of view. The key area of interest of the article is systemic processes of creating knowledge bases that take into account strategic events in organizations in the form of market opportunities. Thus, the article's main purpose is to create two models of knowledge bases, the structure and types of which are directly related to the processes of opportunity management: their discovery and creation. For the main objective thus formulated, the researchers defined the following research questions: 1) What are the information needs for creating a strategic knowledge base model in the opportunity discovery process? 2) what is the information needed for creating a strategic knowledge base model in the opportunity creation process? 3) What are the benefits and utilitarian goals for the organization from the creation of strategic knowledge bases in the context of discovering and creating business opportunities?. The detailed objectives derive from analyzing the organization's interior models and environment. The methodology used in the article is a critical review of the literature, the method of deduction in the area of generating assumptions for discovery processes and creating opportunities in the context of creating knowledge models. The results will enable extracting the cognitive knowledge of strategic knowledge bases in the context of the organization's opportunities. Furthermore, this will result in research models detailing the organization's strategic activities in opportunities and knowledge management processes, along with the specification of the potential benefits of the processes carried out (utilitarian purpose). The research results will expand the understanding of the utilitarian nature of knowledge management processes and strategic theory.

Keywords: Knowledge management, Knowledge base, Opportunity, Opportunity discovery, Opportunity creation, Opportunity management

1. Introduction

Opportunity is a situation arising from the acquisition and processing of incomplete information (uncertainty), with its emergence generated by both external factors and those located inside the company. Opportunities can and are exploited by entrepreneurs, managers, and decision-makers, resulting from these individuals' perception and ability to perceive and discover, but also intentional actions triggering these market situations. An Opportunity can be understood "as the relationship that occurs between events and situations taking place in the business environment and the objectives or intended effects as well as available resources, which consists in the fact that events and situations favor the achievement of goals and effects using available resources" (Trzcielinski, 2019). The process of exploiting opportunities takes the form of active strategic action (Hunter, 2013), The process of exploiting opportunities takes the form of active strategic action (Hunter, 2013), and its objectives are clear and simple: to increase the company's value (Eisenhardt, Martin, 2000). The effects of correctly identifying and exploiting opportunities are usually an increase in the profitability and applicability of the novelty—in the form of a product, service, or technology. An important effect of these is also the increasing attractiveness of the products—in the form of both moral and formal recognition of the new product, service, or technology by society (Baron, 2004).

S. Cyfert and K. Krzakiewicz (2013) evaluated the process of identifying and exploiting opportunities in terms of unfavorable trends in the formulation of strategic objectives that disrupt planning processes. A contrasting perspective stands out in the research of R. Krupski (2007), whose aim was to determine to what extent opportunity determines the development directions of Polish companies. It turns out that 54% of the companies surveyed have developed based on some coincidence (opportunities), and what is interesting is their surprising variety. These range from entering new, previously unknown markets, to the unplanned purchase of new resources, including means of production, such as premises, plots of land, or buildings, as well as diversification of existing activities and increasing the flexibility of the enterprise. Thus, given the positive effects of both taking advantage of emerging opportunities and creating them—the question is whether it is possible to build a knowledge base that would allow opportunities to be treated as a natural and immanent part of the static planning process. This requires a change not only in how decision-makers think but also in how they act. How do you put into a plan something that is not there today?

The article consists of three main parts. The first presents the elements of the strategic model of the knowledge base—providing information on where to both search for and create opportunities. The second – is the models of needs arising from the inside and outside of the organization, answering the question: what are the benefits of monitoring these two elements for the organization if opportunities are discovered or created in them? The third one presents the process of searching for strategic knowledge bases for discovering and creating opportunities.

2. Strategic Knowledge Base Model

Opportunities are future states that may be desirable and feasible for the organization, and their exploitation depends on many individual factors—they, therefore, have a relativistic context (Stevenson, Jarillo, 1990). Consequently, the process of identifying an opportunity is a function of the individual capabilities inherent in enterprise employees: knowledge of the market, technology, or customer needs (Krupski, 2013). The main aspect of the perception of certain phenomena through the lens of opportunity is the priority in identifying them and taking action faster than other market players. Opportunities are, therefore, closely related to the moment of time and period (Krupski, 2007). The inability to capture opportunities in a company's plan indicates its unpredictable nature. Equally difficult to grasp are the periods and lengths of their occurrence. Those opportunities originating from the porter (closer) environment have a much shorter time of market presence, appear abruptly, and last a short time due to their competitive nature.

In contrast, opportunities originating from the Porter environment last longer but have larger and more widespread (Krupski, 2013). The interior of the organization is also an important source of opportunity. The following sections of the study present both opportunities originating from the environment and interior of the organization.

2.1 Knowledge of the Environment as a Source of Opportunity

The environment of modern businesses is dynamic and uncertain. Uncertainty, in turn, translates into the quality of information available to enterprises, which simultaneously reduces their ability to estimate the present and future states of the environment. In addition, the inability to predict future states of the environment generates indeterminacy (ambiguity) in the decision-making process (there is a lack of adequate knowledge about identifying and exploiting opportunities). However, the available research conducted in the subject area under review indicates a positive relationship between the dynamics of the environment and the creation of new ventures based on opportunities (Aldrich, 2000). J. Child defined the complexity of the environment by the heterogeneity and range of activities of companies (1972, in Dess, Beard, 1984), which means that as the heterogeneity of the environment increases, the level of perceived uncertainty will be greater, consequently increasing the need for information and other types of resources. In a dynamic environment, companies will use relationships to gain access to required resources through cooperative arrangements of interaction, such as alliances or co-opetition.

Opportunities arising from external sources should be identified with the elements of the environment and the relationships between them. Although, as the analysis of such sources shows, the greatest opportunities for opportunities exist in the case of competitive behavior. Table 1 shows strategies for exploiting opportunities in the context of individual market forces in the arrangement of active and passive approaches to opportunities.

Table 1: Examples of Active and Passive Strategies for Seizing Opportunities From the Company's Point of View

Part of environment	Examples of active strategies for seizing opportunities	Examples of passive strategies for seizing opportunities
Competition in the industry	differentiating the product using marketing that is unusual for the industry, such as lateral marketing, creation of new channels and ways of distribution (e.g., through a network of partners that is established for the needs of the market entity), introduction of sales of complementary products and/or services (so-called cross-selling)—investment in the development	mistakes of competitors, including “black” P.R. of competitors, use of new, unusual distribution channels, withdrawal from the market of a competitor, reduction of fixed costs by competitors (consequently, reduction of the intensity of competition),

Part of environment	Examples of active strategies for seizing opportunities	Examples of passive strategies for seizing opportunities
	of convergent products, the intentional creation of new co-opetition arrangements;	entry into an existing co-opetition arrangement;
Threat of substitute products	use of alternative and complementary products and/or services as a source of knowledge (the study of substitutes is recommended as one of the paths for the development of a blue ocean strategy), use of new technologies to eliminate from the market a product and/or service that meets the same customer needs;	withdrawal of a substitute product and/or service from the market, taking advantage of deficiencies in the functionality of the substitute product, customer habituation to the substitute product (product obsolescence) and customers' search for other goods and services;
Power of suppliers	cooperative arrangements with suppliers of other services and/or products, but which, in conjunction with a specific service and/or product, form an integral whole, the establishment of a network of technological and commercial partnerships between suppliers, involving backward and forward integration;	low degree of concentration of suppliers in relation to customers, low cost of switching suppliers, low opportunities for horizontal integration, i.e., the supplier's inability to undertake production and/or service provision is an opportunity for the company to enter existing supplier networks;
Power of customers	cooperative arrangements with other customers for products/services, including the initiation of such arrangements by the company, detailed identification of customer needs and provision of tailor-made products/services to customers, opportunities related to increasing the relevance of products and/or services to customer profits;	a high degree of concentration of customers relative to suppliers, a high degree of concentration of companies providing substitute products and/or services, but few suppliers of the desired product and/or service;
Potential of new entrants into the industry	minimizing the likelihood of new business entry through deliberate changes in the law (lobbying), deliberate differentiation of product offerings, as an action to create high barriers to entry, granting patents, utility models, licenses for use of products/services, again: the creation of new channels and means of distribution (e.g., through a network of partners that is created for the needs of a market entity);	"top-down" change in existing laws over which the entrepreneur has no influence, unification and minimization of product offerings of competitors as a result of economic changes (e.g. crisis, fashion, and spread of the idea of simple life among consumers, etc.), invalidation and/or expiration of patents of competing entities, including design decisions and applicable licenses, low capital requirements for launching a new business, lack of market dominance of strong brands;

According to Table 1, opportunities found in the competitive environment of businesses relate to both existing barriers to entry into the sector and forces that act on market players. Detailed identification of these elements allows the entrepreneur to specify potential opportunities. A precondition is to be aware of environmental phenomena and exploit them ahead of the competition, which can significantly affect the enterprise. This impact can be both positive and negative—representing significant sources of opportunities and threats for the company. The methods of analyzing the near and far environment and the event scenarios created on this basis are insufficient to get a complete picture of the spectrum of opportunities. This is primarily because none of the anticipated changes will occur with 100% probability—especially in view of the

multiplicity and diversity of sources of opportunities, including those coming from companies. Nevertheless, this does not exempt entrepreneurs from analyzing signals from the environment, especially the weak ones.

2.2 Knowledge of the Company's Potential

Opportunities emerging inside companies are identified with the category of innovation in Schumpeterian terms—as discoveries of new materials (Schumpeter, 1934 [in:] Shane, Venkataraman, 2000) or market changes in products (Venkataraman, [in:] Katz, 1997) – otherwise as Drucker's changes (Drucker, 1985). The last approach presents opportunities as a) the creation of new information due to the emergence of new technologies, b) the exploitation of market inefficiencies resulting from information asymmetry, and c) responses to changes in the relative costs and benefits of using alternative uses for resources. Opportunities represent a source of internal changes in companies (Allaire, Firsirotu, 2000) and assume the form of innovation activity. M. Hunter suggested a matrix that illustrates four different types of opportunities depending on (a) the charge of innovation and (b) the degree of ambiguity. The author distinguished four basic types of opportunities: allocative, constructive, imitative, and exploratory.

The most basic type of enterprise activity, triggered by the need to adapt to environmental changes, is imitation. It is associated with a low level of innovation and creativity, taking the form of imitating existing solutions. Imitation does not lead to a significant increase in efficiency but is nevertheless associated with a lower risk of implementation. An example of imitation opportunities is expanding existing solutions and duplicating them in other markets.

Allocative opportunities, on the other hand, arise due to a mismatch between demand and supply, the existence of scarce resources in certain areas, or demographic changes that require specific products or services to fill an unexpectedly created gap in customer needs. Viewing opportunities through the lens of supply and demand represents classical economic theory. It is also, to some extent, identical to the resource dependence theory, which emphasizes that there are scarce and valuable resources in the environment that determine the survival of an enterprise. The struggle for resources essentially adopts two objectives. One is to gain control of resources in order to become independent of other market players. The other is to control those resources that increase the dependence of other players on their own resources (Stańczyk-Hugiet, 2013). Allocative opportunities result from a company's response to the needs of its customers, which is why intensive monitoring of the environment is so important. The level of innovation in resource-related opportunities is higher than that of imitative opportunities. However, it is still a passive-reactive form of them (Hunter, 2013) (reflected in the system: stimulus-response, without active participation in their formation).

Discovery opportunities are related to opportunities to gain a competitive advantage by identifying gaps in the market. The sources of these opportunities are new technologies, social conditions, changes in political and legal conditions, and the economic situation. Thus, they are derivative attributes of the environment, regardless of the actions taken by the enterprise. An entrepreneur who knows the specifics of the industry in which his company is embedded combines old and new knowledge in the process of identifying opportunities. This is why in-depth knowledge of the industry in which the company operates is essential. Without this knowledge, the entrepreneur's anticipation of opportunities becomes impossible (Casson, 1982; Shane, 2001). M. Hunter emphasizes the significant role of inductive thinking in the process of opportunity capture, although rational, analytical, and intuitive thinking is also vital in this case (2013).

The sources of constructive opportunities should be sought in the emergent process of certain events emerging from the environment (Chell, 2000; Kruger, 2000; Ardichvili, Cardozo, Ray, 2003), which, through the experience of managers, will be referred to as "opportunities," arising through a process of "trial and error." However, this is a relatively expensive method, which is due to the need to support it with various additional heuristic methods, based on which cognitive maps are created, covering a wide variety of options for action (March, Simon, 1958; Cyert, March, 1963; Mintzberg, Waters, 1985). Knowledge of upcoming opportunities is generated in the process of building on existing information rather than acquiring information and knowledge by new means (Choi, 1993), especially since solutions to complex problems are unique combinations or syntheses of existing knowledge (Nickerson, Zenger, 2004; Henderson. Clark, 1990). The full knowledge resulting from the consequences of seizing an opportunity will therefore be known only after the entire process and may differ significantly from the planned results. The dichotomous effects of the opportunity creation process can thus be both positive and negative, with the opportunity proving to be an opportunity or a threat.

A comparison of the identified forms of opportunity by selected criteria is presented in Table 2.

Table 2: The Comparison of the Forms of Opportunity Exploitation by Selected Criteria

Criteria for comparison	Imitative	Allocative	Discovery	Constructive
Opportunity definition	The ability to undertake a previously known activity in an area defined geographically or by customers.	Opportunities to gain market space through demand-supply mismatches and demographic changes, as a result of using resources to cover these mismatches.	Opportunities to gain an advantage by identifying gaps in the market through new technologies, social conditions, political and legal conditions, and the economic situation.	Opportunities for the emergence (creation) of new phenomena through new means that did not exist before.
Focus of interest	Operational goals and objectives.	Existing market spaces and development of existing strategies (e.g., product sales growth).	Potential market spaces and development of exploitative strategies (e.g., new product development).	The emergence of strategies through environmental monitoring and feedback.
Identification method	Opportunities arise from the ability to replicate the behavior of other market players.	As a result of the deduction.	Through inductive actions.	Constructed through intuition and abduction, based on trial and error, and experiments.
Entrepreneur's assumptions	The selected business models will operate in specific market spaces.	Belief in information and data.	The belief that the market exists due to industry inadequacy and/or structural change.	A wide continuum of entrepreneurial assumptions, but usually with a strong set of values.
Uncertainty	Managed by imitation—what works in other companies will also work in our company.	Managed by product diversification.	Managed as a result of network control, adequate resources, and rare experiments.	Managed as a result of making changes using different, cognitive styles and experiments.
Targeted outcomes	Business operations with sustainable returns.	Success within targeted markets.	Creating new market spaces, differentiating from competitors, and preventing failures.	Profitable new products, services, and business models that are different from competitors and cover new market spaces.

Imitation operations should not be categorized as opportunities since they arise from activities previously known to entrepreneurs. It seems that M. Hunter has misused the term, taking value away from opportunities and claiming that even minor imitative activities can be treated in terms of opportunities. Additionally, given the considerations of H.H. Stevenson and J.C. Jarillo in the context of pioneering the perception and exploitation of opportunities, M. Hunter's concept should be brought into question.

Allocative and exploratory opportunities are typical entrepreneurial opportunities, especially in view of the classic theories of R. Cantillon, A. Smith, or J.B. Say, linking entrepreneurial activities to the functioning of industrial markets. Today, they are concerned with reproductive or imitative innovation rather than pioneering innovation (Fischer, 2011). This classification may be considered to be too radical—however, the idea here is not to draw specific boundaries between the concepts under consideration but rather to outline them in general and to set the direction for further consideration. Such an approach is justified, especially in the context of integrating strategic and entrepreneurial perceptions of organizational reality (McGrath, MacMillan, 2000; Meyer, Heppard, 2000). S. Vantakamaram and S. Shane clearly emphasized that the disconnected study of entrepreneurship and the elements influencing the company (according to

Schumpeter's view), which are the "igniters" of change, results in an incomplete perception of the business landscape (Shane, Venkataraman 2000).

3. Searching Strategic Knowledge Bases for Discovering and Creating Opportunities

Opportunities are a conjunction of chances, company potential, and business goals. Opportunities appear in the environment and are active over a certain period regardless of whether and which companies take advantage of them. Resources with the right potential (qualitative and quantitative structure) are needed to take advantage of an opportunity. Evaluation of opportunities and potential is done from the point of view of the company's business goals.

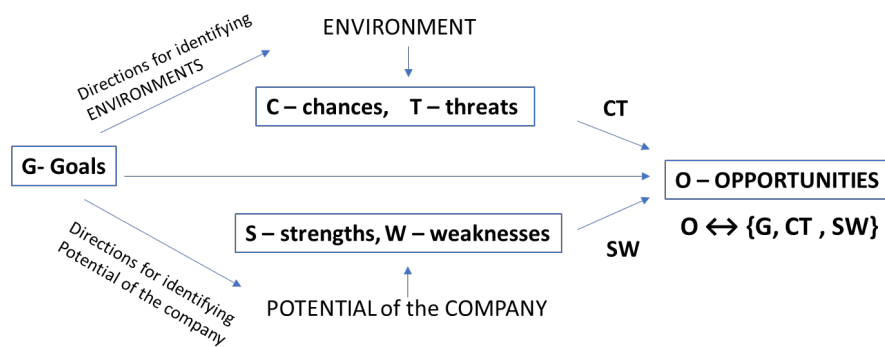


Figure 1: Opportunity Model Interpretation

Chances and threats in the environment can be overt or covert. Overt opportunities and threats are identifiable directly from publicly available or confidential legal, financial, social, marketing, technical, and technological documents, etc.

Examples of such chances could be government agricultural subsidy programs, tax exemptions, customs exemptions, new patents and licenses, news of the bankruptcy of a leading manufacturer in the industry, etc.

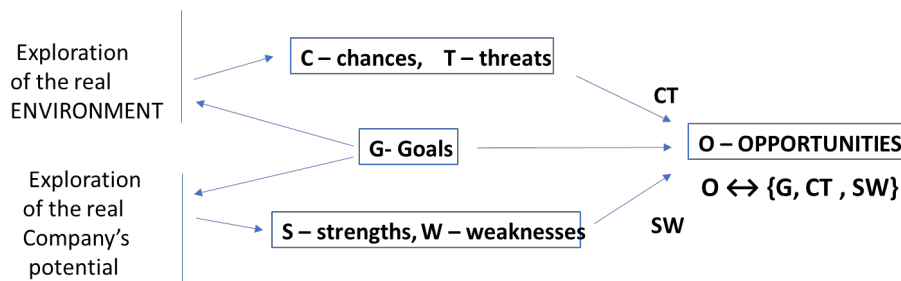


Figure 2: Opportunity Discovery Model

Chances and threats that are covert require specific methods of environmental analysis. This is an area of application of computer simulations and artificial intelligence. This is an area of application of computer simulations and artificial intelligence. These could be predictive analytics methods using Big Data analytics, for example, or Machine Learning. Examples of such opportunities include: potentially new market segments, new product features previously unknown, new substitutes, collapses, or increases in demand.

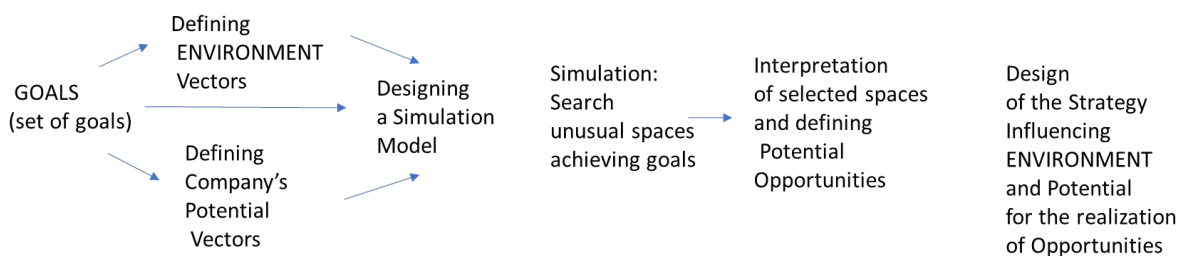


Figure 3: Opportunity Creation Model

There are two possible paths to identifying opportunities:

- Relationship: Objectives—Opportunities; looking for opportunities in the environment from the point of view of defined business objectives
- Relationship: Opportunities—Business Objectives; identifying existing opportunities in the environment and defining business objectives to take advantage of them

Opportunities can be discovered but also created. Discovering an opportunity is finding a way to achieve a goal by aligning a company's potential to take advantage of a chance existing in the environment. For example, the company's potential may be sufficient to take advantage of the chance, or it may need adjustments, such as increased staffing, marketing changes, and capital investment. On the other hand, opportunity creation is finding possibilities to achieve a goal by forcing changes in the environment for business exploitation of the company's potential, e.g., lobbying strategies, mergers and acquisitions, and pricing strategies.

Databases and knowledge bases are needed to identify chances and threats, as well as the strengths and weaknesses of the company. Databases, adequately structured and interpreted, form knowledge bases.

Strategic knowledge bases should include basic information about the environment and information about the company's potential. The information structure of the databases has to allow them to be updated, unambiguously interpreted, and purposefully searched. The knowledge bases of the environment (Table 3, Table 4) are structured according to typical models of macro-environment and micro-environment strategic analyses. Data selection from the point of view of its usefulness for business goals, trend analysis, and evaluation of the data leads to the identification of chances and threats in the environment. Such a model of the environmental knowledge base has been positively verified in searching for opportunities and constructing a business strategy for IAE—Intelligent Autonomous Environment (Kruszynski, Pawlowski, 2020).

Table 3: The Structure of Microenvironment Knowledge Base

Factor of Microenvironment	Relevance for the Company (1 – valid, 0–invalid)	Trend	Trend's Appraisal (Positive, Negative)	Chances	Threats
1 Competitive rivalry in IAE sector					
1.1. Number and variety of competitors	1	↓	positive	✓	
1.2. Industry growth rate	1	↓	negative		✓
1.3. Share of fixed costs in total costs	1	↗	negative		✓
1.4. Degree of product differentiation	1	↗	positive	✓	
1.5. Cost of changing supplier	1	↗	negative		✓
1.6. Exit barriers	1	↓	positive	✓	
2 The bargaining power of customers in IAE sector					
3 The bargaining power of suppliers in IAE sector					
4 The treats of new entrants into the IAE sector					
5 The threat of substitute products or services					

Table 4: The Structure of the Macroenvironment Knowledge Base

Factor of Macroenvironment	Relevance for the Company (1 – valid, 0–invalid)	Trend	Trend's Appraisal (Positive, Negative)	Chances	Threats
1. Economic					
1.1. GNP trends	1	↗	positive	✓	

1.2. Interest rates	1		positive	v	
1.3. Inflation	1		negative		v
1.4. Unemployment	1		positive	v	
1.5. Disposable income	1		positive	v	
2. Political and Legal					
3. Social and Demographic					
4. Technological					

Knowledge bases of a company's strategic potential have a different strategic perspective and, thus, a different internal structure (Table 5). Two hard (assets and liabilities) and two soft factors (human resources and internal knowledge) are at play here. The level of the company's economic potential is informed by—Assets (level of intangible, tangible, and financial assets), and Liabilities (structure of own and external liabilities). The introduction of soft factors into the knowledge base was the result of empirical research determining their importance ascribed by company boards in the process of building strategic advantage and flexibility of the company's management system (Pawlowski K., and Pawlowski E., 2017; Pawlowski E., 2021). Strategic knowledge is built by the relationship of levels: own resources to the level of resources achievable in the sector. Assessing these levels is the premise for identifying the company's strengths and weaknesses.

Table 5: The Structure of the Company's Potential Knowledge Base

The factor of the Company's Potential	Scale – set to the business Golas and market level	Company level	Level assesment (Positive, Negative)	Strengths v	Weaknesses v
1 Assets					
1.1. Investment Capital	1.5 mln EUR		positive	v	
1.2. Liquidity (Quick ratio)	1,0		positive	v	
1.3. Total asset turnover	1,0		negative	v	
1.4. Return on asset	10		positive	v	
2 Liabilities					
3 Human resources					
4 Knowledge, methods, and techniques of management					

4. In Conclusion

Business opportunity theory is evolving in many aspects and covers the definition of the term, its determinants (independent variables), and the context of these determinants' impact on the business (dependent variables). Opportunities are a unique conjunction of chances, company potential, and the company's strategic business goals. Such a strategic view of opportunities requires analyses of the company's environment and potential, and knowledge of existing and potential sources of opportunity is needed. We routinely look to these sources in the traditional structure of macro-environment and micro-environment factors.

With reference to the micro-environment, examples of strategies for exploiting opportunities in the context of particular market forces are presented. These strategies can take an active or passive approach to exploit opportunities and, as a result, create more or less effective strategies for exploiting opportunities. Adapting a company's potential to emerging opportunities and exploiting opportunities manifests itself in various forms of company innovation. The simplest way is to imitate and improve existing solutions in existing or new markets.

Allocative opportunities arise due to demand-supply imbalances and require activities leading to a resource advantage over competitors. Sources of discovery opportunities are emerging gaps in the market. Product and technological innovations, but also environmental, social, political, and legal innovations, may be important for their use. Constructive opportunities are the area of opportunity creation. Based on the analysis of existing databases and knowledge, computer simulations and artificial intelligence algorithms can be implemented to search for previously unknown trends, combinations of events, and their new interpretation as opportunities. For discovering and creating opportunities, data and knowledge about both existing and postulated reality are needed. The knowledge bases of environments are based on traditional

strategic models of macro-environment and micro-environment analysis. To evaluate the data, criteria were put in place to assess trends and their importance to the company's business goals and identify opportunities and threats. The strategic knowledge base model of the company's potential introduces an analysis of hard factors (tangible and financial resources) and soft factors (people and knowledge resources) and an assessment of these resources from a competitive perspective. The structures of the strategic knowledge bases proposed here were partially verified earlier in research on the development of the Intelligent Autonomous Environment. This research continues, mainly in the use of artificial intelligence algorithms in the process of discovering and creating opportunities.

References

- Aldrich H.E., *Organizations Evolving*, Sage Publications, London 2000, pp 176-188.
- Allaire Y., Firsirotu M.E., *Myślenie strategiczne / Strategic thinking*, Wydawnictwo Naukowe PWN, Warszawa 2000, pp 24-25.
- Ardichvili A., Cardozo R., Ray S., *A theory of entrepreneurial opportunity identification and development*, Journal of Business Venturing, 18, 2003, pp 105-123
- Baron R.A., *Opportunity recognition: A cognitive perspective*, Academy of Management Best Conference Paper, 2004, p A1.
- Chell E., *Towards researching the opportunistic entrepreneur: A social construction approach and research agenda*, European Journal of Work and Organizational Psychology, 9(1), 2000, pp 63-80;
- Choi Y.B., *Paradigms and Conventions: Uncertainty, Decision Making and Entrepreneurship*, University of Michigan Press, Ann Arbor, MI, 1993.
- Cyfert S., Krzakiewicz K., *System planowania strategicznego w polskich przedsiębiorstwach – wyniki badań*, [w:] Krupski R. (ed.), *Rodzaje okazji w teorii i w praktyce zarządzania*, Prace Naukowe Wałbrzyskiej Wyższej Szkoły Zarządzania i Przedsiębiorczości, t. 21, Wałbrzych 2013, p 14.
- Cyert R.M., March J.G., *A Behavioral Theory of the Firm*, Prentice-Hall, New Jersey 1963.
- Drucker P.F., *Innovation and Entrepreneurship*, Harper & Row, New York 1985.
- Eisenhardt K.M., Martin J.A., *Dynamic capabilities: What are they?*, Strategic Management Journal, 21, 2000.
- Fischer A., *Recognizing opportunities: initiating service innovation in PSFs*, Journal of Knowledge Management, Vol. 15, No. 6, 2011, p 916.
- Henderson R.M., Clark K.B., *Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms*, Administration Science Quarterly, 35, 1990, pp 9-30.
- Hunter M., *A typology of entrepreneurial opportunity*, Economics, Management, and Financial Markets, Vol. 8(2), 2013, p. 129.
- Kruger N., *The cognitive infrastructure of opportunity emergence*, Entrepreneurship, Theory & Practice, 24(3), 2000, pp 5-23.
- Krupski R. (ed.), *Rodzaje okazji w teorii i w praktyce zarządzania*, Prace Naukowe Wałbrzyskiej Wyższej Szkoły Zarządzania i Przedsiębiorczości, t. 21, Wałbrzych 2013.
- Krupski R., *Elementy koncepcji zarządzania okazją w organizacji*, Prace Naukowe. Akademia Ekonomiczna w Katowicach, 2007, pp 95-106.
- Kruszynski, M. and Pawlowski, E. (2020) Management of intelligent autonomous environment in a context of competitive forces. The case of Polish market in: *Advances in Manufacturing, Production Management and Process Control: Proceedings of the AHFE 2020 Virtual Conferences on Human Aspects of Advanced Manufacturing, Advanced Production Management and Process Control, and Additive Manufacturing, Modelling Systems, and 3D Prototyping*, July 16–20, 2020, USA / Eds. Mrugalska, B. et al, Switzerland: Springer, 2020, pp 33-40.
- March J.G., Simon H.A., *Organizations*, John Wiley & Sons, New York 1958.
- McGrath R.G., MacMillan I.C., *The Entrepreneurial Mindset*, MA Harvard Business School Press, Boston 2000.
- Meyer G.D., Heppard K.A., *Entrepreneurial strategies: The dominant logic of entrepreneurship*, [w:] G.D. Meyer, K.A. Heppard (eds.), *Entrepreneurship as Strategy: Competing on the Entrepreneurial Edge*, Sage Publications, Thousand Oaks 2000, pp 1-22.
- Mintzberg H., Waters J.A., *Of Strategies, Deliberate and Emergent*, Strategic Management Journal, 6(3), 1985.
- Nickerson J.A., Zenger T.R., *A knowledge-based theory of the firm – the problem-solving perspective*, Organizational Science, Vol. 15, No. 6, 2004, p 618.
- Pawlowski, E. (2021) Management System of Intelligent, Autonomous Environment (IAEMS). The Reference Model [in:] *Advances in Manufacturing, Production Management, and Process Control. Proceedings of the AHFE 2021 Virtual Conferences on Human Aspects of Advanced Manufacturing, Advanced Production Management and Process Control, and Additive Manufacturing, Modeling Systems, and 3D Prototyping*, July 25-29, 2021, USA / Eds. Trzcieliński, S. et al. Switzerland : Springer, 2021, pp 345-352
- Pawlowski, K. and Pawlowski, E. (2017) Complementarity of modern management methods and tools, and its impact on economic and organizational performance of enterprises: Empirical results from Polish enterprises In: *Advances in ergonomics of manufacturing: managing the enterprise of the future: proceedings of the AHFE 2017 International Conference on Human Aspects of Advanced Manufacturing*, July 17-21, 2017, The Westin Bonaventure Hotel, Los Angeles, California, USA. Trzcieliński, S. (Eds.): Springer, 2018, p 213-221.
- Schumpeter J.A., *Capitalism, Socialism, and Democracy*, Harper & Row, New York 1934.

- Shane S., Venkataraman S., The promise of entrepreneurship as a field of research, *The Academy of Management Review*, Vol. 25, No. 1, 2000, p 220.
- Shane S., *Technology opportunities and new firm creation*, *Management Science*, 47(2), 2001.
- Stańczyk-Hugiet E., *Dynamika strategiczna w ujęciu ewolucyjnym*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2013, p 17.
- Stevenson H.H., Jarillo J.C., *A Paradigm of entrepreneurship: Entrepreneurial management*, *Strategic Management Journal*, Vol. 11, Special Issue: Corporate Entrepreneurship, 1990, p 23.
- Trzcielinski, S. (2019) Prior Knowledge and Opportunity Recognition, Springer International Publishing AG, part of Springer Nature 2019 in: Karwowski et al. (Eds.): AHFE 2018, AISC 793, pp 191–200.
- Venkataraman S., *The distinctive domain of entrepreneurship research: An editor's perspective*, [in:] J. Katz, R. Brockhaus (eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, JAI Press, Vol. 3, Greenwich, CT, 1997, pp.119-138.