

The Concept of an Agile Enterprise Research Model

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Abstract—The aim of this paper is to present the concept of an agile enterprise model and to initiate discussion on the research assumptions of the model presented. The implementation of the research project "The agility of enterprises in the process of adapting to the environment and its changes" began in August 2014 and is planned to last three years. The article has the form of a work-in-progress paper which aims to verify and initiate a debate over the proposed research model. In the literature there are very few publications relating to research into agility; it can be concluded that the most controversial issue in this regard is the method of measuring agility. In previous studies the operationalization of agility was often fragmentary, focusing only on selected areas of agility, for example manufacturing, or analysing only selected sectors. As a result the measures created to date can only be treated as contributory to the development of precise measurement tools. This research project aims to fill a cognitive gap in the literature with regard to the conceptualization and operationalization of an agile company. Thus, the original contribution of the author of this project is the construction of a theoretical model that integrates manufacturing agility (consisting mainly in adaptation to the environment) and strategic agility (based on proactive measures). The author of this research project is primarily interested in the attributes of an agile enterprise which indicate that the company is able to rapidly adapt to changing circumstances and behave pro-actively.

Keywords—Agile company, acuity, entrepreneurship, flexibility, research model, strategic leadership.

I. INTRODUCTION

IN order to continuously achieve good results and be successful companies must skilfully adapt to the competitive environment, search for attractive areas for competition, and build a competitive advantage. This is the purpose of a business strategy. However, the world is constantly changing, so companies oriented towards long-term success must be prepared to reconstruct their strategies [28]. This ability requires agility, which through such features as fast adaptability to the environment as well as the ability to detect opportunities in the environment or create new opportunities by themselves allows companies to intelligently control their strategic course.

Companies which are considered to be agile can be said to possess strategic intelligence. J. Wells [24] distinguishes several levels of "strategic intelligence."

The least intelligent are companies which do not realize the need for change, and even if they see such a need they are unable to implement changes. Intelligent companies respond to changes in the environment and keep up with them. The most intelligent ones, however, change more quickly and are able to shape the environment for their own benefit. When

their environment is not changing sufficiently, intelligent enterprises capture the territory of their less intelligent rivals. Thus, in more turbulent times they will be able to more accurately predict threats, adapt and survive.

Thus, achieving agility by companies has a direct impact on creating a competitive advantage in order to faster and more efficiently meet the demands of the market in a turbulent environment. If a company is capable of quick responses and has the appropriate competences, it can exploit the opportunities which appear in the business environment, thereby attaining a privileged position in relation to its competitors.

The aim of this paper is to present the concept of an agile enterprise model and to initiate discussion on the research assumptions of the model presented. The implementation of the research project "The agility of enterprises in the process of adapting to the environment and its changes" began in August 2014 and is planned to last three years. The article has the form of a work-in-progress paper, which aims to verify and initiate a debate over the proposed research model.

The principal aim of the project is to systematise and expand knowledge regarding the notion of enterprise agility. In order to achieve this, two aims must be achieved: a theoretical and cognitive task and a research task. The main theoretical and cognitive task is to create an agile enterprise model. The author of this research project is primarily interested in the attributes of an agile enterprise which indicate that the company is able to rapidly adapt to changing circumstances and behave pro-actively. The main research task is to determine the extent to which the concept of agility has been implemented in companies operating in Poland.

II. DETERMINANTS OF AGILITY

It is a considerable challenge for modern companies to conduct their business activities in a difficult and unfavourable environment. This is caused by the emergence of a new business era, in which change has become the main and the most significant feature of the business environment. The rate of change is considerably faster than ever before, which poses a significant challenge for companies and, in order to be able to more rapidly, more skilfully and more efficiently meet customer requirements, forces them to improve through enhancing their processes and adjusting their actions to fully exploit market opportunities. Competing in a changeable and unpredictable environment requires organisations which can create value in cooperation with clients, adapt easily to changes, and quickly respond to changing customer needs.

The instability of markets and of the economic situation means that companies operate under the pressure of uncertainty. Thus managers try to be flexible with regard to

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both strategy and operational activity. They strive to acquire the skill of being able to rapidly respond to any opportunities which appear.

The term agile manufacturing (AM) was first introduced in 1991 by the Agile Forum at the Iacocca Institute, Lehigh University, USA. The manufacturing agility paradigm is based on encouraging manufacturing companies to prepare an offering which would satisfy the changing requirements of individual customers. Thus, at the root of the two approaches, mass customization (MC) and agile manufacturing (AM), is the desire to meet the demands and aspirations of individual customers [26].

Manufacturing agility is a new manufacturing model, which is the result of changes in the environment [5]. A. Gunasekaran defines agility as the ability to survive and cope in a competitive environment with unexpected changes, which requires quick and efficient responses to market changes. In order to meet customers' requirements in a constantly changing market, a company must undertake swift actions aimed at maintaining its competitive advantage. Enterprises need to introduce innovation in the manufacturing process as well as information and communication technologies, which require a reorganisation of the company and new marketing strategies [6].

H. Sharifi and Z. Zhang developed four categories of agile abilities [29]:

- *responsiveness* – this is the ability to identify changes, respond rapidly to changes either reactively or proactively; and recover from changes (sensing, perceiving and anticipating changes; immediate reactions to changes; recovering from changes),
- *competency* – this is an extensive list of abilities that provide a company with productivity, efficiency and effectiveness in achieving its aims and goals (strategic vision; appropriate technology or sufficient technological capability; product/service quality; cost-effectiveness; high rate of introducing new products; change management; knowledgeable, competent and empowered people; operational efficiency and effectiveness; internal or external co-operation; integration),
- *flexibility* – the ability to carry out different work and achieve different objectives with the same facilities (product volume flexibility; product model/configuration flexibility; people flexibility),
- *speed* – the ability to carry out tasks and operations in the shortest possible time (quickness in time-to-market of new products; quickness and timeliness in product and service delivery; quickness in operations – short operational lead-times).

Z. Zhang and H. Sharifi [31] conducted a study of manufacturing companies which achieved success while operating in a turbulent environment. Their findings indicated that agility can be achieved through strategic integration and the use of the available managerial and manufacturing methods and tools. The so-called “agile practices” implemented in an enterprise must be fully integrated with the existing practices in order to achieve the expected results.

The origins of the agility paradigm can be traced back to the theory of lean enterprises, which comprises concepts and methods which aim to minimise waste and consequently maximise efficiency as the company uses fewer resources (capital, financial, human, organisational) and less time to achieve the same goal. As Trzcieliński points out, leanness is a precondition for a company's agility [23].

According to [23] the notion of opportunity, which emerges from the theory of opportunities, plays a fundamental role in defining agility. The author defines an agile enterprise as an entity which is capable of seizing opportunities, therefore exploring the nature of an opportunity seems indispensable to a company's successful operations. Trzcieliński presents a typology of opportunities, their life-cycles, risks and values, and in this way designates an area which must be taken into account by the theory discussed. Considering agility from the point of view of the life-cycle of an opportunity, the author formulates the following attributes which make a company agile:

- *perceptiveness* – a company's ability to quickly identify market opportunities and any threats occurring in the environment,
- *flexibility* – a company's ability to assess the suitability of the resources it has and those it needs to obtain from the environment in order to take advantage of favourable situations (the degree of access to potential opportunities is connected with a company's specialisation, i.e. access to resources),
- *intelligence* – a company's ability to evaluate favourable situations, make choices, react to them, as well as effectively developing their own resources or obtaining resources from the environment to make a given opportunity available to the company,
- *shrewdness* – a company's ability to overcome problems connected with taking advantage of opportunities at the operational level, which includes reconfiguring the resources available as well as initiating and modifying the necessary actions and constantly monitoring their implementation.

The changing conditions in which business entities operate mean that contemporary companies face the challenges of creating value in collaboration with customers, being able to adapt to the changes as well as quickly responding to customer needs. A company which possesses such skills can be called agile and is treated as a new business paradigm [23].

The essence of an agile enterprise is its focus on the opportunities that arise precisely because the environment is changeable and unpredictable. Therefore, achieving agility is part of the improvement of an organization in order to more quickly and efficiently meet the demands of a turbulent market environment. Because of its quick response and appropriate competences a company can exploit the opportunities which appear in the business environment, thereby efficiently implementing its statutory goals and objectives.

TABLE I
PREVIOUS RESEARCH IN THE AREA OF ENTERPRISE AGILITY

Author, year, country	Findings
Roberts, Grover 2012, USA [17]	The researchers found that there is a positive correlation between a company's agility and the results of its operations. They also observed that the ability to react quickly to customer needs indirectly affects the relationship between sensitivity to the needs of customers and the company's performance.
PMI's 2012 Pulse of the Profession In-Depth Report: Organizational Agility [32]	Higher organizational agility means better business results, which implies a greater competitive advantage. Appropriately implemented agility benefits companies on a number of levels. In the survey the respondents pointed to the specific benefits of increased organisational agility.
Yang, Liu, 2012, Taiwan [28]	The research focused on improving the performance of a company through its agility and network structure. The findings revealed that agile skills and a network structure are a critical source of competitive strategies in terms of a company's performance. Moreover, a network structure also partially contributes towards the impact of an enterprise's agility on its results.
Ofoegbu, Ayobami Akanbi, 2012, Nigeria [14]	The study indicated the impact of strategic agility on the perceived performance in manufacturing companies.
Oyedijo, 2012, Nigeria [15]	The findings indicated a significant relationship between strategic agility and the competitive efficiency of companies in Nigeria.
Tallon, Pinsonneault, 2012, USA, Canada [22]	The research uncovered a significant positive link between IT alignment and agility, and between agility and company performance. The effect of the alignment on performance is fully mediated by agility, which has a greater impact on company performance in more volatile markets.
Almahamid, Awwad, McAdams, 2010, Jordan [1]	The study examined the role of agile skills and knowledge sharing for maintaining a competitive advantage in manufacturing companies. It found that agile skills exert a significant influence on an organisation's competitive advantage. It also noted that the practice of sharing knowledge has a significant positive impact on organizational competitive advantage. It is necessary to clearly define agile skills and knowledge sharing practices in order to gain a competitive advantage.
Vazques-Bustelo, Avella, Fernandez, 2007, Spain [25]	The study focused on the impact of agility on company performance. The aim of the research was to verify the role of manufacturing agility as a key factor for success in different sectors.

In a changing and unstable environment companies seek new ways of meeting the growing requirements of customers through further enhancing their offering and continuously improving their performance. Today's companies not only have to deal with changing and difficult to predict market conditions along with confronting global competition and permanently changing customer requirements, but they are also required to adapt their corporate structures and processes in such a way as to meet all these challenges.

III. A RESEARCH GAP

In recent years several publications have appeared relating to empirical studies into the impact of agility on creating a competitive advantage and company performance. However, the research does not present a systematic and holistic approach to the concept of agility: it is just a random collection of various scientific investigations, which shows that research in this area is still at a very early stage.

Analyzing the content of the few publications relating to research into business agility, it can be concluded that the basic issue in dispute in this regard is how to measure agility. Scientists working in this field have still not reached a consensus on the best method for measuring agility. In previous studies the operationalization of agility was sometimes haphazard or fragmentary rather than resulting from a substantive analysis of the determinants of an agile enterprise.

Therefore the measures created to date can only be treated as contributory to the development of precise measurement tools.

This research project aims to fill the existing cognitive gap in the literature with regard to the conceptualization and operationalization of an agile enterprise. The available theoretical studies and research findings do not adopt a holistic approach to the concept of agility. The authors typically

focused their attention either on manufacturing agility or on strategic agility, but the literature lacks an approach which would combine both of these perspectives. Thus, the original contribution of the author of this project is the construction of a theoretical model that integrates manufacturing agility (consisting mainly in adaptation to the environment) and strategic agility (based on proactive measures). Another innovative aspect of the research is developing a precise tool for the operationalization of the attributes of an agile enterprise.

IV. RESEARCH ASSUMPTIONS AND THE PRESENTATION OF THE CONCEPT OF THE MODEL

The conceptual model of an agile company, which is depicted in Fig. 1, has three constituent elements. These are:

- *Agility drivers*, which are the motivators and pressures from the business environment that force a company to search for new ways of running its business in order to maintain its competitive advantage, increase its effectiveness, meet customer needs and survive in difficult conditions;
- *Agile attributes*, which are essential capabilities that a company needs in order to positively respond to and take advantage of any changes;
- *Performance indicators*, which are the results of a company's operations with regard to specific areas indicating the level of business agility.

The left-hand side of the model presents agility drivers; that is, the reasons why companies want to attain agility. In the literature, many definitions of agility can be found. Overall, there are four different agility drivers which are the most frequently indicated by the authors of these definitions. These include meeting customer needs, surviving in difficult conditions, competitive advantage, and the desire to increase effectiveness. Most of the definitions are compartmentalised

in nature, meaning that they concentrate on one specific agility driver (Table II). The successive symbols in the table indicate the following drivers: A – Meeting customer needs, B –

Competitive advantage, C – Surviving in difficult conditions, D – Effectiveness.

TABLE II
PREVIOUS RESEARCH IN THE AREA OF ENTERPRISE AGILITY

Definition of agility	References	Agility drivers			
		A	B	C	D
Agility is a capability; it is an organization's capacity to respond rapidly and effectively to unanticipated opportunities and to proactively develop solutions for potential needs. It is the result of an organization and the people who comprise it working together in ways which benefit the individual, the organization, and their customers	Agile Forum AT Iacocca Institute, Lehigh University, USA, 1991 [7]		X		
The agility that arises can be used for competitive advantage, by being able to respond rapidly to changes occurring in the market environment and through the ability to use and exploit a fundamental resource - knowledge. People need to be brought together, in dynamic teams formed around clearly defined market opportunities, so that it becomes possible to lever one another's knowledge. Through this process is sought the transformation of knowledge into new products and services	Kidd, 1995 [8]			X	
The ability to accelerate the activities on a critical path that commences with the identification of a market need and terminates with the delivery of a customized product	Kumar, Motwani, 1995 [10]				X
The ability of enterprise to cope with unexpected changes, to survive unprecedented threats from the business environment and to take advantage of changes as opportunities. Agility means delivering value to customer, being ready for change, valuing human knowledge and skills, and forming virtual partnership	Goldman, Nagel, Preis, 1995 [5]				X
The ability to produce a broad range of low – cost, high quality products with short lead items in varying lot sizes, built to individual customer specification	Vokurka, Fliedner, 1998, [27]	X			X
Agile production is a new production model resulting from changes in the environment which links innovations in production, information technology and communication by fundamental organizational redesigning and new marketing strategies	Gunasekaran, 1998 [6]				X
The ability of an enterprise to respond quickly and successfully to change	McGaughey, 1999 [11]				X
The ability of an organization to thrive in a constantly changing, unpredictable business environment	Rigby, 2000 [16]				X
The ability to cope with unexpected challenges, to survive unprecedented threats of the business environment and to take advantage of changes as opportunities	Zhang, Sharifi, 2000 [29]				X
An organization's capacity to gain competitive advantage by intelligently, rapidly and proactively seizing opportunities and reacting to threats	Meredith, Francis, 2000 [12]		X		
The ability of a firm to respond quickly and flexibly to its environment and to meet the emerging challenges with innovative responses	Bessant, 2001 [3]				X
The ability of a firm to redesign their existing processes rapidly and crate new processes in a timely fashion in order to be able to take advantage of and thrive in unpredictable and highly dynamic market conditions	Sambamurthy, Bharadway, Grover, 2003 [19]		X		
A set of interlinked changes in marketing, production, design and organization	Storey, 2005 [21]				X
The ability to efficiently change operating states in response to uncertain and changing demands placed upon it	Narasimhan, 2006 [13]				X
Agility encompasses the ability to fundamentally reconfigure available options in order to accommodate unforeseen environmental circumstances and subsumes or is supported by flexibility	Bernardes, Hanna, 2009 [2]		X		
The capability of surviving and prospering in a competitive environment of continuous and unpredictable change by reacting quickly and effectively to changing markets, driven by customer-designed products and services. It is not about small-scale continuous improvements, but an entirely different way of doing business	Dahmaradeh, Banihashemi, 2010 [4]	X		X	
The ability to seize emerging opportunities connected with such features of a company as perceptiveness, flexibility, intelligence and shrewdness	Trzecieliński, 2011 [23]		X		
Strategic agility is the ability to continuously and adequately adjust and adapt at an appropriate time the strategic direction of the core business in relation to changing circumstances, as well as displaying sensitivity to the environment.	Ofoegbu, 2012 [14]				X

Source: based on [20]

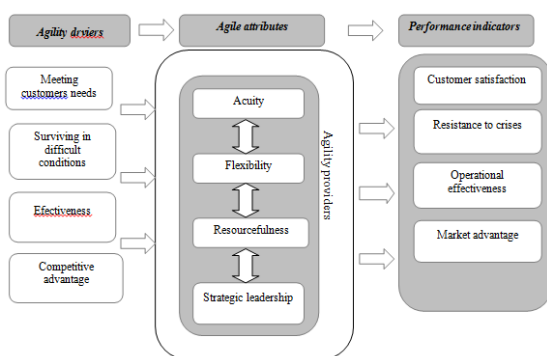


Fig. 1 Conceptualisation of the research model

The middle part of the model presents the attributes of an

agile enterprise. On the basis of the available literature and the author's own thoughts, it was decided that a company ought to have the following competences:

- *Acuity*, involves the ability to quickly observe market opportunities and any threats resulting from the environment as well as being able to classify situations as favourable or unfavourable. This feature is also based on the ability of companies to identify market opportunities through conducting strategic analyses, the use of early warning systems or developing their own effective methods of seeking opportunities in the market environment for their business operations [23]. This also involves the ability of companies to create their own opportunities through innovation and creativity. Another key feature is working with customers in order to explore

and discover opportunities in the environment for the use of market-driven innovation and rapid competitive actions [19]. This involves being able to cooperate with customers in order to achieve market acuity (observing developments in the environment and categorizing them as favourable or unfavourable situations) and identify opportunities for competitive actions. Information technology (e.g. CRM – Customer Relationship Management) enables companies to build and improve a virtual community of customers. Not all opportunities can be used; therefore it is crucial to be able to prioritize market opportunities, bearing in mind the resources and capabilities that a company possesses or is able to “generate from the environment”.

- *Flexibility*, which involves the ability to reconfigure existing resources and the ability to initiate and modify the necessary measures as well as appropriately control their implementation [23]. This ability is related to a company's flexibility and in particular to the so-called flexible manufacturing system. This is a system in which the manufacturing processes of a wide range of products with varying production programmes have been automated in conditions that can be considered similar to mass production, with a lower or similar prime cost and higher productivity [9]. Operational agility enables a company to quickly reconfigure the existing processes and create new processes to take advantage of dynamically changing market conditions. Information technology enables the modularization and integration of business processes as well as their configuration and reconfiguration in order to create new processes. Operational agility enables a company to reduce information asymmetry between buyers and sellers by immediately providing comprehensive information, often through the use of electronic distribution channels [19].
- *Resourcefulness*, which involves the ability to assess the adequacy of resources and to obtain them from the environment. The ability to identify the necessary resources in order to exploit market opportunities involves assessing the adequacy of a company's own resources (development of existing resources) as well as a possible decision to acquire resources from the environment. Through the use of the knowledge and competences of suppliers, distributors, manufacturers and logistics operators in the process of seeking the necessary resources, a company builds strategic networks or virtual strategic partnerships in order to find opportunities for innovation and competitive actions. As regards strategic partnership, the main focus is on the following [32]:
- The creation and use of temporary alliances to give the best value for the customer,
- Flexibility in the ordering process,
- Involvement of suppliers in the product development process.

Strategic leadership, which involves the ability to combine a visionary capacity with operational management; i.e. developing and spreading ideas but also being able to

implement those ideas in the company, taking into account their limitations. In other words, this is an integration of philosophical thought (focusing on the overall vision, intuition, beliefs and values) and the reality (tangible and intangible resource constraints) of a company [18]. Human resource management ought to be based on practices which promote the development of highly skilled, motivated and trusted team workers.

The model also includes agility providers which make it possible to obtain and retain the necessary agile capabilities. Agility providers were first included by [30] in their original model of manufacturing agility. The authors suggested that agility providers ought to be sought in four areas of the manufacturing environment; namely organisation, people, technology, and innovation. The authors' suggestion also involves a full integration of agility providers with the support of information systems. The most common agility providers include Total Quality Management (TQM), Continuous Improvement (CI), Outsourcing (OS), Supply Chain Partnering (SCP), Team-Based Working (TBW), Just in time (JiT), Empowerment (EMP) and Integrated Computer Based Technologies (ICT). The implementation of these practices promotes the agility of enterprises and helps them to faster and more efficiently satisfy the requirements of modern customers.

The right-hand side of the model presents the proposed results of companies' operations in the form of indicators relating to specific corporate areas. The choice of areas for performance analysis was dictated on the one hand by the agility drivers (individual performance areas correspond to the areas of agility drivers), and on the other hand by the critical importance of the selected areas for the efficient operation of an agile enterprise.

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