

Article

Managerial Energy in Sustainable Enterprises: Organizational Wisdom Approach

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Abstract: The circular economy (CE) as an idea involves applying the concept of sustainable development that has been gaining worldwide support. This shift in perception of energy and resource-use from its linear to circular forms creates a specific business environment, which constitutes the subject of this research. This article aims to analyze the impact of a manager's energy on organizational wisdom, focusing on its circular business model activity. In the beginning, the article focuses on presenting ideas of the circular economy, emphasizing the manager's activity in implementing strategic and operational tasks. These activities are identified as energy to launch mechanisms for developing organizational wisdom for sustainable enterprise. Assuming that organizational wisdom consists of two dimensions, organizational learning, and absorptive capacity, the research identifies relationships between them. The study was conducted at VIVE Textile Recycling Ltd., (Kielce, Poland). Empirical data were collected from 138 managers using the PAPI technique. Regression analysis and structural equation modeling (SEM) were applied to test the research hypotheses. *Main results:* Managerial energy (ME) is understood as the active attitude of managers who use knowledge from their environments to achieve goals both in the operational and strategic areas. Being an activating force for sustainable enterprise, ME is viewed as the antecedent to the development of enterprises operating in the CE model. ME directly activates the process of developing organizational wisdom in the area of absorptive capacity (AC) at the stages of assimilation, transformation, and exploitation. The transfer of knowledge from the individual to the organizational level (acquisition) requires a mediator, which is in this case the process of organizational learning (OL).

Keywords: sustainability knowledge; managerial energy; circular economy; sustainable business models; impact assessment



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1. Introduction

Energy is a matter that can be considered not only from a physical but also an economic perspective. Contemporary economic sciences focus on the evaluation of systems and elements of interaction [1,2]. Defining what energy is in this system, is a challenge that will allow the authors to understand better the changes taking place there.

The current model of economic development, based on the so-called linear economy, that can be described with a simple pattern: obtain raw materials—produce a product—use it—get rid of waste [3] is well described in various fields. A new model of the economy, in which the obtained raw materials can be used as long as possible, coupled with multiple uses of its products and where the waste stream will be minimized is being developed before our eyes.

The circular economy (CE) that applies the concept of sustainable development in practice is one of the new trends in economic sciences that is gaining support worldwide. The European Union is particularly active in this area, not limiting itself to adopting specific strategies or resolutions, but also allocates large financial resources to projects and

research in this area. Research results in fields such as water-energy-nutrients synergies in the agrifood sector [4]; municipal solid waste management [3]; the efficiency of circular economies [5]; defining the role of local governments, businesses and citizens in an urban context [6,7]; provide not only knowledge in this area, but also allow for the creation of policies for the development of this concept. From a practical point of view, it is a change in the energy course's perception and the use of resources from a linear system (in a traditional economy) in a circular one, in the concept of a closed economy. As Frosch et al. [8] note, the current and traditional linear extract-produce-use-dump material and energy flow model of the modern economic system is unsustainable. The CE concept is of great interest to both scientists and practitioners as it is seen as an example of the operationalization of the concept of sustainable development [9,10].

To implement management based on sustainable development principles, knowledge and modern technological ideas are necessary [11]. The process of knowledge adaptation and its development hierarchy is known in subject literature as Bloom's Taxonomy [12]. This very popular concept in education interprets phenomena from the perspective of the learning process and knowledge absorption. This concept was used by Bierly et al. [13] to represent levels of learning. They both assumed four levels in the hierarchy of cognition namely, data, information, knowledge, and wisdom. This article compares each element with the Bloom taxonomy concept [12]. Gaining data represents "level-1" (memorization) of increasing one's cognitive skills. Acquiring information represents Bloom's "level 2" (comprehension) while "level 3" (application) represents increasing one's cognitive skill because it goes beyond simply remembering by being able to grasp the meaning of something and using it in new, concrete situations. Gaining knowledge represents Bloom's "level 4" (analysis) while "level 5" (synthesis) represents increasing one's cognitive skill because it goes beyond previous levels by seeing the content and structural form of something and formulates new structures. Gaining wisdom represents Bloom's "level 6" (evaluation) of increasing one's cognitive skill because it goes beyond previous levels by being able to make conscious value judgments, based on clearly defined criteria. Bierly, et al. [13] argue that a key to organizational wisdom is judgment and decision making, which not only requires an understanding of the complexity of a situation but also requires one's ability to make sense and simplify it so that action can be taken. This vague process requires a deeper analysis and getting to know not only in terms of its specific structure but also its reasons and its use.

The abovementioned phenomena, described as the learning process connected with its cognitive power, i.e., absorption capacity, is the starting point for the current analysis. Previous research results show that organizational wisdom can, from the perspective of management science, be viewed as a configuration of two components: organizational learning and absorptive capacity. Based on previous research [14], it was found that exploitative organizational learning plays an important role in shaping both potential and actual absorption capacity. In contrast, exploratory organizational learning only affects actual absorption capacity. In search of the stimulus that activates mechanisms for developing organizational wisdom, the authors put forward the main hypothesis H_m: Managerial energy (ME) positively influences the organizational wisdom (OW) of a company operating based on the circular business model (CBM). As part of the research process, the hypothesis is refined as looking for the relationship between managerial energy (ME) and elements of organizational wisdom: organizational learning (OL) and absorptive capacity (AC).

In designing the research process, the gaps in knowledge about the functioning of CE were taken into account. Kirchherr et al. [15], while analyzing 160 leading articles on CE from 2006–2019, indicate several areas that are key to the understanding and adaptation of this concept by practitioners. The scientific achievements' primary shortcoming is the limited empirical work on CE relating to real business situations. Most of the analyzes focus on the economic perspective, ignoring other sciences, including management sciences. Rather small research samples do not allow for the generalization of phenomena. The

concentration of research on the manufacturing industry may suggest that the CE concept only works there. Moreover, most of the research conducted concerns entities operating in developed economies. This may signify potential insufficiency to implement this concept in less developed economies, which is untenable [16].

Many of these considerations are incorporated in the current research. The authors offer an analysis of the CE model from the perspective of the enterprise. Viewing CE as a system means looking for an incentive within the company to trigger this system. The article aims to analyze the impact of a manager's energy on organizational wisdom, focusing on its activity in the circular business model. The research was carried out in an entity operating in a developing economy in the service industry (textile recycling). The study was conducted at VIVE Textile Recycling Ltd. (city Kielce, Poland). Empirical data was collected from 138 managers using the PAPI technique. Regression analysis and structural equation modeling (SEM) were applied to test the research hypotheses. The subject of the analytical research relies in the context of knowledge in the field of management science. Such an analytical perspective does not only develop the concept itself but is also in line with the demand for knowledge to be applied by practitioners at the micro-level (strategic management).

2. Literature Review

2.1. Circular Economy-The Enterprise's Perspective

The operationalization of the sustainable development concept, known as the circular economy (CE), results from the practical perception of the principles of resource and energy saving. CE was probably first defined and conceptualized in the Ellen MacArthur Foundations report as "an industrial system that is restorative or regenerative by intention and design" [17]. This approach was pioneered by China, implementing this concept in 1998 [18]. Also, other countries or systems such as the EU have considered this concept strategic. CE has been perceived as a development strategy based on resource consumption optimization and a profound transformation of the production and consumption chain into new industrial systems. The key to this concept are closed circuits of energy and matter, enabling the re-use of used materials. The circulation of materials creates a closed system into which products are introduced in such a way that their components (perceived as parts and raw materials) can be recycled. Circular economy is an economy constructed from societal production-consumption systems that maximizes the service obtained from the linear nature-society-nature material and energy throughput flow [19].

The idea of a circular economy rests on three main principles: preserving and enriching natural capital by controlling limited resources and balancing streams of renewable resources, optimizing the use of raw materials, as well as developing system efficiency through the identification and removal of effects [17]. In practice, applying these principles makes organizations conduct businesses in accordance with biological cycles (renewable resources) and technical cycles (non-renewable resources). Technical cycles are carried out in the convention of product maintenance, redistribution, regeneration, or recycling. All cycles lead to the minimization of wastes and adverse internal effects [20]. One of the essential elements of the CE concept consistency is the indication of key business activities that are the basis of the CE model. Researchers point to such critical concepts as regenerate (switching to renewable materials and energy); share (sharing goods); optimize (increasing efficiency and effectiveness, minimizing waste); loop (use of materials that facilitate recycling); virtualize (dematerialization, virtual delivery of products and services); exchange (replacing old-generation materials with new ones) [17,20–24].

With resources becoming more and more exclusive, energy becoming more expensive and market niches more difficult to identify, CE becomes a new vision for treating resources, energy, value creation and entrepreneurship Joustra [25]. A field of research focuses on understanding how to assess CE at micro (products, firms), meso (industrial symbiosis networks), and macro (city, country, and beyond) live [26,27]. When analyzing these three perspectives, it is worth paying attention to the fact that the macro-level concerns the

concept of the functioning of elements in a system-oriented at effective resource renewal from the economy's perspective and has a model dimension. The meso level concerns a network of entities, industries that operate in a competitive space and constitute parallel spaces. However, from the perspective of our research, the most interesting is the micro-level. At this level, the authors consider individual enterprises' functioning, the philosophy of which is implemented taking into account the practical use of the concept of sustainable development, and their performance creates a circular business model (CBM).

Circular business models (CBM) are business models that aim to create sustainable development by creating additional monetary and non-monetary value, proactively managing multiple stakeholders, and taking into account a long-term perspective [24]. Definitions of CBM emphasized various elements, such as a systems approach, taking into account the economic context with closed material loops; the context of values that are created, delivered, and stored in material loops; ability to continue in the long term; a self-sufficient mechanism that enables operation in a closed circuit [28,29]. As Lewandowski [22] notes, there are several proposals in the literature to categorize this type of business model. By systematizing these elements, five main CBMs can be identified: (A) closed-loop supply chain—the use of renewable energy and recyclable materials; (B) recovery and recycling—creating production systems oriented to the use of waste for new applications, (C) extending product life—generating revenues from the extended product life cycle; (D) sharing platform—renting, renting, exchanging products; (E) product as a service—a change in the form of affecting to emphasize its usefulness.

Enterprises have been identified as key actors in transitioning to a CE [30]. Research conducted in the field of practical, and strategic use of CEM in an organization points to three key elements, essential to the success of this concept: creating lasting value, more active and comprehensive management of a set of stakeholders, and long-term prospects for action [31,32]. In researching this area, the article postulates that organizational wisdom be taken care of by organizations implementing sustainable CE activities and ideas. It is argued that significant roles are, in this process, played by managers who are perceived as the sources of strategic activities (the structure of the mission, vision, strategic goals), which translate into lasting values for the client and positive consequences for the environment.

2.2. Organization Wisdom in the Circular Economy Concept

The circular economy concept is a new trend based on the development of knowledge concerning the use, processing, durability extension, and adaptation of raw materials and energy introduced into the economic cycle. This idea of circularity is a premise for creating new knowledge in all areas of its operations that the CBM model will apply. This applies in particular to production systems, customer service systems, etc. [23].

As noted by Akgün et al. [33], knowledge and its related actions serve as a critical element of wisdom. According to researchers, wisdom refers to the awareness of hitherto unknown event and the application of knowledge for problem solving and judgments in real-world situations [34]. Jashapara [35] emphasized that wisdom is the ability to act critically or practically in a given situation. Bierly et al. [13] made significant contributions to its definition. They interpret organizational wisdom as effectively selecting and applying appropriate knowledge in a given situation or action. According to their research, it concerns the assessment, selection, and use of knowledge resources in a specific context, or action. The definition presented above is essential, taking into consideration two issues—the complexity of the concept of organizational wisdom and the context of its use in the company's operations based on the CBM model. Organizational wisdom is a complex category. Our research found that, from the perspective of management sciences, it can be considered a configuration of two elements: organizational learning and absorptive capacity [14]. This article draws attention to the relationship between these elements. The wisdom effect is achieved by the organization when the enterprise's absorptive capacity, consisting of giving organizational learning the right direction of impact is activated.

The context of using organizational wisdom relates to conducting business activities using the CE model. When analyzing these activities at the level of a single organization, it is worth noting that organizational learning concerns two dimensions: exploratory (focused on implementing strategic goals) and exploitation (related to the consolidation or updating of knowledge during current activities). From the CE perspective, organizational learning supports the process of adapting the organization's activities to the CBM model. It supports the implementation of business activities that the organization carries out at the operational level.

When analyzing these procedures, the questions that arise are: what causes organizational learning mechanisms to be triggered? What power is conducive to the development of absorptive capacity in an enterprise operating under the CBM model?

2.3. Managerial Energy as a Force Activating Organizational Wisdom

The activity of a manager in an organization can be considered from several perspectives. The most common is the practical approach, in which the manager assigns activities related to management functions [36]. His activities are analyzed from the perspective of performance, aiming to improve the customers' value and improve the profits by providing such value [37,38].

The authors propose a different research perspective. When analyzing the literature on the subject in the field of organizational learning [39,40], it was noticed that it was confirmed that strategic (exploration) and operational (exploitation) activities can be carried out at the level of an organization or its units. They stem from managers' activity, which we call manager's energy.

Considering the exploratory and exploitation perspective of the manager's activity enables full analysis of his activity. Exploration activities refer to activities related to the new knowledge the manager has acquired [41]. They are a stimulus in the system of connections that, when activated, influence decisions in the perspective of the future functioning of the organization. Researchers identify this area as creating variety in experience, orientation to new things in the area of enterprise functioning [42], experiments with new approaches to technology, business processes, or markets [43], or introducing innovations [44]. Generally, it is a group of activities related to the search for new directions of development or adaptation to trends in the changing environment that managers in new economic conditions undertake-e.g., circular economy or adaptation to changing conditions (VUCA). The authors understand such activities as strategic, aimed at the implementation of the company's vision and mission. Exploitation activity is related to the operational context, which concerns creating reliability on experience, that is, new knowledge for current activities [41]. It is mainly related to the use and improvement of existing knowledge, which broadens the manager's competencies used in short-term, ongoing activities.

The manager's source of energy is knowledge. The concepts and theories described in this field in the literature entitle us to draw two conclusions. First, knowledge is the matter that the manager acquires. Knowledge flows are not unequivocal in the literature [45]. On the one hand, one can treat the flow of knowledge as a process and understand it as sharing knowledge or analyzing the flow of knowledge, taking into account the directionality of this process from the perspective of the individual's learning [46–48]. From this perspective, not only the channels through which knowledge is transmitted are important, but also the sources of knowledge. Mom et al. [49] define the knowledge inflows of a manager as the 'aggregate volume' [45] of tacit and explicit knowledge pertaining to several domains such as technology, products, processes, strategies, and markets, which a manager receives or amasses per unit of time, from other persons and units within the organization. We propose to extend and generalize this definition while simplifying it. From our perspective (practical approach), the source of knowledge is the manager's environment. It is, in our understanding, the closer environment related to his professional work and those further that shape his attitudes and values. It should be remembered

that this knowledge of the manager “works” and is introduced to the organization at the “information” level and in the process of absorptive capacity, is similar to the concept of Bloom’s taxonomy [12].

Following the above considerations, managerial energy is considered a category of an active attitude aimed at achieving a goal/success in the operational and strategic area, resulting from the inflow of knowledge from the environment. However, this process is only the initiation of activities launched at the level of the organization. Both absorptive capacity and organizational learning are mechanisms that favor the construction of the CBM model. The context of the above dependencies is present in Figure 1.

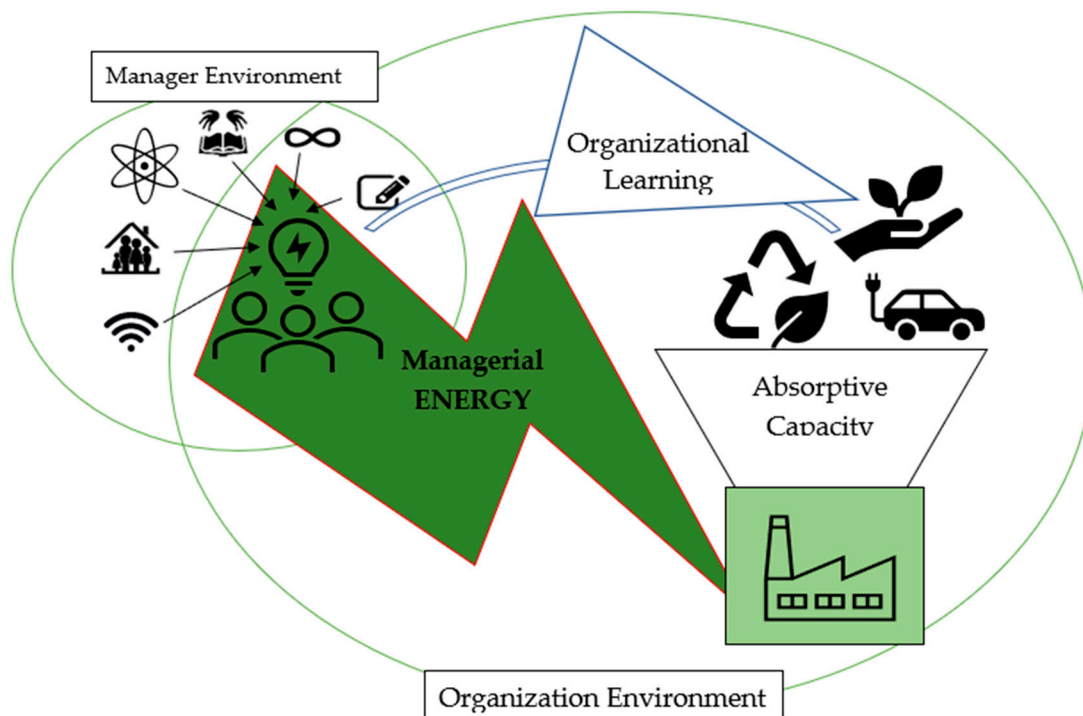


Figure 1. The role of the manager’s energy in the CBM building process.

In the 1960s, Cyert et al. [50] defined organizational learning as part of the decision-making process and effective adaptation to the organization’s changing environment. They were also among the first to connect organizational learning with individual learning processes known from psychology. As noted by Jaskanis [51] and Stelmaszczyk [52], learning at the organizational level is possible thanks to learning at the individual and team levels, which means that organizations learn thanks to the skills, attitudes, and commitment of individual employees [53]. Thus, the greater their learning abilities, the more intensive and effective this process takes place at the organizational level, and the greater the organizational knowledge resources created in this process [54].

Absorptive capacity is an abstract category related to the level of organization. This concept was created in the early 1990s and is primarily considered at the organizational level. Most authors define this category as activities starting from the recognition and acquisition of valuable external knowledge, through its assimilation and processing by the organization, to the exploitation of new knowledge to achieve business goals [55–59]. The literature review shows that the factors conditioning the development of absorptive capacity are, among others, the individual abilities of employees to acquire knowledge [55] or activities that stimulate the enterprise to seek external knowledge (activation triggers). Adopting these research results to our considerations, we assume that the manager’s energy enhances levels of organizational absorptive capacity.

Summing up the considerations, the thesis that knowledge absorption at the level of an individual (manager’s energy), in order to undertake actions relative to the enter-

prise's functioning, transforms into organizational wisdom at the organizational level was adopted. The manager's energy directly affects the absorptive capacity, while organizational learning, due to individual perception of the management staff, acts as an intermediary in this relationship.

3. Measurement Model

According to the deductive-empirical approach used, it is justified to formulate the main hypothesis concerning the relationship between managerial energy occurring at the level of the individual and the organizational wisdom of a CBM-oriented enterprise (Figure 2.):

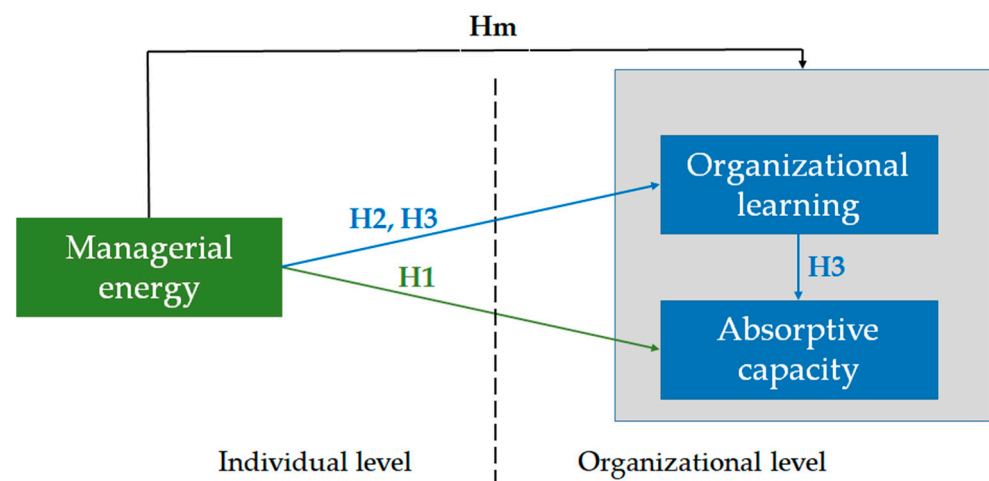


Figure 2. Conceptual model of research.

Hm. Managerial energy positively influences the organizational wisdom of a company operating based on the CBM model.

The main hypothesis is translated into the following sub-hypotheses, which are original research assumptions:

H1. There is a positive relationship between managerial energy and the absorptive capacity of a CBM oriented enterprise.

H2. There is a positive relationship between managerial energy and organizational learning of a CBM-oriented enterprise.

H3. Organizational learning is a mediator of the relationship between managerial energy and the absorptive capacity of a CBM oriented enterprise.

The research model is multi-level. It took into account the phenomena that occur at the lower and higher levels of analysis and in consequence recognizes the relations between them. The phenomenon of organizational wisdom (organizational learning and absorptive capacity) that occurs at the entire organization's level, using a variable reflecting the individual level (managerial energy) is explained.

4. Sample and Data Collection

The study of the relationship between the company's managerial energy and organizational wisdom in circular business models was carried out at VIVE Textile Recycling Ltd. The choice of the research object was dictated primarily by the fact that it is a CBM-oriented company. Its goal is to use 100% used textiles and clothes using the most modern, in Poland, fully computerized lines for sorting clothes. Recycling textiles and second-hand clothes are carried out in four areas: production of alternative fuel, composite textile production, industrial wipers, and second-hand clothing stores. VIVE Textile Recycling Ltd.

pursues a policy of sustainable development. It undertakes activities for the benefit of the environment, employees, local communities, and education and market development.

Empirical data was collected using the survey method. For this purpose, the Paper and Pen Personal Interview (PAPI) technique was used. The research tool was a questionnaire. It uses a seven-point Likert scale. Responses were assigned numbers from one to seven. In each case, the values increased by the direction and nature of the defining feature.

All employees of VIVE Textile Recycling Sp. Ltd. (Kielce Poland), who performed managerial functions in the company were targeted. Out of 138 managers at various levels, 78 respondents took part in the survey. The response rate was 57%. Women accounted for 44% of the respondents, and men for 34%. They were people of different ages. The most numerous group were the managers between 26 and 40 years of age (56.4%). 38.4% of people were between 41 and 50 years of age. Respondents over 50 constituted only 2% of the group, as were managers under 25 (2%). The most numerous group of respondents with higher education constituted 68% of the respondents. 25.6% of the respondents had secondary education and 6.4% had vocational.

For the purpose of the empirical research, three types of variables: the dependent variable, the independent variable, and the mediator were distinguished. The dependent variable is the enterprise's absorptive capacity, while the independent variable is managerial energy, and organizational learning plays the role of a mediator.

4.1. Dependent Variable

Absorptive capacity (AC) is VIVE Textile Recycling's ability to acquire, assimilate, transform, and exploit external knowledge. Acquisition (ACacq) is an action which coming into possession of valuable external knowledge. In the context of acquisitions, it is essential determine whether the company seeks information relevant to itself outside the company, whether it uses external sources of industry related knowledge and whether it is interested in information relating to other industries. *Assimilation (ACass)* is about analyzing, understanding, and interpreting knowledge acquired from external sources. What is important here is the speed of information flow within the company and the mutual support of individuals and/or organizational units in resolving problems. The organization should also emphasize organizing meetings with representatives of respective organizational units to exchange information on achievements, events, or problems. Another element of absorptive capacity is transformation. *Transformation (ACtra)* consists of combining existing knowledge with new external experience. In other words, it is the processing (transformation) of knowledge acquired from external sources to adapt it to the needs of the enterprise. The transformation may be the improvement of existing or the development of new procedures, methods, rules, processes, etc. *Exploitation (ACexp)* is putting knowledge into practical use. It is a solution to an existing problem or the implementation of a previously set goal necessitated by the application of the transformed knowledge. A new procedure, method, process, or rule is thus being put into practice. For this to be possible, the organization must support the development of new ideas and concepts and develop the ability to apply them in practice.

The enterprise's absorptive capacity was measured using a 14-item scale developed by Flatten et al. [60]. It covers the acquisition (three items), assimilation (four items), transformation (four items), and exploitation (three items) of external knowledge. Details of related questions are included in the Appendix A.1.

4.2. Independent Variable

The operational definition of managerial energy relates to exploring and exploiting managerial activities in VIVE Textile Recycling. *Manager's exploration activities (MEextr)* are new (innovative) activities undertaken, based on newly acquired personalized knowledge. They require the acquisition of new skills by individuals. The manager is looking for new solutions about the products, services, processes, or markets. *Manager's exploitation activities (MEext)*, which consists of taking actions that the manager knows and understands well.



He can do them correctly using his previous knowledge and skills. These are activities aimed at existing customers in terms of existing products and services. These activities are part of the company's current policy.

An 11-point scale developed by Mom et al. [49] was used to measure this part of organizational wisdom. Out of the 11 items, five were related to exploration (strategic) and six exploitation (operational) manager's activities. Details of related questions are included in the Appendix A.2.

4.3. Mediator

Organizational learning (OL) is the accumulation of knowledge in organizational memory in instructions, databases, documents, certificates, patents, processes, procedures, etc., which VIVE Textile Recycling company uses to achieve its goals [38]. We reduced this variable's operationalization to exploitative and exploratory organizational learning. *Exploitative organizational learning (OLext)* means storing in organizational memory that is preserved or updated in the enterprise's day-to-day operations. The organization then absorbs knowledge, thanks to which it is able to improve the current methods and concepts and maintain current levels of efficiency. The organization looks for typical and proven methods of action. Uses available methods of obtaining information (e.g., data from reports, magazines) to update the current knowledge. It emphasizes the use of knowledge based on experience. Meanwhile, *exploratory organizational learning (OLexr)* consists of accumulating completely new knowledge in the organizational memory, which is necessary to react to changes in the environment and achieve a competitive position. The organization absorbs the necessary knowledge thanks to which it learns something new. It is looking for information about endeavors related to experimenting, creating, and discovering new opportunities. The activities are accompanied by high market risk. It gathers currently available knowledge that goes beyond her everyday experience.

In this study, a 10-item scale proposed by Atuahene-Gima et al. [61] was adopted, where five items fell under exploitation and another five under exploratory organizational learning. Details of related questions are included in Appendix A.3.

Statistical analyses were performed to test the research hypotheses. This involved using the IBM SPSS Statistics 25.0 program (company, city, state abbrev if USA, country) and the AMOS program (company, city, state abbrev if USA, country). It also involved analysis of basic descriptive statistics, the Shapiro-Wilk (S-W) normality test, mediation analysis using Hayes' macro PROCESS, and modeling structural equations (SEM) using the maximum likelihood method. The significance of indirect effects was also checked, using the bootstrapping method. For interpretation of the results, the significance level p was assumed to be 0.05.

5. Study Results

The analysis started with the evaluation of the measurement tool. For this purpose, the reliability of the scales used were checked. A computation of the Cronbach's alpha (α) reliability index for each of them was undertaken. It turned out that all the scales used in the study have reliability greater than 0.7 (Table 1). This proves the high measurement accuracy of individual scales and a very low measurement error of the examined features.

Basic descriptive statistics were also calculated. The calculation was in order to present the most critical information on individual variables and the collected statistical data. Then, analyses were carried out to verify the similarity of the measured variables' distribution in relation to the theoretical normal distribution. For this purpose, the Shapiro-Wilk distribution normality test was performed. The results show that the distribution of managerial energy, organizational learning, and absorptive capacity is slightly different from the normal distribution. However, the value of skewness and kurtosis of these variables did not exceed 0.8. It means that the deviation is not significant and the distribution of these variables is relatively symmetrical to the mean [62]. The situation is similar for the sub-dimensions of these variables included in later analyzes. Only exploratory managerial

activities, assimilation, and exploitation have a different shape than the theoretical normal distribution. Nevertheless, a visual inspection of the result histograms shows that they are symmetrical and resemble a normal distribution more than any other known distribution. Basic descriptive statistics and the S-W test result present in Table 1.

Table 1. Descriptive statistics, S-W test and Cronbach's alpha scores.

| | M | Me | SD | Sk. | Kurt | Min. | Maks | S-W | <i>p</i> | α |
|---|-------|-------|-------|-------|-------|-------|-------|------|----------|----------|
| Managerial Energy (ME) | 62.51 | 63.00 | 8.72 | −0.18 | −0.52 | 44.00 | 77.00 | 0.97 | 0.033 | 0.934 |
| Managers' exploitation activities (MEext) | 34.58 | 35.00 | 4.74 | −0.39 | −0.23 | 24.00 | 42.00 | 0.96 | 0.010 | 0.900 |
| Managers' exploration activities (MEextr) | 27.94 | 28.00 | 4.48 | −0.01 | −1.11 | 20.00 | 35.00 | 0.95 | 0.003 | 0.884 |
| Organizational learning (OL) | 47.88 | 47.50 | 7.66 | −0.10 | 0.57 | 24.00 | 63.00 | 0.96 | 0.024 | 0.905 |
| Exploitative learning (OLext) | 27.96 | 27.0 | 4.31 | −0.19 | 0.09 | 16.0 | 35.0 | 0.11 | 0.014 | 0.841 |
| Exploratory learning (OLextr) | 19.92 | 19.0 | 3.91 | 0.18 | 0.74 | 8.0 | 28.0 | 0.15 | <0.001 | 0.861 |
| Absorptive capacity (AC) | 72.33 | 72.00 | 11.12 | −0.63 | −0.23 | 45.00 | 88.00 | 0.95 | 0.002 | 0.863 |
| Acquisition (ACacq) | 14.95 | 15.0 | 3.17 | −0.22 | 0.19 | 6.0 | 21.0 | 0.12 | 0.009 | 0.738 |
| Assimilation (ACass) | 20.90 | 22.0 | 4.73 | −0.97 | 0.87 | 5.0 | 28.0 | 0.10 | 0.047 | 0.815 |
| Transformation (ACtra) | 19.90 | 20.0 | 4.20 | −0.52 | 0.06 | 9.0 | 28.0 | 0.13 | 0.004 | 0.839 |
| Exploitation (ACexp) | 16.59 | 17.0 | 2.97 | −0.16 | −1.04 | 10.0 | 21.0 | 0.11 | 0.024 | 0.784 |

M—Mean; Me—Median; SD—Standard Deviation; Sk.—Skewness. Kurt.—Kurtosis; Min. and Max.—Lowest and Highest Distribution Value; S-W—Shapiro-Wilk result; *p*—Significance; α —Cronbach's alpha.

In the second part of the analysis, a direct relationship between managerial energy and each of the two dimensions of organizational wisdom was tested. The analyses indicate that the influence of managerial energy on the absorptive capacity is positive [$b = 0.68$; $SE = 0.12$; $t(1.76) = 5.45$; $p < 0.001$; 95% CI: 0.43–0.92] and the model fits the data well [$F(1.76) = 29.66$; $p < 0.001$]. The results of subsequent regression analysis proved a statistically significant, positive impact of managerial energy on organizational learning [$b = 0.62$; $SE = 0.07$; $t(1.76) = 8.56$; $p < 0.001$; 95% CI: 0.47–0.76]. This model also fits well with the data [$F(1.76) = 73.24$; $p < 0.001$]. Managerial energy has the strongest impact on organizational learning and slightly less on the absorptive capacity, as evidenced by the values of standardized regression coefficients β , which amounted to 0.70 and 0.53, respectively.

In the third stage, the which assumes organizational learning as a mediator was tested. Therefore, subsequent regression analysis was performed using Hayes' PROCESS macro. The model takes into account the influence of managerial energy on absorptive capacity with the intermediary role of organizational learning turning out to be well suited to the total [$F(2.75) = 19.66$; $p < 0.001$].

A positive impact of organizational learning on the absorptive capacity of the enterprise was observed [$b = 0.51$; $SE = 0.19$; $t(2.75) = 2.69$; $p = 0.009$; 95% CI: 0.13–0.89]. Taking into account this dependence, the influence of managerial energy on the absorptive capacity remained significant [$b = 0.36$; $SE = 0.17$; $t(1.76) = 2.16$; $p = 0.034$; 95% CI: 0.03–0.69]. Its value decreased from the level of 0.53 to the level of 0.28 (Figure 3). This means that we are dealing with partial mediation.

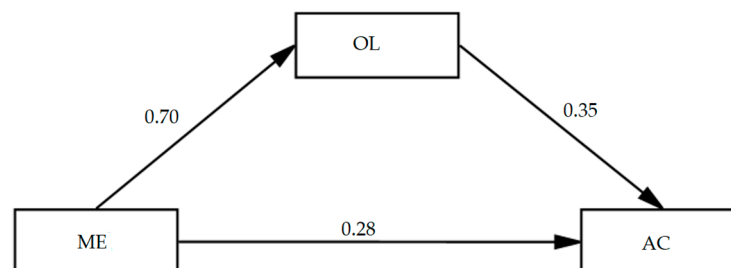


Figure 3. Standardized regression coefficients for the mediation model.

To confirm the indirect effect's significance, additional statistical analysis was carried out by bootstrapping for the sample of 5000. 95% percentile confidence intervals were adopted. This time, the mediation effect also turned out to be significant ($b = 0.31$; $\text{BootSE} = 0.14$; $\text{BootCI}: 0.03\text{--}0.59$). The addition of learning to the organizational model has weakened the relationship between managerial energy and absorptive capacity.

The results of the conducted research prompted the authors to deepen their analytical research. This time, a decision was made to consider each of the variables' sub-dimensions and examine the relationships between them. The research model was extended to include the sub-dimensions of absorptive capacity (acquisition, assimilation, transformation, exploitation), managerial energy (exploitation and exploratory managerial activities), and organizational learning (exploitation and exploratory organizational learning).

The study applied the maximum likelihood method of structural equation (SEM) modeling to test this model. The model turned out to be a good fit for the data [$\chi^2(3) = 2.92$; $p = 0.404$; $\text{CMIN}/\text{DF} = 0.97$; $\text{CFI} = 1.000$; $\text{GFI} = 0.991$; $\text{RMSEA} < 0.001$; $\text{SRMR} = 0.022$].

The analytical results show that operational management activities have the most substantial impact on exploitation organizational learning. This is depicted by the value of the standardized regression coefficient β of 0.43. Exploitation managerial activities were also shown to affect three dimensions of absorptive capacity: the strongest on transformation (0.42), a little less on exploitation (0.35), and the least weakly on assimilation (0.30). Next, a statistically significant impact of exploratory managerial activities on the assimilation and exploitation of external knowledge was observed. The strength of the effects is the same in both cases. This is evidenced by the value of the β coefficient, which has the same value of 0.36. In the next stage of the analyses, the impact of exploitation and exploratory learning on individual absorptive capacity dimensions was examined. It turned out that there are only two statistically significant relationships: the result of exploitative organizational learning on the acquisition and the impact of exploratory organizational learning on transformation. The former is stronger, while the latter is relatively weak. The β standardized regression coefficients' values are 0.40 and 0.27, respectively—the results of the analyses are presented in Table 2 and Figure 4.

Table 2. Estimation results of the path model.

| | | | b | SE | β | CR | <i>p</i> |
|--------|---|--------|----------|-----------|---------------------------|-----------|-----------------|
| MEext | → | OLext | 0.54 | 0.19 | 0.43 | 2.80 | 0.005 |
| MEextr | → | OLextr | 0.32 | 0.20 | 0.26 | 1.60 | 0.111 |
| MEextr | → | OLext | 0.20 | 0.21 | 0.15 | 0.98 | 0.326 |
| MEext | → | OLextr | 0.29 | 0.18 | 0.25 | 1.56 | 0.118 |
| MEext | → | ACacq | 0.06 | 0.16 | 0.06 | 0.35 | 0.726 |
| MEext | → | ACass | 0.42 | 0.21 | 0.30 | 2.01 | 0.045 |
| MEext | → | ACtra | 0.52 | 0.18 | 0.42 | 2.85 | 0.004 |
| MEext | → | ACexp | 0.31 | 0.11 | 0.35 | 2.81 | 0.005 |
| MEextr | → | ACacq | −0.14 | 0.17 | −0.14 | −0.85 | 0.398 |
| MEextr | → | ACass | 0.55 | 0.22 | 0.36 | 2.51 | 0.012 |
| MEextr | → | ACtra | 0.22 | 0.19 | 0.16 | 1.13 | 0.258 |
| MEextr | → | ACexp | 0.34 | 0.12 | 0.36 | 2.97 | 0.003 |
| OLextr | → | ACexp | 0.09 | 0.09 | 0.12 | 1.10 | 0.270 |
| OLext | → | ACacq | 0.30 | 0.12 | 0.40 | 2.48 | 0.013 |
| OLext | → | ACass | −0.01 | 0.16 | −0.01 | −0.05 | 0.962 |
| OLextr | → | ACacq | 0.05 | 0.13 | 0.07 | 0.43 | 0.668 |
| OLextr | → | ACass | −0.01 | 0.16 | −0.01 | −0.05 | 0.963 |
| OLext | → | ACtra | −0.13 | 0.14 | −0.13 | −0.96 | 0.336 |
| OLext | → | ACtra | 0.29 | 0.14 | 0.27 | 2.03 | 0.043 |
| OLext | → | ACexp | 0.01 | 0.08 | 0.02 | 0.13 | 0.893 |

b—non-standardized regression coefficient, SE—standard error; β —standardized regression coefficient; CR—critical ratio; *p*—significance level.

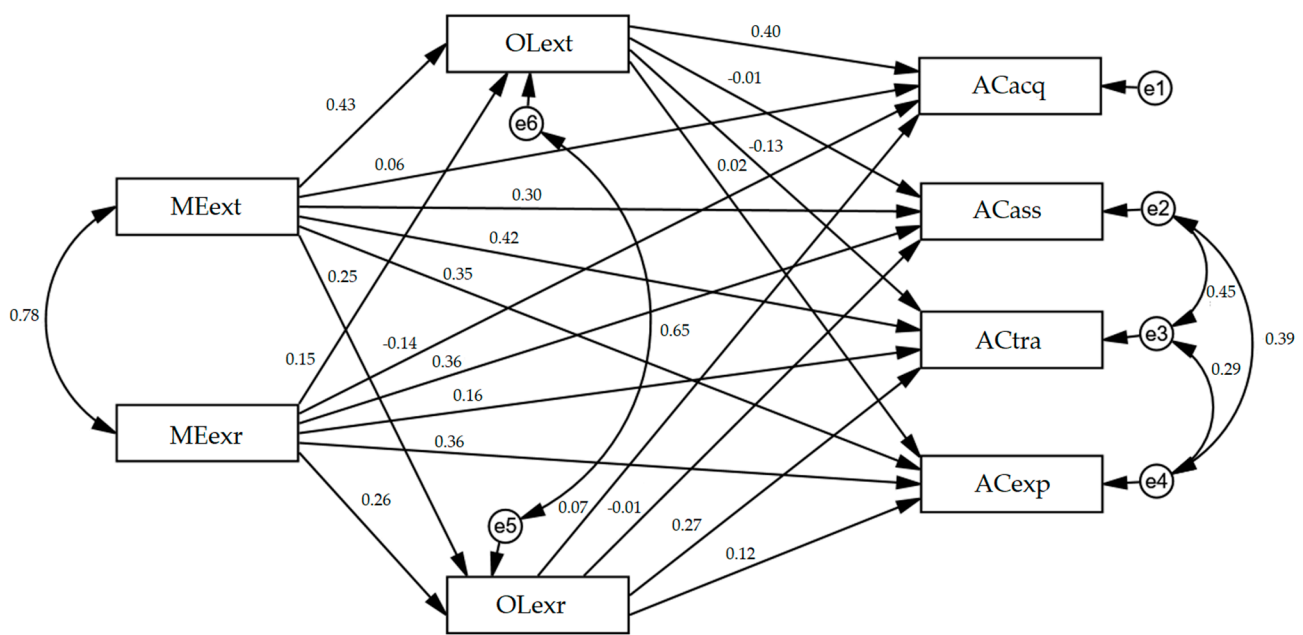


Figure 4. Results of structural equation modelling.

During the analysis of the path model, one significant mediating effect was obtained. It turned out that exploitation organizational learning is a mediator of the relationship between exploitation managerial activities and external knowledge acquisition. This, of course relates to the statistically significant impact of exploitation organizational learning on the previous relationship. To confirm the significance of this effect an additional statistical analysis was carried out by bootstrapping for the sample of 5000. In this way, a 95% percentile confidence intervals was determined. Detailed analysis of the results showed that the previously observed indirect effect is statistically significant (Table 3).

Table 3. Mediation effect of exploitative learning in the relationship between managers’ exploitation activities and acquisition.

| | b | SE | BootLL | BootUL | p |
|-----------------------|------|------|--------|--------|-------|
| MEext → OLexr → ACacq | 0.16 | 0.10 | 0.02 | 0.46 | 0.031 |

b—non-standardized regression coefficient, SE—standard error; LL & UL—lower and upper limits of the confidence interval; p—significance level.

The results of the analyzes show that the detailed hypotheses H1, H2, and H3 were positively tested (Table 4). On this basis, the main hypothesis Hm is supported. Therefore, it can be concluded that managerial energy positively influences the organizational wisdom of a company operating on the basis of the CBM model.

Table 4. Summary of hypotheses testing.

| Hypotheses | Result |
|---|-----------|
| H1. There is a positive relationship between managerial energy and absorptive capacity | Supported |
| H2. There is a positive relationship between managerial energy and organizational learning | Supported |
| H3. Organizational learning is a mediator of the relationship between managerial energy and absorptive capacity | Supported |

6. Discussion

The article aimed to analyze the impact of a manager’s energy on organizational wisdom, with emphasis on the company’s activity in CBM. The following issues contribute to the development of strategic management theory. First, our research introduces a new understanding of organizational wisdom to the science of management. The findings of

the current research, as in the article by Bierly et al. [13], identify the complexity of organizational wisdom. They refer to the hierarchical concept of its structure. In particular, the variable absorptive capacity (AC) proposed in the analysis as a sequence of four elements (acquisition, assimilation, transformation, exploitation), similarly to the Bloom's Taxonomy [12] concept, demonstrates the structure of knowledge absorption and its usefulness in operational and strategic activities. The absorptive capacity analysis, shows that in addition to the acquisition phase (ACacq), which is moderated by exploitative learning (OLext), all other elements of AC depend on managerial energy, which activates them.

Second, the research identified the force that activates organizational wisdom. This is managerial energy, which is here equated with active managers' attitudes in the organization. This variable should be added to the set of so-called managerial activities described in the literature Mom et al. [49].

The results of the current research refer to a company operating according to the CMB model. The significance of the manager's energy in developing organizational wisdom will enrich knowledge in this area. Like educational factors that can be seen as antecedents to CE [63] the manager's energy is an important factor in its development.

The analysis is an elaboration of the concept presented in a previous article by Pierścieniak et al. [14] The results of the research conducted allow for the adoption of the three detailed hypotheses. The obtained results prove that a higher level of managerial energy causes an increase in a company's absorptive capacity under the CBM model. Managerial energy also has a direct and positive effect on organizational learning. Additionally, it has been observed that organizational learning is a mediator of the relationship between managerial energy and absorptive capacity. This means that managerial energy will affect the ability to absorb knowledge from external sources with organizational learning occurring simultaneously. In other words, managerial energy by stimulating the enterprise to learn activates the organizational wisdom, which consists in the impact of organizational learning on the absorptive capacity of the enterprise. Thus, positive testing of the three detailed hypotheses enables the adoption of the main hypothesis concerning the positive impact of managerial energy on the organizational wisdom of an enterprise operating under the CBM model. To sum up, the stronger the managerial energy of an enterprise's managerial staff, the higher the enterprise's organizational wisdom.

7. Conclusions

7.1. Theoretical Implications

The research undertaken, is an extension of a scientific study related to the search for mechanisms for implementing sustainable development in contemporary economies. Cognitive value in the field of management sciences focuses on three areas related to strategic management:

- managerial energy, understood as a category of active attitude aimed at achieving goals in the operational and strategic area. It is activated due to the inflow of information, the development of knowledge from the environment, and initiates sustainable development activities at the organizational level. It has been determined that the stronger the managerial energy of an enterprise's managerial staff, the higher its organizational wisdom.
- managerial energy, being an activating force for sustainable enterprise is seen as the antecedent to the development of enterprises operating in the CE model.
- managerial energy which directly activates the process of building organizational wisdom in the area of absorptive capacity at the stages of acquisition, assimilation, transformation, and exploitation. Transferring knowledge from the individual to the organizational level requires a mediator, which is identified as the process of organizational learning.

7.2. Managerial Implications

In practice, top management has been provided with guidelines on how to best use managerial energy to achieve the highest possible level of organizational wisdom (Figure 5). From the perspective of the enterprise, it is used to implement operational and strategic activities within the operating business model.

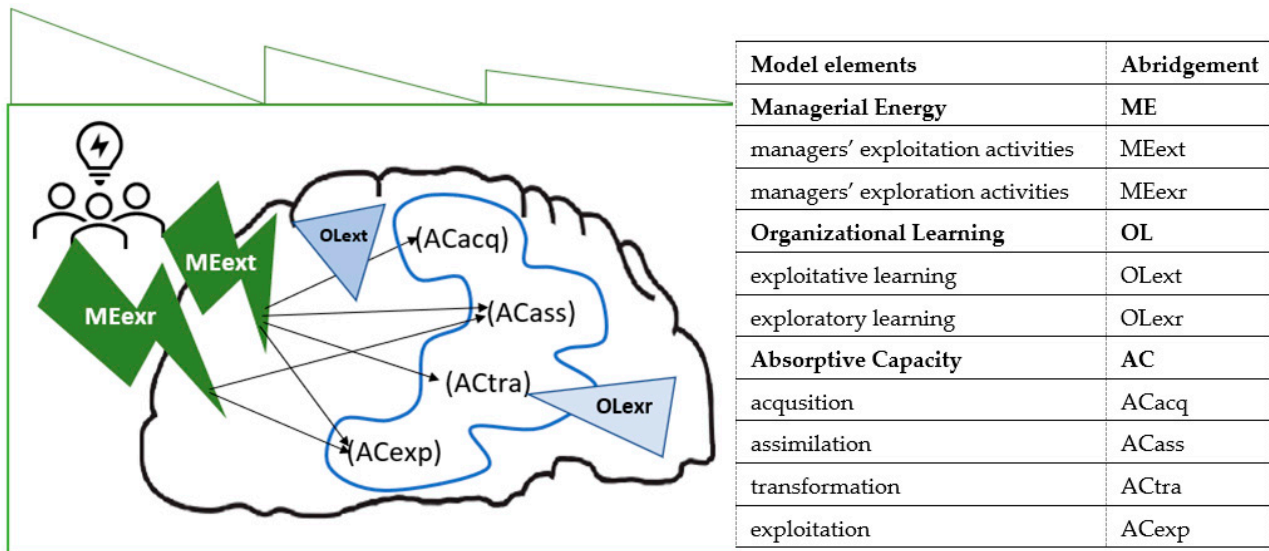


Figure 5. The impact of managerial energy on organizational wisdom—study time VIVE Textile Recycling Ltd. (Kielce, Poland).

If the enterprise wants to improve a specific absorptive capacity stage, it should consider a specific configuration of appropriately selected factors (variables). Acquiring valuable knowledge from external sources depends primarily on the knowledge accumulated in the organizational memory. However, it depends on the kind of knowledge (documents, databases, processes, procedures, methods, concepts, etc.), on the basis of which VIVE Textile Recycling takes its typical, proven actions. They enable one to maintain the current performance level, relying on experience based knowledge. Therefore, organizational knowledge used for the company's everyday activities (operational activities) is of the most significant importance when diagnosing the company's needs, scanning the environment, and finally deciding on the type and quality of new knowledge that is to be acquired from external sources. The force activating the above mentioned exploitation organizational learning is this aspect of managerial energy that is based on the manager's previous knowledge and skills. Based on it, the manager takes actions that he is aware of and understands well. They stimulate the organization to take proven actions, which affect the acquisition of the desired external knowledge.

If the assimilation of external organizational knowledge is improved, VIVE Textile Recycling can use all its available managerial energy. Our research has shown that exploitation and exploratory management activities have a similar impact on this stage of the enterprise's absorptive capacity. Managers should, however, remember that the best results in understanding new organizational knowledge will be achieved thanks to the simultaneous use of their individual knowledge and existing skills as well as their unique, personalized knowledge and new, customized skills.

Transformation (i.e., adapting external knowledge to the needs of the enterprise) is most easily achieved thanks to well-known, proven, and understandable managerial activities and new procedures, processes, methods, or concepts applied at the level of the entire organization. However, to use the newly acquired knowledge in practice (exploitation) in the form of, for example, launching a new product on the market, the company should use every dimension of managerial energy.

7.3. Limitations and Future Research

The conclusions thus formulated, based on the research results should be interpreted, bearing in mind certain limitations. Both the mediating effect and the strength of direct linear dependencies prove that the organizational wisdom of an enterprise operating under the CBM model is also influenced by other factors. Therefore, the search for more micro-foundations of organizational wisdom is the direction of future research. Managerial skills seem to be an exciting research area.

The second limitation is related to the selection of the research sample. It focused on one large enterprise that fits perfectly into the CBM model. It aims to maximize the use of textiles and used clothing through its recycling procedure. It is believed that researchers should look for micro-foundations of organizational wisdom in other industries as well. Particularly noteworthy is the IT industry, for which the acquisition of external knowledge and its proper application in practice is a determinant of market success.

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Appendix A. Measurement Items

Appendix A.1.

Appendix A.1.1. Acquisition (ACacq)

- (1) The search for relevant information concerning our industry is every-day business in our company.
- (2) Our management motivates the employees to use information sources within our industry.
- (3) Our management expects that the employees deal with information beyond our industry.

Appendix A.1.2. Assimilation (ACass)

- (1) In our company ideas and concepts are communicated cross-departmental.
- (2) Our management emphasizes cross-departmental support to solve problems.
- (3) In our company there is a quick information flow, e.g., if a business unit obtains important information it communicates this information promptly to all other business units or departments.
- (4) Our management demands periodical cross-departmental meetings to interchange new developments, problems, and achievements.

Appendix A.1.3. Transformation (ACtra)

- (1) Our employees have the ability to structure and to use collected knowledge.
- (2) Our employees are used to absorb new knowledge as well as to prepare it for further purposes and to make it available.

- (3) Our employees successfully link existing knowledge with new insights.
- (4) Our employees are able to apply new knowledge in their practical work.

Appendix A.1.4. Exploitation (ACexp)

- (1) Our management supports the development of prototypes.
- (2) Our company regularly reconsiders technologies and adapts them accordant to new knowledge.
- (3) Our company has the ability to work more effective by adopting new technologies.

Appendix A.2.

Appendix A.2.1. Managers' Exploration Activities (MEextr)

- (1) Searching for new possibilities with respect to products/services, processes or markets
- (2) Evaluating dividers options with respect to products/services, processes or markets
- (3) Focusing on strong renewal of products/services or processes
- (4) Activities requiring quite some adaptability of you
- (5) Activities requiring you to learn new skills or knowledge

Appendix A.2.2. Managers' Exploitation Activities (MEext)

- (1) Activities of which a lot of experience has been accumulated by yourself
- (2) Activities which serve existing (internal) customers with existing services/products
- (3) Activities of which it is clear to you how to conduct them
- (4) Activities primarily focused on achieving short-term goals
- (5) Activities which you can properly conduct by using your present knowledge
- (6) Activities which clearly fit in to existing company policy

Appendix A.3.

Appendix A.3.1. Exploitative Learning (OLext)

- (1) Our aim is to search for information to refine common methods and ideas in solving problems in the project.
- (2) Our aim is to search for ideas and information that we can implement well to ensure productivity rather than those ideas that could lead to implementation mistakes in the project and in the marketplace.
- (3) We search for the usual and generally proven methods and solutions to product development problems.
- (4) We use information acquisition methods (e.g., survey of current customers and competitors) that helped us understand and update the firm's current project and market experiences.
- (5) We emphasize the use of knowledge related to our existing project experience.

Appendix A.3.2. Explorative Learning (OLextr)

- (1) In information search, we focus on acquiring knowledge of project strategies that involved experimentation and high market risks.
- (2) We prefer to collect information with no identifiable strategic market needs to ensure experimentation in the project.
- (3) Our aim is to acquire knowledge to develop a project that led us into new areas of learning such as new markets and technological areas.
- (4) We collect novel information and ideas that went beyond our current market and technological experiences.
- (5) Our aim is to collect new information that forced us to learn new things in the product development project.



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