

# Structure of the Chain Management Concept

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**Abstract**—Purpose of this paper is to develop the structure of Chain Management concept including Value Chain Management, Demand Chain Management, Supply Chain Management and Integrated Chain Management, based on unified components, objects, and blocks of Management. Following results, which have features of scientific novelty, were got: the list of main Management components that are targeted Management actions; the classification of basic concepts of Chain Management and its objects; the list and content of Chain Management blocks, including its main processes; and the structure of Chain Management concept. The prerequisites are created for digitalization, computer-aided design, and optimization of Management components, objects, and blocks.

**Index Terms**— concept, Chain Management, value, enterprise, relationships, flow, process

## 1 INTRODUCTION

The competitive survival and effective performance of enterprises are contingent upon the development and periodic adjustment of strategies using an appropriate management concept ([1], [2]). Recent years have seen the intensive development of concepts focused on the management of several linearly ordered enterprises or chains. The general component of management as a “chain” assumes that structure and development correspond to regularities which can be identified within the framework of a higher-level concept, hereinafter referred to as Chain Management<sup>1</sup>. There are clear trends in the development of these concepts:

a) horizontally, when, along with the previously developed concept of Supply Chain Management [3], the concepts of Value Chain Management [4] and Demand Chain Management [5] are formed and improved, i.e., if the component “chain” is immutable, the management object “supply” varies; and

b) vertically, when the concept of Supply Chain Management is complemented by the concept of Integrated Chain Management, i.e., parameters and characteristics of the research object are corrected [6].

The differing perspectives of specialists on the nature and content of Chain Management create significant obstacles to the integration and cooperation of enterprises [7]. As a consequence, the information technologies used in Chain Management do not fully achieve the goals set out for their links ([8], [9]) but constantly lead to lost profits. Due to the above problems, the conditions for creating and delivering value of products and/or services to end consumers (hereinafter referred to as the consumer) are far from ideal [10]. In addition, the loss of sustainability of enterprises and, accordingly, their chains are an almost inevitable threat ([11], [12]).

A solution to the ensuing situation requires the following tasks to be solved, if possible:

- clarification of the list of the principal components of Chain Management, at which the corresponding management actions are directed;

- enhancement of the classification of the basic concepts of Chain Management and, accordingly, the objects of these concepts;

- identification of the patterns of the basic concepts of Chain Management;

- definition of the list and specification of the content of the main blocks of Chain Management, including its main processes;

- identification of the relationships between components, objects and blocks and establishment of the structure of the Chain Management concept.

The components, objects and blocks of Chain Management are mainly characterised by qualitative attributes. These are difficult to account for and analyse, since the scale and tool required to measure these attributes are absent or poorly developed. Therefore, the study relies on methods of classification, analysis and synthesis, induction and deduction, in which binary matrices [13], based on relevant qualitative attributes, are used as tools. These attributes determine the classifications of components, objects and blocks of Chain Management. Each can be assigned a corresponding binary code processed by computer software thus forming the structure of the Chain Management concept.

## 2 LITERATURE REVIEW

There are numerous studies devoted to identifying trends in the development of management as a type of enterprise activity. Rigby and Bilodeau [14], for example, refer to the following trends: “the backlash against bureaucracy and complexity; making the most of digital technology; developing a strong corporate culture; the focus on customers; and watching costs at a time of growth”.

In addition to the above trends, a number of researchers highlight a trend towards globalisation of economic activity of enterprises, which suggests chains [1] and/or networks [15] of these enterprises.

The “chain” and “network” concepts share a number of common characteristics, which allowed Lazzarini et al. [16], to introduce the term “netchain” to denote a combination of networks and chains. To clarify the essence of the concept “chain”, the following expanded definition<sup>2</sup> fully corresponds to the purpose of this research: “a system of people, processes, or organizations that work together in a particular order”.

There are various types of chains (networks), such as “supply chain” ([17], [18]) or “supply networks” [19]; “value

<sup>1</sup> Identification of this term through Internet search engines did not give positive results.

<sup>2</sup> Chain. – Available at: <https://dictionary.cambridge.org/dictionary/english/chain> (accessed 13 October 2020).

chain" ([20], [21]) or "value networks" [5]; and "demand chain" ([22], [23]).

The authors make attempts to clarify the relationships between these types of chains (networks) in the following combinations: "supply chain" and "value chain" ([21], [24]); "demand chain" and "value chain" [25]; "demand chain" and "supply chain" ([6], [26], [27]); "supply chain", "demand chain" and "value chain" ([28], [29]).

To define the concept of management, some authors use terms other than "chain": "Value Management" ([4], [30]) and "Value Chain Management" ([31], [32]); "Demand Management" ([33], [34]), and "Demand Chain Management" ([26], [35]); "Supply Management" ([36], [37]) and "Supply Chain Management" ([38], [39]).

Some studies are aimed at clarifying the essence and relationships of these concepts ([28], [40], [41], [42], [43], [44], [45]).

Based on their analysis, the following sequence of Chain Management options can be formed: "Objects → Object Management → Object Chain Management", e.g., "Supply → Supply Management → Supply Chain Management". These management options vary in content. As noted by Mentzer et al.: "supply chains exist whether they are managed or not" [46]. According to Leenders et al.: "supply management is different from SCM in that SCM emphasizes all aspects of delivering products and services to customers, whereas supply management emphasizes primarily the buyer-supplier relationship" [47].

The authors take into account the current trends in the development of the theory and practice of management and their impact on the content of Chain Management. The implementation of information technologies has led to the creation and development of "Integrated Supply Chain Management System" [48]. In addition, the widely recognised concept of Integrated Chain Management [49] has similarities and differences with the concept of Supply Chain Management as outlined by Seuring [50]. 2000. This is focused on reducing the burden on the environment in the framework of sustainable development of human society. These trends clearly have an impact on the concept of Supply Chain Management, as well as on other types of concepts, which has not been adequately reflected in studies.

Achieving the research goal, as indicated earlier, involves studying management components that have been created and implemented over a long period irrespective of consumer requirements, as well as management objects, which cyclically transform from one form to another depending on the requirements of consumers. This study will also include management blocks that include processes used in chains, regardless of the form of management objects.

The views of authors on the nature and content of Chain Management components differ significantly. For example, the most popular term "Supply Chain Management" has the following definitions:

(1) "Supply chain management is the integration of trading partners' key *business processes* from initial raw material extraction to the final or end customer, including all intermediate processing, transportation and storage activities and final sale to the end product customer" [51];

(2) "Supply Chain Management is "a series of integrated *enterprises* that must share information and coordinate physical execution to ensure a smooth, integrated flow of goods, services, information, and cash through the pipeline" [52];

(3) "Supply chain management is a total systems approach to managing the entire *flow* of information, materials, and services from raw-material suppliers through factories and warehouses to the end customer" [53]; and

(4) Supply Chain Management is "... the management of upstream and downstream *relationships*<sup>3</sup> with suppliers and customers in order to deliver superior customer value at less cost to the supply chain as a whole" [54].

In this way, the components of Supply Chain Management today include enterprises, their relationships, business processes, and flows simultaneously. If one of the concepts of Chain Management envisages four components, then these components should be typical of the concepts of: Value Chain Management, Demand Chain Management, and Integrated Chain Management.

Moreover, enterprises and relationships between them form a chain of the first level (a chain in statics), and processes and upstream and "down-stream linkage" between them [55] form a chain of the second level (a chain in dynamics). In this case, the term "flow" fades into the background. Previously, this term was used as object of logistics research ([56], [57]), however, "in the late 1990s, to some extent, supply chain management supplanted the term "logistics" [58]. Further, the term "flow" and its antipode, the term "inventory" (for example, [59]), will again be referred to the competence of logistics. Even if we imagine that enterprises and processes, in addition to relations, connect flows, then inventories do not explicitly connect them. Additionally, the terms "logistics" and "logistics management" will be used as different but related terms.

In terms of marketing, listed above concepts form a cycle which eliminates consumer perception that they might be missing something. This is achieved primarily through "creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large" [60], and "value is always intangible, heterogeneously experienced, co-created and potentially perishable" [61]. The above point of view assumes an innovative character of value ([62], [63]), while not all products and/or services can create the value needed by the consumer [64]; participation in creating value not only among consumers [65], but also suppliers [61]; as well as the use of senses to confirm perceived value [66] and the formation of the corresponding impressions in the consumer [67] (Marandi et al., 2010).

The cycle of eliminating deficiencies or creating, ... and delivering value to the consumer [60] takes the following form: (1) "a feeling of insufficient (lack of) value → (2) formation of a pre-image of value → (3) informing suppliers about the parameters and characteristics of value → (4) placing and fulfilling an order for products and/or services as sources of values → (5) eliminating deficiencies (receiving and consuming value)". Thus, the concepts we are investigating form a circular chain when creating value: the first, second and fifth stages of this chain relate to Value Chain Management, the third

<sup>3</sup> Emphasis added

stage corresponds to Demand Chain Management, while the fourth stage relates to Supply Chain Management. These stages can then be combined into the concept of Chain Management. The cycle described above is typical both for creating value for the end consumer and for each link of chain that acts as a consumer and supplier at the same time.

Remarkably, the concept of Supply Chain Management has recently come under increasingly criticism. Experts note the following shortcomings: "inability to meet customer demand" ([42], [68]); and "the conflict between the efficiency focus of supply chains and effectiveness focus of demand chains" [26]. The above shortcomings suggest a need for clarification and addition to the substance and content of Supply Chain Management and, accordingly, Chain Management as a whole.

Chain Management thus implies continuous and/or discrete impact on components (enterprises, relationships, business processes and flows), as well as on the objects of management (values, demands and supplies). Such a wide variety of components and objects defines the specification and addition to the processes of Chain Management. Due to their wide variety, these are expediently then combined into management blocks and divided into "operations" which are further proposed to be considered as the main component of Chain Management instead of the "business processes" component. They are studied under the auspices of the "operations" component. As a side note, the process is "a set of activities that put together produce a value to a customer" [69].

Attempts to substantiate and classify processes in supply chains have been undertaken in the works of ([70], [71], [72], [73], [74], [75], [76], [77], [78], [79]). Nevertheless, in order to form the structure of the concept of Chain Management, the above points of view need to be clarified and supplemented in the context of its components and objects.

### 3 RESEARCH METHODOLOGY

The goal of this study is based on qualitative methods (for example, [80] which "present a challenge because the process of collection and organization of these images is not well-defined" [81]. The main research method is classification which defines "a set of entities into groups, so that each group is as different as possible from all other groups, but each group is internally as homogeneous as possible" (Bailey. 1994).

The method has certain specific features. Firstly, the classification "can generally be formed without quantification or statistical analysis" [82]. Secondly, the characteristics of an object used in the classification are applied either sequentially, in order to determine the differences between objects, or in parallel to describe a group of objects and establish relationships between them. Thirdly, when describing objects, binary matrices (for example, [13]) are the main tool in the parallel use of qualitative attributes (two, three, etc.). The literature review has shown that binary matrices are used to solve local tasks, revealing one or another aspect of a research object. In order to demonstrate this, we can cite surveys on strategic management of such authors as Ansoff [83]; Abell [84]; Hichens and Robinson [85]; Patel and Younger [86]; Rasiel and Friga [87]; Stern and Deimler [88] etc. At the same time, the systemic use

of binary matrices for the level structuring of complex research objects and studying relationships between its elements is of special interest. Fourthly, if in binary matrices "all dimensions are dichotomies, the formula for determining the number of cells is  $2^w$ , where  $W$  is the number of dimensions" [82]. Fifthly, if the number of objects to be classified is significant, then there is a problem in selecting a limited number of attributes of these objects, since otherwise "this would provide a matrix of truly staggering proportions" [82].

Modern trends in the development of economics and management have enabled us to perform a number of adjustments to the above attributes of the classification method. In particular, the introduction of the term "value" [20] suggests its uniqueness [61], as created by a unique *product and/or service* for a unique *consumer* with a unique *supply chain* using a unique *technology* from a unique set of *resources*<sup>4</sup>, or a situation referred to by the author as Six "U". This situation presupposes the classification of all its elements separately and jointly, regardless of the number of research objects, i.e. without the use of "some shorthand methods such as clustering algorithms or formulas" [82]. The complexity of using a large number of attributes of the object of research is easily eliminated in supply chains in the process of unbundling the initial batches of products and / or services when they are moved to the final consumer. In this case, the supplier uses one group of attributes, and the retailer uses another group of attributes.

When a limited number of attributes is inexpedient, the objects of research should be digitised, primarily using binary matrices.

In the aims of creating a scientifically grounded and adequate classification, the attributes of the research object can usefully be divided into two groups:

(1) a group of relevant attributes sufficient to describe all variants  $R_N$  of a given object  $R_1$ . Let us take the market segment as object  $R_1$ . If there are, for example, 34,129 consumers in the market segment, we compose the equation " $2^w=34129$ ", where  $W=16$  in whole numbers. This means that in order to describe a specific consumer  $R_N$  out of 34,129 consumers available in the market (market segment  $R_1$ ), at least  $W=16$  relevant attributes are required;

(2) a group of irrelevant attributes of an object that are in reserve or excluded from it due to the loss of relevance. Let us suppose that 129 qualitative attributes have been proposed by the authors to describe a specific consumer  $R_N$ . Thus, of these 129 attributes, at least  $W=16$  are relevant, and  $W_n=113$  should be referred to as irrelevant attributes.

Over time, new attributes appear. Previously irrelevant attributes which may replace attributes that have lost their relevance are increasingly being used. Therefore, specialists need to identify these attributes and evaluate the prospects for their inclusion in the group of relevant attributes or exclusion from this group; something which can significantly change the idea of an object (for example, of the market segment  $R_1$ ). A group of relevant attributes can be identified and corrected on the basis of surveys of theoreticians and practitioners or according to the number of references in associated works. Following their ranking by quantity in descending order, a group of re-

<sup>4</sup> Italics indicate the author's note.

quired relevant attributes is formed: for example,  $W_a=16$  attributes for classifying the market segment  $R_1$ . If this segment grows, for example, to 158,213 consumers, then the number of relevant attributes should be increased to at least  $W_a=18$ . If the total number of qualitative attributes increases, for example, up to 142, then the number of irrelevant attributes will be  $W_N=124$ .

In this way, the object of research can change its substance and content due to a change in the structure and composition of its relevant attributes. In other words, the same object, for example, the term "Supply Chain Management", can be correct both on the start date with one group of relevant attributes [32], and on the end date with another group of relevant attributes, which has been formed or is being formed at present. In this paper, the number of relevant  $W_a$  attributes will be two and three.

The research methodology involves the following stages:

- selection of the relevant attributes which characterise the existing components, objects and blocks of Chain Management; the construction and study of the binary matrices which allow us to either confirm or supplement the set of the existing components, objects and blocks of Chain Management;
- synthesis of the components and objects thus obtained, in order to clarify the content of the terms "Supply Chain Management", "Value Chain Management", "Demand Chain Management" and "Flow Management", as well as their relationships; the formation and study of binary matrices to sequentially highlight the Chain Management blocks and then the processes and functions that form these blocks;
- creation and analysis of a volumetric matrix which reflects the structure of the Chain Management concept.

These stages and the results obtained therefrom make it possible to establish the theoretical and methodological prerequisites for improving Chain Management, in order to better create value for their consumers and ensure the sustainability of the links of these chains, taking into account the concept of Integrated Chain Management [89].

#### 4 CLASSIFICATION AND SYNTHESIS OF THE MAIN COMPONENTS OF CHAIN MANAGEMENT

The introduction and development of the research object complies with consistent patterns which can be defined using binary matrices. There are two well-known methods of scientific research: analysis, which implies decomposition of the research object into several other objects; and synthesis, which means combining a single research object from several objects.

If the following relevant attributes are used in combination: the number of objects before the study – one and several (codes "0" and "1", respectively); and the number of objects after the research – one and several (codes "0" and "1", respectively), then the stages in the development of any research object can be defined. These are as follows: introduction; highlighting options; creation of modifications and creation of a new more complex object (Fig. 1) with respective codes: "00", "01", "10" and "11".

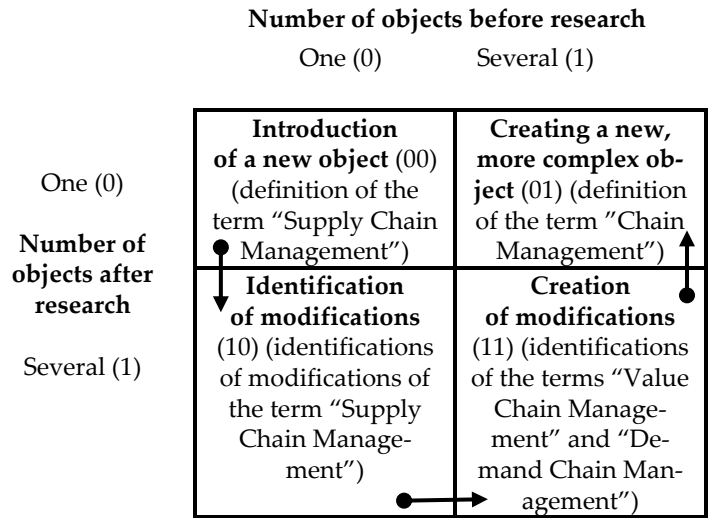


Fig. 1. Development stages of the research object

With regard to the term "Supply Chain Management", the stage data can be further organised. The term "Management" with the research object of "enterprise" provides a basis for a new term "Supply Chain Management", focused on a combination of linearly ordered enterprises (code "00"). The bibliographic analysis has revealed modifications of the term "Supply Chain Management" with such components as "enterprises", "relationships", "business processes" and "flows" (code "10"). Definitions of new terms, such as "Value Chain Management" and "Demand Chain Management" (code "11"), which are close to the term "Supply Chain Management", are formed in parallel or sequence.

The emergence of these terms paves the way for introduction of the more complex term "Chain Management" (code "01"), the substance and content are disclosed in this paper. The next object to be introduced is likely to be "Netchain Management" [16]. In addition, the term "Integrated Chain Management" will be further developed [89].

The concept of Chain Management has a complex structure, and it is advisable to study it in parts which can be distinguished using a binary matrix. In order to determine the relevant attributes necessary for solving this problem, it must be taken into account that the required parts of Chain Management can be used by enterprises and chains either for a short or long time, and then corrected. In this regard, the time required to adapt the parts of the chain to the consumer's requirements can also be either short or long. These aspects of the research allow for the formation of a binary matrix as shown in Fig. 2.

Analysis of Fig. 2 suggests the following conclusions:

(1) values, demands and products and/or services as objects of Chain Management are constantly present in the market. At the same time, the adaptation time of chain parts to the customer's demands can be long due to their uniqueness which requires adjustment of the chain management components. When creating and delivering value, management objects are transformed into one another which predetermines a relatively short time of use;

		Lifetime of Chain Management Parts	
		Short	Long
Continuous Adaptation time of chain parts to customer require- ments Short	<b>Objects</b> (values, demands, products/services)	<b>Complexes</b> (management, mar- keting and logistics)	
	<b>Functionality</b> (tools, competen- cies, mechanisms, functions)	<b>Components</b> (enterprises, relation- ships, operations, flows)	

Fig. 2. Classification of Chain Management Parts

(2) value is a form of deficiency of something such as need or requirement. Therefore, a specific form of deficiency of something requires various complexes of Chain Management, for example a marketing complex [90] and/or a logistics one [91] (Shapiro and Heskett. 1985). Unlike management objects, its complexes are used for a long time under the conditions of long-term adaptation to the requirements of consumers (an emerging market segment);

(3) the unique requirements of the end consumer determine the selection and/or formation of adequate components of Chain Management under a specific order: enterprises, relationships, operations and flows that are used in the market for a long time and are able to adapt to the requirements of the end consumer in minimal time;

(4) functionality, including tools, competencies, mechanisms and functions [92], implies the application of adequate and effective procedures in the framework of the management of relationships with staff, consumers and suppliers. Since such procedures are usually standardised, their implementation does not require a significant investment of time, either in terms of their use, or from the perspective of adaptation to the requirements of end consumers. The substance and content of the complexes and, to some extent, the management functionality have already been examined in detail. There, this paper presents deeper research into components and objects, as well as processes and functions (blocks) of Chain Management.

In order to specify the main components, objects and blocks of Chain Management, their relevant attributes need to be highlighted and the relationships between them established. The solution to this problem is shown in Fig. 3.

From the information presented in Fig. 3, the relevant attributes of chains include: the status of the chain over time – statics (fixed time) and dynamics (time interval), as well as the processes performed by the chain; the processing of resources (technology, consolidation/fragmentation) and their transfer/receipt (buying/selling or trade). These qualitative attributes make it possible to form a binary matrix as shown in Fig. 4.

Fig. 4 confirms the view established by specialists that the main components of Chain Management are “enterprises”, “operations” (instead of the component “business processes”), “relationships”, as well as “flow” [93] or “inventory” [59].

“Enterprises” and “relationships” allow us to form “chains” (Fig. 3) and explore them as a complex or minor component of management (Fig. 5).

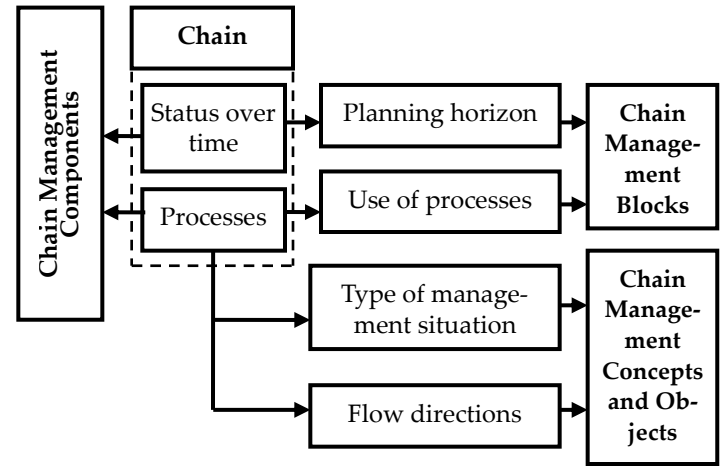


Fig. 3. Relevant attributes of components, objects and blocks of Chain Management

		Chain status over time	
		Statics	Dynamics
Resource processing Processes performed by the chain Transfer/receipt of resources	<b>Enterprise</b> (Ent)	<b>Operations</b> (Op)	
	<b>Relationships</b> (Rel)	<b>Flow (Fl) or Inventory (Inv)</b>	

Fig. 4. Classification of Chain Management Components

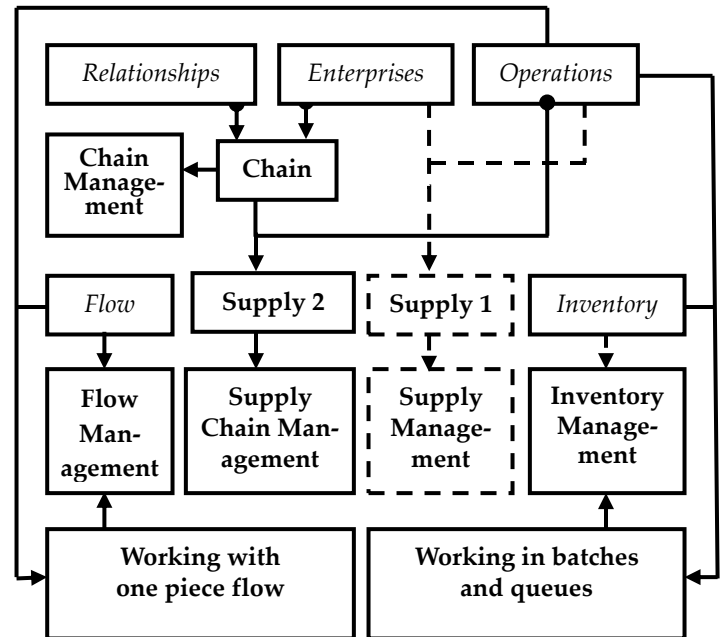


Fig. 5. Components and principal types of Chain Management

The components of Chain Management determine its principal types:

(1) "operations" and "inventory" form the chains oriented to work "in batches and queues" [94]; "operations" and "flow" form chains oriented to work with one piece flow [95];

(2) "supply" as a complex or minor component of management can be formed into two modifications: by the components "enterprise" and "operations", if supply is carried out by an enterprise (dotted lines, Fig. 5); and by "chains" and "operations", if supply is carried out by several enterprises (solid lines, fig. 5); (3) "supply" provided by an enterprise implies "Supply Management"; "supply" through the chain designates "Supply Chain Management";

(4) orientation of an enterprise and/or a chain to "inventory" suggests "Inventory Management"; enterprise and/or chain orientation to "flow" entails "Flow Management" (or Logistics);

(5) "Supply Management" and "Supply Chain Management" can be oriented either towards "Inventory Management" or to "Flow Management". Note that at present the prevailing view is that "SCM cannot exist without Logistics" [96], i.e. without Flow Management.

### 5 CLASSIFICATION OF BASIC CHAIN MANAGEMENT CONCEPTS AND THEIR OBJECTS

To this end, the following relevant attributes as presented in Fig. 3 can be usefully indicated: the direction of the flow of resources – "downstream" (from the supplier) and "upstream" (from the consumer); and the type of management situation – standard (typical) and non-standard (non-typical). The joint use of these attributes allows for the development of the binary matrix shown in Fig. 6.

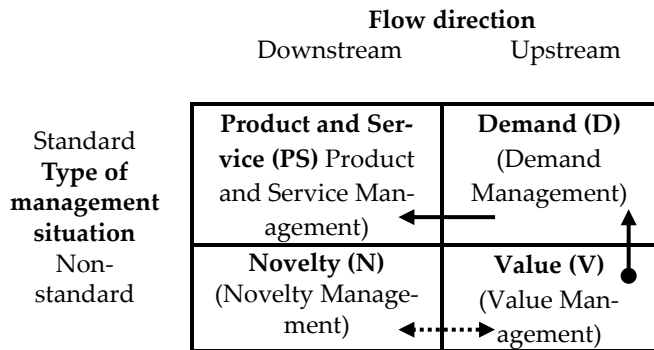


Fig. 6. Classification of basic Chain Management concepts and their objects

Fig. 6 suggests the following conclusions. An enterprise as part of a chain can implement four options for management concepts: "Value (Chain)<sup>5</sup> Management"; "Demand (Chain) Management"; "Product and Service (Chain) Management"; and "Novelty (Chain) Management" or "Innovation (Chain) Management". Accordingly, in this case the management objects are: "value"; "demand"; "product and service"; and

"novelty". The arrows in Fig. 6 show the sequence of transformation of these objects as discussed in the bibliographic review.

The concepts of Chain Management (Fig. 6) are interconnected at various stages of eliminating the deficiency of something (creating, ... and delivering value). At the same time, consumer value is created independently or with the help of novelties offered by suppliers. This appears in two main forms: at the initial stage as a prototype; and at the final stage as feelings and impressions of the consumed products and/or services.

The information presented in Fig. 4 and 6, allows for the establishment of the relationship between objects and components of Chain Management (table 1).

Table 1 Relationships between objects and components of Chain Management

Management components	Management objects				Type of Management
	Value	Demand	Novelty	Product/ service	
Inventory	In-V	In-D	In-N	In-PS	Inventory Management
	Values inventory	Demands inventory	Novelties inventory	Products inventory	
Flow	Fl-V	Fl-D	Fl-N	Fl-PS	Flow Management
	Values flow	Demands flow	Novelties flow	Products/services flow	
Operation	Op-V	Op-D	Op-N	Op-PS	Operation Management
	Values operation	Demands operation	Novelties operation	Products/services operation	
Enterprise	En-V	En-D	En-N	En-PS	Enterprise Management
	Enterprise, managing by values	Enterprise, managing by demands	Enterprise, managing by novelties	Enterprise, managing by products/services	
Relationship	Rl-V	Rl-D	Rl-N	Rl-PS	Relationship Management
	Relationships about values	Relationships about demands	Relationships about novelties	Relationships about products/services	
Type of Management	Value Management	Demand Management	Novelty Management	Product / service Management	

Table 1 suggests that there are twenty unified management areas which provide a preliminary understanding of the structure of the Chain Management concept.

### 6 THE USE OF THE TERM "SUPPLY" IN CHAIN MANAGEMENT: PROBLEM AND SOLUTION

The above material identifies the problem with the use of the term "supply". In Fig. 4 the term "supply" is not shown, i.e., it does not refer to the main components of Chain Management. To clarify the place and role of the term "supply" in Chain Management, refer to Fig. 7.

If chain 1-2-3 is selected as the object of management which includes three enterprises and the relationships between them,

<sup>5</sup> Author's note.

and designate Enterprise 2 as the focus enterprise, then in relation to this enterprise, Chain 1-2-3 will consist of two chains: Purchase Chain 1-2 and Supply Chain 2-3.

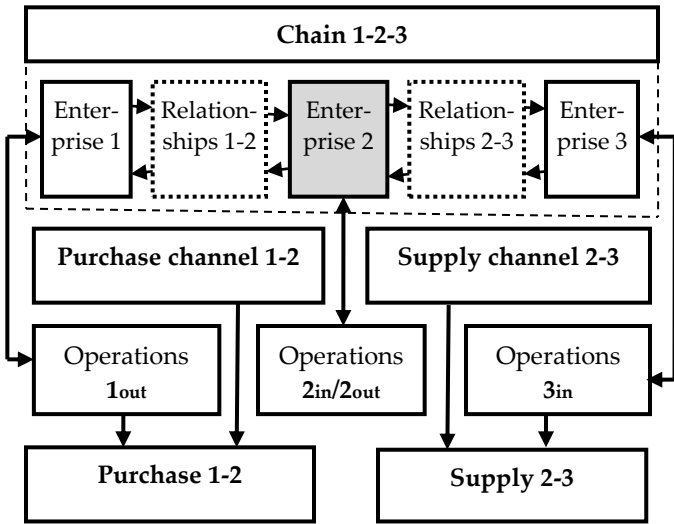


Fig. 7. The structure of management components of focus Enterprise 2

If we consider Purchase Chain 1-2 with operations performed by Enterprises 1 (at the output) and 2 (at the input), then in terms of the focus enterprise, we can talk about Purchase 1-2. If we consider Supply Chain 2-3 with operations performed by Enterprises 2 (at the output) and 3 (at the input), then we can talk about Supply 2-3. These conclusions are due to the fact that focus Enterprise 2, when interacting with the supplier (Enterprise 1), acquires resources from it. When interacting with its consumer (Enterprise 3), on the contrary, Enterprise 2 supplies it with resources. This means that there are at least two cross-functional barriers in Chain 1-2-3. They are formed on the basis of conflicts of interest between Enterprises 1 and 2 and Enterprises 2 and 3. This is most probably why “some authors do not differentiate purchasing and supply management but use it synonymously” ([47], [97]). The above cross-functional barriers can be eliminated through the “relationship” component (Fig. 4), although not entirely.

However, the term “supply” can be used when there is a need to affect several different Chain Management objects (Fig. 6) at the same time. Therefore, the term “Supply Chain Management” can mean that the supply includes combinations of prototypes of values, novelties, demands, and products and/or services. In this regard, the supply is performed towards the consumer (recipient) of these objects, without providing for their purchase or refusal on his part. This assumption allows us to argue that attempts to combine supply chains with value chains or demand chains are theoretically unjustified, while at the same time, the combination of value chains and demand chains leads to the formation of their supply chains. Note, for example, that due to the use of the term “supply”, the phrase “supply chain management for products and/or services” contains an element of tautology. Thus, the term “supply” is a complex or minor object of Chain Man-

agement, broader in meaning than Management objects shown in Fig. 6.

In theory, the term “supply” should really be replaced gradually with the term “flow” (Table 1). “Flow” is formed from objects (prototypes of values, demands, novelties, products and/or services) and is transformed into a “flow” of real values of end consumers. It is extremely difficult to imagine how the “supply” of products and/or services (?)<sup>6</sup> is transformed into supply of values, since values are not just acquired, but are perceived or rejected, including in the form of a flow. The term “flow” can be used in broader combinations than the term “supply”. This refers to an additional combination of the term “flow” with the components of Chain Management (Fig. 4). It seems reasonable to consider flows of operations, flows of relationships and even flows of enterprises when the representatives of various enterprises are sequentially moving towards a fixed object of Chain Management (for example, towards a product, in particular, a house under construction), in order to change or maintain its quantitative parameters and quality characteristics. The flow has starting, intermediate and end points (*enterprises*) and moves when the corresponding *operations* are performed along the agreed path in accordance with the agreement reached (*relationships*<sup>7</sup>). In addition, flow, in contrast to supply, is focused on eliminating cross-functional barriers in chains, thereby reducing the lost profit of their parts [98].

## 7 DEFINITION OF THE LIST AND CONTENT OF THE CHAIN MANAGEMENT BLOCKS

Bibliographic research shows the area of identifying the functions and processes of Chain Management is sufficiently well developed. Nevertheless, in order to substantiate the structure of the Chain Management concept, the list and content of its basic processes and functions that ensure the digitalisation of Chain Management need to be defined. For this purpose, the relevant attributes are used (Fig. 8).

These attributes were selected according to the following grounds: value for the end consumer (the initial object of management); the external environment of the chain and its enterprises (factors of threats and opportunities); as well as the Chain Management itself (impact on management components and objects).

The main Chain Management blocks corresponding to its updated content, can be obtained using the following relevant attributes (Fig. 8): implementation of processes at the enterprise; production (service) and management apparatus and planning horizon of the enterprise; operational and strategic. The combined use of these attributes forms a binary matrix and justifies four blocks of Chain Management: functional, administrative, economic and organisational (Fig. 9).

In order to determine the processes of the functional block of Chain Management, the following relevant attributes can be used (Fig. 8): the task of the process of the functional block – creation and maintenance of value; and the form (result) of the value created for the consumer: product and service. As a re-

<sup>6</sup> Author's note.

<sup>7</sup> Italics indicate the author's note.

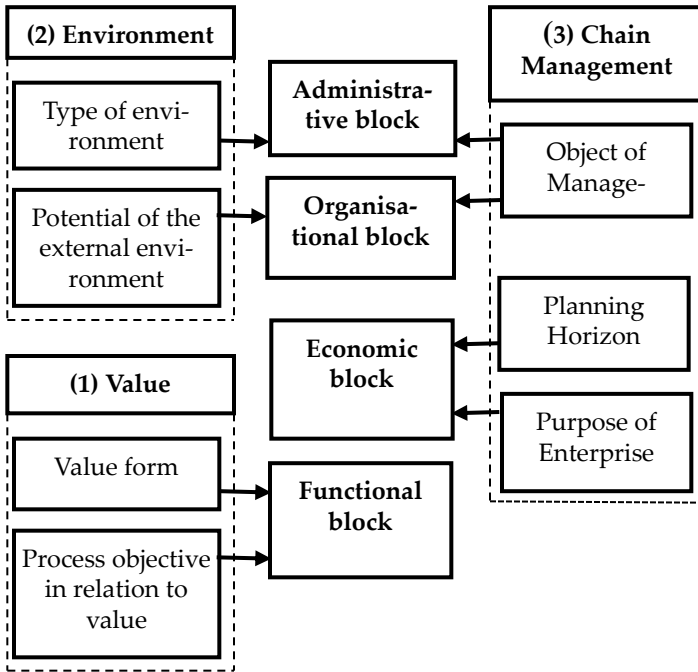


Fig. 8. Relevant attributes of Chain Management blocks

Areas of processes implemented at the enterprise	
Operational	Management apparatus
Enterprise planning horizon	
Strategic	
Production (service)	
Functional block (F)	Administrative block (A)
Economic block (E)	Organisational block (Or)

Fig. 9. Classification of Chain Management blocks

Task of Functional Block Process	
Value creation	Value maintenance
Product Form (result) of created value	
Service	
Technological management F (Tch)	Trade management F (Tr)
Logistical management F (L)	Personnel Management F (Ps)

Fig. 10. Classification of Chain Management functional block processes

sult of applying these attributes, the following types of processes of the functional block can be distinguished: technological management; logistical management; trade management and personnel management (Fig. 10). It is worth remembering, that logistical management includes operations for managing transport, warehousing, inventory, etc. Logistical management

(CSCMP. 2013) is a part of Supplies Chain Management distinguished from Logistics [96], which is aimed at Flow Management. In order to determine the processes of the administrative block of Chain Management, the following relevant attributes can be used (Fig. 8): potential of the enterprise's external environment – opportunities and threats; and the object of management impact – information and personnel. When applied, the following types of administrative block processes can be distinguished: knowledge management; risk management; communication management; and conflict management (Fig. 11).

Potential of external environment of the enterprise	
Opportunities	Threats
Information	
Object of management impact	
Personnel	
Knowledge Management A (K)	Risk Management A (R)
Communications Management A (Cm)	Conflict Management A (Cf)

Fig. 11. Classification of processes of Chain Management administrative block

In order to determine the processes of Chain Management economic block, the following relevant attributes can be used (Fig. 8): the planning horizon of the enterprise's activities – operational and strategic; and the purposes of the enterprise – earning profit and ensuring survival [99]. When applied, the following types of processes of the economic block can be distinguished: cost management; price management; capital management; and sustainability management (Fig. 12).

Activity planning horizon	
Operational	Strategic
Profit	
Purposes of Enterprise	
Survivability	
Cost Management E (C)	Price Management E (P)
Capital Management E (Cp)	Sustainability Management E (Ss)

Fig. 12. Classification of the economic block processes of Chain Management

In order to determine the processes of Chain Management organisational block, the following relevant attributes can be used (Fig. 8): type of the enterprise's environment – internal and external; and object of management impact – information and personnel. When applied, the following types of processes of the organisational block can be distinguished: insourcing; outsourcing; organisational culture; and consulting (Fig. 13).

The processes presented in Fig. 10-13 have different content depending on the types of components (Fig. 4) and objects (Fig. 6) of Chain Management. They must be coordinated in Chain Management and must prevent or eliminate cross-functional barriers, ensure the smooth movement of material, financial, informational flows and other resources. They must also create the prerequisites for developing the concept of



Chain Management, taking into account the concept of Integrated Chain Management, focused on decreasing the burden on the environment within the framework of sustainable human development [49]. The information presented in Fig. 4, 6 and 9, is the basis for structuring the concept of Chain Management.

- through "areas", for example, "Flow Management" (Fig. 2);
- through "strings", for example, "Flow Sustainability Management" (Fig. 2 and 12);
- and through "points", for example, "Management of the Value Flows Sustainability" (Fig. 2, 6 and 12).

Similarly, other "points", "strings" and "areas" of Chain Management can be selected for ease of digitisation and processing by means of computer software.

In the course of the study, the relationships between the "points" are established. "Points" form "strings" which are collected in the "areas" to create "a cube". This then gives a holistic view of the structure of the Chain Management concept. The structure of Chain Management is complex, but at the same time it must be flexible and adjustable to changes in the external environment. This aspect assumes taking into account the stages of development of both the concept as a whole and its parts – components, objects and blocks, including the stages of design, formation, application and optimisation. It is very difficult to develop a definition of the term "Chain Management". On the one hand, the term should be based on the already created definitions of its terminological units, and, on the other hand, should considerate its own specifics, which is the goal of further research.

	Type of Enterprise Environment	
	Internal	External
Information	Insourcing O (I)	Outsourcing O (O)
Object of management impact	Organisational culture O (OC)	Consulting O (Con)
Personnel		

Fig. 13. Classification of the organisational block processes of Chain Management

### 8 STRUCTURING THE CONCEPT OF CHAIN MANAGEMENT

The structure of the Chain Management concept with emphasis on management blocks is shown in Fig. 14.

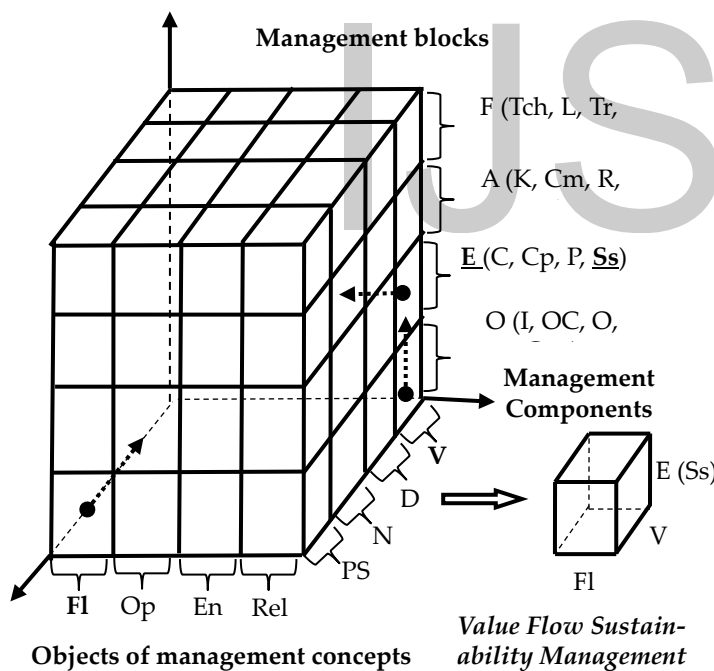


Fig. 14. Structure of the Chain Management Concept

The combined application of components (Fig. 4), objects (Fig. 6) and blocks (Fig. 9) of Chain Management forms "a cube" – a dimensional 4x4x4 matrix, including 64 parts of the Chain Management concept (or its 256 variants based on the information in Fig. 10-13). Clarification and supplementation of the content of this concept can be carried out in the following way:

### 9 Findings

Modern management concepts consider chains as the basis for improving the necessary impacts on values, demands, products and/or services, as well as novelties. Despite the differences in these objects, they are created, improved, and transformed based on components such as: enterprises, relationships, operations, flows, and/or inventory. Based on this, objective prerequisites are created for the formation of the structure of the concept of Chain Management. Currently, this concept is focused on flow management, which should be attributed to the competence of logistics in accordance with the earlier ideas about it. At the same time, it is necessary to distinguish logistics from logistics management, which is one of the processes of chain management.

In the course of the study, the following academically innovative results were obtained: a list of the main components of Chain Management, which are targeted by the impact of management apparatus (Fig. 4); a classification of the basic concepts of Chain Management and, accordingly, objects of these concepts (Fig. 6); a list and content of the main blocks of Chain Management, including its main processes (Fig. 9, 10-13) and the structure of the Chain Management concept (Figure 14).

The results obtained allow us to clarify the relationship between logistics, logistics management and Chain Management. These relationships to some extent contradict the traditional concept of supply chain management and are therefore debatable. In the course of further discussion, it is necessary to develop a general idea of the prospects for the development of the Chain Management of objects, both by their type and in the process of their transformation from one to another in the form of their flows and/or inventories, which will create the necessary prerequisites for creating the new values for the final consumers of products and/or services.

## 10 Conclusion

The research results presented above allow for a definition of the content of the Chain Management components and take them into account when developing practical recommendations for managing values, novelties, demands, products and services in various types of chains. They create prerequisites for improving the terminology of Chain Management which will clarify the duties, responsibilities and functions of performers in the creation, ... and delivery of values to their end consumers. They also facilitate the more effective organisation of Flow Management within the framework of various concepts of Chain Management, while eliminating cross-functional barriers or reducing their negative impact on consumer values. In addition, they improve the management of processes in chains and reduce the lost profit of enterprises and their chains.

Further research is planned in order to clarify and supplement the theory and methodology of Value and Demand Chain Management on the basis of the updated list of components, objects and blocks of Chain Management. Investigation will be carried out into the theoretical aspects, and practical recommendations will be developed for Novelty Management in supply chains, focused on improving the quality of creation, ... and delivery of value to their end consumers. Further study and development will be carried out in the area of Flow Management theory in chains of various types, providing the required sustainability. Finally, the substance and content of the Integrated Chain Management Concept will be defined by optimising its components, objects, processes, as well as the relationships between them.

## References:

- [1] Birnbaum, R. (2000). "The Life Cycle of Academic Management Fads". *Journal of Higher Education*, 71(1), 1–16.
- [2] Potočan, V., Nedelko, Z., Mulej, M. (2012). "Influence of organizational factors on management tools usage in Slovenian organizations". *Engineering Economics*. 23(3), 291-300.
- [3] Oliver, R.K. & Weber, M.D. (1982). "Supply-chain management: Logistics catches up with a strategy", Christopher, M.L. (Ed.), *Logistics: The strategic issues*, Chapman & Hall, London, 63–75.
- [4] Kelly, J. & Male, S. (2006). "Value management", Kelly, J., Morledge, R. & Wilkinson, S. (Eds.), *Best value in construction*, Blackwell Publishing, United Kingdom, 77-99.
- [5] Ericsson, D. (2003). "Supply/Demand chain management: The next frontier for competitiveness", Walters, D. (Ed.), *Global logistics and distribution planning*, Kogan Page, London, 117–135.
- [6] Walters, D. (2006). "Demand chain effectiveness supply chain efficiencies". *Journal of Enterprise Information Management*, 19(3), 246–261.
- [7] Power, D. (2005). "Supply chain management integration and implementation: a literature review". *Supply Chain Management: An International Journal*, 10(4), 252–263.
- [8] Auramo, J., Inkiläinen, A., Kauremaa, J., Kemppainen, K., Kärkkäinen, M., Laukkanen, S., Sarpola, S. & Tanskanen, K. (2008). "The roles of information technology in supply chain management", available at: [https://www.researchgate.net/publication/228906036\\_The\\_roles\\_of\\_information\\_technology\\_in\\_supply\\_chain\\_management](https://www.researchgate.net/publication/228906036_The_roles_of_information_technology_in_supply_chain_management) (accessed 20 November 2020).
- [9] Marinagia, C., Trivellasb, P. & Sakas, D.P. (2014). "The impact of Information Technology on the development of Supply Chain Competitive Advantage", *Procedia - Social and Behavioral Sciences*. 147, 586 – 591.
- [10] Nickerson, J.A., Silverman, B.S. & Zenger, T.R. (2007) „The ‘problem’ of creating and capturing value”. *Strategic Organization*, 5(3), 211–225.
- [11] Gray, R. & Bebbington, J. (2005). "Corporate Sustainability: Accountability and the Pursuit of the Impossible Dream", available at: [https://www.standrews.ac.uk/media/csear/discussion-papers/CSEAR\\_dps-sustain-handcorp.pdf](https://www.standrews.ac.uk/media/csear/discussion-papers/CSEAR_dps-sustain-handcorp.pdf) (accessed 20 November 2020).
- [12] van der Heijden, A., Cramer, J.M. & Driessen, P.P.J. (2012). "Change agent sensemaking for sustainability in a multinational subsidiary", *Journal of Organizational Change Management*, 25(4), 535-559.
- [13] Warfield, J.N. (1973). "Binary Matrices in System Modeling", *Transactions on systems, man, and cybernetics*, 3(5), 441-449.
- [14] Rigby, D. & Bilodeau, B. (2018). *Management Tools & Trends*, Bain & Company, Inc., Boston, available at: [https://www.bain.com/contentassets/f8361c5cd99e4f40bbb83c17d6a91b9/bain\\_brief-management\\_tools\\_and\\_trends.pdf](https://www.bain.com/contentassets/f8361c5cd99e4f40bbb83c17d6a91b9/bain_brief-management_tools_and_trends.pdf) (accessed 20 November 2020).
- [15] Netessine, S. (2007). „Supply Chain Networks“, available at: [https://www.researchgate.net/publication/228383625\\_Supply\\_chain\\_networks/link/00463519f337cccf5a000000/download](https://www.researchgate.net/publication/228383625_Supply_chain_networks/link/00463519f337cccf5a000000/download) (accessed 20 November 2020)
- [16] Lazzarini, S.G., Chaddad, F.R. & Cook, M.L. (2001). "Integrating supply chain and network analysis: the study of netchains", *Journal on chain and network science*, 1(1), 7-22.
- [17] Ayers, J.B. (2006). *Handbook of Supply Chain Management*, 2nd ed., Boca Raton: Auerbach Publications.
- [18] Kaina, R. & Verma, A. (2018). "Logistics Management in Supply Chain – An overview", *Materials Today, Proceedings*, 5, 3811–3816.
- [19] Harland, C.M. (1996). "Supply Chain Management: Relationships, Chains and Networks", *British Journal of Management*, 7 special Issue, 63-80.
- [20] Porter, M.E. (1985). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, The Free Press, New York, NY.
- [21] Ramsey, J. G. (2005). "The real meaning of value in trading relationships", *International Journal of Operations & Production Management*, 25(2), 549–565.
- [22] Selen, W. & Soliman, F. (2002). "Operations in today's demand chain management framework", *Journal of Operation Management*, 20, 667–673.
- [23] Seethamraju, R. (2014). "Enterprise systems and demand chain management: a cross-sectional field study", *Information Technology Management*, 15, 151–161.
- [24] Feller, A., Shunk, D. & Callarman, T. (2006). "Value Chains Versus Supply Chains", *BPNrends*, available at: <https://www.bptrends.com/publicationfiles/03-06-ART-ValueChains-SupplyChains-Feller.pdf> (accessed 20 November 2020)
- [25] Walters, D. & Rainbird, M. (2004). "The demand chain as an integral component of the value chain", *Journal of Consumer Marketing*, 21(7), 465–475.
- [26] Rainbird, M. (2004). "Demand and supply chains: the value catalyst", *International Journal of Physical Distribution and Logistics Management*, 34(3/4), 230–250.
- [27] Santos, J.B. & D'Antone, S. (2014). "Reinventing the wheel? A critical view of demand-chain management", *Industrial Marketing Management*, 43, 1012–1025.

- [28] Singh, P.J. & Power, D. (2009). "The nature and effectiveness of collaboration between firms, their customers and suppliers: a supply chain perspective", *Supply Chain Management: An International Journal*, 14(3), 189-200.
- [29] Thublier, F., Hanby, T. & Shi, Y. (2010). *Value Chain = Supply Chain + Demand Chain: New Approaches to Creating and Capturing Sustainable Value*, Institute for Manufacturing University of Cambridge, Cambridge, CB3 0FS, UK.
- [30] Rangelova, F. & Traykova, M. (2014). "Value Management in Construction Project", paper presented at the First Scientific-Applied Conference with International Participation "Project Management in Construction", 4-5 Dezember, Sofia, Bulgaria, available at: <https://studylib.net/doc/10707158/--4--5-2014> (accessed 20 November 2020).
- [31] APICS (2010). "APICS Dictionary", available at: <http://www.apics.org/apics-for-individuals/publications-and-research/apics-dictionary> (accessed 20 November 2020).
- [32] CSCMP (2013). "CSCMP Supply Chain Management Definitions and Glossary", available at: [https://cscmp.org/CSCMP/Academia/SCM\\_Definitions\\_and\\_Glossary\\_of\\_Terms/CSCMP/Educate/SCM\\_Definitions\\_and\\_Glossary\\_of\\_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921](https://cscmp.org/CSCMP/Academia/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921) (accessed 09 January 2021).
- [33] Croxton, K.L., Lambert, D.M., García-Dastugue, S.J. & Rogers D.S. (2002), "The Demand Management Process", *The International Journal of Logistics Management*, 13(2), 51-66.
- [34] Melo, D.C. & Alcântara, R.L.C. (2011). "A gestão da demanda e cadeias de suprimentos: uma abordagem além da previsão de vendas", *Gestão & Produção*, 18(4), 1-16.
- [35] Madhani, P.M. (2015). "Demand chain management: Enhancing customer lifetime value through integration of marketing and supply chain management", *IUP Journal of Business Strategy*, 12(3), 7-26.
- [36] Khan, S.A.R., Dong, Q.L. & Yu, Z. (2016). "Research on the measuring performance of green supply chain management: In the perspective of China", *International Journal of Engineering Research in Africa*, 27, 167-178.
- [37] Schiele, H. (2019). "Purchasing and Supply Management", Zijm, H., Klumpp, M., Regattieri, A. and Heragu, S. (Eds.), *Operations, Logistics and Supply Chain Management*, Springer International Publishing, Germany, 45-73.
- [38] Gereffi, G. (1994). "The organization of buyer-driven global commodity chains: How U.S. retailers shape overseas production networks", G. Gereffi and M. Korzeniewicz (Eds.), *Commodity Chains and Global Capitalism*. Greenwood Press, Westport, 95-122.
- [39] Martins, C.L. & Pato, M.V. (2019). "Supply chain sustainability: A tertiary literature review", *Journal of Cleaner Production*, 225(10), 995-1016.
- [40] Croxton, K.L., Lambert, D.M., García-Dastugue, S.J. & Rogers D.S. (2002). The Demand Management Process. *The International Journal of Logistics Management*, 13(2), 51-66.
- [41] Becker, H.S. (2003). "The politics of presentation: Goffman and total institutions", *Symbolic Interaction*, 26, 659-669.
- [42] Jüttner, U., Christopher, M. & Baker, S. (2007). "Demand chain management: integrating marketing and supply chain management", *Industrial Marketing Management*, 36(3), 377-392.
- [43] Ericsson, D. (2012). "Demand chain management - The evolution", *ORiON*, 27(1), 45-81.
- [44] Anning, K.S., Okyere, S. & Annan, J. (2013). "Demand chain management model: a tool for stakeholders' value creation", *International Journal of Business and Social Research*, 3(12), 37-47.
- [45] Bustinza, O.F., Parry, G.C. & Vendrell-Herrero, F. (2013). "Supply and demand chain management: the effect of adding services to product offerings", *Supply Chain Management*, 18(6), 618-629.
- [46] Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. & Zacharia, Z.G. (2001). "Defining supply chain management", *Journal of Business Logistics*, 22(2), pp.1-25.
- [47] Leenders, M.R., Fearson, H.E., Flynn, A.E. & Johnson, P.F. (2002). *Purchasing and Supply Management*, McGraw-Hill/Irwin, New York, NJ, USA.
- [48] Bandyopadhyay, P., Chowdhury, J. & Raja Dutta, R. (2012). "Introduction of "Integrated Supply Chain Management" for Manufacturing and logistic domain", *International Journal of Scientific and Research Publications*, 2(12), 1-6.
- [49] Seuring, S. (2004). "Integrated chain management and supply chain management comparative analysis and illustrative cases", *Journal of Cleaner Production*, 12, 1059-1071.
- [50] Seuring, S. (2000). "Integrated chain management and supply chain management—differences and similarities", *Umwelt (VDI)*, 30(6), 30-31.
- [51] Wisner, J., Tan, K.C. & Leong, G.K. (2012). *Principles of Supply Chain Management: A Balanced Approach*, South-Western Cengage Learning, Mason.
- [52] Coyle, J.J., Langley, C.J., Novack, R.A. & Gibson, B.J. (2013). *Supply Chain Management: A Logistics Perspective*. Mason, OH, South-Western Cengage Learning.
- [53] Blackhurst, J., Cantor, D., & O'Donnell, M. (2012). *Sustainable Supply Chains: A Guide for Small - to Medium-sized Manufacturers*, available at: <https://www.hbs.edu/faculty/conferences/2015-strategy-research/Documents/Sustainable%20Supply%20Chains.pdf> (accessed 13 May 2020).
- [54] Christopher, M. (2011). *Logistics & Supply Chain Management*. Pearson Education Limited, Harlow, Edinburgh.
- [55] Christopher, M.L. (1992). *Logistics and Supply Chain Management*. London: Pitman Publishing.
- [56] Waters, D. (2003). *Global Logistics and Distribution Planning—Strategies for Management*, Kogan Page Limited: London.
- [57] Gundlach, G.T., Bolumole, Y.A., Eltantawy, R.A., & Frankel, R. (2006), "The changing landscape of supply chain management, marketing channels of distribution, logistics and purchasing", *Journal of Business & Industrial Marketing*, 21(7), 428-438.
- [58] Rogers, D.S. & Leuschner, R. (2004). "Supply chain management: retrospective and prospective", *Journal of Marketing Theory and Practice*, 12(4), 60-67.
- [59] Goldsby, T. & Martichenko, R. (2005). *Lean six sigma Logistics. Strategic Development to Operational Success*, J. Ross Publishing, Inc., U.S.A.
- [60] AMA. American Marketing Association (2017). *Definition of Marketing*, available at: <https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx> (accessed 20 November 2020).
- [61] Vargo, S.L. & Lusch, R.F. (2008). "Service-dominant logic: Continuing the evolution", *Journal of the Academy of Marketing Science*, 36(1), 1-10.
- [62] Flint, D.J., Larsson, E., Gammelgaard B. & Mentzer, J.T. (2005). "Logistics innovation: a customer value oriented social process", *Journal of Business Logistics*, 26, 113-147.
- [63] Busse, C. & Wallenburg, C.M. (2011). "Innovation management of logistics service providers: foundations, review, and research agenda",

*International Journal of Physical Distribution and Logistics Management*, 41, 187–218.

[64] Bartels, J., & Reinders, M.J. (2011). "Consumer innovativeness and its correlates: A propositional inventory for future research", *Journal of Business Research*, 64, 601–609.

[65] Taheri, B., Coelho, F.J., Sousa, C.M.P. & Evanschitzky, H. (2017). "Mood regulation, customer participation and customer value creation in hospitality services", *International Journal of Contemporary Hospitality Management*, 29(12), 3063–3081.

[66] Woodruff, R.B. (1997). "Customer value: The next source for competitive advantage", *Journal of the Academy of Marketing Science*, 25(2), 139–153.

[67] Marandi, E., Little, E. & Hughes, T. (2010). "Innovation and the children of the revolution: Facebook and value co-creation", *Marketing Review*, 10(2), 169–183.

[68] Zsidsisin, G.A., Panelli, A. & Upton, R. (2000). "Purchasing organization involvement in risk assessments, contingency plans, and risk management: an exploratory study", *Supply Chain Management*, 5(4), 187–198.

[69] Hammer, M. & Champy, J. (1993). *Reengineering the Corporation. A Manifesto for Business Revolution*, Harper Business, New York, NY.

[70] Cooper, M.C., Lambert, D.M. & Pagh, J.D. (1997). "Supply Chain Management: More than a New Name for Logistics", *The International Journal of Logistics Management*, 8(1), 1–14.

[71] Croxton, K.L., García-Dastugue, S.J. & Lambert, D.M. (2001). "The Supply Chain Management Processes", *The International Journal of Logistics Management*, 12(2), 13–36.

[72] Sanjay, J. & Eric E. (2005), "Evaluation of supply chain business process improvements using simulation", *International Journal of Simulation and Process Modelling*, 1(3/4), 138–149.

[73] Krajewski, L.J., Ritzman, L.P. & Malhotra, M.K. (2012). *Operations Management. Processes and supply chains*, Pearson, Boston etc.

[74] Tyapukhin, A.P. (2012). *Logistics*, Yurayt: Moscow. Russian Federation (in Russian).

[75] Saroha, P. & Yadav, S.K.S. (2013). "Supply Chain Management: A Tool of Business Process Integration", *International Multidisciplinary e-Journal*, 2(11), 32–55.

[76] APICS (2014). *Design Chain Operations Reference model DCOR. Version 1.0*, available at: <http://www.apics.org/docs/default-source/scc-non-research/dcor-framework-a4.pdf?sfvrsn=2> (accessed 20 November 2020).

[77] Crandall, R.E., Crandall, W.R. & Chen, C.C. (2015). *Principles of Supply Chain Management*, CRC Press. Taylor & Francis Group, USA.

[78] Basodan, H. (2016). "Process View of a Supply Chain", *International Journal of Scientific & Engineering Research*, 7(4), 663–668.

[79] APICS (2017), *Supply Chain Operations Reference Model SCOR. Version 12.0*, available at: <http://www.apics.org/docs/default-source/scor-training/scor-v12-0-framework-introduction.pdf?sfvrsn=2> (accessed 20 November 2020).

[80] Creswell, J.W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches*, SAGE Publications, Inc., USA.

[81] Hameed, H. (2020). "Quantitative and qualitative research methods: Considerations and issues in qualitative research", preprint, available at: [https://www.researchgate.net/publication/342491265\\_Quantitative\\_and\\_qualitative\\_research\\_methods\\_Considerations\\_and\\_issues\\_in\\_qualitative\\_research/link/5ef6c13b92851c52d60064b5/download](https://www.researchgate.net/publication/342491265_Quantitative_and_qualitative_research_methods_Considerations_and_issues_in_qualitative_research/link/5ef6c13b92851c52d60064b5/download) (accessed 09 January 2021).

[82] Bailey, K.D. (1994). *Typologies and taxonomies: An introduction to*

*classification techniques*, Sage Publications, Inc., London.

[83] Ansoff, H.I. (1957). "Strategies for Diversification", *Harvard Business Review*, 35, 113–124.

[84] Abell, D.F. (1993). *Managing with Dual Strategies: Mastering the Present – Preempting the Future*, Simon and Schuster, New York, NY.

[85] Hitchens, R.E. & Robinson, S.J. (1978). "The Directional Policy Matrix: Tool for Strategic Planning", *Wade Long Range Planning*, 11, 8–15.

[86] Patel, P. & Younger, M. (1978). "A frame of reference for strategy development", *Long Range Planning*, 11(2), 6–12.

[87] Rasiel, E.M. & Friga, E.M. (2001). *The McKinsey Mind. Understanding and implementing the Problem-Solving Tools and Management Techniques on the World's Top Strategic Consulting Firm*. 1st Edition, McGraw-Hill: New York etc.

[88] Stern, C.W. & Deimler, M.S. (2006). *Boston Consulting Group on Strategy*. Wiley & Sons, Inc., Hoboken, New Jersey.

[89] Wolters, T., James, P. & Bouman, M. (1997). "Stepping-stones for integrated chain management in the firm", *Business Strategy and the Environment*, 6, 121–132.

[90] Kotler, P. (1967). *Marketing Management: Analysis, Planning, and Control*, Prentice-Hall, NJ, USA.

[91] Shapiro, R.D. & Heskett, J.L. (1985). *Logistics Strategy: Cases and Concepts*, West Publishing, St Paul, Minnesota.

[92] Tyapukhin A.P., Kolovrtnova M.Yu. & Tarasenko E.A. (2019). "Supply chain management system: essence and methodical approach to creating", *The Eurasian Scientific Journal*, 2(11), available at: <https://esj.today/PDF/47ECVN219.pdf> (accessed 20 November 2020) (in Russian).

[93] Forrester, J.W. (1958). "Industrial dynamics: A major breakthrough for decision makers", *Harvard Business Review*, 38, 37–66.

[94] Xia, C.H., Michailidis, G., Bambos, N. & Glynn, P.W. (2002). "Optimal control of parallel queues with batch service", *Probability in the Engineering and Informational Sciences*, 16, 289–307.

[95] Womack, J. & Jones, D.T. (1996). *Lean Thinking: Banish Waste and Create Wealth for Your Corporation*, Simon and Schuster, New York, NY.

[96] Zinn, W. & Goldsby, T.J. (2014). "Logistics Professional Identity: Strengthening the Discipline as Galaxies Collide", *Journal of Business Logistics*, 35, 23–28.

[97] Lysons, K. & Gillingham, M. (2003). *Purchasing and Supply Chain Management*, Financial Times Prentice Hall, Harlow, UK et al.

[98] Bala, K. (2014). "Supply Chain Management: some Issues and Challenges – A Review", *International Journal of Current Engineering and Technology*, 4(2), 946–953.

[99] Drucker, P. (1958). "Business objectives and survival needs: notes on a discipline of business enterprise", *The Journal of Business*, 31(2), 81–90.