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## The Etiology of Formation and Reacting Way to a Change in the Supply Chain

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**Abstract:**

**Purpose:** The aim of this article was to determine the etiological factors of changes occurring in supply chains and to diagnose the reactions to these factors.

**Design/Methodology/Approach:** The study was carried out for separated 19 categories grouping etiological factors. To structure the data in the process of building the categories, a systematic diagram and a code distribution analysis diagram were used. In the next part, when creating the ASPM method, some assumptions of the Scrum and DSDM method were used. Due to the subject matter of the conducted research, it was decided to apply a case study supplemented by a structured interview. The sample consisted of companies conducting business in international supply chains and cooperation with logistics operators, including 4PL.

**Findings:** The results show that the development should be towards a flexible organization. The process of flexible adaptation of an organization that is compound, i.e., the supply chain, to changes of an exo- and endogenous nature requires the operationalization of the entire concept based on the experience in project management, especially due to the non-linearity of emerging interactions within the framework of the change taking place.

**Practical Implications:** Etiology, by focusing on the background of a given phenomenon, fact or process, by isolating etiological factors that cause them, allows us to discover the causes of the existing state of affairs. This applies to virtually every discipline and area of life.

**Originality/Value:** The study identified factors of changes occurring in supply chains and to diagnose the reactions to these factors.

**Keywords:** Change management, project management, flexible organization, agile methodology.

**JEL codes:** M2, M20.

**Paper Type:** Research study.

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## **1. Introduction**

The increase in the dynamics of changes in the environment and the evolution of the organization's capabilities make it necessary to consider it in the context of the network of which it is an important node or the supply chain of which it is a link (Teece, 2007). The path of evolution from a static to a dynamic organization in the light of literature analysis is usually presented on an example of a single autonomous enterprise and its bilateral relations with the nearest nodes of the logistics network. Less frequently, issues related to a wider aspect of the organization considered as a link in the supply chain are addressed, while changes of an exo- and endogenous nature, providing a competitive advantage, cover the entire supply chain. This chain also should not be treated as a simple cooperative relationship or a system consisting of elements and relationships, but as an indeterministic dynamic system in which even the slightest change, according to the concepts of Lorenz and Poincaré, has a whole series of consequences, sometimes disproportionate to the scale of this change (Jakimowicz, 2003).

The aim of this article was to determine the etiological factors of changes in supply chains and to diagnose the responses occurring. The subject of the research was therefore etiology (Greek *aitía* - cause and *lógos* - word) of the phenomenon of responding to change, while the complex organization of the supply chain was the subject of the consideration. According to the authors, this allowed for the observation of multiple effects of individual elements of this organization on each other. Preliminary studies have shown that the strength and intensity of mutual interactions are not of a linear but a probabilistic nature, which should consider both the increase in intensity and decrease in these interactions, which led the authors to try to indicate a set of causes that make up this phenomenon. Etiology, by focusing on the background of a given phenomenon, fact, or process, by isolating etiological factors that cause them, allows us to discover the causes of the existing situation. This applies to virtually every discipline and area of life.

The study was carried out for separated 19 categories grouping etiological factors. The etiological factors, i.e., the factors causing a given situation, fact, or process, are grouped into:

- factors related to the structure of complex international supply chains (endogenous),
- exogenous factors causing the changes,
- factors related to the way of approaching the process of change absorption and reaction to change (mixed).

The assumed scope required empirical research. Due to the subject matter of the conducted research, it was decided to apply a case study supplemented by a structured interview. The sample consisted of companies that met two conditions, conducting business in international supply chains and cooperation with logistics operators, including 4PL. The collected data were coded using preliminary coding, simultaneous coding, and structural coding. The number of codes in the study is the result of coding

of repeated idiomatic expressions. Repetition of indications in the statements of the surveyed managers resulted in multiplication of indications within individual codes. Subsequently, the codes obtained were categorized into these 19 categories, formulating conclusions for 5 areas and 3 groups of etiological factors. The research was again supplemented with interviews within sample saturation. Due to the adopted method of data acquisition and analysis, iterative and layered data processing was applied. The research was preceded by a literature review.

## **2. The Essence of Supply Chain Changes - Literature Review**

The dynamic nature of the supply chain requires an appropriate relationship between service level and investment in resources (Ettl, Feigin, Lin, and Yao, 2000). A well-functioning supply chain can provide a competitive advantage through better organization and efficiency (Schary and Skjott-Larsen, 2002). Innovations, faster introduction of new products and services to the market, shortening the lead time are further factors contributing to increased reliability and customer service level (Christopher and Peck, 2005). Thus, the appropriate configuration and management of the supply chain is a dynamic ability of an organization (Teece) to capture opportunities and threats and increase competitiveness by improving, combining, protecting, and reconfiguring the company's tangible and intangible assets.

Competitive advantage is achieved by using these resources faster and better than the competitors (Eisenhardt and Martin, 2000), with a more complex level of competition based on both the resource approach (Pierścioneck, 2007) and the positional approach (Świerczek, 2012). The first approach of an endogenous nature, assumes that ensuring competitive advantage is a result of an appropriate configuration of the company's resources, while the second, often perceived as a developed variant of the planning approach, is of an exogenous nature and assumes that competitive advantage is conditioned by the type and intensity of impact of factors outside the organization (Porter, 1994; Zakrzewska-Bielawska, 2014). However, resource constraints, structure, and specialization, as well as the strength of competitive supply chains in individual sectors (Bozarth and Handfield, 2007) and the need for their continuous reconfiguration (De Witt and Meyer, 2007) must be considered. The reconfiguration process, in turn, requires an in-depth analysis of macro-environmental factors (Kawa, 2009; Kramarz, 2008; Tang, Yung, and Liu, 2007).

To survive, organizations need to be knowledge-based, capable of self-transformation, and flexible and susceptible to the changes which they should create and not just react to (Druker, 1992). Increasingly, the organizational structures of market leading companies are organic (O'Reilly III and Tushman, 2004) or creative-matrix (Jermakowicz, 1979; Baruk, 2006), combining both traditional and project (temporary) structure elements. The combination of research, development, and production activities in one organizational structure within teams creative, design and production team, creates an organic, team-based structure, grouping together

significant intellectual potential (Damanpour and Aravind, 2012; Colarelli, O'Connor, and Ayers, 2005) that ensures the company's market success (Jasiński, 2006). More and more often, objectives and ways of achieving them are defined on an ad-hoc basis, depending on market challenges and changes in the environment, so flexibility is becoming the basic principle of operation (Bakker, 2010; Modig, 2007), as an important feature of both project and temporary organization.

For many authors, the terms temporary organization and project organization are the same (Modig, 2007; Engwall and Svensson, 2004; de Waard and Kramer, 2008; Cattani, Ferriani, Frederiksen, and Täube, 2011). Others define a project as a temporary organization set up to achieve a set objective, which is to create a non-routine process or product (Packendorff, 1995) or to deliver one or more business products as specified in the reasons for the project implementation (Bradley, 1999; Turner and Muller, 2004). Research shows a close relationship and even identity between the two concepts (Bechky, 2006; Kellogg, Orlikowski, and Yates, 2006).

However, the project and the temporary organization have only some common features, but differ in certain areas (Winch, 2013) in terms of equipment with certain resources to make a positive change (Turner and Keegan, 2001). Temporary organization is defined by four dimensions, time, task, team, and rapid change (Sydow and Braun, 2017). The perception of time is an important factor distinguishing a temporary organization from traditional ones. In traditional organizations, special emphasis is placed on the linearity of development, progression (Modig 2007; Bakken, Holt, and Zundel, 2013; Holt and Johnsen, 2019), while in temporary organizations there is a break and continuation of a different timeline (Bakker, DeFillippi, Schwab, and Sydow, 2016; Crossan, Pina, Cunha, Vera, and Cunha 2005).

The temporary organization is a task-based organization (Rodney, Turner, and Müller, 2003; Bechky, 2006) and allows both routine and non-routine tasks (Ding, Li, Zhang, Sheng, and Wang, 2017) to be carried out by a highly qualified team (Akgün, Byrne, Lynn, and Keskin, 2007). It can be set up to make a change in a parent organization that is stagnant in terms of e.g., organizational culture, ideology of behavior, instruments, etc., (Vakola and Nikolaou, 2005) or technology (Marion and Uhl-Bien, 2001). Changes resulting from operations of a temporary organization can be radical or iterative depending on the tasks of the temporary organization and its role in the parent organization (Lindner and Wald, 2011). The project organization is a form of temporary organization, as after the realization of the assumed task it discontinues (meeting the criterion of temporality). This type of approach is consistent with the concept of project organization contained in PMBOK as well as the concepts of other authors (Jacobsson, Lundin, and Söderholm, 2015; Sydow, Lindkvist, and DeFillippi, 2004). Also authors such as Bryman, Bresnen, Beardsworth, Ford, and Keil (1987) confirm in their literature research the strong link between the two concepts of organization - project and temporary organization.

Traditional project management methodologies, also known as sequential and cascade methods, are based on the project life cycle, which identifies a sequence of stages that must be implemented in each project (Kozioł-Nadolna, 2014). The following methodologies are particularly popular among traditional approaches, PRINCE2 (Projects in Controlled Environments), PMI (Project Management Institute esp. PMBOK - Project Management Book of Knowledge), PCM (Project Cycle Management), (Lampel and Pushkar, 2004; Andersen and Jessen S.A., 2003; Cooke-Davies, 2004; Borowska, 2012). Problems arising in the implementation of projects with traditional methodologies have led entrepreneurs to look for alternative project implementation methodologies (Elssamadisy, 2010). The source of alternative solutions were agile software design and implementation process management practices (AGILE) used in IT projects, such as Extreme Programming - XPM, Scrum, Dynamic Systems Development Method - DSDM, Adaptive Software Development, Crystal Clear, Feature Driven Development, Pragmatic Programming. The basis for creating agile methodologies is the so-called Agile Manifesto (<http://agilemanifesto.org/principles.html>, 2011). In principle, these methodologies focus on an iterative way of implementing projects (Iacocca Institute, 1991; Hormozi, 2001; McCullen and Towill, 2001), where the starting point is the company's ability to react flexibly to change (Maskell, 2001; Brown and Bessant, 2003).

### **3. Research Methodology and Research Process**

The methods most frequently used in the interpretative approach are qualitative methods (Burrell and Morgan, 2017), which are idiographic in nature. In their case, close contact of the researcher, open to all available information related to the studied organization and the surrounding reality, is possible. According to the assumption of the alleged instability and relativity of the organization's reality, there is no single "objective" reality that can be examined and described. Because the existence of alternative processes, phenomena and behaviors was assumed in the explored areas (Mc Guiggan, Lee, Denize, and Sharma, 2008) - the case study method was used (Cassella and Symon, 2009), supplemented by unstructured interviews (Uzzie, 1997), in the form of open questions (Charmaz, 2009). Systematically collected empirical data, modified, and reformulated, verified and supplemented (Konecki, 2000), have become the basis for theoretical induction (Glaser, 1978).

The selection of the sample was targeted (Brown and Einserhert, 1998) and in line with the purpose of the investigation (Mintzberg, 1979), the principle being that companies with at least one supply chain operated by a logistics operator are represented. For methodological as well as pragmatic reasons, it was found that the number of cases studied should range from 4 to 10 (Eisenhardt, 1989). Samples of more than 10 cases rarely allow for additional content to be brought to the study that would justify the additional effort incurred to investigate them (Czakov, 2006). The process of data collection and interpretation required the analysis of partial conclusions and modifications at each stage. The whole research process lasted

continuously from 2011 to 2017. The schedule included the following phases 2011-2014 - establishing cooperation with 4PL logistics operators, selecting companies for research; 2014-2016 - acquiring further data, preliminary research conclusions, their verification, formulating further research problems and questions, 2016-2017 - conducting interviews in companies, collecting materials, creating notes, conducting interviews, their transcription, analysis, data encoding, categorization.

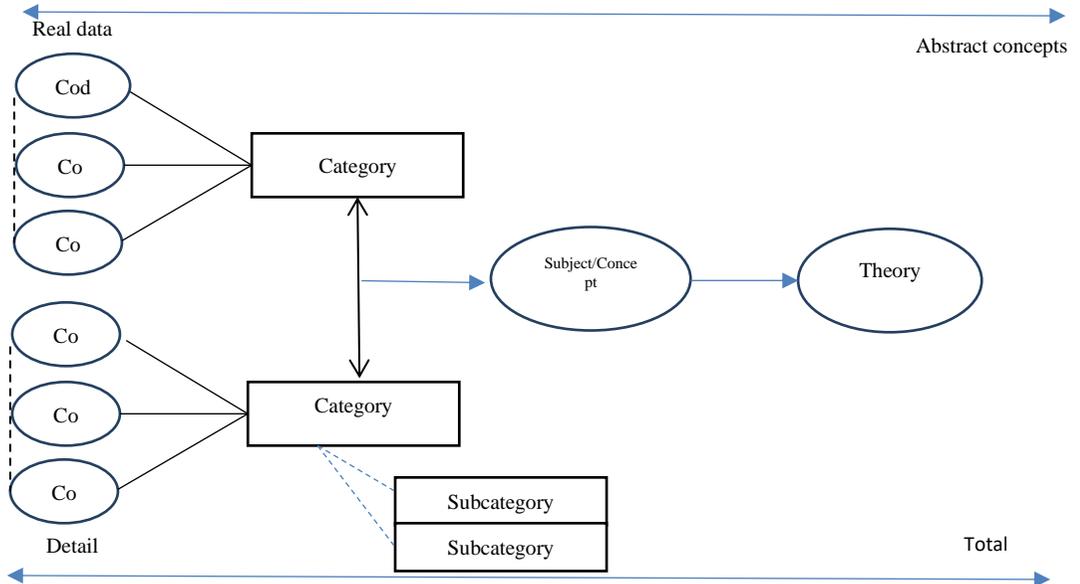
Seven companies finally participated in the research, five of which outsource their supply chains using 4PL logistics operators. A major constraint was to find companies with experience in outsourcing entire supply chains - where the operator not only performs individual logistics functions, but also integrates the entire supply chain and fully performs regulatory activities in the supply chain. The number of companies carrying out this type of outsourcing is also limited due to the number of 4PL operators carrying out this type of services and not only declaring their provision. All studied entities are large companies with more than 250 employees. The scale of their activity is pan-European or global, with the head office (owner) located outside Poland in some cases. In all cases, the supply chains are stretched globally, and a large part of their suppliers is located outside Poland. The studied companies represented the petrochemical, clothing, trade, food, automotive, and household appliances and electronics industries. The surveyed managers represented mainly the logistics and supply chain management departments, but also accounting and R&D.

The direct effect of the interviews are recordings and their transcriptions, as well as notes from observations made during the visits, supplemented by internal documents of the companies. The interviews were conducted with high-level managers (board members) as well as managers responsible for logistics and supply chain management. As part of the research, 18 managers representing 7 companies were interviewed. When selecting the research sample, the following proportions were attempted: at least one manager representing the management and at least one manager representing the area of logistics or supply chain management. In the case of 5 companies there is a full supply chain outsourcing, in other cases individual logistics activities are outsourced - transport, storage and warehouse operations. In all cases, the companies required confidentiality clauses for the information that were obtained. The statements recorded during the interviews were coded using three coding techniques, preliminary, simultaneous, and structural (Saldaña, 2009) according to the model shown in Figure 1.

To structure the data in the process of building the categories, a systematics diagram and a code distribution analysis diagram were used. In the next part, when creating the ASPM method, some assumptions of the Scrum and DSDM method were used. For categorisation, the technique of syntactic analysis as well as visualization techniques of grouping into categories were used. The categorization coding process was also supplemented by the results of direct observations (observation notes) and

internal documents made available by the studied companies, including provisions of agreements with logistics operators concerning SLA (Standard Level Agreement).

**Figure 1.** A model for creating a theory using codes



**Source:** J. Saldaña, (2009), *The Coding Manual for Qualitative Researchers*, SAGE Publications Ltd. p.14.

Ultimately, data processing was both iterative and layered, where individual iterations modified categories and data streams modified the iterations themselves. The construction of the category matrix was carried out in two stages - after the initial coding, the codes were combined into sets to separate the categories. This process included the change of the code numbers so that the secondary coding, on the one hand, allows to establish a set of relevant information and, on the other hand, maintains the logic of the construction of the category description. The code numbers with description are shown in Table 1. At the initial stage, software supporting qualitative analyses was used. However, due to the lack of standards in the nomenclature used by individual managers, as well as the lack of possibility of contextual analysis of statements, the results of the action and categorization carried out with this application on the transcription of conversations with managers turned out to be unsatisfactory. It was decided to "manually" correct the results and re-analyse the content of statements to define categories.

**Table 1.** List of codes and categories

Category no./code no.	Description
1.0	Supply chain management

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1.1	The need for supply chain integration
1.2	Information on production and purchase plans of customers
1.3	Information on current stock levels at suppliers
1.4	Maintaining stocks for customers
<b>2.0</b>	<b>Complexity of the supply chain</b>
2.1	Higher level of complexity in managing the supply chain compared to a single company
2.2	Importance of the number of suppliers
2.3	Importance of the number of sub-suppliers
2.4	Properly selected and configured mechanisms for suppliers and sub-suppliers control
2.5	Increased uncertainty related to the complex structure of the supply chain
2.6	Autonomy of suppliers
2.7	Number of suppliers
2.8	Need to reduce the number of suppliers
2.9	Cascade control of suppliers
2.10	Quality of supply
2.11	Timely delivery
2.12	No information on the sales by customers
2.13	Incorrect allocation of resources
2.14	Creation of so-called non-rotating stocks
2.15	Different other causes of non-rotating stocks creation
2.16	Customer requirements not fully recognized
2.17	Sale or liquidation of redundant stocks significantly reduces margins
2.18	Strong buyer pressure on price
2.19	High costs of new product development and R&D costs
<b>3.0</b>	<b>Supply chain reach</b>
3.1	All supply chains in the surveyed companies are transcontinental
3.2	The managers surveyed declare that they have their suppliers in Europe
3.3	The managers surveyed declare that they have their suppliers in the Far East
3.4	Having suppliers in China
3.5	Distant locations of supply sources complicate control over the supply chain
3.6	Distant locations of supply sources reduce the speed of their response to changing customer needs
3.7	The need to reduce production costs
3.8	Multiplication of number of suppliers
3.9	Competition between the different elements of the supply chain logistics network
3.9	Extension of the supply chain
3.10	Deliveries from Asia are full container load deliveries
3.11	Delivery time from Asia is from 1.5 months to 2 months
3.12	Companies use maritime transport
3.13	"Postponement in time" between decision making and implementation
3.14	Extended order cycle, which takes about six months in all companies
3.15	Logistic and technical problems, i.e., the necessity to fully load the container - the so-called top-ups
3.16	Structure and type of recipients of their products and goods
3.17	They have quite different distribution channels
3.18	They have intermediate channels (classic)
3.19	They have direct sales channels based primarily on on-line sales
3.20	However, both direct and indirect channels are operated by the same distribution centers (warehouses)
3.21	The stream of returns increasing year after year
3.22	Declared 14-day return period for on-line consumer purchases and 30-day return or replacement period for intermediate sales

3.23	Organizing a well-functioning return channel
3.24	Preparation of appropriate infrastructure to assess the completeness of returns
3.25	Assessment of the degree of consumer interference in the goods (product) or their packaging
<b>4.0</b>	<b>Exchange rate volatility</b>
4.1	The main settlement currency for purchases in the Far East and Africa is
4.2	They use Euro for settlements in Europe and Turkey
4.3	Exposure to high exchange rate volatility
4.4	The need for currency conversions, with large changes, consumes their entire margin
4.5	Necessity of implementing Euro in Poland
4.6	Exchange rate risk
4.7	Options
4.8	Insurance against the exchange rate risk
<b>5.0</b>	<b>Cultural differences</b>
5.1	The countries where the sources of their supply are located are characterized by cultural differences
5.2	Cultural differences generally concern Asian and African countries
5.3	In the case of contractors located in Europe or the USA, the managers surveyed do not notice special cultural differences
5.4	Cultural differences concern ways of behaving
5.5	Cultural differences concern ways of dressing
5.6	Cultural differences concern attitudes
5.7	Asian contractors are seen as insincere
5.8	Asian and African contractors are characterized by patriarchy in terms of social relations in companies
5.9	Clearly flattened organizational structures in European or American companies
5.10	The products supplied to them from the Far East and Africa are of low quality
5.11	Products supplied to them from the Far East and Africa are imitative (copy American and European patterns)
<b>6.0</b>	<b>Differences in work culture</b>
6.1	Engaging Asian workers in their work
6.2	These Asian workers are a cheap labor force
6.3	Asian workers do not take holidays
6.4	Employees commitment to work
6.5	Admiration for Western European and American companies for their creativity and entrepreneurship
6.6	Negative assessment of payment requirements of employees of Western European and American companies
6.7	Negative assessment of non-payment requirements of employees of Western European and American companies
6.8	Negative assessment of the limited employees' commitment to the company's operations outside their working hours in Western European and American companies
6.9	Negative assessment of the clear separation of work and family life by employees of Western European and American companies
<b>7.0</b>	<b>Differences in working hours</b>
7.1	Communication problems due to different time zones
7.2	Difference in the working hours of different actors in the supply chain
7.3	In their supplier countries, the daily working time is usually 8 hours
7.4	The holidays are also an important obstacle
7.5	Chinese New Year
7.6	Ramadan
7.7	Due to holidays, deliveries from these countries are suspended for one and a half months

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7.8	In their statements, managers also point to other local holidays that significantly reduce production
7.9	In Western European countries and the USA, working time is limited to seven working hours
7.10	The working time regime is strictly observed in Western European countries and the USA
7.11	In Western European countries and the USA, after the end of nominal working hours employees leave their jobs completely, unlike those employed in Poland who work overtime
7.12	In the Far East, employees work from Monday to Saturday
7.13	In Western Europe, as they themselves stated, they cannot place an order on Friday after 1 p.m
7.14	An additional difficulty for Europe are the holidays in the transit countries through which supplies are transferred
7.15	During the holidays, employees of distribution centers are off
<b>8.0</b>	<b>Language differences</b>
8.1	The basic language of communication in Asian countries is English
8.2	In Turkey German is the equivalent, if not predominant to English language for communication
8.3	In Morocco and Tunisia, Spanish and French are the equivalent, if not predominant to English language for communication
8.4	For Europe, German is very popular
8.5	For Europe, French is very popular
8.6	Communication problems resulting from the level of language skills of contractors and the way they express themselves
<b>9.0</b>	<b>Diversity of laws in different countries</b>
9.1	The problem of legal services, especially in the Far East
9.2	In the Far East, local companies are favored
9.3	Negative results of their legal disputes before local courts
9.4	Handling legal disputes requires a thorough knowledge of local law
9.5	They are forced to hire a legal firm to represent them
9.6	They are forced to maintain a local resident
9.7	Purchases executed by a local company
9.8	They try to eliminate legal obstacles
9.9	Elimination of legal obstacles significantly increases operating costs
<b>10.0</b>	<b>Variability</b>
10.1	Companies are in the process of permanent change
10.2	The main reason for the change is, according to the surveyed managers, the growth of the company itself
10.3	The growth causes organizational changes
10.4	Growth also causes changes in organizational structures
10.5	Growth is the cause of supply chains reconfiguration
10.6	Growth is the reason for creating new supply chains
10.7	The managers also associate the change with the internationalization of the companies' activities
10.8	The growth is also related to the good economic situation in Poland
10.9	The company's growth also creates the need to increase employment
10.10	It is becoming more and more difficult to acquire specialists on the labor market
10.11	The increase in their salaries translates into an increase in operating costs of the company
<b>11.0</b>	<b>The dynamics of change in the supply chain</b>
11.1	Increase in the speed of changes in the supply chain

11.2	The speed of change in the supply chain is linked to the increasing globalization of their businesses
11.3	Even small changes in different countries make it necessary to adapt the entire supply chain quickly
11.4	Increasingly frequent outsourcing of logistics services
11.5	Outsourcing of logistic services provided by logistic operators
11.6	Logistics operators react much faster to changes in the supply chain compared to their own logistics departments managing supply chains
11.7	logistics operators are entities specializing in the implementation of specific activities
11.8	logistics operators are not burdened with other supply chain activities
11.9	Logistics operators are not burdened with designing new products
11.10	Logistics operators are not burdened with sales activities
11.11	Logistics operators are not burdened with commercial negotiations with suppliers
11.12	Logistics operators are not burdened with customer service
11.13	Logistics operators are not burdened with finding new supply markets
<b>12.0</b>	<b>The changing environment in which the supply chains they manage operate</b>
12.1	Speed of legislative changes
12.2	The increase in the dynamics of changes in the legislative environment concerns mainly Poland
12.3	Outside Poland, the increase in the dynamics of changes in the legislative environment is practically imperceptible
12.4	There is a growing number of players in the market and potential suppliers
12.5	There is a growing number of players in the market and potential competitors
12.6	Increasing sales
12.7	Changing customer preferences
12.8	Increase in their customers' income
12.9	Customers are increasingly looking for branded goods
12.10	Customers are increasingly looking for luxury goods
12.11	Increased dynamics of changes in the information environment. According to them, this is manifested primarily by the increase in their customers' access to the Internet
12.12	Using the alibaba.com search engine
12.13	Through a search engine they are able to find a potential supplier relatively quickly and efficiently
12.14	the risks involved in eliminating some or all of their trade
12.15	Customers can now order goods themselves directly from manufacturers in the Far East, without their intermediation
12.16	The delivery itself is made by a courier company
12.17	As a consequence of direct purchases over the Internet, their supply chains become unnecessary
<b>13.0</b>	<b>The dynamics of changes in the company</b>
13.1	The most important is the growth factor - the development of the company itself
13.2	Many of the surveyed companies record a 100% increase in sales from year to year
13.3	Rapid growth requires rapid expansion of the company, including production infrastructure
13.4	Rapid growth requires rapid expansion of the company, including storage infrastructure
13.5	Rapid growth requires additional staff
13.6	Over the last ten years, the companies have set up a number of new production sites as well as sales offices
13.7	In the case of rapid growth, management methods characteristic of a small enterprise do not work according to the managers surveyed
13.8	Managers begin to see the need to formalize processes by, for example, developing procedures

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13.9	The requirements of individual and institutional customers are also growing and changing
13.10	Institutional customers expect comprehensive support from the company in the pre- and post-sale phases
13.11	Institutional clients expect a dedicated account manager
13.12	The task of an account manager is to supervise the entire relationship with an institutional client
13.13	For all surveyed companies the Internet is becoming both a natural method of selling their products and goods
13.14	The Internet is becoming a platform for direct communication with customers
13.15	The Internet also eliminates another restriction in the work of enterprises - the need for traveling
13.16	All companies surveyed have already implemented teleconferences
<b>14.0</b>	<b>Unpredictability of changes</b>
14.1	It seems impossible to predict the direction and strength of change
14.2	According to the surveyed managers, very often one change results in further changes
14.3	Changes work according to the domino effect
14.4	Individual changes may influence each other by increasing or decreasing their intensity
14.5	They do not have the resources and time to monitor the discrete signals that inform about the appearance of the first phases of change
14.6	Their action is therefore primarily reactive
14.7	Indication of the pointlessness of analyzing discrete signals at supply chain level
14.8	Indication of the pointlessness of analyzing discrete signals at supply chain level is related to the complexity of the supply chain described earlier
14.9	Every link in the supply chain and every relationship between the links and their environment can be the cause of change
14.10	The number of potential change initiation locations is therefore endless for them
14.11	It is also a significant and main feature that distinguishes supply chain management from the management of a single company
14.14	They respond only to those changes that are direct and immediate
14.13	They respond only to those changes that are strategic in nature
14.14	Response is reactive, once the event has occurred they remove or minimize its effects
14.15	As basic example of strategic changes they mention changes in the political environment, including, above all, legislative changes
14.16	In the case of strategic exchanges, they take anticipatory action to adapt the way their supply chains or parent company operate to the changes that arise
14.17	An example of an active response to a change is to prevent an increase in the purchase price of a material or good or the provision of a service by the supplier (subcontractor)
<b>15.0</b>	<b>Flexibility and adaptability to change</b>
15.1	There are no inflexible companies
15.2	Companies that do not adapt to changes most often go bankrupt
15.3	The change which forces flexibility in reconfiguration of the company is, according to the surveyed managers, continuous and unavoidable
15.4	Flexibility is a feature of any existing and functioning organization including the company
15.5	The problem does not concern flexibility as such, but the speed of response to change and adaptation
15.6	The larger the company or more complex the supply chain, the less flexible it is
15.7	The decrease in flexibility is related to the increasing inertness of the organization
15.8	Long supply chains with a complex structure and a significant degree of internationalization are also less flexible

15.9	This may also be related to differences in the rate of absorption of change between countries
15.10	In some Asian companies, but also in those located in Western Europe, changes are being introduced much more slowly than for example in Polish companies
15.11	It is also important whether there is a change advocate in the board of directors of a company
15.12	If a change advocate, who has a significant interest in the change, appears in the company's board of directors, it guarantees greater flexibility and a quicker response to the change
15.13	The level of flexibility is also a result of the company's duration, growth rate and whether the company has an owner, founder and president in one person
15.14	The level of flexibility decreases dramatically when you are dealing with a company with rapid growth founded and managed by the same person
<b>16.0</b>	<b>Temporary and project organization</b>
16.1	Adapting to customer expectations requires the appointment of temporary teams
16.2	The aim of the temporary team is to create a new product, service or organizational solution
16.3	When developing new products or services, the key element is to use the experience and solutions of the supplier
16.4	The direct exchange of information in the work of the temporary team is also of considerable importance
16.5	The work carried out with the help of temporary teams accelerates the time of the project implementation
16.6	The work carried out with the help of temporary teams increases the productivity of employees involved in the process
16.7	The work carried out with the help of temporary teams reduces the costs of developing a new product or service
16.8	The temporary team most often includes employees of the surveyed company as well as other companies involved in the supply chain
16.9	Temporary teams are much more flexible in adapting to endo- and exogenous changes
16.10	temporary teams are much more flexible, this is a direct result of flattening of the organizational structures of such teams
16.11	this is a direct result of flattening of the organizational structures of such teams
16.12	Another reason for improving the effectiveness of teams and increasing their flexibility is to reduce the procedural requirements of their activities
16.13	Temporary teams have more autonomy
16.14	Temporary teams have their own budget
16.15	Temporary teams are not subject to part of the procedures
16.16	A characteristic feature of temporary teams is also the fact that when the goal is achieved, they are dissolved
16.17	A characteristic feature of temporary teams is also the fact that they are reconfigured after the goal is achieved
16.18	Temporary teams ensure an adequate workload for the staff employed in these teams
16.19	that such teams are made up of employees with the appropriate qualifications and availability necessary to achieve the objectives set for the team in question
16.20	temporary teams are therefore a better tool for achieving non-standard objectives compared to traditional organizational solutions
<b>17.0</b>	<b>Criticism of a traditional functional organization</b>
17.1	The managers surveyed consider the traditional organization to be inefficient
17.2	The managers surveyed consider the traditional organization to be inflexible
17.3	The traditional structure is based on the so-called functional and not process areas
17.4	Thus, optimization of operation in a traditional structure takes place in the area of a specific management function, not a process

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17.5	In the traditional structure, individual departments begin to realize only their goals by sub-optimizing them
17.6	Sub-optimization often leads to disruption of another department
17.7	The antagonisms arising from sub-optimization in consequence reduce the effectiveness of the entire organization
17.8	A factor complicating the functioning of traditional organizational structures are the KPIs, which are appearing more and more often in Polish companies
17.9	According to the surveyed managers, KPIs are inadequately constructed and implemented
17.10	KPIs measure and verify the effectiveness of functional areas and not processes in their companies
17.11	Excessive formalization of actions aimed at optimizing the indicator
17.12	Antagonizing individual functional areas
17.13	KPIs are designed in such a way that optimisation of indicators of a given functional area harms other functional areas
17.14	Achievement of an indicator is even conditioned by the impairment of another functional area
17.15	This is the result of focusing on achieving, at all costs, an indicator and ignoring the changes taking place in the environment and inside the company
17.16	The surveyed managers are advocates of a process approach to business management
<b>18.0</b>	<b>Project organization as a special form of temporary organization</b>
18.1	The managers surveyed do not make a division into temporary organizations and project teams
18.2	The temporary organization is identical to the project team for them
18.3	In all surveyed companies, managers declare having project management procedures
18.4	The official launch of a project and the creation of a project charter provides the basis for establishing a project team
18.5	Project teams are appointed to implement only specific projects
18.6	The project teams operate simultaneously with the functional organization
18.7	This causes a number of problems that arise at the interface between the project team and the traditional organization
18.8	These problems are mainly related to the availability of resources belonging to particular functional areas
18.9	These problems are related to different objectives of the project team and the traditional organization
18.10	In the case of a project team, its operation corresponds to values identical to those of process management
18.11	The project team has autonomy in operation
18.12	The use of project teams in the organization mainly concerns unique projects
18.13	The use of project teams in the organization concerns primarily projects of big significance for the organization
18.14	The use of project teams in the organization concerns primarily projects of big significance for the organization
18.15	The use of project teams in the organization concerns primarily projects involving the resources of many divisions
18.16	Proper justification of the project implementation
18.17	Detailed project planning
18.18	Control of the final results of the project
<b>19.0</b>	<b>Agile methodology in project management</b>
19.1	So far, projects implemented in certain areas have not achieved their objectives
19.2	The most frequently mentioned projects that do not achieve their objectives include the department's restructuring projects

19.3	The most frequently mentioned projects that do not achieve their objectives include those of company restructuring
19.4	The most frequently mentioned projects that do not meet their objectives include supply chain restructuring projects
19.5	Many factors, not only material but also non-material ones, must be taken into account in complex projects
19.6	Many factors, exo- and endogenous, must be taken into account in complex projects
19.7	According to the surveyed managers, the number of these factors is infinite and unpredictable
19.8	Also, the strength of these factors is unspecified
19.9	An additional element complicating the implementation of such projects is the dynamics of change and the need to constantly adapt to changes
19.10	The company and each of its parts and the supply chain in which it operates is a dynamic system
19.11	It is a system consisting of many elements and an infinite number of relations between them
19.12	In their opinion in such a system it is difficult or even impossible to clearly predict results at the very beginning of a long-term project
19.13	According to the surveyed managers, especially supply chain reorganization projects require alternative methods of operation
19.14	This is related to two factors - the already described complexity of the supply chain and the permanent exogenous change occurring in such a chain
19.15	According to the managers surveyed, it is advisable here to apply methodologies for phased reorganization of the supply chain (or company)
19.16	Changes made within a given phase will be based on conditions resulting from the implementation of an earlier phase
19.17	Focusing primarily on the SCRUM methodology
19.18	Necessity to develop a dedicated project methodology for supply chain reorganization, taking into account aspects related to dynamic changes in the supply chain

*Source: Own study.*

#### 4. Results

The results obtained were analysed for each of the 19 established categories. To make the structure of the conclusions more visible, the results have been grouped into areas covering several categories:

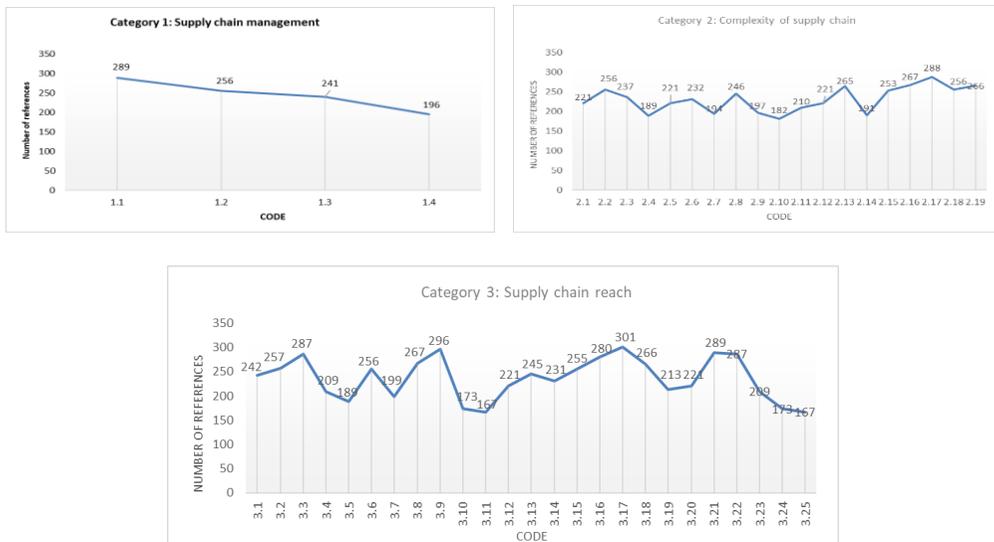
- I - structure of the supply chain (1.0, 2.0, 3.0, 11.0, 12.0),
- II - economic and legal conditions (4.0, 9.0),
- III cultural, linguistic, and organizational differences among supply chain participants (5.0, 6.0, 7.0, 8.0),
- IV - dynamics of changes in enterprises (10.0, 13.0, 14.0, 17.0),
- V - temporary and project organization as flexible organizations (15.0, 16.0, 18.0, 19.0).

The codes that obtained the highest number of indications are marked in bold.

## 5. Results in Area I - Supply Chain Structure

Within the categories that were directly relevant to the supply chain area, all managers declare in their statements that they actively support supply chain management (Category 1). Figure 2 shows the structure of the references to each code within categories 1-3.

**Figure 2.** Structure of references to particular codes for categories 1-3



*Source: Own study.*

**The code number 1.1**, which indicates the need to integrate the supply chain, appeared 289 times in all statements made by managers of the studied companies. These managers pointed out that integration concerns not only the flow in the real sphere, but also in the regulatory sphere. In the regulatory sphere, they expect, above all, information on their customers' production and purchase plans (**code 1.2**) and plans for promotions for customers and information on current stock levels at suppliers (**code 1.3**). However, when asked whether they make their production plans available and maintain stocks for their customers (**code 1.4**), managers usually responded negatively, so the previously presented expectations towards suppliers and customers are not fulfilled by themselves.

A further analysis of this issue in the face-to-face interview shows that supply chain integration is not clearly understood by them. When using 4PL operators' services, they expect integration on their side, while having their own services trying to integrate the supply chain in their own way. This certainly has to do with the *complexity of the supply chain - category 2*, as managers in their statements point out that supply chain management is much more complicated (**code 2.1**) compared to the

management of a single enterprise, indicating not only the number of links but also all types of flows identified within the supply chain.

Production companies indicate that the number of suppliers (**code 2.2**) and sub-suppliers (**code 2.3**) is important for them, since flows with many of them can cause problems, among other things, with quality, hence the need to reduce this number (**code 2.8**) was indicated in managers' statements. Significant number of references was also obtained for **code 2.13** indicating an incorrect allocation of resources. This has a significant relationship with non-rotating stocks, which, although they are most often sold or liquidated, nevertheless, according to managers, significantly reduce margins (**code 2.17**). The remaining codes were of lesser importance - an extensive network of suppliers (**code 2.7**), which is the basis for building the supply chain, requires appropriately selected and configured mechanisms of control (**code 2.4**) of suppliers and the entire network of sub-suppliers, according to the managers surveyed is not a particularly important factor.

Also, the increase in uncertainty linked to the complex structure of the supply chain (**code 2.5**), the threat of reconfiguration of the chain due to high supplier autonomy (**code 2.6**), the unpredictability of demand and, in the case of manufacturing companies, the lack of information on sales volumes at customers (**code 2.12**) and the creation of non-rotating stocks (**code 2.14**) did not have high significance according to the respondents.

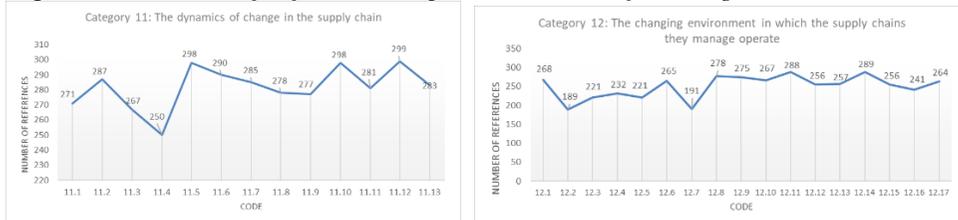
In category 3 *Chain coverage* - important references were made to having suppliers in the Far East (**code 3.3**), to longer supply chain (**code 3.9**) and to diverse distribution channels (**code 3.17**). A significant threat in this area, according to the respondents, is the stream of returns that is increasing every year (**3.21**).

In the studied companies, all supply chains are transcontinental (**code 3.1**), but such remote locations of sources of supply, according to the managers, do not complicate the control of the supply chain (**code 3.5**); also, the duration of full container deliveries (**code 3.10**), which ranges from 1.5 months to 2 months (**code 3.11**) was the code with the lowest number of references. Nor do they recognise the urgent need to assess the completeness of returns (code 3.24) or the degree of consumer interference in the goods (product) or their packaging (**code 3.25**).

Based on the in-depth interview, it was found that many of the surveyed managers indicate a strong correlation between cost reduction and the structure and number of suppliers. Clothing companies emphasise the "periodic change of all suppliers". During their selection, apart from the ability to produce the ordered products, the price is what counts most. In practice, the managers surveyed describe these activities more bluntly as "an attempt to set individual suppliers on each other" to reduce the purchase price. Such an approach is contrary to their own declared values in terms of the previously described expectations of supply chain integration. The categories

described above are integrally linked to the next category - *the dynamics of change in the supply chain (category 11)*. Figure 3 shows the structure of the references to particular codes within categories 11 and 12.

**Figure 3.** Structure of references to particular codes for categories 11 and 12



**Source:** Own study.

The surveyed managers link the change dynamics in supply chain to the increasing globalisation of their businesses (**code 11.2**), where even minor changes occurring in different countries make it necessary to adapt the entire supply chain quickly. An important element influencing the increase in the dynamics of change is the outsourcing of logistics services performed by logistics operators (**code 11.5**), which, according to the respondents, reacts much faster to changes in the supply chain. Managers link this with the fact that operators are specialised in certain activities but are not burdened with sales activities (**code 11.10**) or the search for new supply markets (**code 11.13**). There is some inconsistency in indicating the small impact of outsourcing of logistics services (**code 11.4**), which is probably since this was considered to be the existing state of affairs.

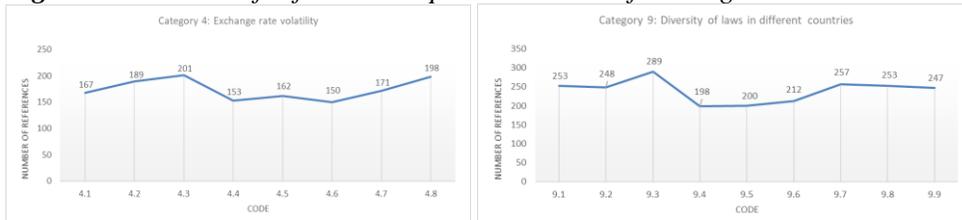
The structure of references to the individual codes under category 12 The variability of the supply chain environment is also shown in Figure 3. Among the important features for this category, managers point to the increase in the speed of legislative changes (**code 12.1**) and the increase in sales (**code 12.6**), linked to the increase in their customers' income (**code 12.8**). According to them, this is manifested primarily by the increase in their customers' access to the Internet (**code 12.11**), which allows to eliminate many intermediaries. There is, however, a risk that their company's trade intermediation may be also eliminated (**code 12.14**) - customers can order goods directly from producers, which creates the risk that their supply chains may become redundant (**code 12.17**). They link the increase in the dynamics of changes in the legislative environment with Poland (**code 12.2**) and changing customer preferences (**code 12.7**) to a lesser extent.

## 6. Results in Area II - Economic and Legal Conditions

All the studied companies operate within international supply chains, but their structure is clearly differentiated. Textile companies rely entirely on foreign sources of supply, the household appliances industry is largely based on foreign suppliers, while petrochemical and food companies have few foreign suppliers. All surveyed

companies have European and Far Eastern suppliers. For automotive and clothing companies, some of the suppliers are also based in Africa and Asia (Turkey). All surveyed managers indicate the essence of Category 4 *Exchange rate volatility* and Category 9 *Differences in laws in different countries* (Figure 4).

**Figure 4.** Structure of references to particular codes for categories 4 and 9



**Source:** Own study.

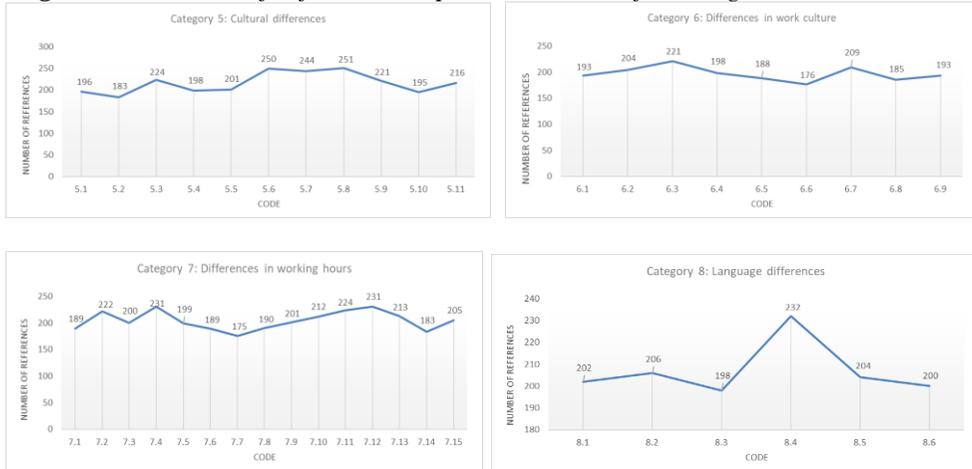
The primary settlement currency for purchases in the Far East and Africa is USD. For settlements in Europe and Turkey Euro is used - both currencies have high volatility of exchange rates (**code 4.3**). The managers surveyed indicated that in the last five years the Euro exchange rate fluctuated between PLN 4.0 and PLN 4.5 for EUR 1. The situation was much worse with the USD. Over the past five years, the exchange rate of this currency has fluctuated between PLN 3.0 and PLN 4.25 per 1 USD. This means more than forty percent change of the exchange rate of this currency against PLN. At the same time, all surveyed managers are insured against the risk of currency fluctuations (**code 4.8**) and are therefore prepared to reduce their trading margins (**code 4.4**). Only representatives of textile companies claimed in the interview that they monitor the minimization of exchange rate risk (**code 4.6**). Category 9 Differences in laws in different countries, indicates legal service problems, especially in the Far East, which is a result of legal disputes conducted by managers before local courts (**code 9.3**).

Managers point out in their statements that in these countries they are forced to make purchases by a local company (**code 9.7**), which significantly increases their operating costs (**code 9.9**). Although managers indicate in their statements that handling legal disputes requires a thorough knowledge of local law (**code 9.4**) and hiring a legal firm to represent them (**code 9.5**) - these indications were the rarest.

## 7. Results in Area III - Cultural, Linguistic and Organisational Differences Among Supply Chain Participants

In this area, the separate categories intersect and each of them is very important. Under Category 5 *Cultural Differences* (Figure 5) according to the managers surveyed, Asian and African contractors are characterized by patriarchy in terms of social relations in companies (**code 5.8**), which manifests itself in a lack of decision-making power of lower-level employees and, in general, different attitudes (**code 5.6**) and insincerity (**code 5.7**).

Figure 5. Structure of references to particular codes for categories 5-8



Source: Own study.

The assessment presented in the research is a completely subjective opinion of the surveyed group of managers and it is based on their personal experiences and considerations. Very often it is also based on stereotypes concerning given communities, so it is not an objective cultural assessment of the described business partners. As an alternative example of behaviour, they indicate European or American companies, where they observe a clear flattening of organisational structures (**code 5.9**). The managers surveyed do not see special cultural differences in the case of counterparties located in Europe or the USA (**code 5.3**).

However, the cultural differences observed in Asian and African contractors are not particularly significant for them (**code 5.1**), as well as the low quality (**code 5.10**), but they do highlight that they are imitative (copy patterns) (**code 5.11**). They consider this feature to be negative, also addressing the aspect of intellectual theft and copying of products of recognized American and European brands. The managers surveyed, despite such moral and ethical reservations do not see any contraindications to purchase in these countries due to the low price of the goods purchased.

For category 6 *Differences in work culture* (Figure 10) the assessment of suppliers from the Far East and Western European countries and the USA is also completely different. The managers surveyed appreciate the low labor cost (**code 6.2**) and the fact that the suppliers in the first group do not take holidays (**code 6.3**), showing full commitment to work. Regarding American and European companies, they pay less attention to their creativity and entrepreneurship (**code 6.6**), focusing on the negative assessment of non-payment requirements (**code 6.7**) of their employees.

Under Category 7 *Differences in working hours*, an element which makes coordination difficult is the difference in working hours between different actors in

the supply chain (**code 7.2**), but especially the time of holidays such as Chinese New Year's Day or Ramadan (**code 7.4**). The first problem is related to the inability to do business with employees who, after the end of nominal working hours, unlike employees employed in Poland, leave their workplace immediately (**code 7.11**), while due to an atypical working week in the Far East, employees there also expect deliveries on Saturdays (**code 7.12**). In their statements, the managers to a lesser extent indicate communication problems due to different time zones (**code 7.1**) and holidays in the transit countries (**code 7.14**), although there is usually also a road traffic ban there.

In the area of the defined *Category 8 Language differences*, managers indicated that the most used language in communication is German (**code 8.4**). Such popularity of the German language, according to the managers surveyed, is because many inhabitants of these countries have worked and work in Germany, which means that they know it at a fairly good level. In their statements, managers also pointed out communication problems resulting from the low level of language skills of contractors and the way they express themselves (**code 8.6**), but all declared the possibility of using English as the basic language (**code 8.1**). There are difficulties in communicating in Spanish and French in European countries.

## 8. Results in area IV - the dynamics of change in enterprises

Based on the previously cited statements of managers concerning the conditions related to the operation and management of the global supply chain, it was concluded that the management of this type of network is a more complex process compared to the management of a single enterprise. The *area of change dynamics in enterprises* is grouped into *categories 10; 13; 14 and 17* (Figure 6).

Under *Category 10 Variability*, managers found that the primary cause of change is the growth of the enterprise itself (**code 10.2**), which is also the cause of supply chains reconfiguration (**code 10.5**). According to the surveyed managers, the growth is also related to the good economic situation in Poland (**code 10.8**). Although changes are seen as beneficial, managers believe that they are also a reason for increasing the company operating costs (**code 10.11**). Less attention is paid to changing organizational structures (**code 10.4**) and the need to increase employment (**code 10.9**).

Under *Category 13 Dynamics of change in the company*, managers indicate that in the case of rapid growth, management methods specific to a small enterprise do not work (**code 13.7**). In their opinion the rapid growth also requires a rapid expansion of the company, especially the storage infrastructure (**code 13.4**). According to the surveyed managers, an increase in the speed of changes in the field of computerization of enterprises is also of great importance. The Internet, as already mentioned many times, is becoming for all surveyed companies both the natural method of selling their

products and goods (**code 13.13**) and a platform for direct communication with the customer, which reduces the need of traveling (**code 13.15**). This is probably the reason why in this category they pay less attention to the employment of additional staff (**code 13.5**) and the formalization of processes by, for example, developing procedures (**code 13.8**).

**Figure 6.** Structure of references to particular codes for categories 10; 13; 14 and 17



Source: Own study.

In Category 14 *Unpredictability of changes*, the managers surveyed indicate that they do not have the ability to monitor discrete signals that inform about the appearance of the first phases of the change (**code 14.5**), and the number of potential change initiation locations is infinite for them (**code 14.10**). This is, in their view, the most significant feature distinguishing supply chain management from single enterprise management (**code 14.11**). Their anticipatory actions are designed to adapt the way their supply chains or parent company operate to the changes that are occurring (**code 14.16**), but the number of external and internal factors causing the change is so large that it seems impossible to predict its direction and strength (**code 14.1**). Their action is therefore primarily reactive to changes that are direct and immediate (**code 14.12**), mainly due to the signalled complexity of the supply chain (**code 14.8**). The most frequently cited example of an active response to change is to counteract an increase in the purchase price of a material or good or the provision of a service by the supplier (sub-contractor) (**code 14.17**), but it did not have many indications.

In the last category in this area, Category 17 *Criticism of traditional functional organization*, it was shown that all examined organizations have both temporary and project teams, which gives the possibility to directly observe and evaluate both traditional organization and modern forms. The greatest criticism was directed at the fact that in a traditional organisation the company focuses on achieving, at all costs, an indicator and thus ignores the changes taking place in the environment and inside the company (**code 17.15**). Often Key Performance Indicators are constructed in such a way that optimizing the indicators of a given functional area harms other functional

areas (**code 17.13**), which often leads to disruption of other departments operations (**code 17.6**). The reason for considering a traditional organization as inefficient and inflexible is the fact that the traditional structure is based on functional rather than process areas (**code 17.3**) and excessive formalisation of activities aimed at optimizing the indicator (**code 17.11**). Consequently, on the basis of the statements of the surveyed managers it can be concluded that they are advocates of the process approach in enterprise management, and in two of the surveyed enterprises the process approach is formally introduced, but these statements had the lowest number of indications.

## 9. Results in Area V Temporary and Project Organisation as Flexible Organisations (15.0, 16.0, 18.0, 19.0)

The factor complicating the functioning of traditional organizational structures is, according to the surveyed managers, a faulty construction and implementation of KPIs, which measure in their enterprises the effectiveness of functional areas and not processes, which results in a whole range of negative consequences. Apart from antagonizing functional areas, an important problem is a significant reduction of the company's flexibility. Thus, the research conducted in the next area concerns the approach to temporary and project organisation, as well as agile solutions as flexible organizations. This area includes Categories 15.0, 16.0, 18.0, 19.0 (Figure 7).

Within Category *15 Flexibility* and adaptation to change, there was a high degree of consensus among the managers surveyed that the level of flexibility is a result of the duration of the company's existence, the speed of its growth and whether the company has an owner, founder and president in one person (**code 15.13; code 15.14**). This is most often the result of a lack of knowledge and willingness of business owners to take the risk of introducing changes. Low flexibility is also related to differences in the rate of change absorption between countries (**code 15.9**). According to the managers surveyed, there are no inflexible enterprises (**code 15.1**), since the problem does not concern flexibility as such, but the speed of response to change and the time to adapt (**code 15.5**). There is therefore a direct correlation between the organization and the speed, depth, and extent of the response to change - long supply chains with complex structure and a significant degree of internationalization feature greater inertness.

Even though it is important to have a so-called 'change advocate' (**code 15.11**) in the board of directors of the company, there have been the fewest references in this regard. Category *16 Temporary and Project Organization*, is integral to the flexibility mentioned above. According to the surveyed managers, these two types of organizations are purpose-built organizations, i.e., they are set up temporarily to achieve a specific goal. Within this category one can see many indications to almost all codes. According to the surveyed managers, such teams have greater autonomy (**code 16.13**), often their own budget (**code 16.14**), and the cooperation of temporary

teams accelerates the time of project implementation. Another important element is to reduce the costs of developing a new product or service using such a solution (**code 16.7**) and to adequately assign tasks to employees working in such teams. In the opinion of managers, temporary teams are a better tool for achieving non-standard objectives compared to traditional organizational solutions, although they attach less importance to adapting to endo- and exogenous changes (**code 16.9**) and using the supplier's experience and solutions (**code 16.3**), which was suggested.

**Figure 7.** Structure of references to particular codes for categories 15; 16; 18 and 19



**Source:** Own study.

The results of analysis of Category 18 *Project organization as a special form of temporary organization*, show that the surveyed managers again pay special attention to the autonomy of such a team (**code 18.10**) and the way in which the objective is achieved (**code 18.11**), especially as regards unique projects (**code 18.5**; **code 18.12**). They pay particular attention to proper project planning (**code 18.17**) and control of the results of the project (**code 18.18**). These are characteristics of traditional business management methodologies, and the temporary organization is identical to the project team for the surveyed managers (**code 18.2**). According to the surveyed managers, the official launch of a project and the creation of a project charter provides the basis for establishing a project team (**code 18.4**). The lowest number of references suggests that they do not make a division into temporary organizations and project teams (**code 18.1**), although the in-depth interview indicates the parallel existence of both temporary organizations and project teams.

The results of Category 19 *Agile methodology in project management*, indicate that, according to the surveyed managers, the best solution should be to apply methodologies that reorganize the supply chain (or company) in stages (**code 19.15**), where changes made within a given stage will be based on conditions resulting from an earlier stage (**code 19.16**). The project concept they presented generally corresponds to Agile method in the implementation of projects, however, only three

companies' managers answered yes to the question if they have met or know any Agile methodology. According to the managers surveyed, supply chain reorganisation projects require alternative methods of operation (code **19.13**), and their responses focused primarily on the SCRUM methodology (code **19.17**). However, in their statements they did not associate this methodology with business projects, but with IT projects. The low number of indications in the need to restructure the company (code **19.3**), the strength of exo- and endogenous factors (code **19.6**; code **19.8**) and the lack of experience in implementing projects in this methodology shows that, despite the interest in such solutions, managers do not implement advanced solutions for the reorganization of the supply chain that considers aspects related to dynamic changes in the supply chain.

## 10. Discussion on the Research Results

Analyzing the structure of the statements of the surveyed managers, it can be observed that the distribution of their statements is relatively even. The deliberate selection of a sample of companies with extensive international supply chains has confirmed the existence of significant differences between business management and supply chain management, as the surveyed managers have repeatedly stressed in many categories of the survey. In Area **I - structure of the supply chain** (1.0, 2.0, 3.0, 11.0, 12.0), an important feature is its complexity, which goes well beyond standard cooperative relations and operation range. The number of companies, as well as the structure of the logistics network created for them, determines the complexity of the supply chain and its international reach. The need for supply chain integration was pointed out in all statements made by the managers of the companies surveyed (code **1.1**), but the managers do not focus on the search for tools, concepts or supporting techniques, but only on the conviction that changes are unpredictable.

This approach explains the search for a solution to management problems by finding an external entity - a logistics operator who would take over supply chain integration functions. This is because operators are specialized in the implementation of specific activities (code **11.13**). It is therefore inconsistent to point out the small impact of outsourcing of logistics services, which is probably since this fact is considered to be an existing state of affairs.

Managers recognize an incorrect allocation of resources, but only consider it in the context of the link with non-rotating stocks, which significantly reduce margins (code 2.17). However, the high expectations towards suppliers and customers are not met by themselves. Among the main problems arising from having suppliers in the Far East, the lengthening of the supply chain and the diverse distribution channels, according to the respondents the most important threat in this area is the returns flow that increases every year (code **3.21**). However, they do not see a need to assess the completeness of the returned goods or the degree of consumer interference in the product. As an important feature of the volatility of the environment in which supply

chains operate, managers point to the increase in the speed of legislative changes, the increase in sales related to the increase in income of their customers, but above all the increase in the access of their customers to the Internet, which allows to eliminate many intermediaries. The emergence of the Internet as a medium for information transmission has created both threats and opportunities for their businesses. It also had a significant impact on supply chain management. The possibilities are mainly related to searching for new suppliers and monitoring the physical flow of a given shipment.

There is, however, a risk that their intermediary company will also be eliminated (**code 12.14**), which poses a threat to the stability of their supply chains. It also creates a new dimension of competition - the physical supply chain must compete with the virtual supply chain. A change in the purchasing orientation of customers also has a direct impact on the supply chain of the companies surveyed, which must organize fast and small unit deliveries. This, in turn, creates a new dimension of competition based on price, time and speed of response to customer demand, although surveyed managers link the growth of change dynamics with changing customer preferences to a lesser extent.

In **Area II - Economic and legal conditions (4.0, 9.0)**, managers have highlighted the high volatility of exchange rates (**code 4.3**) and the diversity of laws in different countries, resulting in legal disputes before local courts (**code 9.3**). Although dispute resolution requires a thorough knowledge of local law and the hiring of a representative law company - these indications were the rarest. The internationalization of the chain causes a whole range of interferences due to local political, cultural, and organizational conditions. These interferences often overlap and reinforce each other. In many cases, the interferences related to local circumstances in individual countries occur autonomously and although they may be predicted, the entrepreneur has no possibility to influence them.

In addition, unlike a single company operating in a single market, the supply chain is exposed to multiple distortions from local markets at the same time. This obliges the manager to monitor in detail all changes in the local markets. This, in turn, requires an organization with such a chain to achieve a higher level of organizational maturity, which is reflected, among other things, in greater flexibility and speed in adapting the supply chain and the organization itself to local changes. The level of complexity of the international supply chain is also due to several reasons related to the need to operate in different time zones and linguistic, legal and organizational differences, as shown by the results in **Area III - cultural, linguistic and organizational differences among supply chain participants (5.0, 6.0, 7.0, 8.0)**.

According to the managers surveyed, Asian and African contractors are characterized by different attitudes (**code 5.6**), lack of decision-making powers of lower-level employees and insincerity. They consider the most negative feature to be the fact that they copy products of recognized American and European brands, which does not

discourage them from buying products due to the low prices. The managers surveyed also appreciate the low cost of labor (**code 6.2**) in Asian countries, while in the case of US and European companies they negatively assess the non-payment requirements of employees. A significant problem is also the difference in working hours between the different actors in international supply chains, particularly in relation to the working week in the Far East where deliveries are also expected on Saturdays (**code 7.12**). In their statements, the managers also pointed out communication problems resulting from the low level of language skills of contractors from Asian countries.

The most used language in communication is German (**code 8.4**), while difficulties in communicating in Spanish and French are encountered in European countries. Change in the international supply chain is permanent, which means that it cannot be predicted or eliminated. According to the managers surveyed, a mature organization should respond flexibly to change by adapting its supply chain and the organization itself. In the case of long and extended supply chains of manufacturing companies, the inertness in responding to change is much greater compared to short and slender supply chains of trading companies.

The results of the survey in **Area IV - dynamics of change in enterprises (10.0, 13.0, 14.0, 17.0)** indicate that the sources of change are both exogenous and endogenous. The managers stated that growth, which is at the same time the cause of chain reconfiguration, is related to the good economic situation in Poland (**code 10.8**). At the same time, they pay less attention to changing organisational structures and the need to increase employment. Also important is the change brought about by endogenous factors, related to the evolution of the supply chain itself as well as the development of the company managing the supply chain. Respondents indicate that, in the case of rapid growth, the management methods specific to a small business do not work (**code 13.7**), while the number of potential change initiation locations is infinite for them, which, in their view, is the most significant feature distinguishing supply chain management from single business management (**code 14.11**). The greatest criticism was directed at the fact that the company focuses on achieving, at all costs, an indicator and thus ignores the changes taking place in the environment and inside the company (**code 17.15**).

Consequently, at a certain stage of its development, a company may not be able to integrate its own supply chain because it has no resources or tools. This probably makes it necessary to transfer the integration function to the logistics operator. Companies with organizational maturity respond much more quickly to change than traditional companies based on hierarchical structures. In the opinion of the surveyed managers, the key element ensuring flexible adaptation of the organization seems to be the appointment of temporary organizations or teams implementing specific objectives.

Within **Area V - temporary and project organization as flexible organizations (15.0, 16.0, 18.0, 19.0)** there was a high level of consensus among the surveyed managers that the level of flexibility is a result of the duration of the company's existence, the speed of its growth and whether the company has an owner, founder, and president in one person (**code 15.13; code 15.14**) and whether they pursue a strategy for establishing such teams. According to the surveyed managers, such teams have greater autonomy (**code 16.13**) and the cooperation of temporary teams accelerates the time of project implementation. The supply chain is consequently referred to only now of delivery to the customer. Once implemented, it is dissolved. The selection and characteristics of the links in the supply chain as well as the actors involved in its operation are related to the specificity of the order.

The managers surveyed also pay particular attention to the autonomy of the project team and the way in which the objective is achieved (**code 18.11**), especially as regards unique projects. The work of such a team is of a process nature, which means that it uses, among other things, the resources necessary to achieve the goal, and does not suboptimize individual functional areas, but focuses on the very result of its work. All these elements are necessary to react quickly and flexibly to change. In a traditional organization, it is most often required to obtain consensus between the different functional areas. According to the surveyed managers, the best solution is to use methodologies that reorganize the supply chain (or the company) in stages, in which changes made within a given stage will be based on conditions created because of an earlier stage (**code 19.16**). The project concept presented by them generally corresponds to Agile concept in the implementation of projects, however, the Agile methodology was known only to the managers of the three companies.

## **11. Conclusion**

The results of the studies presented in the Article, relating both to the individual company and to the whole supply chain, indicate the unpredictability of the direction and strength of change in the organization. The respondents surveyed clearly indicate that some changes in supply chains are unexpectedly strengthening, while others are weakening in their opinion. This increases management risk. The respondents themselves, while recognizing the complexity of change as well as the unpredictability of its direction and strength, claim that development should take place towards a flexible organization.

This flexibility, in the case of a complex organization, ceases to be understood in terms of speed and means of responding and adapting to change, but as *ex ante* flexibility, actively diagnosing the direction and magnitude of change. Such flexibility is beyond traditional organizational structures based on hierarchical management. Traditional structures have some capacity to absorb change, but in the case of complex organizations this capacity is significantly weakened by the size and reach of the organization. The natural counterpart of a traditional organization becomes, in the

opinion of the respondents, a temporary organization and a project organization, which allows for an accelerated response, as well as for the possibility of an initial verification of the direction, manner and strength of the response to change. Despite a clear preference for such solutions, they are burdened with some inertness. The solution seems to be the use of project management methodologies alternative to traditional ones - agile and hybrid methods - which are highly flexible in nature.

Through a series of iterations, they are not only able to adapt to the change, but which is particularly important, to actively follow its direction by actively correcting the course of actions taken so far. The impact of the already indicated unpredictable changes of an exogenous nature resulting from the complexity of the supply chain construction, the supply network that forms it and the impact of the international environment, which further modify the direction and scope of changes in the supply chain, is not negligible in this process.

Based on the results of the research carried out it was assumed that ensuring a sufficiently flexible adaptation to the above changes requires an alternative method of change management based on the so-called temporary organization. The process of flexible adaptation of an organization that is compound, i.e., the supply chain, to changes of an exo- and endogenous nature requires the operationalization of the entire concept based on the experience in project management, especially due to the non-linearity of emerging interactions within the framework of the change taking place. The identification of etiological factors, which are both the premise, stimulator, and context of supply chain changes, can be a starting point for further research on the applicability of the Agile methodology.

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