

**TUNA ORGANISATIONAL ENVIRONMENT AND THE NEEDS
OF MEMBERS OF A CO-OPETITION NETWORK,
USING THE EXAMPLE OF CONSTRUCTION COMPANIES
ASSOCIATED IN THE “STROPY.PL” ORGANISATION**

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Purpose: The purpose of the study is to find out the needs of co-opetition network members in the building material market, under the conditions of the TUNA organisational environment.

Design/methodology/approach: In order to test the research hypotheses, an empirical research method was applied, involving a standardised interview questionnaire carried out using the CAPI technique among the companies associated in the “Stropy.pl” co-opetition network. The survey involved 53 respondents.

Findings: Under the conditions of the TUNA organisational environment, there occurred differences in assessments of the economic situation in the building material market by the members of the co-opetition network. Differences in assessments of the economic situation in the building material market have a moderate to large positive impact on the differentiation of needs of the members of the co-opetition network. Improving the quality of panel floors was more important for those who expected a moderate or high economic situation compared to those who were very or little optimistic. On the other hand, those who were very or little optimistic paid more attention to the clarity of communication, more frequent contact with the head office and new materials regarding the cooperation with “Stropy.pl”. In contrast, those who expected moderate or high economic situation were more appreciative of the improved sales availability of panel floors and the personalisation of fittings.

Research limitations/implications: In order to obtain a more complete picture of the needs of the building material market in Poland, in the context of the TUNA organisational environment, it is recommended to conduct further research with the participation of end-users of these materials.

Practical implications: The applicability of the study relates to the possibilities for company managers to use knowledge about the needs of members of a co-opetition network in the building material market, in the context of the TUNA organisational environment.

Originality/value: The conclusions of the study made it possible to identify the correlation between the TUNA organisational environment, causing discrepancies in assessments of the economic situation in the building material market, and the needs of members of a co-opetition network. Conducting considerations in relation to the building material industry market further enhances the originality of the study.

Keywords: co-opetition, organisational environment, TUNA, building material market.

Category of the paper: research paper.

Introduction

Over the past three years, the world has been struggling with three exceptional phenomena: the COVID-19 pandemic, the war in Ukraine and the economic crisis. These factors have had a huge impact on various sectors of the economy, including the building material market in Poland. The most acute effect of the pandemic in this market was a decline in demand, as many construction projects were halted and construction companies scaled down their operations, resulting in a reduction in demand for building materials. The residential and commercial construction market segments were particularly affected (Staniszewski, 2022). The impact of the pandemic was further exacerbated by problems related to raw material shortages and price increases in the construction industry in Poland, while Russia's invasion of Ukraine in 2022 reduced imports of aggregates, cement and wood, aluminium and steel products (Czech et al., 2020).

As a result of the above factors, the current organisational environment in the Polish building material market is characterised by the TUNA (turbulent, uncertain, novel, ambiguous) concept, which was developed by David Snowden and Mary Boone in 2007 (Snowden, Boone, 2007). This model describes four types of situations in which organisations and leaders need to make decisions and take actions. The TUNA environment is characterised by high levels of turbulence, uncertainty, novelty and ambiguity. Under such conditions, it is difficult to predict the consequences of actions and apply traditional management methods. Leaders must be flexible, creative and able to learn on an ongoing basis. The concept of the TUNA organisational environment is based on the earlier concept of VUCA (volatile, uncertain, complex, ambiguous), which was proposed by the US Army War College (2019) in the 1990s. The difference between these concepts is that TUNA also includes "novelty" as an influencing factor. "Novelty" refers to the emergence of unknown phenomena or problems that require innovative solutions. The TUNA concept is applicable in various fields such as strategic management, leadership, innovation or education.

The aim of the study is to find out the needs of members of a co-opetition network in the building material market, under the conditions of the TUNA organisational environment. In order to meet this challenge, an empirical survey has been carried out among the

representatives of companies affiliated to the “Stropy.pl” co-opetition network. The research questions relate to the predictions, expectations and priorities of the survey participants regarding the economic climate and cooperation within the co-opetition network:

1. Under the conditions of the TUNA organisational environment, are there differences in assessments of the economic situation in the building material market by members of a co-opetition network?
2. What is the direction of actions and the strength of the relationship between differences in assessments of economic situation in the building material market and the differential needs of members of a co-opetition network?
3. What are the differences in the needs of members of a co-opetition network in the building material market, under the conditions of the TUNA market environment?

Conditions of the TUNA organisational environment in the building material market in Poland

Turbulent in the TUNA concept refers to the rate and speed of change in the organisational environment that companies operating in the market face (Snowden, Boone, 2007). This turbulence in the environment can manifest itself in the form of increases or decreases in the prices of products and services occurring at unpredictable intervals, regulatory changes and even natural disasters. One of the areas where turbulence is of particular importance is the construction industry. The building material market is susceptible to price changes, which can be the result of a number of factors, such as currency fluctuations, modifications to tax laws or changes in market demand (Główka, 2011). These changes can have a significant impact on the operations of construction companies and even condition their survival. The instability of construction material prices can lead to difficulties in predicting the costs of construction projects, which in turn can have a negative impact on companies' profitability. Price turbulence can also hinder financial planning and force frequent modifications of project budgets. In addition, the volatility of construction material prices can lead to difficulties in negotiating contracts with clients. Construction companies may find it difficult to set a fixed price for their services, due to the inability to predict the cost of materials in the future. This, in turn, can induce a decrease in confidence from clients and a reduction in the number of orders. Instability in the price of construction materials can also lead to difficulties in hiring and managing a team. High raw material prices may result in the need to lay off employees, which can have a negative impact on team morale and productivity. On the other hand, low prices of construction materials may cause excessive competition in the market, which may prompt companies to reduce wages, which in turn may lead to employee turnover and employment instability (Chen, Miao, 2023). To cope with the

volatility of construction material prices, construction companies can use several different strategies to act. One is to build relationships with suppliers and enter into contracts with long-term price guarantees. It is also possible to conclude short-term contracts, which allows flexibility in responding to changing prices (Surówka-Marszałek, 2010). Another way to deal with the volatility of construction material prices is to increase efficiency in resource management and reduce wastage (Bąk-Sokolowska, 2015). These measures may involve better project planning and more economical use of available materials, as well as ensuring that excessive waste and unnecessary costs are not created. In addition, construction companies may consider diversifying their activities and developing new business areas, such as renovation or modernisation services, which are less susceptible to changes in the price of construction materials (Grudzewski, Hejduk, 2000). This can provide greater financial stability and enable the company to withstand difficult periods better.

Uncertain, according to the TUNA concept, is a characteristic of the organisational environment, determining the inability to predict future events and situations (Snowden, Boone, 2007). It can be caused by the volatility of the environment or lack of knowledge to assess the impact of events. In such a situation, the key is to have information resources that need to be continually expanded to recognise patterns and better understand the possible consequences of situations (Piątkowska, 2021). Bennetta and Lemione (2014) note, however, that it is difficult to infer the future from the past experiences, as new exceptions to the rules and even exceptions to the exceptions keep appearing, while the rules themselves are losing their validity. Uncertainty in the building material market may manifest itself in the inability to predict changes in the price of raw materials, changes in the supply of or demand for given products, as well as modifications to construction laws or changes in customer preferences (Surówka-Marszałek, 2010). Uncertainty can lead to difficulties in planning construction projects and generate additional costs, e.g. due to the need to purchase reserve stocks of materials or changes in the construction schedule. Another effect can be lack of certainty about the achievement of anticipated profits and cause financial problems for companies operating in the construction industry (Skorupka, 2008). In order to minimise the effects of uncertainty, it is important for construction companies to continuously improve their knowledge and monitor changing market conditions (Soniewicki, 2017). It is also worth considering the use of flexibility strategies and avoiding heavy involvement in single projects, as well as protecting through insurance or contracts with contractors (Kotter et al., 2022).

Novel in the TUNA concept refers to the degree of unfamiliarity with the environment and the level of innovation or creativity required of an organisation to cope with the complexity of the environment (Snowden, Boone, 2007). This complexity means that different companies may achieve different results despite following the same procedures. Consequently, it is important to make decisions by considering many different factors simultaneously (Nogalski et al., 2018). Complexity can be a particularly difficult challenge for the construction industry, as it involves a huge amount of data and information that needs to be

taken into account when making decisions (Sharafi et al., 2018). Managers in this industry have to take into account not only the current needs and expectations of clients, but also legislation and safety standards, as well as changing market conditions, such as the price of construction materials or the availability of labour. In addition, in the case of large construction projects, the interaction of many different parties is necessary, which adds to the complexity of the entire project. As a result of complexity, managers are forced to deal with a large amount of information and solve a variety of problems (Sharafi et al., 2018). In such an environment, it is difficult to predict the consequences of decisions, as there is no clear link between causes and effects. Managers have to consider multiple factors when making decisions, which requires them to manage complex situations efficiently. One way to deal with complexity is to use project management tools and techniques, such as, for example, project modelling (Bryde et al., 2013) or scheduling techniques (Adamczewski, 2009). With such tools, managers can better understand and anticipate the consequences of their decisions and better manage risks.

Ambiguous, according to the TUNA concept, refers to a feature of the organisational environment causing difficulty in understanding it and imposing different possible interpretations of situations and events (Snowden, Boone, 2007). It can manifest itself when there are many potential ways to solve one problem, but it is difficult to decide which solution is best. The ambiguity of a situation, the possibility of misreading signals from the environment, the multiplicity of meanings and the lack of experience in a particular area of business mean operating in what is described as an “unknown unknown” (Mack et al., 2015). Ambiguity in the building material market can include a lack of clear and consistent regulations regarding, for example, the sourcing of raw materials, the construction of facilities or the operation of buildings (Deszcz, 2013). It can also refer to lack of clear information regarding the prices of raw materials or a lack of transparent criteria regarding the quality and safety of the products used (Surówka-Marszałek, 2010). Ambiguity can also result from lack of clear guidelines on how companies can access new markets or change their business models (Knop, Brzóska, 2016). As a result of ambiguity, managers face the need to cope with the ambiguity of a market situation, the danger of misreading signals coming from the environment, the multiplicity of meanings and the lack of previous experience in a given area (Piątkowska, 2021). This may include, for example, lack of clarity about the legislation that applies to building in a particular location, lack of certainty about the future prices of building materials, lack of experience in implementing new technologies or ambiguity about future market trends (Bastian, Muchlish, 2012). In such situations, managers need to be able to manage uncertainty appropriately and respond quickly to changing conditions. Attempting to cope with the ambiguity of the business environment may involve continuous monitoring of the situation in the building material market and changes in laws and regulations (Soniewicki, 2017). It is also worth networking with other companies in the industry to access information on their experiences and to exchange knowledge (De Klerk, 2010). Another way to deal with

ambiguity is to create scenarios for different eventualities (Skorupka, 2008). These activities can include preparing contingency plans for unforeseen events or developing strategies for operating in markets with high uncertainty. In addition, managers can enlist the help of specialists in risk management or strategy development to better deal with ambiguity in the construction industry (Pittaway et al., 2004).

Co-opetition in the building material market as an implementation of Taleb's concept of antifragility

The TUNA organisational environment is largely a consequence of the occurrence of the phenomenon of so-called “black swans” – a term popularised by Nassim Nicholas Taleb, an American writer and investor of Lebanese origin, who in 2007 described in his book the phenomenon of unexpected and unpredictable events with a huge impact on the functioning of the modern world (Taleb, 2007). Examples of black swans include the outbreak of World War I, Hitler's rise to power, the 11 September 2001 attacks in New York, or the 2008 financial crisis. Unprecedented, however, is the ongoing period of cumulative black swans, initiated in 2020 by the Covid-19 coronavirus pandemic, followed by other sensitive events, i.e. the war in Ukraine, the global economic crisis and the technological revolution in the field of artificial intelligence. Taleb argues that people tend to ignore or underestimate the possibility of black swans because they rely on simplistic and linear models of reality that do not take into account the complexity and variability of the world. People also frequently try to rationalise black swans afterwards, giving them meaning and cause, which reinforces a false sense of control and predictability. The author suggests instead adopting an anti-fragile stance, i.e. one that is not only resilient to shocks and crises, but also able to benefit from and learn from them. Antifragility is about being open to uncertainty and risk, experimentation and innovation, diversification and decentralisation. Antifragility is also about being able to recognise and take advantage of black swan opportunities (Taleb, 2013).

The search for an anti-fragility formula requires managers and leaders to constantly adapt to changing situations and challenges, and to invent new ways of creating values for customers and stakeholders. One such way is co-opetition – a concept introduced by American economists Adam Brandenburger and Barry Nalebuff in 1996 in their book entitled: “Co-opetition” (Brandenburger, Nalebuff, 1996). The authors defined co-opetition as a value stream or, in other words, a value network in which companies cooperate with competitors to enlarge the so-called “cake”, and competition refers to the sharing of the cake. Thus, co-opetition is a form of business strategy that combines two seemingly contradictory approaches: competitive and cooperative.

The concept of co-opetition has been developed by a number of researchers in different academic fields such as economics, management, marketing or psychology. Three main approaches to the study of coopetition can be distinguished in the literature: strategic, network and relational (Bengtsson, Kock, 2014). The strategic approach focuses on analysing the competitive and cooperative behaviour of market actors and its impact on economic performance. The network approach emphasises the significance of the structure and dynamics of relationships between actors and their impact on value creation and distribution processes. The relational approach focuses on the social and emotional aspects of relationships between partners and their impact on trust, loyalty and commitment.

Co-opetition can take various forms, such as joint research and development of products or technologies, group purchasing of raw materials or services, collaborative use of infrastructure or human resources, combined marketing or distribution activities, or joint participation in publicly funded projects (Czakon, Klimas, 2018). Examples of co-opetition in the building material market in Poland include a consortium of companies producing steel for road and bridge construction, an e-commerce platform linking producers and distributors of building materials, or a network of research laboratories cooperating with producers of insulation materials.

This study adopts a network approach to the study of co-opetition, which was analysed in four areas of cooperation and value distribution: product, advertising, communication and cooperation with a co-opetition network. In order to find an answer to the research question posed, the following hypotheses were formulated:

- H1:** Under the conditions of the TUNA organisational environment, there will be discrepancies in the assessment of economic situation in the building material market by members of a co-opetition network.
- H2:** Differences in assessments of economic situation in the building material market will have a large positive impact on the differentiation of needs of members of a co-opetition network.
- H3:** Differences in the needs of members of a co-opetition network which brings together companies from the construction industry, under the conditions of the TUNA market environment, will occur in most of the four areas of cooperation and value distribution: (product, advertising, communication and cooperation with a co-opetition network).

Methodology

In order to test the research hypotheses, an empirical research method involving a standardised interview questionnaire, carried out using the CAPI technique, was applied, among companies belonging to the “Stropy.pl” co-opetition network, between 22 August 2022 and 30 November 2022. 53 respondents were surveyed.

The “Stropy.pl” co-opetition network was established in 2016 and is the only initiative of its kind in Poland, bringing together construction companies that offer or manufacture floor systems. At the end of 2022, the network comprised 12 partners and 36 distributors. The network operates at two levels: communication with the market and distribution. Communication with the market involves enabling the customer to compare floor systems available in the market, familiarising them with the technical and economic aspects of different solutions, expert advice and the possibility of pricing and ordering them online via the “Stropy.pl” portal (Jasiński et al., 2022). Quotation requests generated on the portal are forwarded by the head office to the network members closest to the notified investment. Distribution involves ensuring that floor solutions are available and can be purchased throughout Poland. Distributors’ range of products include over a dozen different floor systems available exclusively within the network, while partners, in addition to the same range of floors, also manufacture the “Vector” floor system under the network licence. The members of “Stropy.pl” are family businesses from the SME sector, dominating the economic market with different sizes. They range from small contractors, design and construction wholesalers employing a few or a dozen or so people, to multi-branch construction wholesalers and manufacturers of precast concrete products employing up to 250 people. The “Stropy.pl” network supplies products to various market sectors such as B2B, B2C, B2B2C and B2G. Its products are suitable for residential, commercial and industrial construction (Kisiołek, 2017). The network covers entire Poland. Its members support one another in promoting their own products (hence its co-opetitive nature). They also cooperate at various levels (including contractor – floor assemblies, design – advisory and technical services and commercial – brokerage).

IBM SPSS Statistics 28.0 was used for calculations. $\alpha = 0.05$ was adopted as the level of significance. Frequency analysis was used to describe the responses to each question. In order to determine the significance of ratings of different needs related to the product, advertising, communication and “Stropy.pl”, an analysis was carried out using the Friedman test (Friedman, 1937). The Friedman test is a non-parametric test used to compare mean ranks across several dependent groups. The test statistic is calculated according to the following formula:

$$x^2 = \frac{12}{k(k+1)n} \sum_{i=1}^k \left(\sum_{j=1}^n r_{ij} \right)^2 - 3(k+1)n, \quad (1)$$

where:

k – number of measurements (number of activities, devices, tools evaluated),

n – number of observations,

r_{ij} – rank for the j^{th} observation in the i^{th} measurement.

This test examines whether there are differences between the measurements of the variable under study. The null hypothesis shows no such differences and the alternative hypothesis is that at least one pair of measurements differs.

If the Friedman test showed statistically significant differences between the needs assessments, an additional analysis was applied using the Dunn test (Dunn, 1964) with the Bonferroni correction for multiple comparisons. This correction reduces the risk of making a Type I error (Abdi, 2007).

In order to compare those rating the economic situation of building materials in 2022 and 2023 as very low/low or moderate/high in terms of needs assessment, analyses were performed using the Mann-Whitney U test (Mann, Whitney, 1947). For a large sample, the statistic is calculated according to the following formula:

$$Z = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{(n_1 + n_2 + 1)}{12} - \frac{n_1 n_2 \Sigma(t^3 - t)}{12(n_1 + n_2 + n_2 - 1)}}}, \quad (2)$$

where:

$n_1 n_2$ – number of samples,

U – Mann-Whitney test statistic for small samples calculated from the following formula:

$$U = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1, \quad (3)$$

where:

R_1 – sum of sample ranks,

t – number of cases included in the tied rank.

Results and discussion

Fifty-three people were surveyed, two of whom rated the current economic situation in the building material market as very low. One of them expected no change in the following year and the other forecast stagnation. Most of the respondents (34.9%, N = 18) considered the current market situation as low. Of this group, 10 people did not change their ratings for 2023, 5 people expected stability, 1 person expected growth and 2 people expected depression. The most frequently the respondents (58.5%, N = 31) believed that the building material market was currently stable. Among them, 58.1% (N = 18) predicted no change for the following year, 19.4% (N = 6) expected stagnation and 22.6% (N = 7) anticipated development. Only two people assessed the current market situation as high and both predicted it to remain stable in 2023. Table 1. shows the detailed distribution of economic situation ratings for 2022 and 2023.

Table 1.

Frequency analysis of respondents' expectations in relation to the economic situation of the building material market

Expectation rating	This year (2022)		Next year (2023)	
	<i>n</i>	%	<i>n</i>	%
Very low (depression)	2	3.8	3	5.7
Low (stagnation)	18	34.9	17	32.1
Moderate (stabilisation)	31	58.5	25	47.2
High (development)	2	3.8	8	15.1

Source: own study.

First, the respondents were divided into two groups – those who rated the economic situation of building materials very low or low and those who rated the economic situation moderately or high. For these groups, analyses were carried out using the Mann-Whitney U test, comparing their assessments of product, advertising, communication, sales and cooperation needs with “Stropy.pl”.

The analysis showed one difference in the ratings – for those who rated the economic situation as moderate/high, the improvement in the quality of the panel floors was more important than for those who rated the economic situation very low/low. The strength of the effect for the difference was moderate. In terms of other needs, there were no differences between the groups (Table 2).

Table 2.

Comparison of respondents rating the economic situation in 2022 as very low/low and moderate/high in terms of needs assessment

Dependent variable	Very low/low (n = 20)			Moderate/high (n = 33)			Z	p	r
	average rank	Me	IQR	average rank	Me	IQR			
Product									
General product quality assessment	27.53	5.00	0.75	26.68	5.00	2.00	-0.21	0.835	0.03
Accessibility improvement	23.58	4.00	1.00	29.08	5.00	2.00	-1.30	0.193	0.18
Advertising									
More advertising campaigns	28.43	4.00	1.00	26.14	3.00	1.00	-0.54	0.586	0.07
More incisive communication	26.38	3.00	1.00	27.38	3.00	1.00	-0.24	0.808	0.03
Advertising to new customer segments	28.18	3.00	1.75	26.29	3.00	1.00	-0.45	0.649	0.06
More online advertising	26.50	4.00	0.00	27.30	4.00	1.50	-0.20	0.840	0.03
More social media advertising	27.50	4.00	0.75	26.70	4.00	1.00	-0.20	0.841	0.03
More mobile advertising	26.45	3.00	1.75	27.33	3.00	1.00	-0.22	0.827	0.03
More advertising in paper press	26.20	2.00	1.00	27.48	3.00	1.00	-0.32	0.749	0.04
More outdoor advertising	27.33	3.00	2.00	26.80	3.00	2.00	-0.13	0.900	0.02
Communication									
Communication frequencies	29.65	3.00	1.00	25.39	3.00	0.50	-1.08	0.282	0.15
Clarity of message	28.68	3.50	1.00	25.98	3.00	1.00	-0.65	0.515	0.09
Better audience outreach	30.38	4.00	0.75	24.95	4.00	1.00	-1.37	0.172	0.19
Sales needs for panel floors									
Lower price	24.58	4.00	2.00	28.47	4.00	1.00	-0.94	0.345	0.13
Accessibility improvement	26.75	4.00	1.75	27.15	4.00	2.00	-0.10	0.922	0.01
Quality improvement	20.73	2.00	1.00	30.80	3.00	1.00	-2.43	0.015	0.33
Sales needs for beam-and-block floors									
Lower price	23.20	3.00	1.00	29.30	4.00	1.00	-1.45	0.147	0.20
Accessibility improvement	24.50	3.00	0.75	28.52	3.00	2.00	-0.97	0.331	0.13
Quality improvement	24.98	3.00	0.75	28.23	3.00	1.00	-0.84	0.403	0.11
Requirements for fittings and lintels									
Lower price	26.15	4.00	1.50	27.52	4.00	1.50	-0.33	0.738	0.05
Quality improvement	27.48	3.00	1.50	26.71	3.00	2.00	-0.18	0.857	0.02
Personalisation of fittings (fittings with your logo)	24.08	4.00	2.75	28.77	5.00	1.50	-1.16	0.247	0.16
New types of fittings	24.28	3.00	1.00	28.65	3.00	1.50	-1.07	0.284	0.15
New types of lintels	26.70	3.00	0.75	27.18	3.00	1.00	-0.13	0.900	0.02

Cont. table 2.

Cooperation needs with Stropy.pl									
More frequent contact with customer service consultant	29.65	3.00	2.00	25.39	3.00	1.00	-1.02	0.310	0.14
More frequent contact with headquarters	26.90	3.00	1.75	27.06	3.00	1.50	-0.04	0.969	<0.01
Improving the quality service by customer service consultants	29.45	3.00	2.00	25.52	3.00	2.00	-0.93	0.353	0.13
Improving the quality service by headquarters	26.80	3.00	1.50	27.12	3.00	2.00	-0.08	0.939	0.01
Development of new promotional materials (leaflets, boards, banners, displays)	31.23	3.00	1.00	24.44	3.00	0.50	-1.71	0.088	0.23

Source: own study.

Analogous analyses were carried out to compare those who rated the economic situation of the coming year as very low/low and moderate/high. Those who rated the economic situation as very low/low attached more importance to clarity of message in terms of communication, as well as to more frequent contact with the head office and the development of new materials in terms of cooperation with “Stropy.pl”. On the other hand, those evaluating the coming economic situation moderately/high rated the importance of improving the availability of sales of panel floors and the personalisation of fittings higher. The strength of the effect for the differences was at the weak or moderate level. For the other needs, differences between the groups were found to be insignificant (Table 3).

Table 3.

Comparison of respondents rating the economic situation in 2023 as very low/low and moderate/high in terms of needs assessment

Dependent variable	Very low/low (n = 20)			Moderate/high (n = 33)			Z	p	r
	average rank	Me	IQR	average rank	Me	IQR			
Product									
General product quality assessment	27.33	5.00	1.75	26.80	5.00	1.00	-0.13	0.897	0.02
Accessibility improvement	24.20	4.50	1.00	28.70	5.00	2.00	-1.07	0.287	0.15
Advertising									
More advertising campaigns	29.83	4.00	1.00	25.29	3.00	1.50	-1.08	0.281	0.15
More incisive communication	29.35	3.50	1.00	25.58	3.00	1.00	-0.92	0.360	0.13
Advertising to new customer segments	30.95	4.00	1.00	24.61	3.00	1.00	-1.53	0.126	0.21
More online advertising	25.60	4.00	1.00	27.85	4.00	0.00	-0.57	0.571	0.08
More social media advertising	28.53	4.00	1.00	26.08	4.00	0.50	-0.61	0.540	0.08

Cont. table 3.

More mobile advertising	28.70	3.00	1.00	25.97	3.00	0.50	-0.68	0.499	0.09
More advertising in paper press	29.58	3.00	1.00	25.44	2.00	1.00	-1.03	0.304	0.14
More outdoor advertising	29.13	3.00	2.00	25.71	3.00	2.00	-0.82	0.413	0.11
Communication									
Communication frequencies	29.65	3.00	1.00	25.39	3.00	0.50	-1.08	0.282	0.15
Clarity of message	32.13	4.00	1.00	23.89	3.00	1.00	-1.99	0.046	0.27
Better audience outreach	28.80	4.00	1.00	25.91	4.00	1.00	-0.73	0.466	0.10
Sales needs for panel floors									
Lower price	21.98	3.50	1.75	30.05	4.00	1.00	-1.96	0.050	0.27
Accessibility improvement	19.73	3.50	1.75	31.41	5.00	1.00	-2.87	0.004	0.39
Quality improvement	25.93	3.00	1.00	27.65	3.00	2.00	-0.42	0.677	0.06
Sales needs for beam-and-block floors									
Lower price	25.00	3.00	1.00	28.21	4.00	2.00	-0.76	0.445	0.10
Accessibility improvement	25.55	3.00	0.00	27.88	3.00	2.00	-0.56	0.573	0.08
Quality improvement	27.43	3.00	0.00	26.74	3.00	1.00	-0.18	0.861	0.02
Requirements for fittings and lintels									
Lower price	28.38	4.00	1.00	26.17	4.00	2.00	-0.54	0.588	0.07
Quality improvement	27.18	3.00	0.75	26.89	3.00	2.00	-0.07	0.947	<0.01
Personalisation of fittings (fittings with your logo)	21.65	3.00	2.75	30.24	5.00	1.00	-2.12	0.034	0.29
New types of fittings	26.13	3.00	0.75	27.53	3.00	2.50	-0.34	0.731	0.05
New types of lintels	27.95	3.00	0.00	26.42	3.00	1.00	-0.40	0.691	0.05
Cooperation needs with Stropy.pl									
More frequent contact with customer service consultant	31.55	3.00	1.75	24.24	3.00	1.00	-1.74	0.081	0.24
More frequent contact with headquarters	33.53	3.00	1.00	23.05	2.00	1.00	-2.51	0.012	0.34
Improving the quality service by customer service consultants	28.78	3.00	2.00	25.92	3.00	2.00	-0.67	0.501	0.09
Improving the quality service by headquarters	30.50	3.00	1.00	24.88	3.00	2.00	-1.34	0.180	0.18
Development of new promotional materials (leaflets, boards, banners, displays)	33.08	3.50	1.75	23.32	3.00	0.00	-2.46	0.014	0.34

Source: own study.

The results of the study show that the conditions of the TUNA organisational environment have an impact on the formation of the needs of members of a co-opetition network.

H1: Under the conditions of the TUNA organisational environment, there will be discrepancies in the assessment of economic situation in the building material market by members of a co-opetition network. The study has confirmed that under the conditions of the TUNA organisational environment, there are discrepancies in the assessment of economic

situation in the building material market by members of a co-opetition network (positive verification of hypothesis H1).

H2: Differences in assessments of economic situation in the building material market will have a large positive impact on the differentiation of needs of members of a co-opetition network. The analysis has showed that differences in assessments of economic situation in the building material market have a moderate but not large positive impact on the differentiation of the needs of members of a co-opetition network (negative verification of hypothesis H2).

H3: Differences in the needs of members of a co-opetition network which brings together companies from the construction industry, under the conditions of the TUNA market environment, will occur in most of the four areas of cooperation and value distribution: product, advertising, communication and cooperation with a co-opetition network. The study has confirmed that differences in the needs of members of a co-opetition network bringing together companies from the construction industry, under the conditions of the TUNA market environment, will occur in most of the four areas of cooperation and value distribution (positive verification of hypothesis H3).

Conclusion

In order to find out the needs of members of a co-opetition network in the building material market, under the conditions of the TUNA organisational environment, an empirical survey was conducted among the representatives of the companies affiliated to the “Styropy.pl” co-opetition network.

The research allowed all research hypotheses to be verified and the research questions to be answered:

1. Under the conditions of the TUNA organisational environment, are there differences in assessments of economic situation in the building material market by members of a co-opetition network?

Under the conditions of the TUNA organisational environment, there was a divergence in the assessments of economic situation in the building material market by members of a co-opetition network. Regarding the situation of the building material market in 2022 and 2023, most respondents showed moderate or low expectations. Some respondents rated the economic situation in the building material market as low (in 2022 – 39.4% of the respondents, in 2023 – 32.1% of the respondents) and some rated it as moderate (in 2022 – 58.5% of the respondents, in 2023 – 47.2% of the respondents).

2. What is the direction of actions and the strength of the relationship between differences in assessments of economic situation in the building material market and the differential needs of members of a co-opetition network?

Differences in assessments of economic situation in the building material market have a moderately positive impact on the differentiation of the needs of members of a co-opetition network.

3. What are the differences in the needs of members of a co-opetition network in the building material market, under the conditions of the TUNA market environment?

Improving the quality of panel floors was more important to those who expected moderate or high economic situation than to those who were very or lowly optimistic. On the other hand, those who were very or lowly optimistic paid more attention to the clarity of communication, more frequent contact with the head office and new material regarding the cooperation with “Stropy.pl”. On the other hand, those who expected moderate or high economic situation were more appreciative of the improved sales availability of panel floors and the personalisation of fittings.

In order to obtain a more complete picture of the needs of the building material market in Poland, in the context of the TUNA organisational environment, it is recommended to conduct further research with the end users of these materials. This research should cover the same thematic area as the previous one, i.e. identifying the needs of market participants, but it should focus on the B2C sector, which has not been covered before. Such a research scope would allow the formulation of holistic conclusions, taking into account both major stakeholder groups of the construction market in Poland.

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