The research problem undertaken to be solved in the article is specified in the following form: what and to what extent determines to the greatest extent the continuity of military supply chains? The article is structured in two main parts, the first theoretical – The essence and dimensions of business continuity management of military supply chains, and second empirical – Challenges in business continuity management of military supply chains. A number of methods were used in the content, the leading ones being analysis and synthesis, literature query, abstraction, and inference. A diagnostic survey method using an expert interview technique was used as the empirical method. The approach adopted made it possible to achieve a cross-sectional character of the considerations, at the same time providing a basis for further, extended research into this extremely important and topical problem.

Keywords: logistics, management, business continuity, supply chains

INTRODUCTION

One of the key issues during the implementation of tasks within the framework of support and logistic security of military subdivisions and branches is ensuring the uninterrupted implementation of individual logistic processes. The degree of achievement of the assumed objectives in the training and operational dimensions directly depends on ensuring their continuity. Recent experience from a detailed analysis of the area of logistical security of military operations conducted on the territory of Ukraine unequivocally shows that effective management of the continuity of logistic processes is one of the main determinants of success, or failure in combat operations.
In view of the problem situation briefly outlined above, the aim of the article was to identify and assess the key factors determining to the greatest extent the continuity of military supply chains. The research problem undertaken to be solved in the article was specified in the following form: what and to what extent determines to the greatest extent the continuity of military supply chains? The article is structured in two main parts, the first theoretical – The essence and dimensions of business continuity management of military supply chains, and second empirical – Challenges in business continuity management of military supply chains. A number of methods were used in the content, the leading ones being analysis and synthesis, literature query, abstraction, and inference. A diagnostic survey method using an expert interview technique was used as the empirical method. Due to the adopted research limitations, efforts were concentrated on the essence of the problem undertaken to be solved, while at the same time indicating future directions of research on the extremely topical and multifaceted problem, which is still the issue of ensuring the continuity of military supply chains for the armed forces.

**THE ESSENCE AND DIMENSIONS OF BUSINESS CONTINUITY MANAGEMENT OF MILITARY SUPPLY CHAINS**

In order to properly implement the tasks of material security of troops, military supply chains are created, which, within the scope of the subject, should be understood as a set of cooperating, structural internal and external elements satisfying the logistic needs of troops by providing them with goods necessary for the implementation of training, operational and combat tasks. Table 1. presents the key parameters characterising contemporary military supply chains.

Table 1. Key parameters characterising today's military supply chains

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJECTIVE</td>
<td>unequivocally defined – securing the material needs of the troops to a degree that guarantees their day-to-day functioning and, above all, the fulfilment of the training, operational and combat tasks assigned to military units and institutions</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>repeatedly inadequate; difficult to obtain in the area of operations; very difficult to forecast due to the volatility</td>
</tr>
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</table>

### Parameter Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>RANGE OF NEEDS MET</td>
<td>extensive; all the means of supply conditioning the proper execution of training, operational and combat tasks; repeatedly hampered by long-term planning in terms of the place, type and size of the necessary material resources</td>
</tr>
<tr>
<td>TASK HOLDERS</td>
<td>military actors supported by civilian forces; national forces supported by allied, multinational capabilities</td>
</tr>
<tr>
<td>TIME OF OPERATION</td>
<td>time pressure; many times a very short time due to dynamic changes in the course of activities, operations</td>
</tr>
<tr>
<td>INFORMATION</td>
<td>much of it classified; often inadequate, inaccurate; circulation difficult when using IT systems</td>
</tr>
<tr>
<td>SUPPLY CHAIN CONFIGURATION AND COORDINATION</td>
<td>Complex; difficult to monitor as a result of many variables and unknowns at each stage of delivery to troops; high dynamics of change during the course; difficult to coordinate as a result of the great diversity of the different chains</td>
</tr>
<tr>
<td>COOPERATION IN THE SUPPLY CHAIN</td>
<td>formalised, governed by a number of external and internal rules and procedures</td>
</tr>
<tr>
<td>FINANCING OF ACTIVITIES</td>
<td>state budget</td>
</tr>
<tr>
<td>SUPPLY CHAIN ORIENTATION</td>
<td>clear priorities; focus on training and operational tasks in peacetime and operational and combat tasks in times of crisis or war;</td>
</tr>
<tr>
<td>PERFORMANCE MONITORING AND EVALUATION</td>
<td>limited; limited possibilities to control and evaluate effectiveness due largely to many non-parametric features of the force’s activities</td>
</tr>
</tbody>
</table>


Referring to the specifics of military supply chains contained in Table 1, it is important to emphasise its multidimensionality, and note that it is determined by a number of diverse factors. One is the issue of ensuring the continuity of operation of individual logistics processes implemented at all functional levels of the military logistics system. In improving it, solutions developed, as early as the 1980s in the United States should be used, which initiated the emergence of a new concept of 'disaster recovery'² (IT disaster recovery).

which included office computers, as well as entrepreneurs. Selected definitions of business continuity are shown in Table 2.

Table 2. Selected definitions of business continuity

<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
</table>

source: own study

In the first phase of practical interest in the business continuity approach, a distinction was made between a Disaster Recovery Plan (DRP) and a Business Continuity Plan (BCP). They were used interchangeably, but the difference between them was not perceived. The need to separate the names emerged as the frequency of developing disaster recovery plans increased. It became apparent, that disaster recovery was one thing and planning for the continuity of an organisation was another. In the 1990s, interest in business continuity management began to develop intensively practically worldwide. The first attempt at a business continuity management approach was the development of the document 'Professional Principles for Business Continuity Planning Specialists' by the Disaster Recovery Institute International in 1997. The next stage in the development of the concept in question was the publication of 'Best Practices' by the Business Continuity Institute in 2000, which formed the basis for the construction of the new business continuity standard PAS 56 'Guide to Business Continuity Management. Code of Practice'. In 2006, the British Standard BS 25999 was developed on the basis of PAS 56. Two parts were published:

- BS 25999-1:2006 'Business continuity management. Code of practice' A standard derived from PAS 56, which is a code of good BCM practice, and takes the form of a guide and recommendations. BS 25999-1 covers guidelines and recommendations and describes the

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5 Ibid.
Business Continuity Management of Military Supply Chains

Process, principles and terminology of BCM (business continuity management). The standard includes guidance intended for internal use only (so this part of the standard was not intended for certification).

- BS 25999-2:2007 'Business continuity management. Specification', was published in August 2007. This standard contained the requirements for an Organisational Business Continuity Management System and provided the basis for the implementation and certification of the BCMS.

From the perspective of the considerations carried out, it should be noted that the ISO 22301:2012 terminology standard includes a definition of a Business Continuity Management System (BCMS). The BCMS is the part of the overall management system concerned with the establishment, implementation, operation, monitoring, review, maintenance, and improvement of business continuity. The management system includes organisational structure, policies, planning activities, responsibilities, procedures, processes, and resources. This system emphasises the importance of understanding the needs of the organization, and the need to establish business continuity management policies and objectives. Secondly, it is important to implement and operate mechanisms and measures to manage the organization's overall ability to meet disruptive incidents. Next, it is essential to monitor and evaluate the effectiveness and efficiency of the business continuity management system, and to continuously improve based on objective measurement results.

In the literature, business continuity management (BCM) is defined as a holistic management process (Figure 1.) that identifies organisation's potential threats, and the effects these threats may have on business operations, should they occur, which provides a framework for building an organisation's resilience and enables effective response to protect the interests of its key stakeholders, its reputation, brand and value-creating activities. BCM focuses on planning an organisation's strategy in emergency situations, i.e.: natural disasters, major IT system failures, or unavailability of key resources. This holistic approach to the problem of an organisation's functioning distinguishes BCM and makes it an effective tool for ensuring business continuity. While doing so, it should always be remembered that a business continuity management system should not be equated with an organisation's risk management system. However, it is worth noting that BCM is related to the identification and management of different types of risks in an organisation.

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6 W. Kopaliński, Słownik wyrazów obcych i zwrotów obcojęzycznych z almanachem, Oficyna Wydawnicza RYTM, Warsaw 1994, p. 492.

In conclusion, part one of this article should specifically highlight the complexity and multidimensionality of managing the business continuity of military supply chains. The challenge for the further development of this extremely important area of functioning of the armed forces, will certainly be the identification of the factors most influencing the continuity of military supply chains. To this end, it proved necessary to conduct empirical research, a description of which is presented in the second part of the article.

**CHALLENGES IN BUSINESS CONTINUITY MANAGEMENT OF MILITARY SUPPLY CHAINS**

An analysis of the literature on the development of military logistics, points to key elements that determine the effectiveness of logistics processes taking place in military supply chains. The most frequently described area in recent publications is the issue of security of supply chains, including security.

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of transport processes\textsuperscript{9} and management of military supply chains,\textsuperscript{10} for which properly prepared logistics personnel\textsuperscript{11} and modern IT systems\textsuperscript{12} in particular those dedicated to the armed forces,\textsuperscript{13} are essential. In the opinion of the author’s team, the available publications insufficiently address the issue of business continuity management of military supply chains. Therefore, in order to solve the defined research problem, it became necessary to conduct empirical research. Due to the nature of the area under study, qualitative research carried out using the diagnostic survey method with the expert interview technique was selected as the most appropriate. Prepared interview sheets containing four open-ended questions were addressed to 9 experts representing all functional levels of the military logistics system. The research proper, preceded by a pilot study, was conducted in the period of June-September 2022.

The interview sheet comprised four open-ended questions in wording:

\begin{itemize}
  \item Which activities do you think are the priority and most important in military supply chains today?
  \item What internal vs. external factors have the greatest impact on ensuring the business continuity of military supply chains?
  \item What is currently affecting/can affect negatively the continuity of processes in military supply chains, and to what extent?
  \item What changes do you think should be made first to improve the ability of military supply chains to run smoothly?
\end{itemize}

Due to the limited scope of the present material, the empirical results obtained have been aggregated and presented in Table 3.

Table 3. Summary of empirical findings on improving freight management in the military sector

<table>
<thead>
<tr>
<th>Question</th>
<th>Aggregated expert opinions</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Which activities do you think are the</td>
<td>– the formation of new logistics units and the replenishment of staff in logistics units;</td>
</tr>
</tbody>
</table>

\textsuperscript{13} W. Olszak, \textit{Systemy informatyczne jako element wsparcia decyzji w logistyce sił zbrojnych RP}, „Rocznik bezpieczeństwa morskiego - Year XI - 2017, pp. 65-76.
<table>
<thead>
<tr>
<th>Question</th>
<th>Aggregated expert opinions</th>
</tr>
</thead>
</table>
| priority and most important in military supply chains today? | – expansion of storage infrastructure (warehouses, field depots and yards);  
- increasing the mobile capabilities of the logistics brigades;  
- stockpiling/replenishing supplies in relation to increasing numbers of troops (particularly Class V);  
- modification of the organisational structures of the 2nd (logistics regiments) and 3rd (logistics brigades) levels of security in relation to changing needs;  
- full implementation of an asset inventory database, accessible to all required users;  
- ensuring the continuous supply of technical material resources necessary for the operation of owned and deployed military equipment. |
| What internal vs. external factors have the greatest impact on ensuring the business continuity of military supply chains? | internal factors:  
- the degree of manpower complementation (soldiers of the logistics personnel corps and employees of the Ministry of National Defence);  
- the degree of computerisation of the functional system of the logistics of the Polish Armed Forces;  
- adaptation of logistical capacity to the needs of troops.  
external factors:  
- the capacity of the actors in the economy, i.e. the ability to provide the armed forces with an assortment of goods at the right time, in the right quantity and in the right quality, both in peacetime and in wartime;  
- complex and restrictive contractual freedom in public procurement procedures;  
- the scale and pace of military equipment (SpW) purchases;  
- SpW logistics supply (size of budget and capacity of economic operators);  
- frequent changes in the assumptions of the development strategy of the Polish Armed Forces. |
| What is/can negatively affect the continuity of processes in military supply chains today and to what extent? | shortages in logistical staffing;  
- The unfinished process of computerisation of the Polish Armed Forces;  
- lack of adequate infrastructure;  
- insufficient funding for logistics processes;  
- the slow pace of the process of forming new logistics units (plog and Blog);  
- high rate of technical modernisation of the Polish Armed Forces;  
- inefficiencies in the territorial military logistics security system;  
- Domestic market constraints (ensuring that sup- |
<table>
<thead>
<tr>
<th>Question</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td>Aggregated expert opinions</td>
</tr>
<tr>
<td></td>
<td>plies/purchases are delivered in sufficient quantity, quality and time);</td>
</tr>
<tr>
<td></td>
<td>European energy and raw material crisis related to the war in Ukraine.</td>
</tr>
<tr>
<td></td>
<td>accelerate the process of adapting logistics capabilities to the expanded and modernised Armed Forces of the Republic of Poland;</td>
</tr>
<tr>
<td></td>
<td>changes to the territorial logistics support system (including the addition of stationary logistics with mobile sub-divisions);</td>
</tr>
<tr>
<td></td>
<td>to accelerate the process of computerisation of the Armed Forces of the Republic of Poland, in particular with regard to material and technical resources, and to increase the capabilities of the Integrated Multi-level Information System of the Ministry of Defence (ZWSI RON) in terms of the rational use and disposal of logistical resources;</td>
</tr>
<tr>
<td></td>
<td>filling vacancies in logistics positions and increasing the number of logistics specialists in logistics and operational units.</td>
</tr>
</tbody>
</table>

In an attempt to generalise the results collected during the research process and summarised in Table 3. It should be pointed out that all experts agreed, that the issue of managing the continuity of their operations is crucial for military supply chains today. Expressing their opinions, they specifically pointed to the need to increase the logistic potential, adequately to the developed combat potential of the Polish Armed Forces. As a result of changes in the security environment of our State, a number of activities are being implemented to increase defence capabilities. Experts note that the pace of creation of new logistic units and their completion in personnel and SpW is too slow. Similarly, the accumulation of stockpiles of supplies and technical material means, as well as the adaptation of the logistics infrastructure, has not kept pace with the planned and implemented purchases of modern SpW. Another element that is necessary to maintain the continuity of military supply chains is the computerisation of the Armed Forces of the Republic of Poland including logistic processes, enabling the ongoing tracking of logistic resources at all organisational levels of the Armed Forces of the Republic of Poland. The ongoing process of computerisation of the military needs to be accelerated and streamlined, according to experts. The last factors limiting the continuity of military supply chains are constraints of the national economy and disruptions in the European market, caused by the war in Ukraine, as well as the Covid-19 pandemic.
Taking the activities in military supply chains as the realisation of standard processes immanent to the chain, on the basis of the research carried out, it can be concluded that the priority is currently given to the process of replenishing the stockpile of means of warfare (SW), in particular Class V (warfare assets) through supplies from the national economy (or imports). This refers to both the current-use stock and the war stock. The former ensures the continuity of the implementation of training undertakings. On the other hand, the war stock should be urgently (as a priority) replenished, as its condition directly determines the combat readiness of the Armed Forces of the Republic of Poland (SZRP). The need for replenishment is due, among other things, to the implementation of the prominent assistance provided to the fighting SZ of Ukraine. However, greater challenge is not so much the replenishment as the creation of a war stockpile of combat assets for newly introduced military equipment (SpW), in particular tanks and air defence systems.

On the other hand, assuming that "activities in military supply chains" also concern the implementation of already initiated reforms, then two processes may have priority in the opinion of experts: the formation of new logistics units and the filling of vacant positions in logistics units, in particular military economic branches (WOG), regional logistics bases (RBLog) and depots), and logistics management cells at all levels (S4, G4, J4, etc.). The first process is important primarily because of the need to ensure the readiness of the Polish Armed Forces to perform tasks in accordance with their wartime designation. This readiness depends, among other things, on the SZRP having the capability to organise the military supply chain in the framework of an ongoing operation.

The second process mentioned, i.e. the replenishment of logistic vacancies, is due to the large number of vacant positions in logistic units such as military economic units. The problem with completing the staffing of military positions is due to, among other things: the establishment of a new type of armed forces (Territorial Defence Forces), the formation of the 18th DZ, logistics regiments, or the low 'supply' of those willing to join the ranks of the army. In turn, the shortage of RON personnel is mainly due to the low salaries offered to them by the army. It should be noted that filling vacancies is a lengthy process (especially if one assumes that competent and reliable people are accepted into service and work, rather than those whom "no one wanted anymore" within the labour market).

The internal factors most influential in ensuring the continuity of military supply chains were primarily: having in-house resources (inventories) to meet the current needs of the military. Under conditions of uncertainty in the civilian market, increased in-house inventories allow military supply chains to maintain continuity of operations when supply chains from the economy are disrupted. Maintaining stockpiles requires adequate storage and handling in-
Frastructure and transport capacity of logistics units. From the Ukrainian experience (from the Polish experience in Iraq and Afghanistan as well – author’s note), the critical factor for on-time and on-delivery time was in many cases an insufficient number of forklift trucks.

One of the factors that may have a negative impact on the continuity of processes taking place in military supply chains is the pace of the process of forming new plog and BLog logistics units. On the one hand, the very beginning of the changes (replenishment of logistic potential) should be appreciated, but on the other hand, due to the dynamically changing security environment (spectrum of military threats) the slowness (related to objective reasons) of the formation of logistic regiments and logistic brigade and the achievement by these units of readiness to perform tasks may be a factor significantly reducing the ability of the Polish Armed Forces to conduct defence operations on the territory of the country. On the processes of logistic support of current operations this impact is smaller, however, it should be taken into account that the attainment of readiness by plog and BLog would increase, for example, the transport and reloading capacity of troops.

Another negative factor is the protracted process of computerisation of the Polish Armed Forces. The Integrated Multi-level Information System of the Ministry of Defence (ZWSI RON) has still not been fully implemented. It is only recently that the possibility of planning the exploitation of SpW by logistic cells of military units (S4) using ZWSI RON has emerged. However, it is still not possible for the beneficiary of logistics support, for example, to view stock levels of the required assortment. In addition, ZWSI RON continues to be criticised for its complex operation (e.g. the use of incomprehensible and unintuitive acronyms to describe system functions). In the current era, the standard that should be aspired to, should be the ease of use of IT logistics systems similar to that encountered, for example, when shopping in the online shop.

Factors negatively affecting the continuity of processes taking place in military supply chains paradoxically also include the accelerated technical modernisation of the Polish Armed Forces. Of particular importance here is the acquisition of new equipment to replace the withdrawn "old stock". The problems are not only related to the already mentioned issue of availability of combat assets. It is also necessary to take into account the provision of transport capacity for Class V, but also fuels (Class III), because, for example, Abrams tanks are equipped with turbine engines and, with the engine switched on, require full refuelling three times a day regardless of the type of operations. An important aspect here is also the availability of technical material resources for the newly deployed SpW.

The conducted theoretical and empirical research not only solved the identified research problem, but also provided a basis for further, extended research aimed at continuous improvement of military supply chains. In view of
the limited scope of this article, the greatest challenge was to collate the results obtained in terms of their comprehensive comparison with the detailed opinions of experts representing all functional levels of the military logistics system. This approach, however, allowed cross-cutting results to be obtained, providing a basis for the presentation of scientific conclusions to guide further multidimensional work on improving the business continuity management of military supply chains.

CONCLUSIONS

The results obtained in the research process mandate the following general conclusions:

1. There is an urgent need to identify logistical needs in relation to the increasing numbers of operational troops. The construction of defence capabilities adequate to the challenges of the security environment must include the capabilities of the military logistics system at each level of logistic support.

2. It is necessary to speed up the creation of structures and the completion of logistics units. Achieving readiness by logistics regiments and the logistics brigade would increase transport and reloading capacities, which would translate into shorter delivery times to supplied units.

3. The personnel situation in the logistics personnel corps requires urgent action to fill vacancies existing and those anticipated in the conditions of increased size of the armed forces. Actions taken by the organiser of the logistics functional system in terms of recruiting and preparing logistics specialists (military and civilian) are slowly yielding positive results. However, the real challenge will be the process of completing the staffing of the newly created structures.

4. The unstable situation on the civilian markets: national and European, requires the planning of alternative sourcing, which entails increased costs for maintaining stocks of own supplies, for which an adequate storage and handling infrastructure is necessary.

5. Planned expenditure on the modernisation of the Polish Armed Forces must cover the needs for the expansion of the logistics system on an appropriate scale. The research in question did not relate to the budget plans of the Armed Forces of the Republic of Poland, but expert experience shows that often in the past, spending on logistics was not prioritised.
In conclusion, it should be emphasised that systematic scientific research in the field of business continuity management of military supply chains, is extremely important due to the dynamic changes taking place in both the international and national security environment. In addition, due to the close correlation of the operation and development of military supply chains, an extensive exchange of views and joint interdisciplinary research by researchers representing in particular the scientific disciplines of management and quality sciences and security sciences is essential.

BIBLIOGRAPHY


