ANALYSIS OF PROBLEMS OF THE PERFORMANCE MANAGEMENT OF HUMANITARIAN SUPPLY CHAINS

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Abstract

The research paper analyzes humanitarian supply chains compared to business chains and addresses performance management. The study employs quantitative and qualitative research methods, literature review analysis, statistical tools, previous research, and grounded theory. The findings consolidate significant issues limiting the performance of humanitarian supply chains and highlight challenges in measuring performance in the humanitarian sector. This study contributes to a better understanding and more effective management of humanitarian supply chains for improved operational outcomes.

Keywords: Humanitarian supply chains, humanitarian logistics, performance management, performance measurement, analysis

1. INTRODUCTION

Performance management is defined as the use of information to influence positive changes in organizational culture, systems and processes, define performance goals, allocate resources, set policies, set targets and share performance results in achieving them (Amaratunga, Baldry, Sarshar 2001). The process consists of selecting performance variables, defining metrics, setting goals, measuring and analyzing the process (Forslund, Jonsson 2007). Sets of performance indicators then provide qualitative and quantitative information on the building elements of success in which firms need to improve performance (Melkers, Willoughby 2005). Organizations that apply performance management perform better than those that do not measure and manage performance (De Leeuw, Van Den Berg 2011). Thus, many organizations

implement the system to achieve competitive advantage, to maintain responsiveness to an ever-changing environment (De Waal, Kourtit 2013), or to increase stakeholder support and trust (Anjomshoae et al. 2017).

Performance measurement systems are often recommended to facilitate strategy implementation and improve organizational performance (Davis, Albright 2004). Since the late 1950s, they have been implemented in business, public and military organizations, and more recently in the humanitarian sector, to improve productivity, accountability and service delivery (Abidi 2019). In recent decades, the field of performance measurement has been the focus of many academics and practitioners (Franco-Santos, Lucianetti, Bourne 2012). Performance measurement includes processes for setting targets, designing indicators, and collecting and analyzing data on supply chain performance (Abidi 2019). It enables the transformation of data into information that facilitates control and remediation by reporting the actual level of supply chain performance against a desired level (Melnyk et al. 2014). Performance metrics can have a significant impact on performance by putting things into perspective, focusing attention on what is important, increasing objectivity, improving understanding, decision making and execution, improving consistency of performance over the long term, facilitating feedback, providing early warning signs to management, and helping the organization prepare for the future (Parmenter 2015).

To effectively apply performance management, organizations can coordinate key activities and initiate related performance management practices through performance measurement systems (De Waal 2003). These practices include selecting performance indicators and monitoring and evaluating them regularly to communicate direction, provide feedback on current performance, influence behavior, and stimulate improvement actions (Bourne, Bourne 2011). In modern management, performance measurement goes beyond quantification and accounting. Due to the limitations of traditional financial metrics, academics and practitioners advocate multidimensional performance indicators (typically financial and non-financial) (Chan, Qi 2003). Parmenter then describes four types of indicators (Parmenter 2015):

- key result indicators (KRIs) provide an overall view of how an organization is performing;
- result indicators (RIs) inform management about how teams are coming together to achieve results;
- performance indicators (PIs) tell management what teams are achieving;
- key performance indicators (KPIs) tell management how well the organization is performing on critical factors, and by tracking them, management can significantly improve performance.

However, every performance measure has a dark side, a negative consequence and an unintended action that can lead to poorer performance. Neely and Bourne cite poor system design and difficulty of implementation as the two main reasons for failure (Neely, Bourne 2000). In particular, the difficulty of implementation can be a pivotal issue in the humanitarian sector. In the commercial sector, more than 70 per cent of BSC (Balanced Scorecard) implementations fail (Neely, Bourne 2000), and



more than half of the measures encourage unintended negative behaviors (Parmenter 2015), such as linking rewards to metrics (Spitzer 2007). Related to this is the identification of appropriate metrics and their number in a large amount of available data (Monczka 2009). Organizations often fail to distinguish critical success factors (Parmenter 2015). Employees should not be tracking more than a dozen metrics, only half of which should be crucial (Monczka 2009). These problems are exacerbated by big data and new technologies, leading to a regime of ever-increasing reporting of irrelevant indicators (Parmenter 2015). Thus, selecting fewer meaningful indicators is crucial to improving performance (Parmenter 2015). However, over-aggregation can be a mistake which aggregates information to the point that it loses value (Monczka 2009). Conversely, many organizations rely only on short-term indicators, such as financial and operational indicators, or indicators focused on behavior rather than results (Monczka 2009). In order to set up a meaningful performance measurement system, it is necessary to focus on auditable events, strong internal communication of the system and metrics, reduction of bureaucratic burden, and future orientation (Parmenter 2015).

The research goal is to analyse humanitarian supply chains compared to business chains and address aspects of performance management in humanitarian environment (Jambor 2023). As the above suggests, this is a critical part of the logistical optimization of rescue operations. The paper is structured according to answering to each research question. First, the specifics of humanitarian supply chains are defined, then the differences between humanitarian and business supply chains are explored. Next, current approaches and models are analysed, and the challenges needed to overcome are discussed.

2. OBJECTIVES, METHODS AND LIMITATIONS

The research goal is to analyse humanitarian supply chains compared to business chains and address aspects of performance management in humanitarian environment. To fulfil the objective, the following research questions (RQs) were formulated:

- **RQ1:** What are specifics of humanitarian supply chains and its environment?
- **RQ2:** What are differences between humanitarian and business supply chains?
- **RQ3:** Which theoretical approaches and models are used to measure performance in humanitarian environment?
- **RQ4:** What are challenges in measuring performance in the humanitarian sector?

By researching the answers to these questions, the study will contribute to a better understanding and more effective management of humanitarian supply chains for improved operational outcomes. Simultaneously, the findings consolidate significant issues limiting the performance of humanitarian supply chains and highlight challenges in measuring performance in the humanitarian sector.

The study employs mostly qualitative research methods, literature review analysis, previous research, content analysis and grounded theory. The data was collected from various relevant sources, mainly from European Commission, IFRC (International Federation of Red Cross and Red Crescent Societies), and Web of Science.

The research limitation was to use the only open data, publicly available, based on the wide literature review. There was not used internal data from private, public or NGO (Non-governmental organization) organizations.

3. SPECIFICITY OF HUMANITARIAN SUPPLY CHAINS

In the commercial sector, the convention is to use a division of supply chain flows into tangible (material) and intangible (information and financial) flows (Repík 2021). Information flows are the basis on which HSC (Humanitarian Supply Chain) can be designed, shaped and managed (Tomasini, Wassenhove 2009a). When an emergency of the type of earthquakes in Turkey and Syria occurs, information flows flow to different actors around the world to alert them to the need for assistance and define the needs on the ground, i.e. describe and activate material flows. In the reverse flow, information about what material flows are being implemented. Finally, in the next wave, information about the receipt and use of the shipments is sent, and the cycle repeats (Tomasini, Wassenhove 2009a). Financial flows enable the implementation of the whole chain. Without financial flows, it is impossible to function even in the non-profit sector. A prerequisite for the effectiveness of the basic flows is to set up visibility, transparency and accountability (Tomasini, Wassenhove 2009a). It makes it possible to distinguish what resources need to be improved, how needs are being met and who has erred in the event of failure. With large-scale emergencies and a lot of media attention, shipments of tens of thousands of tons of goods are made that would cause extreme logistical bottlenecks without proper setup. In the humanitarian sector, these basic flows are augmented by (Tomasini, Wassenhove 2009a):

- people: representing all the labor available to the chain in each operation;
- knowledge and skills: are particularly important in the humanitarian sector, as each time an HSC is deployed in response to an emergency, skills need to be reconfigured quickly, i.e. each HSC is new and different.

All five flows are equally important in managing the response to the emergency. Disruption to anyone can affect the performance of the entire chain. Under pressure from limited resources (i.e. people, capital and infrastructure) (DG ECHO 2022), there is a need to ensure that all flows in the chain are managed. However, actions in the humanitarian sector are often uncoordinated, spontaneous, unsolicited or unwanted (Tomasini, Wassenhove 2009a). A common problem in humanitarian organizations is the limited amount of trained and coached personnel, as well as the limited ability

to train personnel. Moreover, people usually work under uncertainty and time pressure, which can be accompanied by logistical complications (Repík, Foltin 2022a):

- external origins (e.g. disrupted infrastructure);

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internal (e.g. lack of storage, transport or handling capacity).

Each emergency is different in its course and impact, but the complications have certain characteristics. At the beginning of an operation, organizations face shortages (personnel, material, finance, equipment, etc.) that can quickly turn into surpluses (especially for highly publicized events), see Figure 1. Complications of external origin usually have two possible scenarios of development that reflect on the performance of logistics support (Repík, Foltin 2022a):

- the situation improves over time (e.g., high winds);
- the situation deteriorates over time (e.g. armed conflict).

Based on these specifics, the form of logistic security then changes its character from a push principle at the beginning of the operation to a pull principle after the initial onslaught has been compared (Foltin, 2018). The push principle is generally used for uncertain environments where customer requirements are unknown (Chopra, Meindl 2013). After the first surveys and estimates, it is possible to start adjusting the pull principle according to the demand. The impacts on the supply chain are then mainly influenced by the level of preparation before the emergency and the commitment of the stakeholders. Humanitarian organizations often find themselves in situations that crisis management describes as firefighting (Bohn 2000). There are a lot of examples in the Czech Republic, e.g. the COVID-19 pandemic or the tornado in South Moravia was a major shock to the status quo. For a long time, the humanitarian sector was not prepared, and the response was led by extinguishing one problem after another.



Figure 1 Diagram of the evolution of demand and logistics capabilities during an emergency



4. DIFFERENCES BETWEEN HUMANITARIAN AND BUSINESS SUPPLY CHAINS

Several models and lessons can be adopted from the private sector for HSC management. However, there are specifics in the humanitarian context that can complicate the application of business sector approaches. Researchers already compared the differences between humanitarian and business supply chains, see (Beamon, Balcik 2008; Abidi 2019). However, our paper considers the major changes in the humanitarian sector in recent years, and our comparison is also more comprehensive than previous analyses, see Table 1. HSC, to be effective, must also exhibit three key characteristics that demonstrate utility in the business sector (Lee 2004):

- agility: the ability to respond quickly to changes in external influences;
- adaptability: the ability to adapt the supply chain, modifying strategies, products/services and technologies provided;
- alignment: creates conditions for better performance and requires information exchange with all relevant partners.

At the same time, the International Red Cross and Red Crescent Movement (RCRC) defines basic humanitarian principles, i.e. humanity, impartiality, neutrality, independence, voluntary service, unity and universality (IFRC 2023). At the European Union (EU) level, humanitarian principles are enshrined in the European Consensus on Humanitarian Aid, signed in December 2007 by the EU Council, the European Parliament and the European Commission (Evropská unie 2008). Based on the provisions of the Consensus, EU countries and institutions have agreed to work in a coordinated and complementary manner and to support the overall coordination role



of the United Nations (UN). The UN and the EU have thus adopted the same humanitarian principles based on the IFRC, i.e. humanity, neutrality, impartiality and independence (DG ECHO 2023a). These principles differentiate humanitarian aid from other activities, such as political, religious, ideological or military, and it is essential that the work of the HSC is always based on these principles.

Table 1	Differences	between	business	and hun	nanitarian	supply chains	

Criterion	Business Supply Chain	Humanitarian Supply Chain
Environment	Dynamic environment (Chopra, Meindl	Chaotic and uncertain environment
<i>a.</i>	2013).	(Tomasini, Wassenhove 2009b).
Strategic	Maximising profit, value and high	Minimising loss of life and
objectives	customer satisfaction (Chopra, Meindl	alleviating suffering (Tomasini, Wassenhove 2009b)
Information	Generally making good use of advanced	Information is often unreliable
system	technology (Christopher, Peck 2004).	incomplete or non-existent
system	teemiology (emistophen, reek 2001).	(Christopher, Tatham 2011).
Performance	Performance management is a common	Structured and standardised
measurement	practice (Bititci et al. 2012; Gopal,	performance management is not a
system	Thakkar 2012).	common practice (Abidi, de Leeuw,
•		Klumpp 2014) and lags behind the
		commercial sector (Lu, Goh, De
		Souza 2016).
Configuration	A tightly knit network of actors working	Stakeholder groups without clear
of actors	together to ensure the efficient flow of	inter-linkages, predominance of
	materials and information throughout the	NGOs and government actors
Configuration	Supply chain (Christopher 2005).	(Kovacs, Spens 2007).
of the supply	organisationally stable supplier base	undesirable suppliers (Kovács
network	(Chopra Meindl 2013)	Spens 2007)
Configuration	Well-defined methods for determining the	Challenging due to the nature of the
of the	number and location of distribution centres	unknowns and the risk and urgency
distribution	(Mangan, Lalwanis, Calatayud 2021).	context (Gatignon, Van
network		Wassenhove, Charles 2010).
Delivery times	Determines the supply chain on the basis	Delivery time requirements are very
	of a preliminary agreement (Pettit,	short and critical to saving lives
D	Beresford 2009).	(Kovács, Spens 2007).
Demand	Relatively stable, predictable demand	Demand arises from unpredictable
Iormula	patterns (Beamon, Balcik 2008). Demand	(Pattit Parasford 2000) The domand
	predictable quantities	for goods during these events is also
	predictable qualitates.	unpredictable (Murray 2005)
Inventory	Well-defined methods for determining	Inventory management is
management	inventory levels based on lead times,	challenging due to variables in lead
0	demand and target customer service levels	times and demand quantities and
	(Simchi-Levi, Kaminsky, Simchi-Levi	locations (Balcik, Bozkir,
	2000).	Kundakcioglu 2016).
Staffing	Designed to ensure efficient operation and	Largely by volunteers (Repik, Foltin
structure	optimise performance. Staff is developed	2022a).
	based on current trends (Kisperska-Moroń	
End regiminant	2010).	A vistim of an amanganan (Varia
End recipient	Gros 2016)	A victill of all emergency (Kovacs, Spens 2009)
Output	Products and services (Gros 2016)	A changed human life (Drucker
· p · u ·	(5105 2010).	1994)

Source: (own)

We can identify the main common features and differences between the analysed chains. The objective of both types of supply chain is to deliver goods or services to final recipients. What changes from a technical point of view are the inherent and adherent characteristics of the end recipient. Both types of chains involve the coordination of different actors and stakeholders. However, the stakeholders are changing. HSCs involve a range of stakeholders that business chains do not know. At the same time, stakeholders have a different position and authority in the chain. The configuration of distribution networks is essential for efficient operation. However, it also differs in the humanitarian setting. Although the general principles of tangible and intangible logistics flows are the same, the dynamic and uncertain environment causes complications and differences. Information systems play a vital role in decision-making. Both types of supply chains use information systems. However, HSCs (especially small and medium-sized) are behind the commercial sector. They are not as technologically advanced and lack quality in human capital and data collection. In both types, performance measurement is a necessary prerequisite for data-driven optimization. At the same time, all these aspects play a critical role in performance measurement. Thus, the humanitarian sector will probably never be at the level as the business environment. Therefore, it is crucial to focus on areas we can influence and where we can improve performance.





Figure 2 Performance measurement challenges for humanitarian supply chains

Source: (own)

5. ANALYSIS OF CURRENT THEORETICAL APPROACHES AND MODELS

Research on HSC performance measurement is growing. Despite the growing number of publications, however, a relatively small number of authors have addressed the issue. A keyword analysis of the Web of Science and Scopus databases identified 200 journal articles and conference papers dealing with HSC performance. The analysis was performed by combining the keywords *Humanitarian Supply Chain* and *Performance*, and research areas outside the author's interest were excluded, e.g. energy, meteorology, geology, etc.

Supply chain performance management is no longer based on functional hierarchy, ownership or intra-organisational power but rather on inter-organizational relationships (Forslund 2012). The transformation from organizational competition to supply chains has emphasized the role of managing and improving the performance of supply chains as a whole (Christopher 2005). Managing the performance of the entire supply chain has become a crucial factor in gaining competitive advantage, increasing efficiency and ensuring better execution of objectives (Gunasekaran, Patel, Tirtiroglu 2001). In the last decades, managers have used separate cost, time, and accuracy metrics to manage logistics and supply chain performance (Abidi 2019). As many as 38% of the most widely used metrics between 1995 and 2004 were financial (Gunasekaran, Kobu 2007). However, global supply chains are complex structures in many management areas, and these metrics do not provide insight into areas that are not under the direct control of managers (Shaw, Grant, Mangan 2010). Moreover, HSCs are specific in several characteristics. Thus, such limited metrics may lead to inaccurate or incomplete conclusions (Srimai, Radford, Wright 2011). Therefore, more comprehensive and sophisticated approaches are being explored for planning and managing the supply chain as a whole (Bititci et al. 2011).

Donors are increasingly calling for greater accountability and transparency in the humanitarian sector (Cardoso et al. 2023). A rapid response to a crisis is no longer sufficient. Scrutiny of the effectiveness and efficiency of spending has increased (Anjomshoae et al. 2022). Humanitarian organisations are required to objectively demonstrate positive impacts through sustainable and cost-effective operations (Paciarotti, Valiakhmetova 2021). Several performance measurement standards have been introduced to meet the requirement for greater transparency, e.g. The Red Cross Code of Conduct, The Sphere Project, and The Core Humanitarian Standard. While these initiatives have established standards for humanitarian programmes and projects, they are limited to implementation guidelines and have not been able to fully satisfy the desire for transparency and accountability of HSC (Dufour et al. 2004). Moreover, they are primarily used for reporting purposes and rarely serve as a basis for management decisions to improve performance and resource allocation (Ramalingam et al. 2009). In the absence of rigorous performance measurement systems, donors and the general public are increasingly sceptical of HO (Humanitarian Organization) claims about their impact (Anjomshoae et al. 2022).

Thus, research has begun to focus on more advanced theoretical concepts inspired by commercial supply chain performance. The SCOR (Supply Chain Operations Reference) and BSC models have received the most attention (Behl, Dutta



2019). Both frameworks simplify communication between supply chain actors and lead to increased transparency of supply chain and logistics processes (Gunasekaran, Kobu 2007). SCOR links business processes, metrics, best practices and technologies and has widespread applicability. Successful implementation of the SCOR model can be found in Bölsche's application for WFP (World Food Programme) (Bölsche 2012). The broad applicability of SCOR can create a single reference source for the humanitarian sector (Tatham, Spens 2011). Given humanitarian organisations capacity and knowledge constraints, a unified framework is a strength of this approach. It would allow organisations to partially combat their limitations and provide a uniform standard in the sector. The model has already been partially tested with 13 international HOs (Lu, Goh, De Souza 2016). However, complete testing is hampered by the inadequate state of humanitarian organisations, and the current unpreparedness of the sector may be a drawback.

The BSC considers the financial perspective, the customer perspective, the learning and growth perspective, and the internal process perspective (Kaplan, Norton 1992). One of the earliest applications of BSC in the humanitarian sector was in the final work Davidson did with the IFRC in 2006 (Davidson 2006). A year later, Kyne et al. adapted the BSC to evaluate natural disaster relief projects (Kyne et al. 2007). De Leeuw's research further defined the indicators that can be adopted within the BSC to measure HSC performance (De Leeuw 2010). However, the BSC is also not without its critics. Organizations may want to include social and environmental factors (Epstein, Wisner 2001). Nowadays, these are crucial topics that are also important in the humanitarian sector (notice the link to the SDGs). In humanitarian aid, this is not a priority in the first phase, but the weight of criteria changes over time.

With advances in information technology and data analysis methods, the humanitarian sector has also seen the emergence of innovative and analytical approaches to performance measurement (Anjomshoae et al. 2022). A study by Swaminathan (Swaminathan 2018) provided insights into the types of data streams that could be used to develop big data analytical models to improve the performance of humanitarian operations. Jeble et al. (2020) and Dubey et al. (2019) have developed conceptual models that illustrate the role of big data analytics in improving HSC performance. Agarwal et al. (2019) suggest methods and tools such as analytic hierarchy process, analytic network process, data wrapper analysis, goal programming, rough set theory, and fuzzy approaches to weighting, classification, and aggregation of individual metrics. Researchers have also proposed several other advanced tools for streamlining HSC processes, such as RFID (Radio-frequency identification) (Mukhopadhyay, Roy 2016). However, new technologies have not yet made many inroads in the sector, which relates to HOs limited capacity and skills (Repík, Foltin 2022a), the failure to tie research to the needs of HOs, and other issues identified in this paper.

6. THE CHALLENGES OF MEASURING THE PERFORMANCE OF HUMANITARIAN SUPPLY CHAINS

Setting performance indicators applicable in HSC practice has been a longstanding problem (Anjomshoae et al., 2022; Davidson, 2006). As critical as measuring HSC performance is, it is a complex process and is not consistently performed in most humanitarian organizations (Anjomshoae et al., 2022). Up to 55% of HOs do not track any performance measurement indicators, a quarter uses some indicators and only the remaining 20% measure performance consistently (Blecken 2010). While many performance indicators exist for commercial supply chains, many are invalidated by the nature of the humanitarian sector (Beamon & Kotleba 2006). These differences appear, for example, in the different objectives of commercial and HSCs or the absence of financial indicators as a primary performance measure (Repík, Foltin 2022b). Given the elusiveness of humanitarian services and what constitutes a successful humanitarian outcome, it is even more challenging to translate humanitarian objectives and concepts such as neutrality and impartiality into measurable performance indicators (Anjomshoae et al., 2022).

In the humanitarian sector, it is thus challenging to build a model that ensures the correct performance of flows. In addition to the practical constraints mentioned above, there are also constraints at the conceptual level. It is challenging to link HO's performance (Abidi, de Leeuw, Klumpp 2014) or year-long efforts (Sawhill, Williamson 2001) of a HO to its objectives. Although humanitarian assistance is primarily about alleviating suffering, identifying and quantifying the relationship between HSC performance and alleviation of suffering is challenging (Abidi, de Leeuw, Klumpp 2014). Moreover, it is challenging to consult beneficiaries' views on their assistance due to the unavailability of resources and accurate data (Cardoso et al. 2023; Clarke, Parris 2019). That leads to a discrepancy between the organization's perception of performance and the beneficiaries' perception of the relevance and quality of assistance (Clarke, Parris 2019). There are also problems with the lack of focus on performance indicators for future improvement (Van der Laan, De Brito, Vergunst 2009). Kunz and Reiner point out that HOs cannot fully control the performance of HSC (Kunz, Reiner 2012). In logistics, disaster response is complex regarding tangible and intangible flows. However, HSC as a complex system can be improved by changing the performance of its individual parts (Repík, Foltin 2022a).

After a sudden disaster, the speed of response in the first 72 hours is crucial to save as many lives as possible (Tomasini, Wassenhove 2009b). Speed is the primary criterion for disaster response. However, other specifics of humanitarian operations can limit the speed. Preparation and planning are also critical aspects. However, predicting humanitarian needs' time, place, and scale are challenging. Information is still limited at the beginning of a disaster (Tomasini, Wassenhove 2009b), even if the area has been well monitored before the disaster, which is rarely the case, especially in less developed countries. In logistics performance terms, it is critical to understand the specific impacts and needs and to design and coordinate a response (Tomasini, Wassenhove 2009b). For this, information flows are crucial. They allow structuring the distribution chain around population needs (water, food, medicine, shelter), define the means to meet these needs (storage capacity, access to airports, transport options,



telecommunications) and minimize coordination gaps. However, data accuracy and availability may be limited in environments with disrupted information and communication networks (Van der Laan, De Brito, Vergunst 2009). Uncertain and rapidly changing conditions rarely allow the collection of complete and trustworthy data (Kunz 2019). That is also true for the developing sector and long-term conflict areas where security situations hinder assessment and data collection (Anjomshoae et al. 2022). Sometimes only paper is available for data collection, leading to slow, inaccurate, and outdated evidence for logistics planning and supply (Repik, Foltin 2022b). Most HOs use spreadsheet tools to collect and process data. More advanced information systems are a rarity. Thus, one of the reasons for the inefficient use of data is the lack of innovation.

While in the commercial sector, the pressure to perform well comes from the demand side (from customers), in the humanitarian sector, it is usually pushed by the supply side (donors) (Tomasini, Wassenhove 2009b). Aid recipients typically have a weak bargaining position in the chain. In terms of donors' influence on performance, the fact that they may insist that their funds are used for victim assistance and not, for example, for staff training and investment in HO facilities also plays a role (Murray 2005). Some large organizations are known to have high bureaucratic burdens that can limit the speed of disaster response (Thorvaldsdottir, Patz, Eckhard 2021). In addition, highly publicized events are subject to political and marketing pressures (Repík, Foltin 2022b). It can not only put pressure on bottlenecks in the chain but also already limited staff capabilities. However, the human resource problem is broader than limited skills, abilities or knowledge. It is challenging to manage people who are in the organization voluntarily (Repik, Foltin 2022b). HOs have to contend with uncertain availability and workload. A related issue is the absence of performancebased rewards and punishments (Repik, Foltin 2022b). The effectiveness of humanitarian logistics is strongly affected by high turnover and heavy reliance on volunteers (Tomasini, Wassenhove 2009b). High staff turnover results in poor knowledge retention, which creates additional challenges for performance measurement processes (Anjomshoae et al. 2017). In addition, humanitarian missions focused on performance measurement are typically very time and labour-intensive, requiring extensive support (Anjomshoae et al. 2022). In particular, long-term operations can lead to staff burnout or mental exhaustion (Repik, Foltin 2022b).

However, at the heart of the aid effectiveness debate is the recognition that humanitarian action is often driven by short-term objectives. That can lead to unintended negative long-term impacts on society (Anjomshoae et al. 2022). The negative impact can manifest itself, for example, in the form of market distortions and aid dependency (Moyo 2010), damage to the natural environment, or even prolonged conflict (Anderson 1999). Thus, for the above reasons, it is necessary to go beyond cost or time optimization in the humanitarian sector.

8. CONCLUDING DISSCUSSION

The paper discusses the possibilities of measuring the performance of HSC. Due to the factors mentioned above, such as the increasing number of black swan events

(Taleb 2007), climate change (EM-DAT 2023) or armed conflicts (UN 2023), HSC management becomes an elementary discipline for an effective and coordinated response to these emergencies. Academic research is still in its infancy, and in practice, HSCs are still below the necessary resources (Lowcock 2019). For countries affected by natural disasters or conflicts, ensuring rapid and efficient distribution of humanitarian assistance to civilians in vulnerable areas is crucial. The importance of HSC in such situations lies in the ability to correctly identify needs, coordinate different actors, mobilise resources and capital, and ensure safe, rapid and reliable transport, storage and distribution of supplies. As the disparity between humanitarian needs and available financial resources continues to widen (DG ECHO 2023b), there is a need to develop tools and strategies to respond effectively to humanitarian crises.

In a business environment, performance monitoring is a regular practice. Even in the armed forces, evaluations of missions, tasks and projects take place. In the humanitarian sector, however, it is still an emerging innovation that encounters a number of sector-specificities in practical applications (Repik, Foltin 2022b). HSC operates under challenging conditions of uncertainty and time pressure. As a result, performance measurement is often not a priority and is, therefore, less mature than in business supply chains (Anjomshoae et al. 2022). Establishing performance indicators is also problematic due to the differences between operations, long- and short-term interventions, and pre-and post-disaster phases (Repík, Foltin 2022b). For example, while in acute and rapid response environmental aspects may be sidelined, they should be considered in long-term programmes. Such specificities offer the need for future research on dynamic models for performance management, i.e. models that account for changing priorities over time. Measuring HSC performance requires a systematic and impartial examination of humanitarian operations to increase transparency and accountability (Anjomshoae et al. 2022). The problem should be looked at holistically, seeking ways between the trap of over-generalisation, and the specificity of individual operations (Repík, Foltin 2022a).

However, these challenges and limitations do not mean measuring performance in a humanitarian context is impossible. HOs have recognized that measuring HSC performance can facilitate and guide process improvement initiatives (Rongier et al. 2013). However, measurement frameworks with too many indicators can be complicated, costly, time-consuming, and a drain on already limited time and resources in the humanitarian sector (Anjomshoae et al. 2022). A matrix dividing indicators according to the importance and feasibility of implementation (Lu, Goh, De Souza 2016) or dividing indicators according to linkages to results (Parmenter 2015) can suggest the importance of indicator prioritization. HOs have gradually become aware of the need for empirical research that can provide insights into performance measurement systems, and more integrated and analytical approaches to analyzing the effectiveness and efficiency of their efforts are increasingly being explored (Anjomshoae et al. 2022). A possible strategy to overcome these challenges may be research leading to a general framework for implementing performance measurement systems in humanitarian environments.

The application of the performance measurement, frequently used in private business models, are applicable within humanitarian supply chains. There could be proper to focus the consecutive research on the limitations of the direct applications,

together with the real availability of the data inputs. In this area, the Big Data approach and application of data-mining tools could bring new insight to proper management of available scare resources under the emergency and disaster relief conditions.

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