

## Features and prospects of logistic humanitarian approach to the formation of the supply chain

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*Abstract.* The article investigates improvement of the supply chain according to the requirements of nowadays, particularly impact of natural disasters. The main role in this process is given to humanitarian logistics. The phases of the disaster and the actions of humanitarian supply chain during these phases are analyzed. It is very important to understand in which cases more appropriate using particular type supply chains. From this point of view authors analyzed the main differences between commercial and humanitarian supply chains. The most important role in the supply chain during the crisis situations played humanitarian organizations. For the purpose of comprehensive understanding peculiarities and involve members were identified main participants of humanitarian supply chain. The ranking of donor countries that are in the top 10, and examples of humanitarian operations and logistics companies in the aftermath of disasters are shown. Authors analyze usage of model of disaster management by logistics companies and humanitarian organizations in different disaster stages. The main advantage of proposed approach is getting clear criterion which arises during the recovery phase of the disaster and enables logistics companies, humanitarian organizations and the military to integrate their efforts and logistics performance, and adapt them to the specific needs.

*Key words:* humanitarian logistics, natural disaster relief, humanitarian supply chain, donors, international humanitarian organizations, logistics companies.

### INTRODUCTION

Recently, the numbers of natural disasters, such as hurricanes, earthquakes, floods, are rising around the world, causing great sacrifices and material damage.

They spend limit on human destinies, coolly dividing towns, villages, buildings, life in the “before” and “after”. But if there is hope for life, then it must be fought by all possible means. Effective management during a disaster is the key to leveling effects of the disaster. Organization of an incident response and providing assistance after a disaster is an important step in disaster [7]. Supply chain must be quick to react to sudden changes and be efficiently organized as a coming disaster areas and in remote areas. That logistics is central to the activities associated with the management in the aftermath of the disaster. However, most participants in such operations underestimate the importance of logistics and its role in the aftermath of the disaster. Therefore, disclosure of the concept of humanitarian supply chain and its proper organization and coordination of all participants is an urgent problem nowadays, since the disaster accounted for almost 80 % of it is logistical effort.

### THE ANALYSIS OF RECENT RESEARCHES AND PUBLICATIONS

At its core, a natural disaster can be interpreted as an extraordinary natural phenomenon that operates with great destructive force, causing considerable damage to the area in which it takes place, gives livelihood, destroying wealth. During the occurrence of this nature emergency requires it is need to do a quick reactions and provide necessary assistance to the affected people. This set of actions are relating to humanitarian logistics.

Humanitarian logistics consists of processes and systems that are involved in mobilizing people, resources, skills and knowledge necessary to provide humanitarian assistance to people who are affected by natural disasters and complex emergencies [3, 6, 18].

Humanitarian logistics includes a number of measures, including the purchase of essential goods, medicines and food; transportation of humanitarian goods; system of cargo tracking; customs clearance; storage and packaging of humanitarian goods; direct

delivery of all humanitarian aid to victims of natural disasters people [1].

Disaster Management is usually divided into three phases: preparation phase, response and recovery (Figure 1). The first phase is associated with prevention and preparation for natural disasters. Measures of response in a response phase of natural disasters require flexibility, planning and preparation. A recovery phase could take several years before the public “will not return to the orderly functioning”.

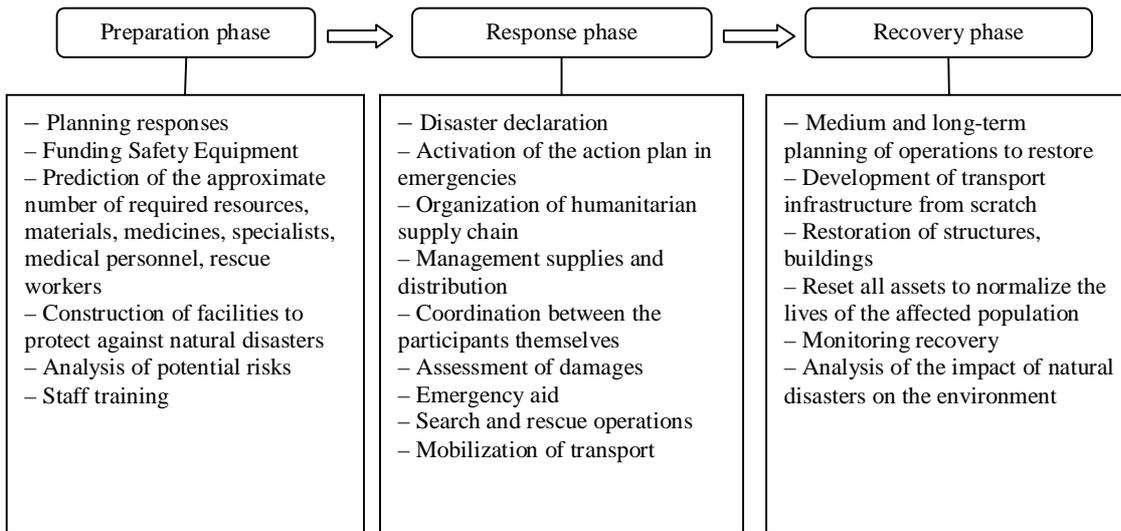


Fig. 1. The phases of disaster\*

\* elaborated based on [16]

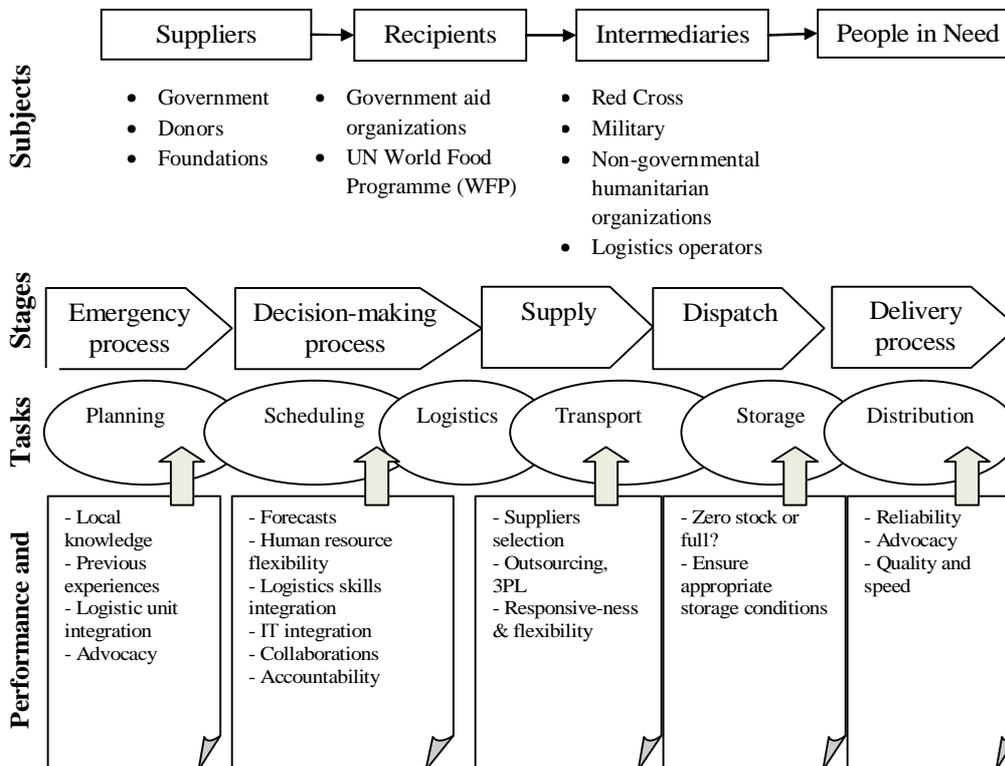


Fig. 2. Humanitarian supply chain\*

\* elaborated based on [16]

**Table 1.** Characteristics of commercial versus humanitarian supply chains\*

Criteria	Commercial supply chain	Humanitarian supply chain
Objectives	Profiting	Minimization of life losses
Planning methods	Strategic	Operational
Time	Delay in supply leads to higher losses in monetary terms	Delay in delivery may result in the loss of thousands, or even millions of people's lives
Inventory management	Accurate methods for determining the stocks based on the terms, requirements, service levels	Management is challenging due to the high variation of time, space and place
Information systems	Accurate reliable information, use new information systems	The information can not be verified, is not reliable and not timely.

\* elaborated based on [1]

Supply chain management for the business has a long evolution, and this process is well-known by logistics companies all over the world [8]. However, the strategic objective of commercial supply chain and supply chain during a disaster are very different from each other (Table 1).

From the table we can determine significant differences humanitarian supply chain from the commercial. There are: the unpredictability of demand in terms of geographical location, type and quantity of the goods; sudden demand for a large number of products and services; limited deadlines logistics operations; lack of basic resources in terms of human resources, technology, food and finance.

### OBJECTIVES

The main purpose of the article is to investigate and disclosure the features of formation of product supply chains in terms of implementation of humanitarian programs; exacerbation of issues regarding responsibility in the management of humanitarian supply chain.

### THE MAIN RESULTS OF THE RESEARCH

Supply chain management is complicated because of coordination of all shareholders. A large number of organizations that are involved in helping should communicate with each other in a certain limit time and unplanned situations [9, 17].

Logistics companies play a crucial role in achieving effective integration of humanitarian ties between members of the supply chain [2, 4]. As members of the chain they must work as partners and it would be advisable to conduct strategic positioning logistics companies as members of humanitarian chain.

The categories of companies who “solve problems” are those logistics providers that organize their financial assets so as to offer customers a range of integrated solutions with high adaptability. This is usually multimodal transport operators and express couriers that are engaged in the delivery of essential humanitarian supplies.

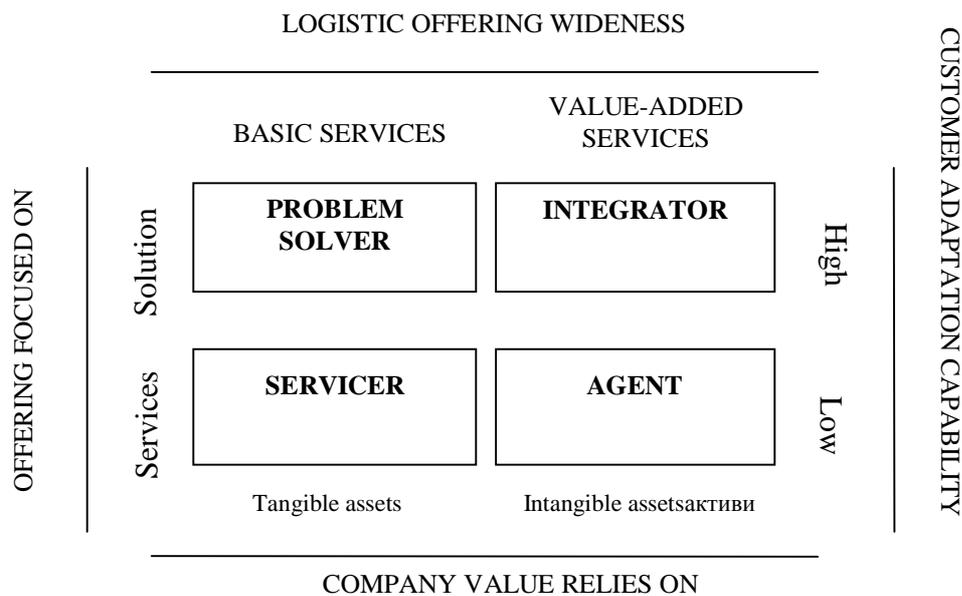
Logistics companies that are referring as “integrators” are logistics providers that offer more complex solutions with a high degree of personalization. The company is integrator that able to organize and direct a portion or the entire logistics process on behalf of its clients. “Agents” are those who offer combined logistics services and play an important international role (e. g., forwarding and logistics brokers) in humanitarian supply chain due to their potential and strong ties. Companies that position themselves as those who “provide services” to its range of services include traditional services such as transport (by ship, by rail, by road and air transport) and storage of materials and products for emergency assistance during natural disasters [5, 10].

Donors provide the bulk of funding assistance. These are the countries that provide monetary and financial aid to victims of natural disasters [19]. In recent years, foundations, donor countries, and companies are an important source of funds for institutions that provide humanitarian assistance. Table 2 shows the top 10 countries – donors in 2011 – 2013. The largest donor is the US, European Union and United Kingdom.

The most important role in the supply chain during the crisis situations played humanitarian organizations. They are the front line assistance to people affected by disasters and emergencies. The major international humanitarian organizations that directly organize the logistics during disasters is the World Food Programme and the International Red Cross and Red Crescent Movement.

The World Food Programme (WFP) is a very important element of the humanitarian supply chain because it provides food for about 90 million people in need throughout the year. It is governed by the WFP Executive Board, which consists of 36 member states. WFP is struggling with hunger and lack of food base and thereby save the lives of people in emergency situations.

In 2013 for humanitarian logistics 14 thousand people all over the world were participated in WFP. In 2013, the WFP for delivered to people affected food has been used 5 thousand trucks, 50 aircraft and 30 ships; delivered more than 3.1 million tons of food. WFP also works with 1352 non-governmental humanitarian organizations; performs specific operations such as local transportation infrastructure recovery after disaster [11, 15].



**Fig. 3.** Strategic positioning of logistics companies, as members of the humanitarian supply chain

Source: [5].

**Table 2.** Top 10 donors for 2011–2013

Year Number	2011		2012		2013	
	Country	The extent million USD	Country	The extent million USD	Country	The extent million USD
1	USA	4,396	USA	3,963	USA	4,686
2	EU	1,744	EU	1,751	EU	1,881
3	Great Britain	1,227	Great Britain	1,166	Great Britain	1,825
4	Japan	972	Turkey	1,046	Turkey	1,638
5	Sweden	818	Germany	811	Japan	1,112
6	Germany	559	Sweden	777	Germany	949
7	Norway	510	Japan	698	Sweden	758
8	Canada	499	Canada	538	Canada	691
9	Australia	434	Norway	527	Norway	613
10	Spain	415	Australia	455	France	427

Source: [17].

International Red Cross and Red Crescent Movement – is an international humanitarian movement, which involved about 97 million volunteers worldwide. The components of this movement are:

- International Committee of the Red Cross (ICRC).
- International Federation of Red Cross and Red Crescent Societies (IFRC) (Federation is responsible for coordinating all national organizations within the movement. In close cooperation with national organizations, it conducts international humanitarian operations that require a lot of resources).

- National Red Cross and Crescent Societies, which are 186 national associations. Each of them works in their country in accordance with the principles of international humanitarian law and the statutes of motion [13].

International Federation of Red Cross and Red Crescent Societies are regarded as the world's largest humanitarian organization. The organization is controlled by seven fundamental principles: humanity, impartiality, neutrality, independence, voluntary, unity and universality.

According to data for 2012 – 48 % of the cost IFRC was necessary to respond during disasters. During the 129 operations during emergencies were assisted 12.2 million people. The organization was initiated 15 complaints regarding response to the effects of natural disasters and other humanitarian organizations and donor countries. The organization attracted 13 million volunteers around the world. It was granted 54 thousand tons of basic necessities and equipment to assist victims of natural disasters people.

Global logistics network IFRC includes headquarters in Geneva; logistics unit in Kuala Lumpur, Panama and Nairobi; office in Dubai; a logistics center in Las Palmas; and staffs directly on the ground of natural disasters around the world [20].

International Federation of Red Cross and Red Crescent Societies has offices all over the world (Figure 4).

Due to its capabilities in improving the speed and effectiveness of efforts to provide assistance, logistics companies play an increasingly prominent role, positioning itself as a partner of humanitarian organizations. One such company is – UPS. The company was in 2014 awarded the organization of “Business in the Community” (BITC). The program of humanitarian assistance in emergency situations UPS uses its expertise, logistics capabilities and financial resources for humanitarian assistance during natural disasters around the world. This means that the company provides support in all phases of disaster response: the willingness to act immediately, first aid and post-crisis recovery.

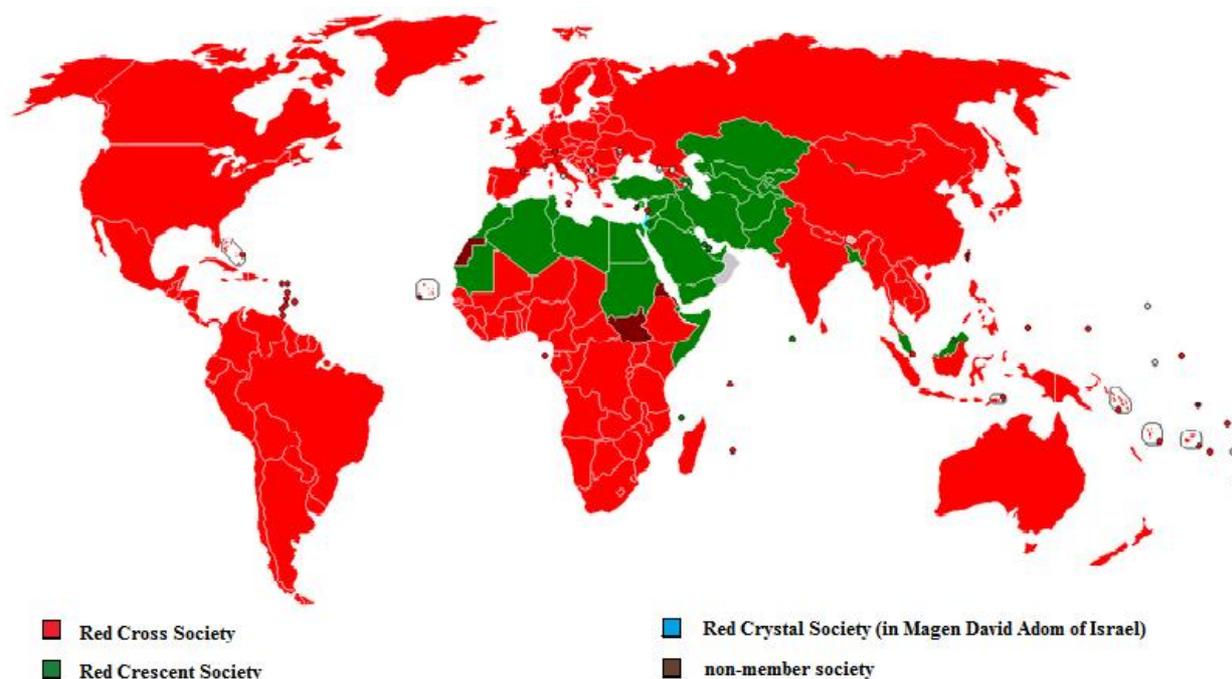
In 2013, the company UPS donated 7.5 million dollars to finance humanitarian aid, technical support and services in-kind more than 20 humanitarian organizations. With its global reach and local operational support, the company has transported 250 humanitarian goods in 46 countries. Also, for many years, the company is actively involved in assisting international after natural disasters, from floods in

Pakistan, Thailand and the Philippines to the crisis caused by famine in the Horn of Africa, earthquakes in China and Haiti, and also the Indian Ocean tsunami and Japan [14].

In November 2013, the Fund UPS has provided 1 million dollars in the form of cash and in-kind assistance to victims of typhoon Haiyang – the largest in the history of Philippine. To participate in the World Food Programme UPS worked with local experts in logistics, which ran for six weeks Logistics Brigade Emergency and coordinated action of customs clearance, warehousing and transport operations in Manila, Cebu and Tacloban.

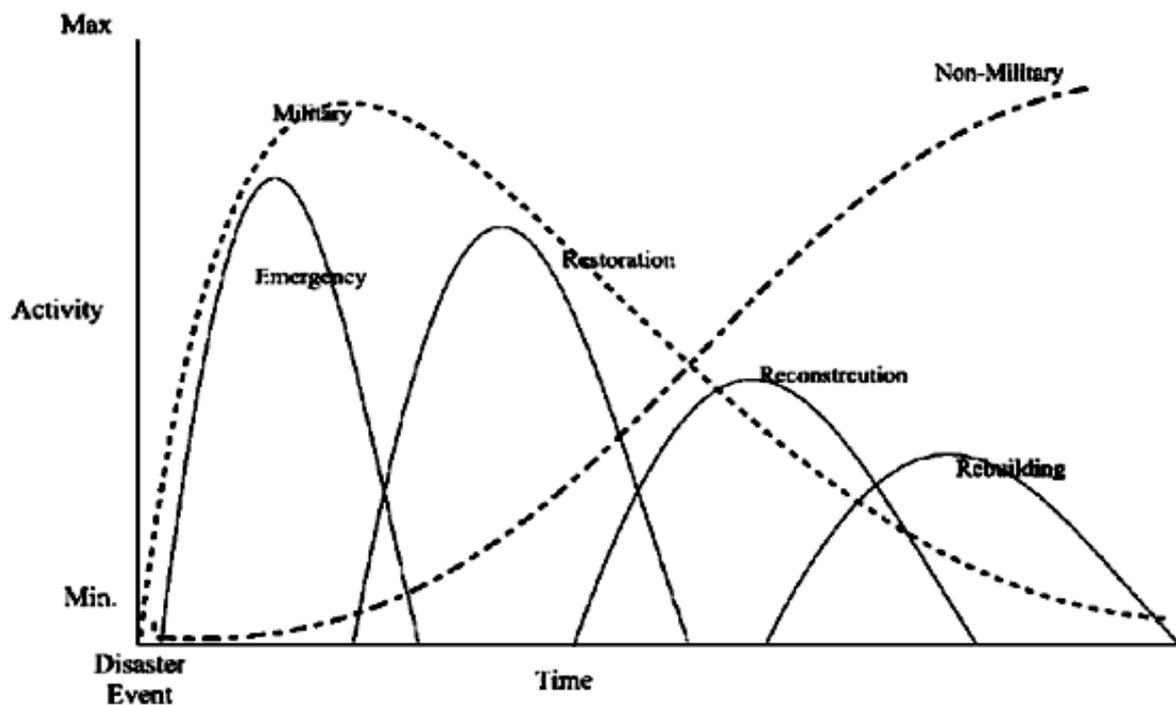
Another famous logistics company in the world that provides humanitarian aid is DHL. The company cooperates with the UN while assisting people affected by natural disasters; provides free air transportation of humanitarian goods (such as the earthquake in Haiti in 2010); organizes temporary warehouse storage of cargo at the airport, including sorting cargo area, as well as conducting an inventory of all received humanitarian goods; provides rapid loading all necessary trucks and helicopters; conducts training for local experts to improve airports in the event of natural disasters (GARD) [12].

Model disaster or “recovery model” (Figure 5) combines together and some milestones cycle management disaster. This model can be applied to any emergency.



**Fig. 4.** Delegation of the International Federation of Red Cross and Red Crescent Societies worldwide stated on 2013

Source: [13]



**Fig. 5.** Model of disaster management

Source: [16]

These logistics companies like UPS and DHL, as well as humanitarian organizations can use this model in the last stage disaster – recovery phase. “Recovery Model” consists of four stages. The emergency phase includes steps to be performed in the first few days or weeks after the disaster. Specific activities may include: search and rescue, evacuation of the population; mobilize all necessary resources. Phase recovery usually takes several months and includes direct introduction of the utility infrastructure (water and electricity); identification and repair of damaged homes and businesses. Phase reconstruction focused on the repair. In most cases, this process is focused on the reconstruction of an artificial environment to the point, which was a disaster. The last phase – the phase of reconstruction and rehabilitation phase II, which includes the actions that are associated with the reconstruction of the built environment in exactly those objects that are historically and economically important. Each of these phases begins far before the finish last. This is the feature of this model – it highlights the interdependence and duplication during recovery. It gives a clear and common criterion to be met during the recovery phase of the disaster and enables logistics companies, humanitarian organizations and the military to integrate their efforts and logistics performance, and adapt them to the specific situation.

## CONCLUSIONS

Unfortunately, in our day is not possible to avoid the disaster, but that the effect of the emergency can be mitigated through integrated supply chain management. Supply chain management should be as fast and in a short time to respond to the many changes. Supply chain should be global, dynamic, flexible and fast, because it is minimizing the loss of life of the population worldwide. It is necessary to organize the effective work of all participants in the supply chain, since, according to the study, international humanitarian organizations, donors and logistics operators are an integral part of this chain and the need to cooperate with each other. Working together, participants must use their own experience and that of my colleagues, constantly exchanging information, to attract the largest possible amounts of financial and human resources required to coordinate with the government of the disaster-affected countries. This will help demonstrate the value of humanitarian logistics organizational strategies and the relationship of each member of humanitarian supply chain and enable them to use one of the “recovery model”, which has been described in investigated. Future directions of research can be deeper analysis criteria exhibitor’s humanitarian supply chain cooperation mechanisms, methods of organization of the supply chain as well as research into new models of disaster.

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