IMPACT OF SHIPMENT MARKING ON THE OPERATIONAL EFFICIENCY FOR NEW SILK ROAD LOGISTICS PROCESSES

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Abstract

Operational conditions for handling e-commerce postal shipments from China are determined by internal regulations and rules of handling shipments from outside the European Union both from postal operators and the Customs Service, as well as by cooperation arrangements of these partners. The different objectives and functions of the partners in handling the flow of e-commerce goods from China also result in different needs for standardised identification of goods and cargo, affecting the performance and efficiency of operations. A key factor for the operational strategy is the efficient and reliable (on-time, error-free) handling of the mass stream of postal letters and small e-commerce shipments, as well as domestic and international palletised shipments, and the reduction of operational time for postal and customs handling. The lack of standardisation for cargo unit identification among logistics and transport partners handling rail deliveries from China to Europe makes it impossible to track the physical flow of logistics units with postal shipments, throughout the New Silk Road supply chain. Cross-border tracking on the basis of a postal item bag identifier, standardised only within postal organisations worldwide according to UPU codification, allows limited tracking of the status of a consignment only for recorded delivery and receipt events at postal links in the supply chain.

The aim of this paper is to analyse the operational conditions for the application of standards and solutions in e-commerce goods handling in the processes of import from China to Poland within the New Silk Road and in transit to other EU countries. This paper contains the results of work carried out between 2019 and 2021 by the Lukasiewicz Research Network-Institute of Logistics and Warehousing, the Poznan School of Logistics in cooperation with GS1 Poland, Polish Post and Polish Customs Service.

Key words: New Silk Road, operational efficiency, e-commerce shipment, GS1 standard, UPU standard.

1. INTRODUCTION

Operational conditions for the handling of e-commerce postal parcels from China result from internal regulations and rules for handling shipments from outside the European Union (import and transit) both postal services and customs handling, as well as from cooperation arrangements of the partners performing these services. Polish Post has the status of a 'Designated Operator (DO) to handle postal items according to the standards of the World Customs Organization (WCO) and the International Postal Union (UPU).

Different goals and functions of the Partners in handling e-commerce goods flow from China, cause also different needs for standardization of identification of goods and cargo, affecting efficiency and effectiveness of operations:

- Customs handling - identifiers of goods and precise descriptions of the value and content of shipments, enabling qualification of customs procedures, calculation of customs and tax values, verification of shipments according to import and transit requirements and regulations, etc.,
- Mail handling - parcel and cargo identifiers /parcels, bags of letters, pallets, containers/, because of the efficient, timely and error-free handling of the receipt, processing and delivery of mail, the ability to track and respond to deviations, and the planning and alignment of teams, equipment and facilities for operational handling.

An important premise for the operational conditions of Poland's handling of the parcel stream is its strategic aspiration to become a leader and coordinator of the stream of e-commerce parcels (Sliwczynski, Kolinski, 2020; Ambalov, Heim, 2020; Shen, 2018) delivered by rail and air from China to Poland and further to Europe, as well as to create a logistics hub and become a logistics operator of trade between Asia and Europe (Zhang, Zhang, & Lee, 2020). An important condition here is the requirements and expectations of both parties to the strategic international agreement regarding postal service on the New Silk Road (Holslag, 2017; Wagener, Aritua, & Zhu, 2020). One of the provisions of the agreement regarding service efficiency is the requirement for Polish Post to expedite shipments from China addressed to other European countries - within 48 hours (this includes customs clearance time).

A key factor for the operational strategy is the efficient and reliable /timely, error-free/ handling of the mass stream of letters and small e-commerce shipments as well as domestic and international pallet shipments (International Pallet Shipping service implemented from February 1, 2019), as well as the reduction of operational time for postal and customs handling.

For the operational handling of e-commerce shipments from China in Poland, the Integrated Information System - ZST - is used for the registration and monitoring of postal shipments (in particular parcels, pallet loads, courier and value shipments). The ZST system is used in all dispatching and distribution nodes (WER) - both the main ones and field ones (distribution and transhipment points). It enables planning and registration of unloading and loading operations, processing of shipments, and handling of shipments delivered in Poland and abroad. On the basis of data recorded

in the system it is possible to track the status of the postal shipment (truck&trace) in the operational system of the Polish Post within the country.

An important function of the ZST system is data exchange with the International Postal System (IPS), which makes it possible to track the status of a package by its sender and recipient.

IT systems of the postal operator are not connected with IT systems of the customs service, as well as with IT systems of partners in the chain of delivery of shipments from China, including systems of railroad carriers, logistic operators and operators of the railroad transhipment port in Małaszewicze. Currently, e-services in the form of web services are not provided between the systems and data exchange in the form of electronic messages is not used (Hänninen, Luoma, Mitronen, 2020). Data exchange is asynchronous non-interactive (Nuce, 2019), bilaterally between partners in the form of email and agreed transfer of shipment data files.

The lack of standardization of cargo unit identifiers among logistics and transportation partners handling rail deliveries from China makes it impossible to track the physical flow of logistics units with postal shipments, across the Silk Road supply chain. Cross-border cargo tracking based on a mailpiece bag identifier, standardized only within postal organizations worldwide according to UPU codification, allows limited tracking of shipment status only for recorded release and receipt events at postal International Exchange Offices involving events (here: real-time tracking of the parcel is interrupted for about 12 days):

- loading of a mail bag into a rail container at a loading point (IOE) in China - e.g. in Chongqing city,
- receipt of the bags from the railroad container at the postal receiving point in Poland - at the Lublin IOE.

Within a given country, the status of consignments is tracked continuously, based on the registration of operations in the integrated postal systems.

2. THE NEW SILK ROAD IN TERMS OF E-COMMERCE MARKET - A LITERATURE REVIEW

The e-commerce market is experiencing an increase in turnover every year, which means a growing business potential, but above all it creates the necessity to undertake research work in this field. The dynamics of the e-commerce market leads researchers to conduct studies both in the field of application of modern technologies (Zhang, 2008; Kawa, 2012; Gerrikagoitia et al., 2015; Turban, 2018; Dujak, Sajter, 2019), as well as on the organisation of logistics, with particular emphasis on IT system integration (Śliwczyński, Hajdul, Golińska, 2012; Kawa, 2017; Maqueira, Moyano-Fuentes, Bruque, 2019), consolidation of shipments (Kayikci, 2019; Hu, Haddud, 2020) and cross-border aspects of shipments (Kawa, Zdrenka, 2015; Wang et al., 2019; Huang et al., 2019). A natural extension of the research scope for the e-commerce market is the monitoring of shipments along the New Silk Road, taking into account the infrastructure of the various modes of transport (Li, Wen, Jiang, 2017; Wang et al., 2020; Li et al., 2020) and economic evaluation of this initiative (Ejdys, 2017; Baniya, Rocha, Ruta, 2019; Bersenev, Chikilevskaya, Rusinov, 2020). The New

Silk Road is a business initiative enabling the movement of goods between Asia and Europe. The most important aspect influencing Poland's attractiveness in the context of the New Silk Road is the favourable combination of geographical, economic and political conditions. Poland is a kind of gateway to the European Union and at the same time it is characterised by a well-developed network of transport and logistics infrastructure, which puts our country in the position of a potential leader in the logistical handling of goods transported from China to the European Union (Łasak, 2018). This is confirmed by the agreement between the Polish Post and the China Post on cooperation in delivering e-commerce shipments to Europe using rail transport on the New Silk Road route (Śliwczyński et al., 2019).

The analysis of the presented issues results from the need to handle the dynamically growing stream of shipments and deliveries of products purchased through Chinese Internet portals (including Aliexpress, Banggood, GearBest, LightInTheBox and many others), as well as the development of the e-commerce channel in cross-border e-commerce between Asia and Europe.

The need to analyse the flow of goods and shipments in the e-commerce market on the China-Poland route, and more broadly Asia-Europe, stems from China's position in this market, which together with other Asian countries forms the largest market for the sale of products in e-commerce channels in the world.

3. OPERATIONAL ANALYSIS OF IMPORT OF E-COMMERCE POSTAL ITEMS FROM CHINA TO POLAND

Postal operators receive information on postal shipments sent by China Post via rail transportation, in the form of a containerized transfer list - CN37 (land-sea shipments) or CN38 (air shipments). The data is sent as MS Excel file via e-mail. The file contains a lot of detailed shipping information - including country and post office of sending and receiving, number and identifiers of individual shipments (letters, parcels) and their content, weight and value. An example of the scope and data standard of the CN37 Summary Shipping List for e-commerce mail shipments shipped in container XHCU5026835 by rail from Chongqing Province, China, is shown in Table 1

Table 1. An example of the scope and standard of the summary data of the CN37 transfer list of e-commerce postal items shipped by container from Chongqing Province, China

Departure Date：	2019.3.22
Intelligent lock No.	CNNT0019414826
China Customs lock No.	CNNT0019414826

	Details of each Parcel											
No.	Orgin Code	Orgin Office	Destination OE	Country	Content	Number of Item	Weight [G]	Value [USD]	Item type code:	Province of Sender	City of Sender	item number
1	40005900	南岸客户	ATVIEC	Austria	按摩油	1	263	30,31	Merchandise	Chongqing	Chongqing	RX806483675CN
2	40005900	南岸客户	ATVIEC	Austria	美甲套装	1	1561	79,32	Merchandise	Chongqing	Chongqing	RX806412057CN
3	40005900	南岸客户	ATVIEC	Austria	工具	1	540	40,52	Merchandise	Chongqing	Chongqing	RX806445661CN

Information of the Document			Information of the Waybill	
Bar code	Document no.	Despatch no.	Waybill no.	Container no.
CNCKGRATVIECCUR90032001110058	32	1	CNCKGZ942733	XHCU5026835
CNCKGRATVIECCUR90031001110036	31	1	CNCKGZ942733	XHCU5026835
CNCKGRATVIECCUR90026001110041	26	1	CNCKGZ942733	XHCU5026835

Source: ILiM and GS1 project data.

The identifier is placed on the postal item in the form of a legible sequence of 13 characters and as a barcode in the Code 128 standard. **From the data structure of the code and its information scope, it is clear that it is a readable identifier in the postal organization environment and operationally of little use to logistics and KEP operators in the market.**

Each bag of China mail - China Post's referrals - in overland transportation bears a CN34 (flag, bar-coded) label. The exchanges of the referrals take place between the International Offices of Exchange (IOE). An example analysis of the structure of the identifier from the CN34 label on bags of mail, according to the CN37 transfer list in Table 1, is shown in Table 3. The identifier of a bag of mail contains 29 characters according to the S9 UPU standard, of which the first 20 characters are the shipping

identifier according to the S8 UPU standard, within the transport unit (here: container XHCU5026835)

Table 2. Analysis of postal item identifier structure according to S10 UPU standard

1	2	3	4	5	6	7	8	9	10	11	12	13
R	X	8	1	5	3	7	2	1	7	5	C	N

Mark position	Format	Meaning	Example
1 ÷ 2	Letters	Service / shipment ratio	RX (registered list)
3 ÷ 10	Digits	The serial number of the shipment sent by the postal operator	81537217
11	Digit	Check digit	5
12 ÷ 13	Letters	Country code of the designated postal operator of dispatch	CN (China)

Source: Postal Parcel Identification - Part D: 13-character identifier for parcels. UPU, 2019.

Table 3. Analysis of the structure of the identifier from the CN34 label of the referral bag according to the S9 UPU standard

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
C	N	C	K	G	R	A	T	V	I	E	C	C	U	R	9	0	0	3	5	0	8	7	1	1	0	0	0	6

Mark position	Format	Meaning	Example	
1 ÷ 6	Letters	Code of the office of consignment forwarding	CNCKGR (China)	S8 UPU standard shipping identifier
7 ÷ 12	Letters	Postal destination office code	ATVIEC (Austria)	
13	Letter	Postal consignment category code	C	
14 ÷ 15	Letters	Postal consignment subclass code	UR	
16	Digit	Year of dispatch	9 (2019)	
17 ÷ 20	Digits	Consignment number	0035	
21 ÷ 23	Digits	Serial Number of container (bag) in shipment	087	
24	Numeral	Priority Indicator for Container (Sack) in Shipment	1 (high importance rate)	
25	Digit	Bag index registered / insured	1 (contains registered and/or insured shipments)	
26 ÷ 29	Cyfry	Gross weight of shipment in hectograms	0006 (0,6 kg)	
	Letters			

Source: S9 Mailpiece Identifier. Standards for defining and encoding data. UPU, 2019

In summary, e-commerce mail from China in import to Poland or in transit to other EU countries can be defined as a data structure at three levels of identification:

- shipment from China - identified according to UPU standard S8 (20-character),
- bag/container in the shipment containing postal items - identified according to UPU S9 standard (29-character),
- postal items in each bag/container - parcels, letters - identified according to UPU standard S10 (13-character).

The shipping record for all bags containing mail is a paper waybill (Table 1 - Waybill No. CNCKGZ942733). A CN 31 document is used for letters (CN 32 - bulk mail) and a CP 87 document is used for parcels. In practice, the document is printed for a closed shipment and is placed in the last bag/container of the shipment just before the container is closed (including e-commerce shipments sent by China Post).

The information on the waybill allows the postal operator to:

- verify - that the shipment is complete and contains all shipments recorded in the waybill - bags, pallets, containers, etc.),
- booking of shipments and in conjunction with other shipping documents (e.g. CN37) is the basis for international postal accounting.

A list of bagged packages is included in the CN33 document. Consignment is the logical association of a group of bags/containers of the same type/category of mail within a container (transport unit), in order to reduce the formality of receipt and improve operational efficiency.

EDI PREDES or PRECON (according to EDI UPU standard) messages of import of consignments by rail from China - in import and in open or closed transit are not sent in relation China - Poland. The information is sent in the form of MS Excel file via e-mail as a CN37 transfer list (presented in table 1).

4. OPERATIONAL ANALYSIS OF E-COMMERCE POSTAL SERVICE FROM CHINA TO POLAND AND POSTAL SERVICE TO OTHER EUROPEAN COUNTRIES

Operational requirements for repatriation of consignments from China by the EU postal operators concern the shortest possible process time - from receipt of postal containers from railroad transport on transshipment platform in Malaszewice, through transport to the International Office of Exchange (IOE) - WER Lublin, unloading and reception of bags/consignments, processing of postal items and their distribution/sorting, border clearance by Customs Service (in import or transit) and further distribution of postal items - domestic (to relevant WER in Poland) or foreign (to European International Exchanges).

Confirmation of container receipt and the dates of commencement and completion of customs control are communicated via e-mail. Mail bags are tracked in the IPS PP system by identifying events:

- 130 - receipt of bag/container from abroad (import) (e.g. at IOE WER Lublin)
- 133 - receipt of bag/container at domestic office (import) (e.g. at WER Warsaw)

Acceptance of containers from China and entering the postal tracking data in the IPS system is performed in IOE Lublin by system operation of opening the container and scanning the flags attached to the bags (Table 4).

Table 4. List of bag tags accepted from the container

Country	Consignment bag code (barcode from CN 34)
Belgium	CNCKGABEBRUACUR80012367110005
Belgium	CNCKGABEBRUACUR80012145010195
Belgium	CNCKGABEBRUACUR80016342010094
France	CNCKGRFRCDGACUR80012871010193
France	CNCKGRFRCDGACUR80016826010196
France	CNCKGRFRCDGACUR80016328010114
France	CNCKGRFRCDGACUR80016318010179

Source: Operational data from ILiM and GS1 research project

The postal operator does not interfere with the identification of mail and bags/containers handled in transit. In cases where there is a need in domestic distribution to affix postal operator barcode labels to letter or parcel shipments from China, the labels shall be:

- placed so as not to cover the shipper's address or return address,
- compliant with the identifier located in the country of posting and UPU requirements,
- affixed in such a manner that it does not obscure the shipper's country identifier.

Designated operators (e.g. Polish Post S.A.) have the right to use in domestic and international postal traffic barcodes according to the principles of unique identification in the world scale defined by technical specifications of the Postal Exploitation Council (e.g. S10 UPU standard - 13 characters - Table 2) for the purpose of tracking and tracing or other operational needs. An example dispatch plan for cargo from China to Europe, accepted from rail transport by Polish Post (container GATU8251543 on a train from China with scheduled arrival on 18.10.2018. /Tuesday/), is presented in Table 5. The plan includes further distribution of postal cargo by air transport from Warsaw Chopin Airport to Spain, Germany, Italy, Great Britain, the Netherlands and France.

Table 5. Sample plan of cargo shipment from China to European countries - cargo from container GATU8251543, on the train with scheduled arrival in Małaszewicze

Container No.	GATU8251543				Operational days						
Destination country	Exchange office	Airport	Total [kg].	Voyage No.	1	2	3	4	5	6	7
Spain	ESMADC	MAD	0,6	LO 433	x		x	x	x		x
Germany	DENIAA	FRA	0,5	LO 383/379	x	x	x	x	x		
Italy	ITMILA	MXP	0,5	LO 321	x	x	x	x	x		
United Kingdom	GBLALA	LHR	0,5	LO 285	x	x	x				
Netherlands	NLAMSA	AMS	0,6	LO 269		x	x				
France	FRCDGA	CDG	0,6	LO 333/AF 1047	x		x	x	x		

Source: Operational data from ILiM and GS1 research project

International traffic from WER Lublin is directed to 32 European countries. Due to the volume of the stream, there are 'main countries' in Europe (mass recipients) to which dedicated truck transport services are organized (e.g. Germany, France, Great Britain, Czech Republic, Italy, Spain - the list of countries may vary depending on the volume of shipments). To the remaining countries, shipments are sent by air transport or as palletized groupage shipments.

Due to the lack of fixed delivery schedules for mail shipments by rail from China, the courses by which mail is transported in transit from Poland to Europe are forecasted on the basis of announcement files forwarded by the China Post. The destination countries and bag weights are the basis for planning the courses and transport fleet. Once the assignment of cargo to individual courses is completed and the cars are systemically locked, CN37 documents are generated for shipments to individual countries.

In postal operations on the Polish side, registered in the integrated IT system ZST, there are distinguished identifiers of cargo as a logistic unit in the transport process and signatures of postal items (packages) within the cargo.

In postal operations, both in domestic and international distribution, cargo is identified according to the coding rules of a given postal operator, with an obligatory inclusion of an identifier of the place (facility) of shipment (e.g. WER Wrocław - 50900). There are many codes used in logistics and transport operations that are necessary for proper management of the process of cargo delivery to the recipient - e.g. the code of: course, shipment, transport relation, packaging, loading list, etc.

GS1 (Srivastava, Cren, 2020) identifiers along with barcodes are used as postal consignment (letters, parcels) signatures within the cargo to automate the processes of reading consignment numbers at loading, unloading, and delivery to the customer

5. IDENTIFICATION OF POSTAL ITEMS IN FOREIGN TRADE – CODE 128

A postal item in cross-border traffic is marked with a 13-digit identifier according to the logic of code 128, created in a system according to the structure presented in Table 6

Table 6. Structure of identifier for cross-border postal items

C	2	3	4	5	6	7	8	9	10	11	12	13
Shipment type		Individual tracking number								Check digit	Country of shipment	
AA		S3 - S10								K	BB	
C	**P**	**1**	**0**	**7**	**2**	**5**	**1**	**1**	**2**	**0**	**P**	**L**

Source: Operational data from ILiM and GS1 research project

Structure of identifier for cross-border postal items:

- Shipment Type - (AA) indicates the type of postal item:
  - CP - postal package in foreign traffic,
  - RR - registered item in cross-border traffic,
  - VV - insured letter with declared value in cross-border traffic,
  - CR – postal parcel for German post,
  - CZ - international postal parcel for EU post,
  - CU - postal parcel for Ukraine,
  - LX - Global Express parcel,
- Individual Parcel Number - (S3 - S10) an individual eight-digit number for a postal item of a given type.
- Check digit - (K) automatically calculated according to the adopted algorithm,
- Country of origin - (BB) letter representing the country to which the office of origin belongs with the use of the national prefix (country code) - for Poland these are the letters PL.

Figure 1. Example of barcode for identification of postal parcels

Figure 2. Example of barcode for identifying registered mail

6. IDENTIFICATION OF POSTAL ITEMS ON DOMESTIC TRAFFIC – GS1-128 CODE

A domestic mailpiece is tagged with a 20-digit identifier according to the GS1-128 barcode logic (Lee, Kim, 2017) - including a 2-digit GS1 application identifier '00' and an 18-digit SSCC number - created systemically according to the structure shown in Table 7.

Table 7. Structure of identifier for postal items in domestic traffic

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Application identifier		IAC	GS1 Prefix			Coding unit number				Individual number of postal item									Check digit
0	**0**	**1-9**	**5**	**9**	**0**	**0**	**7**	**7**	**3**	**S1**	**S2 - S9**								**K**

Source: ILiM own study

- IAC - digits from 1 to 9 identify the postal item; the digit in the IAC field allows 99,999,999 unique numbers to be used in S2 - S9 for the type of postal service specified in S1,
- Prefix - a number that identifies the GS1 national organization; 590 - identifies the Polish GS1 organization.
- Coding unit number - 0773 identifies Poczta Polska S.A.
- Individual number of postal item - digit S1 indicates the type of postal service, and digits in items S2 to S9 create the unique 8-digit number of postal item:
    - S1 = 1 - registered mail
    - S1 = 2 - insured letter
    - S1 = 3 - parcel post, parcel post Plus
    - S1 = 4 - registered mail
    - S1 = 5 - cash on delivery
    - S1 = 6 - E-shipment
    - S1 = 7 - postal item under special conditions
    - S1 = 8 - Business Parcel (with IAC up to "1" to "5"), Oversize Parcel (with IAC from "6" to "9")
- Check digit - check digit calculated automatically according to GS1 standard algorithm.

Figure 3. Example of barcode for mail items

(00)	SSCC application identifier
9	letter
590	number identifying the Polish national organization GS1
0773	coding unit - Poczta Polska S.A.
1	registered letter
54742795	consignment number
4	check digit

The barcodes to identify the other shipments contain the same data, but vary in barcode height and width (Figure 4).

Figure 4. An example of barcode to identify Parcel24, Parcel48

7. CONCLUSION AND FURTHER RESEARCH

The rapid growth of global e-commerce and the associated mass movement of goods, the increasing complexity of trade processes, the customs and tax processes of individual countries and the accompanying regulation of laws and regulations, as well as complex intercontinental supply chains and transport and logistics processes - have made the practices of import and export flows of goods very complex. The resultant problems of supply efficiency and reliability, as well as rising costs, have become a perceived constraint on business growth.

Businesses are collecting, storing and processing more and more data because of this (the big data phenomenon). They are managing operational data, classification data, and regulatory and restriction information in a more centralized manner. Increasingly, data and documents are being processed in public and private clouds (the cloud computing phenomenon), and the need to share, share, and reuse data is widely felt in business and government (according to TOOP - The Once Only Principle).

In trade, customs, tax and clearing transactions worldwide, the basic classification of goods is the CN codification based on the HS Harmonized System established by the World Customs Organization. The CN codification standard is also the basis for classification in the Integrated Tariff TARIC and the basic interpretation

for legal regulations in the EU. Whereas in identification of consignments, cargo and documents in international and global postal turnover identifiers according to the standard of the International Postal Union UPU are used. The identifiers for transport and logistics operations - e.g. containers and transport units, car registration numbers, flight numbers, road and rail route numbers, sea voyage numbers, ships, trains, delivery numbers, document numbers, etc. - are often locally/individually adopted from the identification systems used by carriers, transport and logistics operators.

In handling bulk imports from China of goods purchased through e-commerce channels, there is a market need for both buyers and sellers, customs and other border services, to correctly and accurately identify imported goods. This is driven by the need for postal operators to efficiently handle the mass stream of letters and small e-commerce shipments, reduce customs clearance times, and coordinate the allocation of Customs officers to inspection operations.

There is a need to use tested and reliable market data, instead of one-off and often random entries describing/specifying goods, leading to data errors, higher probability of customs inspections, delayed deliveries, and poor work efficiency for both Customs and Postal Service. In addition, Customs and Border Protection is signaling the need for validated and reliable data for effective risk management.

Identifiers according to the International Postal Union UPU standard are used in identifying parcels, cargo, and documents in international postal traffic. The identifiers used in the postal information system for transport and logistics operations - e.g. containers and transport units, vehicle registration numbers, flight numbers, road and rail course numbers, sea voyage numbers, ships, trains, delivery numbers, document numbers, etc. - are adopted on the basis of identification systems used by carriers, transport and logistics operators.

Based on the literature review as well as on operational and business analysis, it can be concluded that a fundamental problem of risk management by Customs and Border Protection is the often low accuracy, adequacy and reliability of the commodity data entered in documents by shippers. The handling of massive imports from China of goods purchased via e-commerce channels raises the need expressed by buyers and sellers, as well as by customs and other border authorities and postal operators, for correct and accurate identification of imported goods. This is due to the desire for efficient operational handling (receipt, distribution, consolidation) of the massive stream of small e-commerce shipments by operators and to reduce customs clearance times.

The analysis of the impact of using GS1 standards as an accompanying standard when monitoring the goods flow on the New Silk Road is the next step of the research work. The handling of the goods flow from China by different actors (e.g. government authorities, postal operators, carriers) results in different needs for standardisation of the goods and cargo identification, affecting the efficiency and performance of operations. For example, customs and revenue administrations need identifiers for goods and precise descriptions of the value and content of shipments to enable them to qualify for customs procedures, calculate customs and tax values, verify shipments according to import and transit requirements and regulations. On the other hand, an operator or carrier needs identifiers for shipments and cargo (parcels, pallets, containers) to enable efficient, timely and error-free handling of pick-up, processing

and delivery, to track and respond to deviations, and to plan equipment and supplies for operational handling.

Research work will focus on identifying a source of accurate and timely additional information for goods imported from China in customs, tax, trade or transport and logistics processes. This function is fulfilled by the Global Product Classification (GPC), which is a GS1 international standard that provides a unified way of grouping and classifying products. Unlike the commodity classifications for the Common Customs Tariff, the GPC classification is a global classification supporting omnichannel trade, including e-commerce in Asia-Europe trade relations.

Improving operational handling will direct research work towards uniform identification in logistics and transport operations, where multiple codes are used to properly manage the process of cargo delivery to the consignee - e.g. code for: course, shipment, transport relation, packaging, load list, etc. Standardised and consistent throughout the supply chain from China, the use of the Serial Logistic Unit Number (SSCC - Serial Shipping Container Code) in import and transit and its barcode will enable the integration of monitoring as well as the automation of shipment number reading processes at loading and unloading and delivery to the customer.

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