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EFFICIENCY OF TRANSPORT PROCESSES
IN SUPPLY CHAIN - SECOND PART



POZNAN SCHOOL
OF LOGISTICS

6TH INTERNATIONAL WEEK
24TH – 27TH APRIL 2017
OBUDA UNIVERSITY

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POZNAN SCHOOL OF LOGISTICS, POLAND

AGENDA

- Transport processes in the supply chain
- TSL market in Poland
- Risk – global risks and disruptions risk in the transportation process
- Analysis of transport processes disruptions risk – workshop

2



3

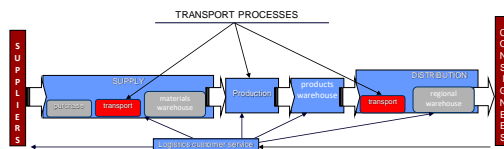
- A plane crashing on an elevated highway in Taipei.
 - Highly unusual weather patterns across the world.
 - Months-long strikes and delays at major U.S. ports.
 - An earthquake in Nepal.
 - Streams of refugees and migrants crossing Europe on foot.
- This is just a small selection of issues from 2015.
Our world is full of risk, and at any time we should expect the unexpected.

- Supply chains are crucial for all organizations – and the more global, the more complex.
- A disruption in a single node of the supply chain can have wide-ranging implications.

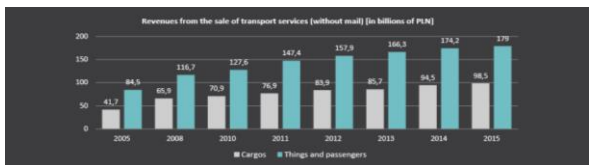


TRANSPORT

Transport of goods is an integral part of the functioning of each supply chain. It determines the flow of raw materials, intermediate products and finished products between the entities in supply chains. Timely transport of supplies and one that ensures the physical security of cargo, determines the possibility of starting the manufacturing processes, as well as organizing distribution.



TSL (TRANSPORT - FORWARDING - LOGISTICS) MARKET IN POLAND



- 141 000 TSL undertakings - about 8.4 % of all companies in Poland [2014-15]
- Average employment in the TSL industry - 550 000 employees [2014-15]

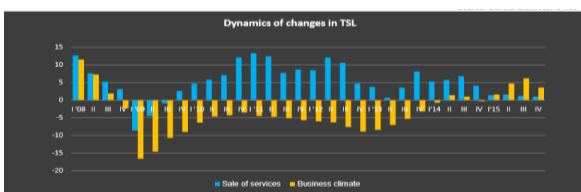
- A systematic increase in the TSL market measured by the revenues from transport, storage and mail (things and humans) - PLN 185 billions [2015], - 10.4 % of GDP, (mail - PLN 6.3 billion)
- Value of the market of contract logistics of things in 2014 exceeded the level of PLN 100 billions.
- 31st place (no change) of the Polish logistics in the ranking of the World Bank.

Source: Compiled on the basis of the data obtained from the Central Statistical Office by GSI Poland and The Institute of Logistics and Warehousing (ILM)



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TSL MARKET IN POLAND



- Expansion and automation of the national transport-storage networks - sorting plants
- Extension of the offer of specialist VAS services - repacking, receipt of returns, etc.
- Improvement of the business climate in the TSL industry
- A decrease in the dynamics of growth of the sale of transport services in 2015
- Low profitability of the industry - an increase in the employment costs, price competition
- Shortage of qualified employees

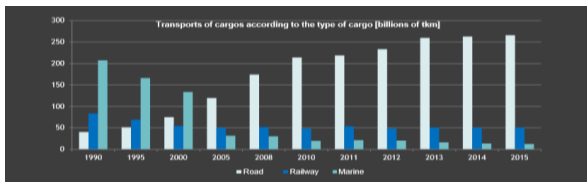
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TRANSPORTS OF CARGOS [TKM]

7



- Overall slow-down in the high speed of growth of the national transports of cargos
- An increase in the domination of the Polish international road transports in U-27; market share - 20%/24% [2012/14]
- Stabilisation on the second position in the road and railway transport in U-27; market share - 14% and 13% respectively [2014]
- Gradual domination of the road transport on the overall transport market; 71,6%/75,2% [2012/14]

Source: Compiled on the basis of the data obtained from the Central Statistical Office by GSIPoland and The Institute of Logistics and Warehousing (IiM)



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RISK

8

- Risk**
"the combination of the probability of an event and its consequence. Consequences can range from positive to negative.."
- Risk management**
"is the systematic process of understanding, evaluating and addressing these risks to maximise the chances of objectives being achieved and ensuring organisations, individuals and communities are sustainable."
- Risk management (defined in ISO 31000) is**
"the identification, assessment, and prioritization of risks (the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities."



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RISK

9

Risks can come from different ways e.g.

- uncertainty in financial markets,
- threats from project failures (at any phase in design, development, production, or sustainment life-cycles),
- legal liabilities,
- credit risk,
- accidents,
- natural causes and disasters as well as deliberate attack from an adversary, or
- events of uncertain or unpredictable root-cause.

There are two types of events i.e.

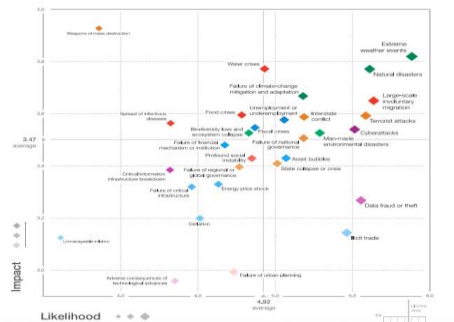
- negative events can be classified as risks while
- positive events are classified as opportunities.



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THE GLOBAL RISKS LANDSCAPE 2017

10



Source: World Economic Forum Global Risks Perception Survey 2016



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RISKS IN SUPPLY CHAINS – MAIN TRENDS

11

PIRACY
Since 2005, more than 149 ships have been captured and ransomed, and many more attacked, by pirates off the Somali coast. A 2013 World Bank report estimated the annual economic cost, including the effect on trade of anti-piracy measures, at \$78 billion.

CARGO THEFT
The Transportation Asset Protection Association estimates that there are three major incidences of cargo theft every day in Europe alone. The average value of these thefts in 2014 was more than \$220,000, and in 15 cases thieves stole goods worth more than \$1.1 million.

CURRENCY VOLATILITY
The steep devaluation of the Venezuelan Bolivar is estimated to have cost U.S. companies nearly \$3 billion in profit in the second quarter of 2015. Some have been forced to write off the value of their assets in the country.

DHL InsightOn: Risk&Resilience, Published by Deutsche Post AG, Bonn 2016



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RISKS IN SUPPLY CHAINS – MAIN TRENDS

12

EARTHQUAKES
The 2011 Tohoku earthquake in Japan was the costliest natural disaster in history with an estimated economic impact of \$235 billion. The 9.0 magnitude earthquake and subsequent tsunami killed 16,000 people and severely damaged the country's industrial infrastructure, including several nuclear power plants.

WAR AND TERRORISM
The port of Hodeidah in Yemen was shut down in August of 2015 after it was bombed by Saudi aircraft as part of a campaign against militants. The port was a major route for humanitarian aid going into the region.

IT AND TELECOMMUNICATIONS FAILURES
According to a survey by the Business Continuity Institute, information and communications technology outages are the most common cause of supply chain disruption, affecting more than half the companies surveyed.

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13

PORT CONGESTION
A ten-day shutdown at ports on the U.S. West Coast in early 2015 is estimated to have cost the U.S. economy \$2 billion a day. The dispute also drove up supply chain costs, as importers were forced to switch to routes between Asia and the U.S. East Coast via the Panama Canal, using smaller, costlier vessels.

CYBER ATTACK
Cyber criminals are increasingly attacking industrial infrastructure as well as conventional computer networks. In 2014, the U.S. Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) responded to 245 incidents reported by asset owners and industry partners. The attacks focused on assets in the energy and manufacturing sectors.

SUPPLIER TROUBLE
Automotive supplier Hella had to reconfigure parts of its supply chain this year, following the failure of a Chinese supplier of plastic components. The company says the disruption cost it \$55 million. Meanwhile, both Boeing and Airbus had to delay deliveries earlier in the year after capacity problems at a seat supplier.

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14

SEVERE WEATHER
Even relatively localized weather events can be costly and disruptive. In 2013, for example, hailstorms outside Volkswagen's Wolfsburg headquarters damaged around 28,000 cars awaiting delivery to customers.

HURRICANES
Hurricane Katrina, which struck the U.S. in 2005, was the costliest natural disaster in U.S. history, with an economic impact estimated at \$108 billion. Hurricanes, storms, and tornadoes were the cause of nine out of the ten costliest disasters in the country.

GEOPOLITICAL DISRUPTION
The activity of migrants attempting to cross from mainland Europe to the United Kingdom has created average delays of nine hours at the port of Calais. In 2014, shippers traveling through Calais paid \$10.5 million in fines following the discovery of stowaways in their cargo.

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RISK IDENTIFICATION

Risks are about events that, when triggered, cause problems or benefits. Hence, risk identification can start with the source of our problems and those of our competitors (benefit), or with the problem itself.

- Source analysis - Risk sources may be internal or external to the system that is the target of risk management.

Examples of risk sources are: stakeholders of a project, employees of a company or the weather over an airport.

- Problem analysis - Risks are related to identified threats.

For example: the threat of losing money, the threat of abuse of confidential information or the threat of human errors, accidents and casualties. The threats may exist with various entities, most important with shareholders, customers and legislative bodies such as the government.

- When either source or problem is known, the events that a source may trigger or the events that can lead to a problem can be investigated.

For example: stakeholders withdrawing during a project may endanger funding of the project; confidential information may be stolen by employees even within a closed network; lightning striking an aircraft during takeoff may make all people on board immediate casualties.

The chosen method of identifying risks may depend on culture, industry practice and compliance. The identification methods are formed by templates or the development of templates for identifying source, problem or event.



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FORMULA FOR RISK QUANTIFICATION

Rate (or probability) of occurrence multiplied by the impact of the event equals risk magnitude.

The above formula can also be re-written in terms of a Composite Risk Index, as follows:

$$\text{Composite Risk Index} = \text{Impact of Risk event} \times \text{Probability of Occurrence}$$

The impact of the risk event is commonly assessed on a scale of 1 to 5, where 1 and 5 represent the minimum and maximum possible impact of an occurrence of a risk (usually in terms of financial losses). However, the 1 to 5 scale can be arbitrary and need not be on a linear scale.

The probability of occurrence is likewise commonly assessed on a scale from 1 to 5, where 1 represents a very low probability of the risk event actually occurring while 5 represents a very high probability of occurrence. This axis may be expressed in either mathematical terms (event occurs once a year, once in ten years, once in 100 years etc.) or may be expressed in "plain English" (event has occurred here very often; event has been known to occur here; event has been known to occur in the industry etc.). Again, the 1 to 5 scale can be arbitrary or non-linear depending on decisions by subject-matter experts.



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DISRUPTIONS

Handfield and McCormack define disruptions as major delays in the production, distribution links of supply chain, which have implications for the activities of the other entities of the supply chain. Disruptions are usually a bottleneck in one of the links, which, in effect, spreads throughout its supply chain. Any single event such as fire, quality problems, machine failures, delayed customer orders can cause significant disruption throughout the supply chain.



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THE IMPORTANCE OF THE RISK OF DISRUPTION TO TRANSPORT

The risk of disruptions and disruptions relates largely to transport. The continuity of the transport process is effective and timely delivery of goods (shipment) to the recipient.

Assessment of the risk level of potential adverse events and identification of disruptive events or delaying the delivery is particularly important for transport companies.

It allows for preventive actions and the development of emergency procedures.



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RISK OPTIONS

19

Once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories:

- **Avoidance** (eliminate, withdraw from or not become involved)
- **Reduction** (optimize – mitigate) - reducing the negative effect or probability of the threat,
- **Sharing** (transfer – outsource or insure) - transferring the threat to another party (e.g. an insurance company),
- **Retention** (accept and budget) accepting some or all of the potential or actual consequences of a particular threat, and the opposites for opportunities (uncertain future states with benefits).

Ideal use of these strategies may not be possible. Some of them may involve trade-offs that are not acceptable to the organization or person making the risk management decisions.



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WORKSHOP

20

- Identification of potential disruptions of transportation processes in companies in the TSL sector (work in groups)
- Potential disruptions of transportation processes identified in Poland – benchmarking
- Assessment of impact and probability of identified potential disruptions – prepare risk matrix (work in groups)
- Analysis of impact and probability of really identified disruptions in the survey conducted in Polish enterprises in the TSL sector
- Risk options - discussion



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Thank you for
your attention