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тел.: (063) 593-30-41  
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**Pozniak O.V.** PhD (Economics), Associate Professor, Associate Professor of Logistics Department, National Aviation University (Ukraine)

**ORCID** – 0000-0003-0701-9698

**Researcher ID** – S-7110-2018

**Scopus author id:** –

**Yurchenko K.M.** Bachelor` degree student of Logistics Department, National Aviation University (Ukraine)

**ORCID** –

**Researcher ID** –

**Scopus author id:** –

## FORMATION OF THE OPTIMAL BUSINESS MODEL OF A LOGISTICS COMPANY

**Oksana Pozniak, Yurchenko Kateryna.** *"Formation of the optimal business model of a logistics company".* The article is devoted to the study of the main types of business models that a logistics company can use depending on its life cycle and development strategy. The main components of the business model are given, which determine the problems of formation and implementation of the selected business model of a logistics company. The author's approach to the concepts of "asset-light business model" and "asset-based business model" is proposed. The characteristic features of each business model, potential problems from their use, and the advantages that the implementation of the "asset-light business model" gives are determined. The evolution of business models and its modifications, which are determined by the stages of the life cycle of a logistics company and are determined by the influence of the main components of the business model, have been investigated. The structuring of logistics providers by types of business models has been carried out, which makes it possible to clearly determine the potential for logistics company's success and the content of the main components, in accordance with the chosen business model. Based on the theoretical developments of the authors, an analysis of logistics companies that use the "asset-light business model" and "asset-based business model" was carried out. The resource provision of each business model is analyzed. It has been substantiated that, despite the type of business model, the main problem is how, using own, leased or resources of other participants in the logistics services market, namely subcontractors, to form an optimal business model or adapt the existing one to the changing conditions of the external environment. To reach this goal, different strategic management tools are used, which include the canvas of the business model. The advantage of using this tool for visualizing the main components that determine the influence of external and internal spheres on the business model of a logistics company has been substantiated. A business model canvas was formed for each logistics company, with different types of business models, which made it possible to determine the competitive advantages of each company. The analysis of indicators (metrics) that are used to assess the effectiveness of business models made it possible to choose the DuPont model based on the return on investment capital. As a result, the influence of the main elements of the model on the final ROIC result was determined, which was confirmed by carrying out the corresponding calculations.

**Keywords:** business model, logistics company, asset-light, asset-based, outsourcing, business model canvas, return on investment capital.

**Оксана Позняк, Катерина Юрченко. «Формування оптимальної бізнес-моделі логістичної компанії».** Стаття присвячена дослідженню основних типів бізнес-моделей, які може використовувати логістична компанія залежно від її життєвого циклу та стратегії розвитку. Наведено основні компоненти бізнес-моделі, що визначають проблеми формування та запровадження обраної бізнес-моделі логістичної компанії. Запропоновано авторський підхід до понять «asset-light business model» та «asset-based business model». Визначено характерні риси кожної бізнес-моделі, потенційні проблеми від їхнього використання та переваги, які дає впровадження «asset-light business model». Досліджено еволюцію бізнес-моделей та її модифікацій, які обумовлені етапами життєвого циклу логістичної компанії та визначаються впливом основних компонентів бізнес-моделі. Проведено структурування логістичних провайдерів за типами бізнес-моделей, що дозволяє чітко визначити потенціал успіху логістичної компанії та зміст головних компонентів відповідно до обраної бізнес-моделі. На основі теоретичних розробок авторів, було проведено аналіз логістичних компаній, які використовують «asset-light business model» та «asset-based business model». Проаналізовано ресурсне забезпечення кожної бізнес-моделі. Обґрунтовано, що, незважаючи на тип бізнес-моделі, головна проблема полягає в тому, яким чином, використовуючи власні, залучені чи ресурси інших учасників ринку логістичних послуг, сформувати оптимальну модель ведення бізнесу або адаптувати існуючі до умов зовнішнього середовища. З даною метою використовують різні інструменти стратегічного менеджменту, до яких можна віднести канву бізнес-моделі. Обґрунтовано перевагу використання даного інструменту візуалізації основних компонентів, що визначають вплив зовнішньої та внутрішньої сфер на бізнес-модель логістичної компанії. Канва бізнес-моделі була сформована для кожної логістичної компанії з різними типами бізнес-моделей, що дозволило визначити конкурентні переваги кожної компанії. Проведений аналіз показників (метрик), які використовуються для оцінки ефективності бізнес-моделей, дозволив обрати модель Дюпона на основі рентабельності вкладеного капіталу. В результаті було визначено вплив основних елементів моделі на кінцевий результат ROIC, що було підтверджено проведенням відповідних розрахунків.

**Ключові слова:** бізнес-модель, логістична компанія, asset-light, asset-based, аутсорсинг, канва бізнес-моделі, рентабельність вкладеного капіталу.

**Оксана Позняк, Екатерина Юрченко. «Формирование оптимальной бизнес-модели логистической компании».** Статья посвящена исследованию основных типов бизнес-моделей, которые может использовать логистическая компания в зависимости от ее жизненного цикла и стратегии развития. Приведены основные компоненты бизнес-моделей, которые определяют проблемы формирования и внедрения избранной бизнес-модели логистической компании. Предложен авторский подход к понятиям «asset-light business model» и «asset-based business model». Определены характерные черты каждой бизнес-модели, потенциальные проблемы от их использования и преимущества, которые дает внедрение «asset-light business model». Исследована эволюция бизнес-моделей и ее модификаций, которые обусловлены этапами жизненного цикла логистической компании и определяются влиянием основных компонентов бизнес-модели. Проведена структуризация логистических провайдеров по типам бизнес-моделей, которая позволяет четко определить потенциал успеха логистической компании и содержание главных компонентов, в соответствии с выбранной бизнес-моделью. Основываясь на теоретических разработках авторов, был проведен анализ логистических компаний, которые используют «asset-light business model» и «asset-based business model». Проанализировано ресурсное обеспечение каждой бизнес-модели. Обосновано, что, несмотря на тип бизнес-модели, главная проблема состоит в том, каким образом, используя собственные, привлеченные или ресурсы других участников рынка логистических услуг, сформировать оптимальную модель ведения бизнеса или адаптировать существующую к изменяющимся условиям внешней среды. Для этого используют разные инструменты стратегического менеджмента, к которым можно отнести канву бизнес-модели. Обосновано преимущество использования данного инструмента визуализации основных компонентов, которые определяют влияние внешней и внутренней сфер на бизнес-модель логистической компании. Канва бизнес-модели была сформирована для каждой логистической компании, с разными типами бизнес-моделей, что позволило определить конкурентные преимущества каждой компании. Проведенный анализ показателей (метрик), которые используются для оценки



*эффективности бизнес-моделей, позволил выбрать модель Дюпона на основе рентабельности вложенного капитала. В результате было определено влияние основных элементов модели на конечный результат ROIC, что было подтверждено проведением соответствующих расчетов.*

**Ключевые слова:** бизнес-модель, логистическая компания, asset-light, asset-based, аутсорсинг, канва бизнес-модели, рентабельности вложенного капитала.

**Introduction.** Competition in the logistics services market requires companies to realize the need to find ways of gaining competitive advantages. The most effective way, from the point of view of practitioners, is the optimization of doing business by forming an optimal business model as a concept for the development of the company, which allows identifying priorities, eliminating discrepancies, optimizing the company's efforts in strategic areas of generating value, profitability, and efficiency. Interest in this issue is connected, firstly, with the fact that the business model determines the logic of the business, reveals the chain of cause-and-effect relationships between the key factors of the business model, forms the basis for rethinking the methods and mechanisms of business organization. As a result, ideas for the production of values come to the fore, not products, the proposal of a given value, and not sales. This principle of building a business in a fundamentally new way answers questions regarding the efficiency and effectiveness of a logistics company.

In addition, the rethinking of the management, owners, and employees of the business logic creates the potential for development, opens up new opportunities for qualitative transformations in the company, which serves as a powerful impetus for innovation in all areas of the company. The experience of successful companies shows that at the stage of designing a business model, the prerequisites for strengthening key competencies are formed, which, due to the unique combination of business processes, creates irreproducible competitive advantages.

Moreover, the business model briefly illuminates the multifaceted functioning of the company, through simple,

understandable things, it provides all stakeholders with information about the principles, mechanisms of functioning, and development priorities of the company. Therefore, the business model of an enterprise can be considered not only a strategic asset of the company but also an extremely effective means of communication.

Thus, a company can get certain advantages from the formation of an optimal business model at any stage of its life cycle, even by adapting and adjusting the existing model, taking into account the conditions of changes in the external and internal environment in order to meet the needs of customers and maintain competitive advantages. This determines the relevance of this topic and the increased interest of the heads of logistics companies in the problems of the optimal business model of the company, as a concept for the effective formation and use of internal sources to achieve the strategic goals of the company.

**Analysis of recent research and publications.** The theoretical and practical aspects of the problematics in the definition, structuring, and classification of business models, periodization of the main directions of their research are reflected in the works of famous scientists of our time, such as V. Revutskaya [14], Strekalova N.D. [18], Kharitonova G., Klimchuk A. [11], Pimenov S.A. [15], Tsvirkun Ya. [21] and other.

Particularly noteworthy is the article by the authors S. A. Pimenov and A. V. Pimenov [16], in which scientific approaches to the definition of the concept of "business model" are investigated, the stages of development and formation of business modeling since the 60s of the twentieth century are analyzed. To the present, the key elements of the business model of the enterprise have been identified, and the definition of the concept of "business

model" has been given. The authors define the business model of an enterprise as a way of organizing a business, reflecting the internal and external relationships of the enterprise, with the necessary detailing at a certain stage of the life cycle in a certain period of time, used by the owners to make a profit through meeting the needs and wishes of consumers.

Skril V.V. [18] summarizes the scientific provisions on understanding the essence of the "business model", gives the main

classifications of business processes by signs and types of processes at enterprises, distinguishes between the differences between a business model and a strategy, and systematizes methodological approaches to building a business model of an enterprise.

Other authors [12] summarized the views of scientists on the concept of "business model" to three types and identified the advantages and disadvantages of each type that were shown in table 1.

Table 1 – Attributes, strengths and weaknesses across the three typologies of business model definitions

Typology	Attributes	Possible strengths	Possible weaknesses
Generic business model definitions	<ul style="list-style-type: none"> <li>- Components that constitute the business</li> <li>- General industry attributes</li> <li>- A meta model or ontology for business model</li> </ul>	The advantages of aggregation, i.e. gaining an understanding of the basic of the value creation in the company	Picture conveyed becomes too general to convey anything relevant about the specific business
Broad business model definitions	<ul style="list-style-type: none"> <li>- The method of doing business</li> <li>- focus on the whole enterprise system</li> <li>- The architecture for generating value</li> <li>- Description of role and relationships</li> </ul>	Value creation must be understood across the whole value chain in which the company participates	<ul style="list-style-type: none"> <li>- Not sufficiently focused on the core value creating processes</li> <li>- Includes factors not completely controlled by the company</li> </ul>
Narrow business model definitions	<ul style="list-style-type: none"> <li>- Describe the uniqueness of internal aspects</li> <li>- Infrastructure for generating value</li> <li>- Detailed accounts of links, processes, and networks of causes and effects</li> </ul>	<ul style="list-style-type: none"> <li>- The level of detail regards the functioning of the specific firm</li> <li>- Precise and relevant descriptions</li> </ul>	<ul style="list-style-type: none"> <li>- Accounts may become too specific to make sense</li> <li>- Loss of overall understanding</li> </ul>

So, summarizing the views of scientists in defining the essence of the concept of "business model", two approaches can be distinguished. The first approach is focused on business processes/roles and is associated with considering the activities of the enterprise from the point of view of business processes and technologies, focused on optimizing the internal environment of the enterprise. The second approach focuses on the value/customer-generated by the enterprise for external customers.

In view of these approaches, the key elements of the business model of an enterprise that determine its content are [16]:

- a value proposition found in the products and services that the company offers to its customers;
- a system for creating a value proposition, including the relationship of the enterprise with suppliers, target customers, as well as value chains;
- the assets that the company uses to create a value proposition;



- the financial model of the enterprise, which determines the structure of income and expenses, as well as ways of making a profit.

Researchers define various types of business models, which are classified according to the following criteria: depending on the direction of business development, according to functional affiliation, and also depending on the degree of openness of the business model [18]. Another classification of business models is applicable to logistics companies, namely asset-based or asset-intensive, asset-light, integrated solutions, and outsourcing, corresponding to the specifics of the logistics business. Some aspects of these models are reflected in the research of scientists [ass], but there is a lack of fundamental research of these types of business models used by logistics companies, in terms of the concept, defining the characteristic features of each business model, the formation of evolution and combination of models.

**Objectives statement.** The purpose of this article is a theoretically study the economic nature of business models used by logistics companies to form the optimal business model, and evaluate their effectiveness based on the DuPont model.

**Basic material and results.** The business model determines the constituent elements of the company's competitive advantage, its potential, through the identification of key success factors, among which the main ones are:

1. Key processes associated with customer service. In every region of the world, a logistics company can provide those types of services that the client needs, taking into account the factors of the regional market (demand, competition, legislation, development of logistics infrastructure, etc.). It is necessary to determine the full list of services and, in accordance with the resource provision, distinguish between the processes that the company will perform independently, and those that the company can purchase from subcontractors, that is,

outsource. Accordingly, a base is being formed - the basis of a business model, which will be complemented by other key factors.

2. Consumer - the company must clearly define who are the consumers of various logistics services, choosing a model of interaction: B2B, B2C, eB2eB, B2G; conduct marketing research to establish the potential demand for logistics services and identify ways to attract new customers; conduct ABC - analysis of clients and, if necessary, develop programs for key clients of the company.

3. The value of logistics services. Depending on the definition of customer groups that are and maybe potential customers, the company must determine what logistics services, integrated logistics solutions the customer needs, to solve the customer's problems, logistics services are directed; what customer needs are satisfied by the logistics company; what list of logistics services the company can offer for each market segment by regions of the world.

4. Economic resources. Logistics companies use the same economic resources: material (most of which is the logistics infrastructure), intangible (software products - software, brands, strategic assets, etc.), personnel, and financial resources [17, p.122]. They can be rented, purchased from your own sources, or borrowed from partners. The problem of obtaining competitive advantages in the market is how to form and manage these types of economic resources in order to be competitive in the market, that is, how, using the same combination of economic resources, some logistics companies occupy top positions in the market, while others cannot reach the planned level. The economic resources generated and used by the logistics company determine the degree of resource support for the execution of business processes, as a result of which the client receives logistics services, and the company receives financial results of activities (income, expenses, profit).

5. Key partners. Depending on the type of business model used by the logistics company, it is necessary to form a "pool" of

partners: resource providers and service providers (subcontractors).

6. The financial results of activities are determined, firstly, by the cost structure (the cost of resources, outsourced services), and secondly, by the structure of revenue in accordance with the structure of the company's services, the company's financial policy in the field of interaction with customers and suppliers (management of accounts receivable and accounts payable) debt).

The concept of an enterprise business model is often confused with strategy, replacing one term with another, or referring to one of its components. To illustrate how the business model relates to strategy, consider the following formula presented by M. Levy [2]:

$$V=M*S, \quad (1)$$

where V – value, M – business-model, S – strategy.

Depending on the strategy that the logistics company chooses for itself, it forms a business model and, accordingly, determines all the constituent elements of the business model.

Analysis of annual reports as carriers of detailed information on the activities of a logistics company made it possible to establish two basic models asset-based or asset-intensive and asset-light and supplement them with modern modifications that were reflected in Fig. 1.

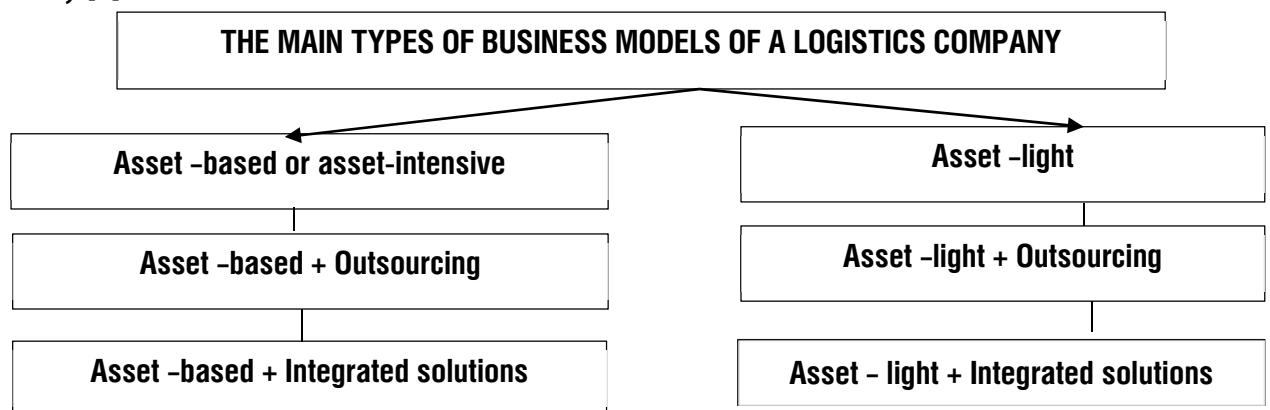


Figure 1 – The main types of business models of a logistics company

Source: compiled by the authors

Asset-based or asset-intensive - a business model based on the use of own or leasing resources to provide resources for the implementation of business processes of a logistics company. These are usually, firstly, tangible assets - buildings, structures, vehicles, warehouses, warehousing

equipment, handling equipment, computers, etc., and secondly, intangible assets - information systems. This also applies to staff.

Table 2 combines the main features of this model and the potential problems caused by its implementation in the logistics company..

Table 2- The main features of Asset-based business model

No	The main features of the model	Potential problems
1	Usage of own assets or assets acquired under leasing conditions (operational or financial) for provision business processes performance of logistics services	Determining the acceptable structure of own and leasing assets. The problem of efficient use of assets, generating revenue to cover leasing costs.

No	The main features of the model	Potential problems
2	The structure of non-current assets of the company is dominated by "heavy" assets - tangible assets.	Such a structure of non-current assets significantly reduces the flexibility and adaptability of the company to abrupt changes in the external environment, namely, reducing demand for services
3	Require significant investment in the formation, operation, maintenance and disposal of assets.	The formation of assets from borrowed sources of funding significantly reduces the financial stability and solvency of the company.
4	Less flexibility due to significant investments	Significant investments "freeze" money in assets, which makes it impossible for them to make alternative, more efficient investments.
5	Operations are carried out on their own and are therefore less dependent on service providers	Customers, in most cases, are interested in obtaining a comprehensive logistics service, which companies with this type of business model, are not able to provide without interaction with other market participants. This significantly narrows the range of customers.
6	In the event of bankruptcy, the company will be able to cover its liabilities by selling its own assets.	The structure of assets (current and non-current) determines the sources of their formation (own or borrowed funds) and maturities of liabilities (long-term and short-term). Funds from the sale of assets may not be enough to repay all liabilities.

Source: compiled by the authors

Asset-light is a business model based on the use of "light assets", which allows a logistics company to scale its activities and respond to changes in market demand, to choose suppliers of resources and services with the most suitable offer. In this model,

some staff can be involved in outsourcing and outstaffing.

Table 3 combines the main features of this model and the potential problems caused by its implementation in the logistics company and advantages of this business model.

Table 3 – Asset-light business model: main features, advantages and potential problems

No	The main features of the model	Potential problems	Advantages
1	Usage of leased assets (warehouses, office space, etc.) or ROU assets (right-of-use assets) and services of subcontractors to ensure the provision of logistics services	A logistics company is responsible to customers for the quality of services, regardless of who is involved in this process. Accordingly, it is necessary to constantly check the quality of subcontractors' services and cooperate only with those who meet the company's requirements.	In the event of a decrease in demand for logistics services, the company can reduce the volume of its activities with the least losses, or, in the event of a crisis, even exit the market.
2	Dependence on the level of development of logistics infrastructure and logistics market operators	As the logistics company leases logistics infrastructure elements to serve customers and buys services from subcontractors, this directly determines the ultimate quality of	Working in the developed market of logistics services, the company can choose the best participants as partners, and provide consulting services for the

No	The main features of the model	Potential problems	Advantages
		logistics services for which the company is responsible.	development of their business.
3	The structure of non-current assets of the company is dominated by "light" assets	The company's competitive advantages depend on the company's strategic assets, namely: customer relations, supplier relations, knowledge ownership, and management of fixed assets, each of which is associated with relevant financial initiatives.	Such a structure of non-current assets significantly increases the company's flexibility and adaptability to abrupt changes in the external environment, namely, reducing demand for services
4	In the structure of direct costs of the company, a significant share is made up of costs for the services of subcontractors.	With an increase in the price of subcontractor services, the amount of gross profit decreases	To optimize direct costs, the company can select subcontractors that meet the price/quality relation
5	Greater flexibility due to lack of significant capital investment	Significant investments "freeze" money in assets, which makes it impossible for them to make alternative, more efficient investments.	Use of financial resources for innovative development of the company
6	Dependence on service providers	Working as an integrator in the logistics services market, using the services of subcontractors, the logistics company is directly responsible for the quality of services to the client. In the event of negative situations, the company's reputation may be damaged	Customers, in most cases, are interested in obtaining a comprehensive logistics service that companies with this type of business model provide in cooperation with other market participants. This significantly expands the range of customers.

Source: compiled by the authors

The next evolution of business models can be identified, which is represented in Figure 2.

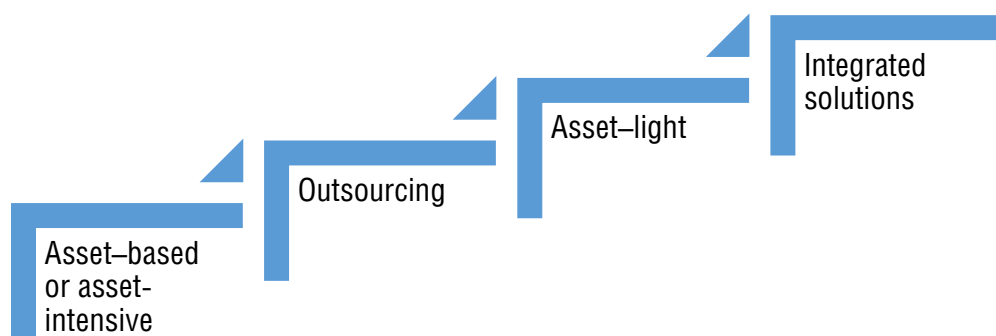


Figure 2 – Evolution of business models of a logistics company

Source: compiled by the authors

Companies supporting the Asset-based or asset-intensive business model begin to operate in the logistics services market as independent market operators, providing services to end customers, that is, they comply with the B2C model. If the company's resources allow it, it begins to increase its supply on the market, offering services to other operators of the logistics services market, who outsource the implementation of logistics services, that is, they are moving to the B2B model. The transition to the asset-light model occurs when the role of the logistics company changes from a service provider to a consumer of services of other participants in the logistics services market. A logistics company can start operating in the market on the basis of the asset-light model if it is provided for by the company's strategy.

Despite the evolution of business models reflected in Figure 2, it is considered that the main are two models, on the basis of which the combination of business models depicted in Figure 1 occurs, which depend on the life cycle of a logistics company and the regions of the world in which they are working.

The addition of the Outsourcing component to the base model expands the functionality of a logistics company in the field of logistics services by using the resources of partners - subcontractors.

Therefore, in deciding which services to outsource, the following components of the business model are combined: economic resources + key partners + key processes.

The addition to the basic model of the Integrated solutions component (integrated solutions), in addition to expanding the functionality of the company, also raises it to a qualitatively new level of provision of logistics services, since an individual integrated solution is developed for a specific client, which combines the following components of the business model. : economic resources + resource and service providers (key partners) + key processes + key services + key customers.

Structuring the logistics services market by types of logistics providers allows combining a specific provider level with possible types of business models that were summarized in Table 4.

The higher the level of the logistics provider, the less resource-intensive its business model is. This is due to the fact that from level 3 PL, a logistics provider begins to act as an integrator in the logistics services market, pooling the resources of other companies, usually of a lower level, supporting the asset-based model, to ensure the implementation of the entire range of logistics services in supply chains.

Table 4 – Structuring the logistics providers by business models

Type of logistics provider	Asset – based	Asset –based + Integrated solutions	Asset –based + Outsourcing	Asset – light	Asset –light + Integrated solutions	Asset – light + Outsourcing
2 PL	+					
3 PL		+	+			
4 PL		+	+	+	+	+
5 PL				+	+	+

Source: compiled by the authors

The place of a logistics company in the top 10 best companies in the world does not depend on what business model the logistics company adheres to. Thus, the rating [20] is topped by logistics operators - Amazon and DHL, which adhere to the asset –based business model with additional solutions.

Kuehne & Nagel (3d place in rating) and DSV Panalpina (6th place in rating) are representatives of another business model - asset –light. The business model of DSV Panalpina, taken from the company's annual report [4], is shown in Fig.3.





Figure 3 - Business model of DSV Panalpina [4]

DSV operates based on an asset-light business model which means that transportation of shipments is booked with subcontractors (carriers and hauliers). They transport customers' goods to, from and between our more than 1,400 offices, terminals and warehouses across the world, enabling company to be close to local markets while taking advantage of a global perspective and network. That way company secure the best possible service at highly competitive rates. DSV's international network consists of more than 200,000 suppliers, partners and agents. They cover strategic international hubs and important sea lanes. Road transport provides customers with trustworthy hauliers with knowledge of local market conditions [4].

DHL operates based on an asset-based business model which means that the company operates more than 84,000 offices, about 34,000 vehicles for the delivery of documents and cargo and more than 260 aircraft, 3 Global Hubs: Hong Kong, Leipzig, Cincinnati, and 15 Main Regional Hubs: Amsterdam, Bergamo, Brussels, Copenhagen, East Midlands (UK), Frankfurt, London, Paris, Vitoria (Spain), Bangkok, Singapore, Bahrain, Dubai, Lagos, Panama, Global IT Centers: IT centers in Cyberjaya (Malaysia) and Prague (Czech Republic), supporting the entire global network [8].

The provision by "real" resources of Post & Parcel Germany Division is shown in fig.4.

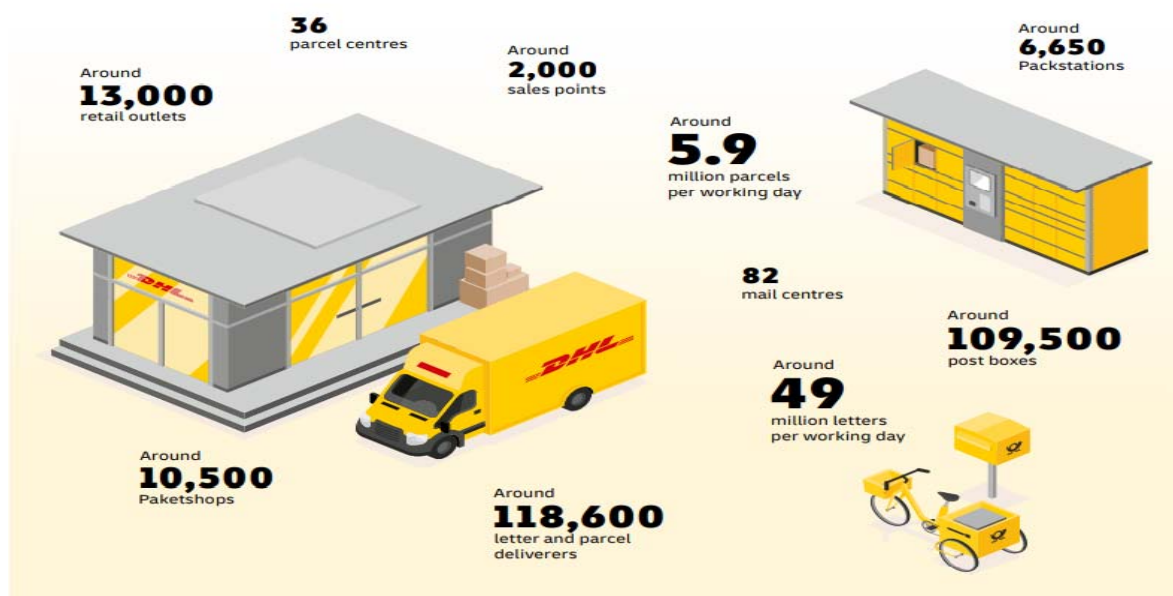


Figure 4- National wide transport and delivery network in Germany, 2020 [5]



Another confirmation of this model is resource provision of DHL Aviation that is a division of DHL (owned by Deutsche Post) responsible for providing air transport capacity. It is not a single airline, but refers to several airlines which are either owned, co owned or chartered by DHL Express [8]

Deutsche Post currently owns five main airlines, which provide services by region:

- European Air Transport Leipzig (EAT Leipzig) is responsible for the major part of the network for Europe, and for long haul services to the Middle East and Africa. From its hub at the Leipzig/Halle Airport it operates a fleet of Boeing and Airbus freighters.

- DHL Air UK (DHL Air) is based at East Midlands Airport, was purchased by DHL in August 1989 and has since July 2000 been operating a fleet of Boeing 757 Freighters on intra European services and a fleet of new built Boeing 767 freighters, primarily on transatlantic routes.

- DHL Aero Expreso is the subsidiary in Central and South America Hub in Tocumen, Panamá, operating a fleet of Boeing 737-400, 757-200 and 767-300 Freighters in Central and South America, as well as serving destinations in the Caribbean and Florida.

- SNAS/DHL (DHL International) handles Middle East destinations from its headquarters and main regional hub at Bahrain International Airport, operating a fleet of Boeing 767 Freighters.[6] The fleet is deployed throughout the Middle East and in Africa.

- Blue Dart Aviation is based at Chennai International Airport, India, with a fleet of Boeing 757 Freighters. It provides services for the Indian network of DHL and regional charters.

- DHL Air Austria is based at Vienna International Airport, Austria, with a fleet of Boeing 757 Freighters.

It also owns the following smaller airlines: DHL de Guatemala (Guatemala City), DHL Ecuador (Guayaquil, Ecuador) and Vensecar Internacional (Caracas, Venezuela) [].

The DHL Aviation aircraft fleet consists of Airbus A300-600RF (35 units), ASL Airlines Ireland (4 units), Airbus A330-300P2F (1 unit), ATR 42-300F (3 units), Vensecar Internacional (1 unit), Boeing 727-200F (6 units), Vensecar Internacional (3 units), Boeing 737-400SF (4 units), Southern Air (5 units), Boeing 747-400BCF (13 units), Kalitta Air (4 units), Boeing 747-8F (4 units), Boeing 757-200F (46 units), European Air Transport Leipzig (11 units), Boeing 767-200F (8 units), Atlas Air (5 units), Boeing 767-300ERF (6 units), DHL Air UK (4 units), Boeing 777F (12 units), Southern Air (4 units), Tupolev Tu-204-100C (1 unit).

In order to meet the growing demand for air cargo transportation, namely the growing demand for cross-border delivery of urgent cargo, DHL Express and Boeing announced a deal to acquire 8 new Boeing 777 Freighters. The Boeing B777F has a carrying capacity of 102 tons and a flight range of 9.2 thousand km. The new aircraft will enable DHL Express to reduce stops on long-haul routes [6]. DHL Express also ordered 12 electric cargo planes from the Eviation startup and plans to create the world's first emission-free electric cargo network. DHL plans to start operating the aircraft in 2024. The Alice can be operated by a single pilot and can carry over 1.2 tons of cargo. Full recharging of the aircraft's batteries is approximately 30 minutes, and the maximum flight range is 815 km at a speed of approximately 400 km/h. [7]

Consequently, DHL continues to evolve based on the model, investing in real assets and intelligent management systems based on artificial intelligence, which will continue to provide it with a competitive edge in the logistics market in the future (Fig.5).



Figure 5 – Applying AI in DHL [1]

Consequently, regardless of the type of business model, the main problem is how, using our own, attracted or resources of other participants in the logistics services market, to form an optimal business model or adapt the existing one to the changing conditions of the external environment. To do this, use various strategic management tools, which include the Business Model Canvas.

The Business Model Canvas is a strategic management template used for developing new business models and documenting existing ones. It offers a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers,

and finances, assisting businesses to align their activities by illustrating potential trade-offs [3]. Osterwalder's canvas has nine boxes: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure [13].

This model shows through which components a logistics company can obtain competitive advantages and provides an opportunity to adapt, adjust it if necessary.

Figure 5 shows the Business Model Canvas for DHL, and Figure 6 shows the Business Model for DSV Panalpina.

Key Partners	Key Activities	Value Propositions	Customer Relationship	Customer Segments
Logistics providers Packaging material manufacturers Retailers Acquisitions like UK Mail, Airborne Express Franchisees	Distribution Tracking systems Quality control Warehousing IT capabilities R&D Marketing Customer support E-commerce <i>Main divisions:</i> Express, Global Forwarding, Freight, Supply Chain,	DHL Warehousing Transportation & Distribution Solution Innovations in logistics E-communication Contract logistics DHL Logistics Consulting DHL Lead Logistics Partner DHL International Supply Chain (ISC)	Trust and reliability High reputation Partnerships Convenient customer assistance Automated solutions	Personal users <i>Industry Sectors</i> Auto-Mobility Chemicals Consumer Energy Engineering and Manufacturing Life Sciences and Healthcare Public Sector Retail Technology

	eCommerce Solutions, Post & Parcel Germany	DHL Industrial Projects DHL Trade Fairs & Events DHL Customs Services DHL Cargo Insurance DHL Security Services Green Logistics Solution DHL Smart Sensor Visibility & Risk Management Solution		
	<b>Key Resources</b> Distribution networks IT capabilities Warehouses Distributions centers DHL`s Airlines Innovation Center of DHL Acquisitions		<b>Channels</b> Production facilities and centers Post offices Sales and support teams Social media News and blogs	
<b>Cost Structure</b> <i>Material costs</i> (Cost of raw materials, consumable and supplies, and of goods purchased and held for resale; Cost of purchased services; Lease expenses)  <i>Depreciation and Amortization</i> (Land and buildings, Technical equipment and machinery, Transport equipment, Aircraft, IT equipment, Operating and office equipment, ROU assets- Land and buildings, Technical equipment and machinery, Transport equipment, Aircraft, IT equipment, Operating and office equipment)  <i>Assets repair and maintenance</i> <i>Other operating expenses</i> <i>Capital investments</i> (Capex) <i>Insurance</i> <i>Finance costs</i> <i>Taxes</i> <i>Staff costs</i> (Wages, salaries and compensation; Social security contributions; Retirement benefit expenses; expenses for other benefits) <i>Marketing</i> <i>Security costs</i> <i>Innovation research</i>		<b>Revenue Streams</b> Service fees Value-added services Commissions Costs of packages		

Figure 5 - Business Model Canvas of DHL

Source: compiled by the authors

<b>Key Partners</b> Subcontractors Carriers Sea lanes partners International hubs agents Logistics providers	<b>Key Activities</b> Trade Supply chain tracking 3D printing Warehousing Cargo consolidation	<b>Value Propositions</b> Shipment bookings Supply Chain Innovations Lead Logistics Blockchains Artificial intelligence	<b>Customer Relationship</b> Reliable customer support High service quality Valued brand name Trust	<b>Customer Segments</b> SME segment (small and mid-sized customers) Retailers Major companies in animal sector
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Warehouse providers Retailers	Bookings for transportations Distribution around the globe Labeling and packaging Documentation clearance e-commerce fulfilment Track-and-Trace	Cross-docking Secure documentation provision Carbon emission reports		Personal customers E-Shops Customers within Automotive, Industrial, Retail & Fashion, Healthcare, Technology and Renewable Energy.
	<b>Key Resources</b> People IT systems Industry know-how Standardized global workflows Carrier relations Global network with local presence		<b>Channels</b> Production centers Sales groups News and blogs Official site of the company	
<b>Cost Structure</b> <i>Direct costs</i> (include settlement of accounts with haulage contractors, shipping companies, airlines, etc.; staff costs relating to hourly workers used for fulfilling orders and other direct costs of operation, such as rental of logistics facilities and costs of property projects)  <i>Amortization and depreciation</i> (Customer relationships, Software and other intangible assets, Buildings, ROU assets – Land and buildings, ROU assets – Other operating equipment)  <i>Innovation investments</i> <i>Insurance</i> <i>Security costs</i> <i>Wages and salaries</i> <i>Financial expenses</i> (Interest expenses on lease liabilities) <i>Carbon emissions costs</i>			<b>Revenue Streams</b> <i>Sale of services</i> (Air services, Sea services, Road services, Solutions services) <i>Financial income</i> (Interest income)	

Figure 6 - Business Model Canvas of DSV Panalpina

Source: compiled by the authors

The underestimation of this tool is precisely the insufficient elaboration of the outline of the business model that led to the closure of the business of small and medium-sized companies in conditions of quarantine [21]. This is due to the fact that the companies did not clearly define their business according to 9 blocks of the business model canvas: they did not clearly define the consumer groups, what value proposition is included in the

company's logistics service, what channels for promoting logistics services the company uses, and define relationships with customers, communication channels between the client and the company, customer loyalty model, work with customer complaints, etc. Searching for and establishing mutually beneficial cooperation with key partners is the most important area of work for a logistics company.

In February-March 2020, EY conducted the Global Capital Confidence Barometer survey, which included 46 countries and 14 sectors of the economy, including consumer goods and retail [10]. According to this report, international enterprises, in order to strengthen their competitive positions during the crisis, began to change the operating conditions, refine their business models, and plan new development steps, taking into account new development scenarios, and some are finalizing strategies for the post-crisis period. EY has identified the main areas of revision of business models in accordance with the canvas of the business model of O. Osterwalder and Yves Pignet in the studied enterprises:

- changes in the delivery system;
- implementation of a delivery system with digital support;
- expanding opportunities for online sales;
- making changes to value propositions;
- creating new partnerships and reallocating resources;
- building relationships with clients.

This includes both working out ways to retain existing customers, taking into account new requirements, and finding and building relationships with new customers.

Therefore, the use of this model allows to visualize the main components of each business model, and show their relationship, the interdependence between the internal and external spheres. An internal sphere is a system that includes a set of business model elements that are controlled and managed by a logistics company. These are value propositions, business processes,

technologies, organizational structure, employees, key resources. In the external sphere, a system of elements is considered with which a logistics company interacts and which affect its activities. These are consumer segments, partners, competitors, taxes, external resources, industry specifics, global and regional trends, society, and the state. The effectiveness of a particular business model depends on how the key components of the business model are organized, which determine the internal sphere, interact with the elements of the external sphere.

To assess the effectiveness of a business model, strategic analysis tools can be used, generalized into two groups: the first - with a focus on profit, the second - with a focus on the consumer [16], or the ROA model, which determines the effectiveness of the formation and use of assets depending on the type of business model. Implementation of ROA model for assessing efficiency of business model of DHL and Kuehne&Nagel was considered by author in the previous research [17]. In this research, we are interested in studying the practice of applying another DuPont model, namely ROIC models, to substantiate the effectiveness of using a certain business model of a logistics company.

The return on invested capital (ROIC) represents the observable competitive advantage of a firm, while the firm's performances are measured by the accounting items in the Du Pont identity [9]. ROIC is calculated as the net operating profits less adjusted taxes (NOPLAT), divided by invested capital (IC):

$$ROIC = \frac{NOPLAT}{IC} = \frac{NOPLAT}{S} \times \frac{S}{IC} = NOPM \times Capital\ Turnover = NOPM \times \frac{S}{Shareholder's\ Equity}, \quad (2)$$

where  $NOPLAT = EBIT \times (1 - t)$ ;

EBIT = earnings before interest and tax;

S = sales; NOPM = net operating profit margin;

IC = (Fixed Assets + Current assets) – non-interest-bearing liabilities.



Return on invested capital can be further decomposed into several related financial ratios as follows:

$$ROIC = \frac{NOPLAT}{IC} = \frac{NOPLAT}{S} \times \frac{S}{IC} = \frac{(S - CGS - R\&D - Dep - SG\&A - Tax)/S}{(FA + AR + Inv - AP + Cash)/S}, \quad (3)$$

where CGS = cost of goods sold;

R&D = expenditures on research and development;

Dep = depreciation;

SG&A = selling, general and administration expenses;

FA = fixed assets;

AR = accounts receivable;

Inv = inventory;

AP = accounts payable.

In this model, the following components can be distinguished that have a significant impact on the ROIC value:

1) NOPLAT defines operating efficiency of specific business model and reflects the relationship between the main element in Business Model Canvas such as Costs structure and Revenue streams.

2) IC defines capital management and reflects the ability of a logistics company to manage the assets (current and non-current assets that the company forms according to a particular business model.

3) AR defines customer relationship between a logistics company external sphere in Business Model Canvas, namely, Customer segment and Customer relationship.

4) AP defines supplier relationship between a logistics company and Key partners as the main elements in Business Model Canvas.

5) R&D reflects the position of the logistics company in the field of investment and innovation, which is determined by the chosen business model. Namely, investments in real assets or light assets of the company, information or intelligent control systems, etc.

6) Depreciation reflects the recoverable amount in the financial statements over the useful life of a tangible asset, while Amortization reflects the same for intangible assets. Taking into account the chosen business model and, accordingly, the structure of non-current assets, the logistics company can manage the impact of depreciation charges on net income.

Within the framework of this work, to analyze the effectiveness of each business model and the corresponding logistics company, formula (2) was used, which gives an overall assessment of the effectiveness of the chosen model. The calculations are summarized in table 5.

Table 5- Analysis of business model efficiency based on Du Pont model ROIC

Items	DHL, €m		DSV Panalpina, DKKm	
	2019	2020	2019	2020
EBIT	4,128	4,847	6,654	9,520
t	0,2	0,23	0,26	0,24
Sales	63,341	66,806	94,701	115,932
Shareholder's Equity	14,392	14,078	49,430	47,385
<b>NOPLAT</b>	3,302	3,732	4,924	7,235
<b>Capital Turnover</b>	4,40	4,74	1,92	2,47
<b>ROIC</b>	<b>14,532</b>	<b>17,690</b>	<b>9,454</b>	<b>17,870</b>



According to our calculations, DSV Panalpina company using the light assets model performed better in 2020, increasing ROIC value by 89% to 17.87 than DHL company using the asset-based model. This was due to an increase in sales by 22%, operating profit (EBIT) by 43%, which led to an increase in NOPLAT by 47%. Consequently, the company's asset-light business model has responded better to changes in external and internal environmental factors caused by Covid-19. However, it is impossible, only on the basis of these calculations, to state about the unconditional effectiveness of one or another business model over another. For such a statement, it is necessary to conduct a detailed analysis of the business models of the logistics companies included in the TOP-20. In addition, in our opinion, the effectiveness of a business model directly depends on the knowledge, skills, and competencies of the main resource in logistics - a human resource that forms all the main elements of a business model, reacts to changes in the external and internal

environment, adapts the existing business model to the new business environment, develops and implements new elements in the basic business model.

**Conclusions.** Consequently, the business model is not an established category; it can change with a change in strategy, phases of the life cycle of a logistics company. Choosing a specific business model requires changing all its main components and adapting the company's internal environment to these changes, which can cause many problems. By reducing the number of real assets such as land and buildings, equipment, cars, and computers, companies will gain a significant advantage over their competitors with large assets. "Real" assets can burden a logistics company, but investing in new digital technologies and personnel as the main resource of a logistics company allows it to expand faster and compete with existing players in the logistics services market in a short period of time.

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