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NATIONAL AVIATION UNIVERSITY
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Academic degree Master
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TASK

FOR COMPLETION THE MASTER THESIS OF GRADUATE

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1. Theme of the master thesis: « Management of urgent supplies using non-road modes of transport » was approved by the Rector Directive №1225/сг. of September 05, 2022.
2. Term performance of thesis: from September 05, 2022 to November 30, 2022.
3. Date of submission work to graduation department: November 07, 2022.
4. Initial data required for writing the thesis: general and statistical information about urgent supply using non-road models of transport over the world, information of the company «AB InBev» LLC, production and financial indicators of the company «AB InBev» LLC, literary sources on logistics and customer service process, Internet source.
5. Content of the explanatory notes: introduction, the essence of urgent delivery process, the specifics of non-road delivery, analysis of the processes of the company «AB InBev» LLC, financial analysis of the company «AB InBev» LLC, the essence of ERP system, advantages and disadvantages of ERP system, providing the project of implementation of ERP system in the processes in all service chains of the company, calculation of the economic effectiveness of the project, conclusions and recommendations, references.
6. List of obligatory graphic matters: tables, charts, diagrams illustrating the current state of problems and methods of their solution.

7. Calendar schedule:

№	Assignment	Deadline for completion	Mark on completion
1	2	3	4
1.	Study and analysis of scientific articles, literary sources, normative legal documents, preparation of the first version of the introduction and the theoretical chapter	05.09.22-28.09.22	Done
2.	Collection of statistical data, timing, detection of weaknesses, preparation of the first version of the analytical chapter	29.09.22-10.10.22	Done
3.	Development of project proposals and their organizational and economic substantiation, preparation of the first version of the project chapter and conclusions. Editing the first versions of maser thesis	11.10.22-28.10.22	Done
4.	Preparing the final version of the master thesis, checking by standards inspector	29.10.22-02.11.22	Done
5.	Approval for a work with supervisor, getting of the report of the supervisor, getting internal and external reviews, transcript of academic record	03.11.22-06.11.22	Done
6.	Submission work to Logistics Department	07.11.22	Done

Graduate _____
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Supervisor of the master thesis _____
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8. Consultants of difference chapters of work:

Chapter	Consultant (position, surname and name)	Date, signature	
		The task was given	The task was accepted
Chapter 1	Associate Professor, Savchenko L.V.	05.09.22	05.09.22
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9. Given date of the task October 04, 2021.

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Task accepted for completion: _____
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ABSTRACT

The explanatory notes to the master thesis « Management of urgent supplies using non-road modes of transport» comprises of 106 pages, 10 figures, 11 tables, 104 references.

KEY WORDS: URGENT SUPPLIES, NON-ROAD MODELS OF TRANSPORT, URGENT LOGISTICS, REAL-TIME SUPPLY CHAIN MANAGEMENT, URGENT ORDERS

The purpose of the study is to study the theoretical foundations and problems of urgent deliveries in the logistics chain of customer service of manufacturing companies and the development of project recommendations for solving problems that arise during urgent orders of customers of manufacturing companies.

The subject of the study is urgent deliveries in customer service networks of AB InBev.

The goal of the study is to determine the possibility of a quick response to urgent orders and to provide recommendations for solving problems that arise with urgent supply.

The object of the study is the supply chain processes for clients of AB InBev.

Research methods: research, empirical, analysis and synthesis, modeling, expert evaluations.

Tasks that are set during the study:

1. Determination of importance of urgent deliveries
2. Use of non-automotive modes of transportation for urgent orders
3. Determination of risks and problems faced by the company during urgent orders
4. Determination of solutions to these problems

The thesis materials are recommended for use during scientific research, in the educational process and practical work of logistics department specialists.

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NOTATION

OP – Operation

S&OP – Sales and operations

AI - Artificial intelligence

ML - Machine learning

OTIF - on time, in full

EU – European Union

PPH - Pre and post haulage

IRRT - Intermodal road-rail transport

HGV - Heavy Goods Vehicle

ITF - International Transport Forum

TEN-T network - Trans-European Transport Network

GPS - Global Positioning System

RFID - Radio Frequency Identification

SSS - Short sea shipping

EFTA - European Free Trade Association

COM - Commission Communication

FIFO – First in, first out

WIP Level - Work-in-Progress level

CPG - Consumer-packaged goods

ERP - Enterprise Resource Planning

INTRODUCTION

The modern world is faced with an endless number of global problems. Even a couple of years ago, it was impossible to imagine that the urgency of deliveries would cost someone their life, and the importance of logistics would grow to impossible proportions. Urgency, first of all, requires twice as much effort and a faster response. There is usually no time to search for cheaper delivery options, sometimes you have to sacrifice this indicator in order to provide the buyer with the goods. Searching for options for solving problems that arise during the organization of urgent deliveries and fall on the company is an important aspect of saving the company's income and reputation.

Business had just begun to adapt to the conditions of strict pandemic restrictions, when a new test arose - active military operations in the center of Europe. The world community is forced to react with sanctions even to the detriment of its economic interests. The increase in the price of petroleum products and gasoline entails an increase in the prices of resources and services.

The lack of stability in the region, and most importantly, the indefinite duration of hostilities and difficult-to-predict consequences for the world economy determine a number of reasons for the increase in the cost of logistics. And most importantly, it increases the need for urgent deliveries.

Now there are very big changes in logistics chains. First of all, I would like to note the gaps in logistics chains, the shortage of ingredients, raw materials and materials. There has been a radical change in the usual routes, countries and methods of shipment. There is no certainty that the route that the company uses for a certain time will work in a week.

For example, in Ukraine, there were very big changes in the logistics infrastructure after the start of the war, and companies had to urgently reconfigure their logistics flows and look for solutions to ensure efficiency in the new conditions.

Due to the war and threats of shelling, the locations, work schedules, as well as the physical presence of warehouses, retail outlets, distributors, and suppliers in the region are changing. Often, trading points simply disappear physically, and tomorrow it is impractical to go to a point where supplies were actively carried out yesterday. A few months ago, the utilization rate of transport in logistics reached 90%, and in current realities its value barely exceeds 20-30%. That is, the main task of logistics is to "deliver" the cargo to its destination. Even after the end of hostilities, it will not be easy to return to the pre-war state of trade relations and logistics. Recovery requires large resources, and the allocation of these resources is a complex and lengthy process. Meanwhile, the business community faces new challenges when the usual solutions and processes do not work. Modern realities require maximum flexibility and speed in making operational decisions.

In peacetime, forecasts worked for half a year or even a year. But now the predictions made in advance do not correspond to reality. Because of the potential risks, retail chains are forced to make their plans within a week, two at most. What advice on supply chain management can be given to retail in such a difficult period?

First of all, provide flexible inventory management. It is necessary to quickly change replenishment policies, based on the short-term forecast of the situation - not only the forecast of demand, but also the forecast of delays and interruptions in the supply chain. That is, the retailer needs to study how the structure of consumption, expectations and needs of buyers will change due to population migration, which has increased many times.

To reduce risks in the supply chain, companies should:

- view inventory management rules: order cycles, min/max batch size, delivery arm. You also need to compare possible delivery options, process pre-order options. In essence, this is the reservation of critical volumes of products for the network, which give confidence that after a week or another specified period, the product will be reserved from the supplier;

- carrying out joint planning of the retailer's and supplier's stocks is the synchronization of the manufacturer's assessment of its production capabilities, and for the retailer

- an objective assessment of the volume of products that he can sell in his network. Here it is important to take into account the shortage of other goods, the peculiarities of switching and cannibalization of demand;

- disperse stocks in accordance with delivery speed, consumption volumes, potential storage risks. You should also not buy goods at the same time. In conditions where there are risks that a warehouse or distribution center may be destroyed, it is impractical to store all the stock in one place.

In order to quickly react to changes in logistics, it is important to regularly recalculate the centers of gravity of deliveries, analyze the cost of several alternative delivery options for critical goods/materials/ingredients. That is why it is important for retail chains:

- conduct a regular review of the terms of transportation (Incoterms), which affect the total cost of transportation and the cost of products;

- use forecasting tools that take into account the last sales period. The last months are essentially force majeure, and traditional methods simply do not work. A flexible approach to forecasting will help free up working capital that should be working, not frozen in excess strategic inventory.

Use flexible automated transportation management systems. Circumstances have been changing rapidly in recent months: new restrictions are being introduced every day or some restrictions are being eased, delivery channels and logistics centers are being closed or opened, fuel costs are rising, and the need for goods and components is changing dramatically. This trend will continue in the near future.

From recent cases for North-Western Europe – addition to the calculation of charging station routes, breaks for replenishment of electricity reserves, accounting for roads that allow charging batteries on the go. In the case of dramatically changing volumes and delivery capabilities, risks, operational complex modeling of various supply chain scenarios is necessary. For this, it is good to have a mathematical model

of the supply chain. With the help of such matmodels, companies can plan transportation in the near future and predict what risks and costs of logistics will be in certain conditions.

In companies, very often specialists who are faced with urgency do not have sufficient knowledge to solve issues in the best way. Specialists need to build in advance the possible options and methods that will be used when receiving urgent orders from customers.

The first thing to understand is whether the current supply chain can respond quickly to change. In normal times, the inertia of logistics when changing the assortment by 30% is at least 5 weeks. There is no such time now, so all chains must be as compact as possible.

In this situation, specialists provide professional business support and offer:

- audit of operational supply chain management processes;
- mathematical modeling of the supply chain;
- learning to work with mathematical models;
- tools for independent processing of various scenarios of the supply chain and search for the optimal scenario literally "next week";
- outsourcing of operational logistics planning: recalculation of replenishment policies, centers of gravity, routes and delivery schedules.

Transfer and sharing information from supplier to customer are the keys to deal with an urgent order. Knowing that information sharing allows firms to improve their supply chain performance resulting in higher revenues and margins; Nevertheless, information sharing should be at the right time in order to respect the harmonization of information systems, thus avoiding a build-up of problems in the supply chain, such as increasing stocks level.

Several methods to manage information sharing e.g. Radio Frequency Identification (RFID) technology that increases data quality and the availability of operational information allowing firms to improve processes such as manufacturing, distribution, and transportation, so all stakeholders in a supply chain could visualize the information flow from upstream to downstream using an effective connections

between both internal and external supply chains via Lean ERP system that provides high customer service and shorter lead times.

In an urgent order the process of managing a normal order changes taking into account the importance of the customer in the portfolio of the company, that means if it is a significant customer he must be satisfied at all costs is needed despite the problems that may result.

This study will allow us to deal with urgent orders, which will help us to understand the progress of these orders at the level of the entire supply chain: from the supplier of the raw material to the end customer.

The goal of the study is to determine the possibility of a quick response to urgent orders and to provide recommendations for solving problems that arise with urgent supply.

Tasks that are set during the study:

1. Determination of importance of urgent deliveries
2. Use of non-automotive modes of transportation for urgent orders
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The problems that have been in introduction, will be the subject of future research, in order to treat an urgent order while respecting the basic principles of lean manufacturing; which have a direct relation with the three aspect of the enterprise: economic, social and environmental, and its tool could help managing urgent orders and decrease the WIP Level that is generated through these orders.

CHAPTER 1

MANAGEMENT OF URGENT SUPPLIES USING NON-ROAD MODES OF TRANSPORT

1.1 Management of urgent supplies

What is the significance of real-time supply chain planning?

Despite the most meticulous planning, a majority of the major “incidents” in today’s global supply chain occur in the moment – meaning that there’s little scope for advance or even just enough of a heads-up or warning. Granted, many modern companies deploy “intelligently planned” programs and distribution strategies to ensure on-time delivery and customer satisfaction. Yet, due to the sheer number of variables that influences the average industry (including large and varied network partners) alone, businesses are often playing catch-up by way of responding to bottlenecks, breakdowns, or any number of other planning and production hurdles.

This is why the value proposition offered by the insights of real-time data analysis make a massive difference in an integrated supply stream – it helps take faster, better decisions, while also helping prioritize tasks effectively. Whether in terms of planning strategy, procurement of material, job/ facility distribution, container/ warehouse management, or distribution of finished product, the real-time insights into demand and supply planning afforded by intelligent, integrated planning and forecasting solutions have time and again proven to be a gamechanger for sales and OP teams in achieving efficiency and productivity [1].

Agile demand and supply chain planning is key to business resilience.

It should be noted that the constraints – and therefore the rules – of production plans or even customer orders are fluid, and can often change in the time between when a material/ component arrives at the production site and when production actually begins. Thus, businesses need to achieve highly agile operational capabilities

to become responsive to the varying dynamics of planning and production processes. The development and imbibing of real-time capabilities arms businesses with the flexibility to compete effectively in an increasingly volatile business environment. By immediately sensing changes in demand, supply, and business conditions while simultaneously leveraging advanced analytics, planning and execution can truly be integrated, leading to the realization of achieved [11].

In short, the importance of real-time decision-making in today's globally-connected supply chain ecosystem cannot be more real. To understand better, let's take a closer look at and discuss the benefits of real-time supply chain planning and management, and the ways in which businesses can convert real-time capabilities into unbeatable competitive advantage.

For true supply chain agility, real-time planning must be incorporated into each of the following four phases [5].

1. Procurement

This involves vendor integration, resulting in efficient, effective sourcing of material with the help of strategic partnerships and cooperation. With the help of intelligent big data analytics, vendor performance is continually evaluated and improved, via either of the following two approaches:

- Top-down, wherein short-term demand forecasts and plans for required materials are shared, or
- Bottom-up, wherein there is high transparency into capacities, just-in-time deliveries schedules, and flexibility of requirement fulfillments.

2. Production

This refers to smart factories with highly connected and automated machines that help accelerate production efficiency. Predictive maintenance is a common feature in this setup, allowing for seamless integration across the production cycle – planning, maintenance, as well as quality management. The hyperconnectivity of all the production layers and systems ensures the required transparency at this stage into machine and process parameters, machine efficiency, and labor and stock availability.

3. Sales

This involves customer integration, with smart products that enable smart services being sold to intelligently targeted audiences. It ranges from production integration for single-piece production and scales up to agile demand planning and order fulfillment at high production variances. This entire process requires intelligent big data analytics of customer data in the form of not just needs and preferences but also habits and constraints.

4. Distribution

In combination with sales planning, this is referred to as the sales and operations (S&OP) planning stage. At the distribution stage, businesses leverage smart logistics, including highly connected and automated haul vehicles and distribution centers, for distribution to warehouses as well as end-users. With the integration of delivery partners and deployment of artificial intelligence (AI)/ machine learning (ML) for intelligent analytics for smart warehousing and goods transportation, on time, in full (OTIF) deliveries become a whole lot easier and more frequent than before.

Control over demand

Real-time data and insights not only afford businesses the opportunity to view and track up-to-the-minute needs and demands from customers, it also helps them plan and manage any potential slowdowns or bottlenecks across the entire length of their supply chain stream.

Real-time visibility into overall demand can also help businesses identify trends or fluctuations in customer need for parts or products, allowing them to adjust production plans and/ or plant/ product line allocations ahead of these fluctuations to significantly impact production output and business outcomes. For example, real-time demand and supply planning capabilities can help a business in France detect a downward trend in demand in Germany, and accordingly reallocate materials and resources to not only adapt to the trend, but make the most of it while also actively preventing overstocking and wastage.

How to achieve truly intelligent supply chain planning [22].

To succeed in an increasingly competitive global market, businesses must adapt effectively and look for simple, practical ways to connect their supply chains from

start to finish. This process of achieving connected supply chain planning involves the following steps.

1. Integrate supply chain planning with enterprise planning

A critical second step once real-time supply chain planning has been achieved is the process of connecting traditionally siloed supply chains with not just sales and operations planning but also financial planning. Businesses that integrate their short-term operational plans with their wider, longer-term business planning processes to enable real-time updates to inventory forecasts (as well as supply) benefit greatly from unprecedented visibility at an enterprise-wide level. Deploying real-time S&OP solutions encourages and enables enterprise-wide collaboration. This in turn means that key stakeholders across the business can evaluate new scenarios and rapidly analyze how to optimize the use of their resources to maximize profitability even in the face of unforeseen incidents.

2. Sense, anticipate, and manage customer demand

Particularly for consumer-packaged goods businesses, sensing the “what” and “when” of customer demand is an ongoing challenge. Smart supply and demand planning affords such companies end-to-end visibility across the entire supply chain ecosystem, going beyond their network of wholesalers and retailers to directly sense demand signals from customers. When such businesses can rapidly identify changing buyer sentiments and analyze how these changes impact product demand, the benefits are multifold – and they affect the business itself, its partners, and customers alike, leading to dramatically improved profitability, margins, and lead time.

3. Always retain the flexibility to cope with change

With the right technology to plan efficiently and react quickly, disruptions are no longer disruptive, because re-forecasting and re-planning is easy. In turn, businesses will notice precious resource savings as well as accelerated profitability.

Real-time demand and supply planning is today's endgame

In today's globally crisis-prone market, there's no such thing as a sure shot strategy when it comes to demand planning and production. Businesses are therefore

always on the lookout for ways to increase their planning and production efficacy so that they can achieve continuously increasing growth, productivity, and profitability.

Real-time demand and supply planning creates an event-based approach to deviations between projections and actual sales or production programs. Leveraging notifications of deviations to alter and adapt production programs for on-time delivery and delighted customer experiences is the true value proposition of real-time supply chain planning.

The modern market requires enterprises to constantly search for the most effective technologies for organizing and managing production activities. The manufacturer must be ready under any conditions for urgent fulfillment of consumer orders and quick response to changes in demand. Here, the main principles of logistics come to the fore, which provide for the priority of the consumer and quality at all stages of the production and distribution cycle. The involvement of logistics in the formation of the general strategy of the enterprise means a new level of its development, primarily in the direction of ensuring economic stability in a competitive market [21].

There may be times when you need to purchase a product or service immediately due to an emergency situation. During times of crisis, there can be many considerations that need to be made.

The main principles for emergency procurement and supply chain preparedness remain the same no matter the event, whether it be a force of nature, pandemic or epidemic.

Standard procurement procedures tend to be stringent and complex. This will not work for a crisis response. When disaster strikes, we are at the mercy of tight timeframes and of the suppliers and service providers who have what we desperately need! During a preparedness stage, companies have the time to set out separate guidelines for emergency procurement. Ensure these are flexible and less rigid, so companies can obtain what they need quickly. Including these guidelines in a procurement manual that is accessible to all relevant staff will ensure supply chain

personnel can more easily jump into action from the outset of a crisis, knowing exactly what to do.

Establish A Common Inventory List – We will never be 100% clear on everything that will be needed to respond to an emergency, but we can make some assumptions. Companies can use their data and knowledge from past emergencies to establish a priority list of commonly procured goods, with approximate quantities, and use it to assess the market for stock in advance of an emergency [2].

Identify and Pre-Position Suppliers – Identifying a supplier or service provider can take time, and in an emergency, time is critical! Even once a service provider has been identified, there are several hoops they need to jump through – can they provide the required specification? Do they have suitable lead times? Will they accept contract terms and conditions? Use the time in a preparedness phase to assess the market and distinguish who can provide the priority items identified, meet ethical and financial compliance and deliver in the time scale required. By setting up Framework Agreements pre-disaster, companies can also eradicate lengthy procurement processes during an emergency and assist in controlling pricing, which often skyrockets during crises.

If supply is compromised emergency suppliers will need to be sourced:

1. Designating Emergency Suppliers

Hopefully, company has prepared well for many different types of emergencies, disasters or adverse events. At a minimum, business should have a contingency plan documented. As part of this planning process, alternate suppliers should have been identified. The last thing that need to be doing when an emergency hits is to be running around looking for raw materials and negotiating an alternate supply chain.

2. Selecting an Emergency Supplier

When selecting the emergency supplier for a particular raw material, start firstly with the purpose and role of the raw material company is looking to replace. Company needs to consider other consumables that it uses to implement safety. Here are some examples:

- Disposable gloves

- Hairnets
- Beard nets
- Cleaning chemicals
- Maintenance chemicals

A good understanding of the ‘intended use’ of each raw material or consumable will greatly assist when deciding the appropriateness of any replacement.

3. Sourcing Emergency Supplies

Sourcing an alternative raw material to be most difficult during an emergency. The best place to start is to ask current supplier if they can make any recommendations. If they cannot help, purchasing may need to think outside the box and turn to retail supply options or even online suppliers.

4. Complying with Approved Supplier Program

Ensure that any emergency suppliers are logged, specifications are obtained (if possible) and normal receivable procedures are implemented. This includes recording any relevant batch codes, expiry dates or emergency supplier manufacturing codes.

Sometimes ‘beggars cannot be choosers’ during an emergency but still try and get as much information as possible and ensure that the replacement will not present an adverse risk to finished product [3].

Assure Specifications – Compliance and quality checks may need to be carried out on goods, ensuring products comply to specifications and required international and manufacturing standards. This can be a complex process particularly when dealing with medical goods and Personal Protective Equipment – as we have experienced on our COVID-19 response. If compliance checks can be carried out during Framework tenders prior to an emergency, this will save significant time and prevent complex technical evaluations during a disaster.

Communicate – Procurement and supply chain work is pressurized and fast pace at the best of times, let alone in an emergency. Tight project and financial management are essential. Communication is of the utmost importance to ensure all key partners within the procurement and supply chain are connected and work as a

team. From the outset, the procurement and supply chain team should have a clear operating structure, as well as clearly defined decision makers. IT systems, such as E-procurement platforms and delivery and tracking systems can also support communication across the supply chain.

Arrange Partnerships with Specialist Freight and Logistic Providers – Transportation within a supply chain can become more complex during a crisis, with varying barriers preventing smooth delivery. Establishing partners who are experts in freight, logistics and clearance procedures ahead of time is key. This preparation allows for the building of relationships, where assurance can be gained that these organizations have the necessary expertise to deliver during a disaster.

1.2 Potential for non-road modes to support urgent logistics

Road freight transport typically dominates in urban delivery operations. However, an increasing number of trials and commercial operations have started in the past 10 years attempting to use non-road modes in a wide range of cities including: Paris, Berlin, Madrid, Amsterdam and others. The research establishes the existing scale of rail freight in two comparable cities (London and Paris/Ile de France) and compares the development process in terms of the stakeholders, the infrastructure and planning issues and the nature of the operations. The review considers the scope and opportunity for an increase in the use of rail for urban freight transport and assesses the barriers to its wider implementation [23].

At the EU level attention on the possibility to shift at least some traffic from road to rail (or perhaps to use rail in combination with clean vehicles making the last mile delivery) has been increased by the EU White Paper on Transport (European Commission, 2011). A number of challenging goals were set, including the aim of achieving essentially CO₂-free city logistics in major urban centers by 2030. The

White Paper makes the point that achieving essentially CO₂-free city logistics would also substantially reduce other harmful emissions.

Examples of initiatives that make use of rail in the urban supply chain

In general rail is a little used mode for urban freight distribution, particularly in relation to flows of consumer goods towards the latter stages of the supply chain. Rail has been involved in urban freight activities for a number of years but complex requirements and obstacles have often prevented the operations from becoming a long-term success. However, although some schemes failed, others succeeded and have become valuable examples of how rail can be successfully incorporated in European urban supply chains. It should be noted that for some schemes identified below, such as the Paris examples or the Rome Fresh Food Centre, the motivation is quite clearly to use rail to resolve urban freight problems, while others, such as those in Sweden, are rail freight terminals that influence urban freight activity but may not specifically aim to reduce urban impacts. This review deals with the potential of urban freight operations carried out by “heavy” rail only and does not include any tram or underground based schemes. Schemes that are in existence or planned are dealt with first, followed by the identification of a number of schemes that were operational but are believed to have ceased operation [4].

Current and planned European urban rail freight initiatives

Based on the review of literature, urban rail freight schemes currently in operation or in the planning stages include the following examples:

Paris (France):

Monoprix - the scheme has been in operation since November 2007 and was initiated by Monoprix, a French retail group owning 300 shops. The concept makes use of a logistics center located in Paris-Bercy where rail carries 30% of flows (120,000 tonnes or 210,000 pallets a year) destined for almost 90 shops in central Paris. The key characteristics of the initiative are as follows [5]:

- daily service, initially serving 27 stores and increasing to almost 90 stores in 2009, and carrying homewares, personal care goods and soft drinks from two warehouses on the edge of Paris. Now it is a large network throughout the country;

- service operates to a 3,700 m² rail terminal near Bercy station in central Paris, with vans powered by natural gas used for onward road distribution of goods to stores;

- availability of a suitable inner-city rail terminal was critical to the launch of the initiative;

- the city terminal only needs enough space for direct transshipment from rail to road, with other activities taking place at the out-of-town end of the rail route;

- currently more expensive option than road-only solution, but environmental and social benefits are substantial.

Financial viability is dependent on the extent to which road's external costs are internalized. The scheme is technically acceptable but its operation is about 25% more expensive than the previous all road solution, but taking into account fuel prices and road pricing, the balance can quickly change – who pays the additional costs of the rail-based solution is not apparent from the literature;

- annual savings of 70,000 litres of fuel, 337 tonnes of CO₂ emissions, 25 tonnes of NO_x emissions, and 12,000 fewer lorry journeys entering the city centre of Paris.

Sogaris is a public-private organisation, 80% owned by local government, which specialises in urban logistics facilities. The organisation has a number of ongoing initiatives in Paris (and elsewhere in France, Luxembourg and Belgium) which are aimed at meeting local government sustainability and business objectives. Sogaris is aiming to develop urban logistics facilities based on the following integrated strategy:

- whole urban areas, with logistics platforms as points of entry
- consolidation centres (known as 'logistics hotels') in the densest parts of urban areas
- final delivery points within neighbourhoods

Multimodal terminals feature as components of the first two categories of facilities with the large Sogaris Rungis (Paris) logistics gateway as an example of the former and the planned logistics hotels in Brussels and Paris are examples of the latter. While multimodal urban logistics gateways are reasonably well established, and usually located at the edge of large urban areas, the logistics hotel concept is

more innovative and aims to bring rail freight closer to the city centre areas. The Brussels proposal includes 30,000 m² of warehousing, together with around 20,000 m² of other activities including parcel docks, offices and craft industries, within an inner city area. The Paris Chapelle International proposal (in the vicinity of Gare du Nord) includes 20,000 m² of land and 40,000 m² of buildings housing logistics activities, offices and community facilities.

Rome (Italy)

A new initiative is planned for the Fresh Food Centre S.p.A. (FFC) which provides logistics services for the distribution of fresh food to supermarket chains (SMA, Auchan, Cityper) in central Italy and, in particular, in Rome.

The FFC's logistics platform is located 30 kilometres south of Rome in the area of Santa Palomba from where it is planned to distribute fish to stores in Rome. The centre of the operation will be a multimodal urban distribution centre (MUDC) located at an existing rail freight terminal situated in the eastern inner area of Rome called Scalo San Lorenzo. It is planned to move the fish by shuttle trains from the existing rail terminal of Pomezia Santa Palomba (located near to the FFC platform) to the MUDC in Scalo San Lorenzo, where the product will be transferred to road vehicles, preferably low-pollution trucks, for the delivery to stores in Rome. Since passenger traffic dominates at Scalo San Lorenzo during the day, the train shuttle linking the two terminals will have to operate at night. It is expected that 2.2 tons of fish will be delivered daily to the MUDC, replacing four separate lorry journeys and saving 287 kilometers travelled by road per day, with 18 supermarkets served.

Dusseldorf (Germany)

The success of heavy rail freight operations in the city is a result of freight policy in which Dusseldorf supports rail and intermodal transport in order to achieve a desired modal shift from road to rail. The most important decision was to secure the railway infrastructure by stopping the decline in the number of rail-connected sites and the loss of any future rail traffic. This has been done as an integral part of the wider city planning process. In order to improve productivity, shorten the transit times and create new connections, the city's plan included the following:

- Completing an efficient central goods sorting point and increasing the number of its connections with local shunting yards;

- Elimination of bottlenecks on capacity-constrained routes in order to increase the number of train paths and make the freight route more independent of the passenger network.

Hannover and Bremen (Germany)

The intermodal terminals in the cities are located within close proximity to the urban core but the freight forwarders' distribution terminals are situated in urban fringe areas which results in relatively long pre and post haulage (PPH) distances in urban traffic conditions. In order to improve the situation in Stockholm, there are plans to build an alternative terminal north of the city. This new location would increase the total PPH distance but the trip would be carried out in less sensitive urban areas.

Stockholm and Gothenburg (Sweden)

An intermodal terminal in Bremen is located in the north-western part of Bremen. In Hannover the intermodal terminal is situated within close proximity to the urban core while the logistics areas are based to the north and east of the city. There are plans to establish a hub for a national intermodal network east of Hannover to allow easy access to the logistics areas.

Barriers preventing successful urban rail freight operations [12].

The available literature provides some arguments about potential barriers preventing urban rail freight operations from becoming a widespread success story.

Limited modal shift potential of rail freight is one of these arguments as the rail transport is not accessible for a substantial part of the market due to the limited opportunities for railway network extension as well as expensive shunting of wagons into private sidings. As a result, intermodal road-rail transport (IRRT) is set up using both road and rail as goods stowed in unit loads move along a supply chain. Often the volumes moved by individual shippers are not big enough for IRRT but the total transport demand of several shippers in the same urban area may be sufficient to achieve the required volumes which are economically viable for intermodal

operations. This can be achieved by consolidating the less-than-trainload shipments from different sources located in close proximity to each other. A city is usually provisioned by many supply chains as it hosts shippers from various economic sectors [6].

On the other hand, space and infrastructure limitations present in urban areas also pose a barrier to a potential intermodal operation while limited relative environmental advantage of rail over road, are also often argued. A higher level of rail freight causes more local air pollution, noise and congestion. Often strong local opposition use arguments about old and noisy locomotives, poorly looking industrial areas and the generation of truck movements. Due to the superior energy efficiency and easier access to renewable energy that rail has over road, a modal shift from road to rail mainly decreases CO₂ emissions but at the same time it may increase air pollution and have a negative traffic impact at the local level. Also often rail freight terminals are situated close to the city centers while the shippers and receivers of intermodal freight are based in the outer areas of the city with good connection to highway intersections. For these reasons rail freight terminals should be relocated to urban peripheries. These areas provide the space and infrastructure needed for effective transshipment operations, reducing the negative impact on the local environment and affecting less people. Some cities such as Gothenburg and Hannover are already planning the move of their rail freight terminal out of the urban core but it is expensive and leads to local protests at the proposed locations of the new terminals.

Other barriers leading to limited opportunities for urban rail freight include perceived high costs of rail infrastructure and related systems, limited physical flexibility, land pressure and the lack of available capacity on the infrastructure due to growing passenger rail traffic.

Cost seems to be an important hindrance to any urban rail freight operation as the initial investment cost is high. Rail normally requires a dedicated logistics infrastructure in the form of tracks, sidings, yards and terminals and it is expensive. Furthermore, operating costs should also decrease while the level of service is

improved. Currently, rail is often perceived as slow moving and unreliable so changing this image is important for any future success of urban rail freight schemes.

The success of heavy rail freight operations in the city is a result of the freight policy in which Dusseldorf supports rail and intermodal transport in order to achieve a desired modal shift from road to rail. The most important decision was to secure the railway infrastructure by stopping the decline in the number of rail-connected sites and the loss of any future rail traffic. This has been done as an integral part of the wider city planning process. In order to improve productivity, shorten the transit times and create new connections, the city's plan included the following [7]:

- Completing an efficient central goods sorting point and increasing the number of its connections with local shunting yards, and

- The elimination of bottlenecks on capacity-constrained routes in order to increase the number of train paths and make the freight route more independent of the passenger network.

Taking account of rail's key characteristics, its biggest potential contributions to sustainable urban freight seem to be:

- Maximizing its use for bulk flows, typically construction materials moving inwards to cities and domestic and industrial waste moving outwards;

- Developing 'green' solutions for the flow of consumer goods for customers in urban areas, which combine the use of rail for the trunk haul from distribution centres to a location within the urban area with the use of 'green' road vehicles for the local deliveries;

- Even where rail itself is not directly used, potentially using existing or new rail infrastructure (e.g. key stations) as hubs for urban freight distribution

For the first of these categories, rail often has natural strengths due to the volumes involved, but its role could often be enhanced through the adoption of policy measures and funding opportunities that extend its reach. For example, major new urban developments such as offices, shopping centers, transport infrastructure and sporting facilities typically require the movement of large volumes of construction materials to the site, and sometime also the movement of extracted materials away

from the site (e.g. contaminated land). In granting planning permission for such developments, the potential use of rail (and water) should be considered and possibly built in as a planning condition. The availability of suitable rail terminals within urban areas can also be an issue, so public sector funding contributions may be appropriate given the wider environmental and societal benefits generally associated with a switch to rail.

The second category is generally more challenging when it comes to integrating rail into the flows. In some cases, particularly for large retailers, it may be possible to operate dedicated freight trains as in the Paris Monoprix example, where the loads are transhipped from rail to road for the final delivery to stores. In many cases, however, to make the rail freight leg viable, a combination of consignments for multiple customers is likely to be needed. Such rail flows are most likely to be an intermodal operation, with simple unit transfer at the rail terminal, although the London trial referred to earlier used roll cages in traditional rail vans, is as another possibility. Terminal requirements would depend on the proposed nature and scale of operations, volume throughput and on-site activities but, with inner city (but not city center) sites most likely to be feasible. In some cases, the use of city center termini may be possible if there is direct transshipment to road vehicles. By using rail for the trunk haul, instead of HGV from the distribution center to retail outlet, the opportunity arises to separate out the longer distance transport leg to the urban area from the last mile delivery. As a consequence, the development of an integrated solution that combines rail and 'green' road vehicles in an overall package may be possible.

The development (or redevelopment) of rail infrastructure within urban areas may offer scope for the coordination of freight flows in a wider sense, by acting as a hub where certain activities can be focused. Coordination opportunities are likely to be greatest for smaller freight generators, where deliveries are typically small and fragmented and lead to inefficient use of transport resources. Even without the use of rail freight, major stations, for example, could act as consolidation points for goods destined to the surrounding areas or could host locker banks where customers could collect their goods while passing through to/from trains [8].

When evaluating the use of rail for freight movement in urban areas, care needs to be taken to mitigate any negative localized consequences of the use of rail hubs within the city, since these consequences may generate local hostility even if the benefits for the urban area as a whole considerably outweigh these negative local impacts [24].

Road transport has the highest share of freight mode in most ITF countries (International Transport Forum.) The ITF statistics database consists of 51 ITF countries which have recent and complete data on freight transport modes. Road transport currently represents approximately 40% of the tonne-kilometres transported in these 51 ITF countries, a significantly larger modal share than freight transport via rail (24%), coastal shipping (16%), inland waterways (13%) and pipelines (7%).

In 37 out of these 51 countries, road transport is the predominant mode; in 35 of these countries road transport represents more than 50% in the modal split. In only 14 out of 51 ITF countries is a non-road transport mode the dominant transport mode. Rail transport is the next most widely used, predominantly in a few Eastern European countries, Australia and Canada (Table 1.1).

Table 1.1 - Countries with predominantly non-road freight transport modes

Freight transport mode	Countries	Modal share
Rail	Georgia	81%
	Ukraine	70%
	Slovenia	70%
	Montenegro	62%
Rail	Australia	56%
	Latvia	48%
	Canada	46%
Pipelines	Azerbaijan	68%
	Armenia	68%
	Belarus	41%
Coastal shipping	Norway	44%
	Japan	42%
Inland waterways	Netherlands	46%

These last two countries all have vast land surfaces; these large distances are generally more favorable to rail transport. Eastern European countries generally have a legacy of freight rail transport, dating back to Soviet times when these countries were highly interconnected to and acting as gateways to the Soviet economy. Inland waterways represent the highest modal share in the Netherlands, coastal shipping in Norway and Japan and pipelines in Azerbaijan, Armenia and Belarus, but these are relatively rare cases.

Note: data are presented for the most recent year for which data are available. For most countries this is 2019, with the exception of Armenia, Montenegro (2017), Australia, (2016) and Canada (2015).

Modal shifts to non-road modes are rare. Between 1980-2019, Slovenia shifted from road to rail and Italy from road to coastal shipping (Table 1.2). Over that same period, there were five countries that witnessed a shift from one non-road mode to another non-road mode, namely rail to inland water transport (Romania and China), coastal shipping to rail (United States and Australia) and rail to coastal shipping (Turkey). More changes in modal splits are taking place when reviewing shorter time periods. For example, between 2003-19 Austria managed a change in modal split from road to rail, returning its rail usage to its share from 1980 even if rail did not become the dominant mode (Table 1.1). Montenegro has managed a change in modal split from road to rail since 2001.

Road freight transport is a competitive market with fairly limited concentration. This is different in rail freight transport where market competition is imperfect and characterized by oligopolies, in many cases also monopolies, despite decades of policy efforts aimed at liberalization. In coastal shipping, many countries protect their national operators via cabotage restrictions. This limited competition could also explain, in part, the higher costs of certain non-road modes in certain countries, especially in countries where economic regulation of the freight transport sector is insufficient.

Modal infrastructures [13]:

Rail infrastructure is often a bottleneck to modal shift. The same rail infrastructure is often used for passenger and freight transport that obviously do not have the same requirements: passenger trains usually connect city-centres, not the most natural destinations for freight trains. Hence, freight train networks might require by-passes to avoid travelling through city-centres. Freight rail capacity is also dependent on how long freight trains are allowed to be. The longest freight trains can generally be found in North America. Longer trains could increase the operational efficiency of freight trains but would require adaptations of infrastructure on certain parts of the rail system. The European Union has developed criteria regarding the speed, length and weight of trains that operate on the TEN-T network. China has developed high-speed freight train services, which can be competitive on the market for mail and parcels. Rail infrastructure investments can also include traffic management systems, electrification of rail tracks and adaptations to facilitate larger and heavier trains.

The use of inland waterway transport is dependent on the navigability of the waterways. Frequent bottlenecks include insufficient depth, currents and sudden differences in water level. Navigability of waterways often requires canalisation, dredging and a system of locks to deal with water level differences. Regular investments to upgrade infrastructure include increasing locks and deepening of fairways. Pipelines could also provide alternatives to freight transport. An extensive network of pipelines connects the petrochemical areas around the ports of Rotterdam and Antwerp. The Netherlands has set up a working group to assess the cost-efficient use of pipelines as part of further development of the national freight system.

Nodal infrastructures

Seaports require regular upgrades to receive calls from ever-larger ships or new sorts of ships, e.g. those powered by alternative fuels or electricity. This could mean investments in stronger quay walls, larger turning basins, shore power, electric charging or alternative fuel bunkering facilities. The possibilities of modal shift in ports are radically increased if all possible transport modes are connected to the port. This could mean dedicated short sea terminals, barge terminals and on-dock rail. All

three measures minimize additional handling costs, facilitate cargo consolidation and smoothen the intermodal process [102, 103].

Several countries have invested in intermodal facilities to transfer containers from road to rail transport. Belgium has invested in an intermodal facility in Genk as France has in Le Havre. In most cases, these investments cover infrastructure, but some schemes – e.g. in Poland – also subsidise purchase or modernisation of rolling stock. There are generally three main models for intermodal terminal development, depending on who develops and finances: the port authority, terminal operator or ocean carrier. In the first case, the seaport authority regularly invests in inland ports or terminals. In the case of development by terminal operator or carrier, the infrastructure will likely be privately owned; in case the government subsidises part of the facilities, it will generally require equal access provisions for all potential users. In some countries, there are enough intermodal facilities available, but the awareness of the opportunities offered by these facilities is limited. For that reason, Sweden has mapped the existing infrastructure to make the offer visible [104].

Various countries invest in greening nodal infrastructures for freight transport. The Netherlands decided in 2020 to equip all public berths for inland waterway transport with shore power facilities. These facilities will make it possible for barges to switch off their engines at berth, which reduces emissions and noise [16].

1.3. Real-time supply chain management using non-road mode of transport

Real-time data is increasingly in demand among customers, and that means logistics companies will need to focus on it. There are now a large number of startups whose solutions provide supply chain transparency, providing technology that facilitates rapid response to change, allowing companies to use real-time data. Such data includes traffic patterns, weather conditions in a specific area, the condition of roads or access roads to ports, which allows for the optimization of delivery routes. In

2019, research showed that logistics companies using fully integrated supply chains were 20% more efficient than their competitors [12].

A successful supply chain depends on information and communication as much as it does on transportation. Day-to-day decisions are often shaped by exceptions and disruptions in the delicate balance between supply and demand. To stay abreast, supply chain managers must be able to track the movement of goods along the supply chain, which includes the ability to quickly identify bottlenecks or other problems. This information helps managers decide whether to reroute products, reassign employees, workstations, or equipment, lay off or relocate production, increase or decrease supplier orders, or take other actions. In doing so, they can often mitigate supply chain challenges caused by sudden changes such as shifting consumer demand [14].

Managers must make decisions and react quickly. To support the decision-making process and improve efficiency, companies use a number of supply chain management applications [13]:

1. Order Management - An order management system receives and organizes orders from multiple sales channels by managing processes including order creation, order prioritization, approval workflows, and returns management. This software can also track supplier performance.

2. Transport management systems - The transport warehouse system helps enterprises to optimize the use of carriers for land, air and sea transport. This solution also tracks shipments in transit and can meet global trade requirements such as international tariffs. While multinational enterprises have been the primary users of transportation management systems in the past, cloud-based solutions have made these benefits more accessible to smaller companies.

3. Warehouse Management Systems - A warehouse management system helps a company optimize the use of warehouse space, plan workforce, manage inventory and fulfill orders. He can guide employees through the process of picking, packing and attaching shipping labels based on the most efficient order picking method for the

organization, redistributing orders between more urgent and those that can be fulfilled later.

4. Warehouse Management Systems - Combined with a warehouse management system, a warehouse management system regulates equipment such as conveyor belts, sorters, and scanners, which can make inventory handling more efficient and expedite order fulfillment by bringing in finished materials. A warehouse management system can also monitor the condition and performance of this equipment.

5. Motion Control Systems - A motion control system, combined with tracking technologies such as GPS and RFID, coordinates the movement of trucks, trailers, and sometimes pallets of goods across manufacturing facilities, warehouses, and distribution centers. These systems help optimize the loading and unloading of goods, for example by directing a truck to a specific warehouse door when its intended load has been moved to the nearest staging area and is ready to go.

So, in today's world, adaptation to customer needs is necessary for high competitiveness of companies. In order to meet the needs of the client, companies need to adapt and quickly respond to changes. Despite the most careful planning, most major "incidents" in today's global supply chain occur instantaneously—meaning there is little room for advancement or even sufficient warning or warning. Of course, many companies today deploy "smart" distribution programs and strategies to ensure on-time delivery and customer satisfaction. However, due to the sheer number of variables affecting just the average industry (including large and diverse network partners), companies often struggle to play catch-up by reacting to bottlenecks, disruptions, or any number of other disruptions to planning and production. Thanks to the latest technologies, companies have the opportunity to quickly change and adjust actions to suit consumers.

Lack of B2B interaction and inventory visibility can become a real challenge, especially under the tight competition between companies striving to achieve “one-day delivery” for more customers’ satisfaction.

Custom or ready-made software solutions can boost the ability of the stakeholders to access real-time data relevant to the order process, inventory, delivery, and potential supply chain disruptions.

Coca-Cola, Best Buy, Walmart, Kraft Heinz, and many more industry giants are using visibility tools.

In today's competitive markets, companies are tasked with being notified of every product movement in their supply chain operations. Whether it's an ocean container, pallet/skid, truck in transit, or drone delivery there is a growing need to keep track of every shipment in real-time. The end-game is to offer the best service and make sure customers are extremely satisfied with 5-star recommendations [32].

While companies are now transforming their linear supply chains into complex multilayer digital networks, tracking operations and keeping them transparent to all stakeholders has become more difficult. For example, a single product can interact with hundreds of people on its journey from manufacturing to delivery. And as the amount of data for analysis and monitoring grows, so does the need for increased security.

- Achieving real-time supply chain visibility can come with unforeseen difficulties;

- Lack of high-quality, reliable, and well-structured data for tracking operations;
- Process inefficiencies and a lack of understanding of the benefits of better visibility;

- Poor risk management within your supply network;
- Inability to effectively handle supply planning and demand forecasting.

Educating your personnel on how to use the insights from real-time visibility (even if it's already integrated into your supply chain)

ASOS Fashion, an online clothing brand, faced difficulties in 2019 with synchronizing their available stock of merchandise and their website. At first glance, this type of inventory visibility should not be a problem. ASOS was using an automated system for monitoring their products departing the warehouse to fulfill orders. Still, the system was not tracking incoming products to the warehouse or any

returns from their customers. This lasted for weeks and cost ASOS and their investors about \$30 Million.

This is a prime example of the complex nature of supply chain visibility and how much preparation has to be made to achieve full transparency. Even the most basic fulfillment systems have bottlenecks; imagine how complex supply networks covering many stages can be!

Urgent international delivery is air delivery. Urgency means that no more than two or three days pass from the moment the order is placed until it is received by the recipient. Given the huge distances, it will be possible to meet such deadlines only if you use air transportation [35].

A simple example. A Ukrainian company selling goods in the USA on Amazon and/or other marketplaces (Ebay, Etsy, Walmart, etc.) found that it had not taken into account the pace of sales and the volume of remaining goods. As a result, there was a real prospect of stop activity and, as a result, deterioration of its position compared to competitors. What is the way out? Urgently deliver your goods to the warehouse in the USA. Therefore, it is necessary to use urgent air delivery of goods.

Unlike regular air delivery, express delivery has several significant differences:

1. The company that provides this service sends its planes every day, at most every other day. At the same time, from several cities, if we are talking about such large countries as Ukraine or China. For example, flights from China to the USA are made from Beijing, Hong Kong, Shanghai, Guangzhou.
2. Documents are processed for customs in parallel with the collection of cargo from the manufacturer.
3. The cargo is immediately sent to the airport and is sent by the nearest plane.
4. Cargo consolidation is not carried out.

Real-time supply by sea

The sea carries more than 80 percent of the world's traded goods, most of which sail inside 40-foot-long steel containers stacked by the thousands atop some of the largest vessels ever built.

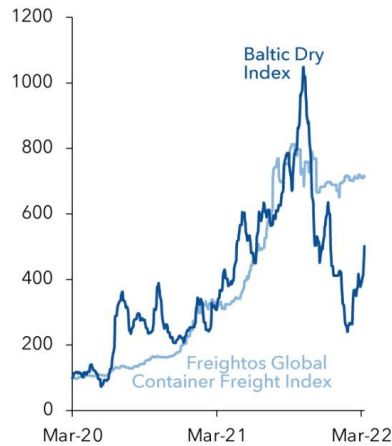
The shock of the pandemic underscored just how crucial the maritime container trade is to the global economy. From Shanghai to Rotterdam to Los Angeles, the coronavirus upended supply chains. Ports lacked workers who were home sick. Truck drivers and ship crews couldn't cross borders because of public health restrictions. Pent-up demand from huge stimulus programs during extended lockdowns overwhelmed the capacity of supply chains. Besides causing delays in getting goods to customers, the cost of getting them there surged.

As the Chart of the Week shows, the result of those challenges was that the cost of shipping a container on the world's transoceanic trade routes increased seven-fold in the 18 months following March 2020, while the cost of shipping bulk commodities spiked even more. New research shows that the inflationary impact of those higher costs is poised to keep building through the end of this year. Analysis predates the war in Ukraine but isn't isolated from it: the conflict will likely exacerbate global inflation [19].

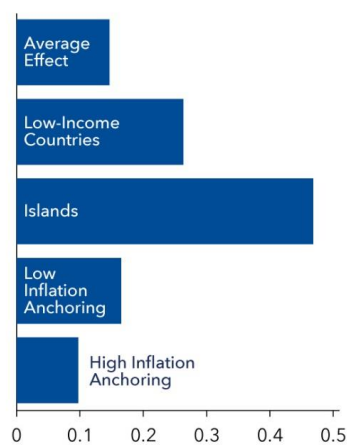
Cargo crunch

Global shipping costs surged during the pandemic, and are likely to continue boosting inflation through year-end.

Shipping costs
(indexes; March 1, 2020=100)



Inflation effects 12 months after shipping costs increase
(percentage point)



Sources: Haver Analytics and IMF staff calculations.

Note: The right panel is based on estimates in Carrière-Swallow and others (2022), and presents the impact of a one standard deviation increase in world shipping costs (+21.8 percentage points) on domestic headline inflation after 12 months.

IMF

Figure 1.1 – How Soaring Shipping Costs Raise Prices Around the World [19]

Results suggest the inflationary impact of shipping costs will continue to build through the end of 2022. This will create complicated trade-offs for many central bankers facing increasing inflation and still ample slack in economic activity. Moreover, the war in Ukraine is likely to cause further disruptions to supply chains, which could keep global shipping costs—and their inflationary effects—higher for longer.

Sea delivery is the best solution when it is necessary to deliver goods in bulk, complying with the terms and rules of customs clearance of the cargo upon import into the country, and to optimize costs as much as possible.

This method is not fast, it is not suitable for urgent transportation, but it takes about 35-40 days, which can be very profitable if you plan in advance. If the terms are short, you can use other methods of cargo delivery [18].

But there are short sea freights that can save time and costs. Below presents recent short sea shipping (SSS) statistics of the European Union (EU), covering the transport of goods between main ports in the EU Member States and ports situated in geographical Europe or in non-European countries on the Mediterranean and the Black Sea. In addition to the EU Member States, short sea shipping statistics are also available for main ports in the EFTA country Norway and the candidate countries Montenegro and Turkey. The results are broken down by country, sea region, type of cargo and top ports. (Figure 1.2)

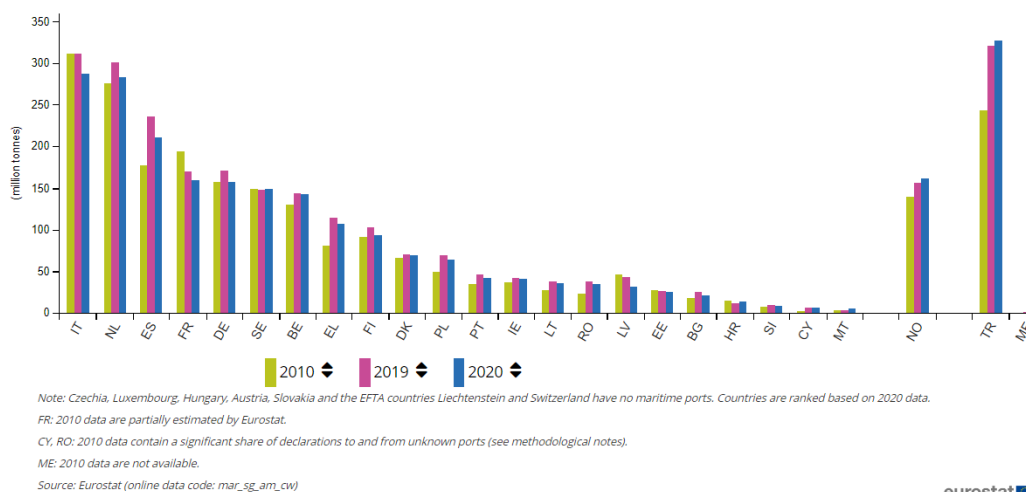


Figure 1.2 – Short sea shipping of freight 2010, 2019 and 2020 [18]

Short sea shipping, abbreviated as SSS, is the maritime transport of goods over relatively short distances, as opposed to the intercontinental cross-ocean deep sea shipping. In the context of European Union (EU) transport statistics it is defined as maritime transport of goods between ports in the EU (sometimes also including candidate countries and EFTA countries) on one hand, and ports situated in

geographical Europe, on the Mediterranean and Black Seas on the other hand, i.e. ports in:

- EU maritime countries;
- EEA maritime countries (Iceland and Norway);
- candidate countries;
- the Baltic Sea area;
- the Mediterranean Sea area (Algeria, Bosnia and Herzegovina, Egypt, Israel, Lebanon, Libya, Morocco, Occupied Palestinian territory, Syria, and Tunisia);
- the Black Sea area (Georgia, Moldova, Turkey and Ukraine).

This definition is derived from Commission Communication COM (1999) 317 final of June 1999 on the development of SSS in Europe (page 2). As a result, short sea shipping also includes feeder services: a short-sea network between ports with the objective of consolidating or redistributing freight to or from a deep sea service in one of these ports, the so-called hub port [17].

1.4 Chapter summary

A successful supply chain depends on information and communication as much as it does on transportation. Day-to-day decisions are often shaped by exceptions and disruptions in the delicate balance between supply and demand. To stay abreast, supply chain managers must be able to track the movement of goods along the supply chain, which includes the ability to quickly identify bottlenecks or other problems.

To succeed in an increasingly competitive global market, businesses must adapt effectively and look for simple, practical ways to connect their supply chains from start to finish.

In general rail is a little used mode for urban freight distribution, particularly in relation to flows of consumer goods towards the latter stages of the supply chain.

Limited modal shift potential of rail freight is one of these arguments as the rail transport is not accessible for a substantial part of the market due to the limited opportunities for railway network extension as well as expensive shunting of wagons into private sidings. As a result, intermodal road-rail transport is set up using both road and rail as goods stowed in unit loads move along a supply chain.

Modal shifts to non-road modes are rare. Over that same period, there were five countries that witnessed a shift from one non-road mode to another non-road mode, namely rail to inland water transport, coastal shipping to rail, and rail to coastal shipping.

The use of inland waterway transport is dependent on the navigability of the waterways. Frequent bottlenecks include insufficient depth, currents and sudden differences in water level.

Urgent international delivery is air delivery. Urgency means that no more than two or three days pass from the moment the order is placed until it is received by the recipient. Given the huge distances, it will be possible to meet such deadlines only if you use air transportation.

Sea delivery is the best solution when it is necessary to deliver goods in bulk, complying with the terms and rules of customs clearance of the cargo upon import into the country, and to optimize costs as much as possible.

This method is not fast, it is not suitable for urgent transportation, but it takes about 35-40 days, which can be very profitable if you plan in advance.

But there are short sea freights that can save time and costs.

Short sea shipping, abbreviated as SSS, is the maritime transport of goods over relatively short distances, as opposed to the intercontinental cross-ocean deep sea shipping.

CHAPTER 2

BUSINESS ANALYSIS OF THE PROCESSES OF ANHEUSER-BUSCH INBEV

2.1 Portfolio of Anheuser-Busch InBev

Anheuser-Busch InBev SA/NV, commonly known as AB InBev, is an American- Belgian multinational drink and brewing company based in Leuven, Belgium. AB InBev has a global functional management office in New York City, and regional headquarters in São Paulo, London, St. Louis, Mexico City, Bremen, Johannesburg and others. It has approximately 630 beer brands in 150 countries [20].

AB InBev was formed through InBev (itself a merger between Interbrew from Belgium and AmBev from Brazil) acquiring Anheuser-Busch (Anheuser-Busch Companies, LLC is an American brewing company headquartered in St. Louis, Missouri. Since 2008, it has been wholly owned by Anheuser-Busch InBev SA/NV (AB InBev), now the world's largest brewing company, which owns multiple global brands) from the United States.

In October 2015, Anheuser-Busch InBev announced a successful all-cash bid to acquire South African multinational competitor SABMiller; the merger was concluded in October 2016. It was the world's largest brewer even before the acquisition of SABMiller and is considered one of the largest fast-moving consumer goods companies in the world. The annual sales for the company in 2019 were US \$52.3 billion; prior to the merger, ABInBev had realized US \$45.5 billion in revenue in 2016. The company was expected to have a 28 percent market share of global volume beer sales in 2017, according to Euromonitor International.

The company subsequently sold the former SABMiller's interest in MillerCoors to Molson Coors, sold many of the former SABMiller's European brands to the Japanese beverage corporation Asahi Breweries and sold much of its Coca-Cola

bottling and distribution interests to the American beverage group Coca-Cola Company.

The following is a diagram of AB InBev's major mergers and acquisitions and historical predecessors, produced prior to the acquisition of SABMiller. (Figure 2.1)

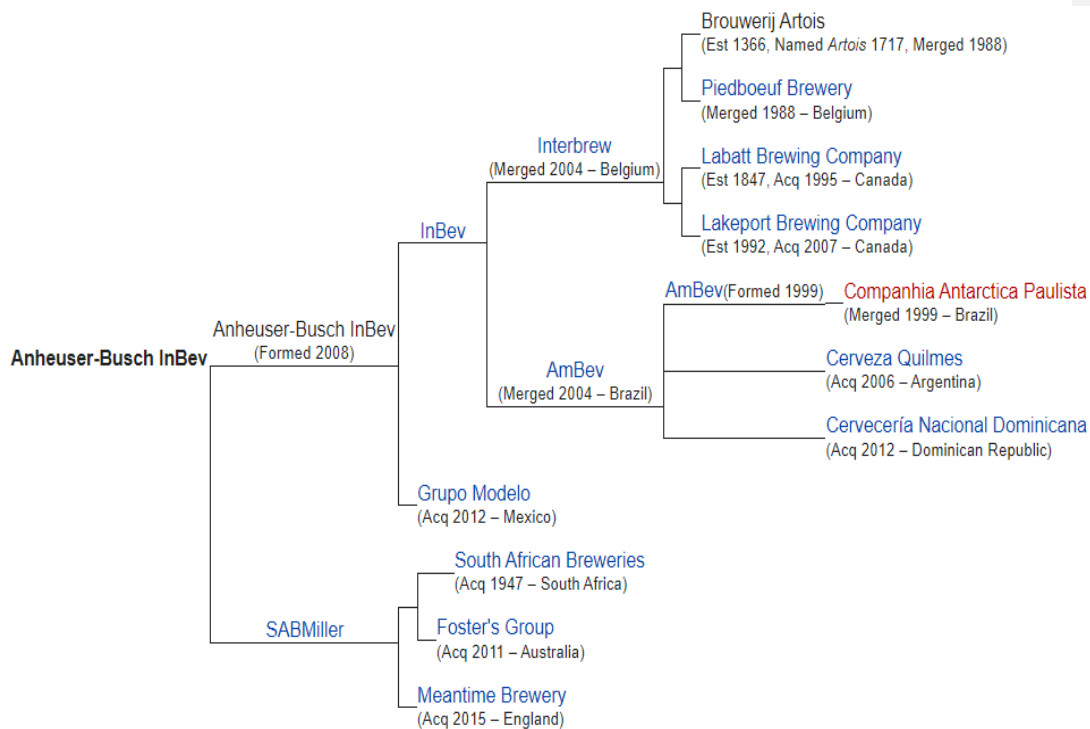


Figure 2.1 – Takeovers of AB InBev's major mergers and acquisitions and historical predecessors [20]

Management team

After the formation of Anheuser-Busch InBev SA/NV on 20 October 2016, the company was to be run by teams of "functional chiefs" and "zone presidents" who reported to AB InBev chief executive officer (CEO) Carlos Brito. All but one of those 19 positions are held by people who were already AB InBev executives before the acquisition of SABMiller. Effective July 2021, Brito stepped down as the CEO of

AB InBev after 15 years at the helm. Michel Doukeris, previously CEO of North American business for Anheuser-Busch, succeeded him as CEO.

Ownership

Anheuser-Busch InBev is controlled by Belgian families Vandamme, de Mévius and de Spoelberch, who as of 2015 owned a combined 28.6% of the company, and Brazilian investors Jorge Paulo Lemann, Carlos Alberto Sicupira and Marcel Telles, who owned 22.7% through their private investment firm 3G Capital.

Brands

AB InBev's brand portfolio includes highly popular beer and soft-drink brands. The company classified its brands as Global Brands, International Brands, and Local Champions. The following are some of the more popular 200 brands for AB InBev prior to the merger with SABMiller on 10 October 2016. The combined AB InBev/SAB Miller entity has approximately 400 beer brands as of January 2017.

Global brands include:

- Budweiser;
- Corona;
- Stella Artois.

International brands include:

- Beck's;
- Hoegaarden;
- Leffe.

Local Champion brands are in the Table 2.1.

Global purpose:

In December, company announced new global purpose: “We Dream Big to Create a Future with More Cheers”.

The first step on this journey was to define the role company want to play and where want to go, as people increasingly expect more from the companies and brands they love. This refreshed purpose represents what company and colleagues around the world can make possible when they dream big.

Table 2.1 – Local brands of AB InBev company

• 10 Barrel	• Dommelsch	• Premier
• Alexander Keith's	• Elysian Brewing Company	• Presidente
• Aguila	• Devils Backbone Brewing Company	• Quilmes
• Atlas	• Four Peaks	• Rifyey
• Balboa	• Franziskaner	• Rolling Rock
• Báltica Dry	• Golden Road	• Rogan
• Becker	• Goose Island	• Shock Top
• Best Damn Brewing Company	• Guaraná Antarctica	• Sibirskaya Korona
• Blue Point Brewing Company	• Harbin Brewery	• Spaten
• Bogotá Beer Company	• Hertog Jan	• Tolstyak
• Boxing Cat Brewery	• Hi-Ball Energy Drinks	• Victoria, strong blond Belgian beer
• Breckenridge Brewery	• Jupiler	• Volzhanin
• Busch	• Karbach	From the takeover of the Ursus Breweries, Timișoara by SABMiller:
• Cafri	• Klinskoye	• URSUS
• Camden Town Brewery	• Kokanee	• Timisoreana
• Cass	• Labatt	• Ciucas
• Cerveceria Boliviana Nacional	• Löwenbräu	• Stejar
• Cussy	• Michelob	• Azuga
• Chernigivske	• Modelo	• Peroni Nastro Azzurro
• Natural	• Poker	• Grolsch
• OB Golden Lager	• Wicked Weed Brewing	• Pilsner Urquell

It enables to unlock, harness and realign existing infrastructure and assets — to drive more innovation, more sustainability, more occasions and more value for all.

This purpose is commitment to building a future that everyone can celebrate and everyone can share.

AB InBev will make a meaningful impact across entire value chain, for all customers and local communities, as well as 169,000 colleagues due to:

1. Advancing sustainability around the world.
2. Driving category leadership and innovation to meet customer and consumer needs.
3. Leading the future growth of industry, reaching more consumers on more occasions with best-in-class portfolio.
4. Using data and technology to connect with customers and consumers.
5. Connecting farmers with resources.
6. Making a positive and lasting impact in local communities around the globe in the moments that matter.
7. Empowering 169,000 colleagues who are passionate owners and problem-solvers to lead real change.

Strategy

To transform business and create a future with more cheers, strategy focuses on organic growth and leading the category. In developing a ten-year plan, AB InBev has identified the following areas for focus:

The beer category

Company sells one out of every four beers in the world and account for a third of the global beer profit pool. Beer will continue to be core business and represents a sizable opportunity for company and its ecosystem.

Beyond Beer

Company is innovating, bringing new liquids that capture new occasions and driving incremental growth to current business.

New businesses

AB InBev can harness the power of existing platforms and ecosystem to help solve problems and to reimagine what a beer company can be. Within the technology space, platforms such as business-to-business BEES platform, direct-to-consumer e-

commerce solutions and fintech services compound the value of core business. In the emerging biotech field, can be leverage core brewing and fermentation capabilities in new and exciting ways.

Given these opportunities, can be evolved and simplified strategy into three pillars:

1. Lead and grow the category

Biggest opportunity is in the beer category, which is inclusive, natural and local. The beer category is inclusive—it is enjoyed by everyone, across geographies and socioeconomic groups. Beer is made with simple ingredients brewed naturally. It is fundamentally local. It is made from local ingredients grown by local farmers, and it is often a major part of local communities and economies. Beer is loved, resilient and reliable. All over the world, people are passionate about their favorite beer brands. The COVID19 pandemic reinforced this truth as people continued to remain loyal to their favorite brands.

In fact, beer revenue of AB InBev in 2021 has outperformed pre-pandemic levels. Beer is big and profitable. Beer is the largest single category within consumer-packaged goods (CPG) and is the number one driver of CPG growth, according to Euromonitor. It has been growing in volume and share of throat in the last five years across key markets including Africa, Latin America and Asia. Premium beer is growing almost twice as fast as premium spirits over the last few years, and beer is better positioned to further benefit from premiumization. Euromonitor projects that beer will grow and gain share of value and volume over the next five years due to beer's runway to further premiumize as well as expected population and per-capita consumption growth in key beer markets. With footprint and ecosystem, company is well positioned to grow, accelerate and expand the category.

2. Digitize and monetize ecosystem

The second pillar of strategy focuses on unlocking value from existing assets and expanding addressable market through the digitization and monetization of ecosystem. Company has built an ecosystem with approximately 200 breweries—an

unmatched distribution route to market that enables to reach two billion consumers and six million customers, and generates ten million weekly transactions.

New technology capabilities have unlocked multiple ways to create value from this ecosystem. The aim to solve customer and consumer pain points, with the potential to create significant value for ecosystem. These technology innovations are positioned to have an impact on business and on the category globally.

Company is focusing on three areas in this space:

- Our business-to-business software and fintech services, such as BEES;
- Our direct-to-consumer e-commerce solutions, including Zé Delivery and PerfectDraft;
- Biotech initiatives that use our expertise in scaled fermentation to create sustainable food production.

3. Optimize business

Disciplined resource allocation is essential to optimize the growth potential of business.

In terms of both profitability and cash conversion, with an EBITDA margin of around 35% and operating cash flow as a percentage of revenue of nearly 27%. Company should allocate resources to drive growth and profitability.

Some examples include shifting resources in the US from mainstream business to premium and Beyond Beer portfolios, investing ahead of the industry in premiumizing the beer category in China and investing in increasing scale in markets like Nigeria and Mozambique.

To position business for the future, AB InBev will continue to devote resources for new businesses. These are longer-term investments that extract new value from ecosystem. They include initiatives such as digital transformation with the BEES platform, and the emerging biotech platforms EverGrain and BioBrew.

Robust risk management

AB InBev has taken steps to de-risk and de-lever balance sheet. Over the past 18 months, have been paid down more than 22 billion USD of debt and redeemed almost

all of maturities over the next five years. With these actions, current liquidity is sufficient to cover all of maturities in aggregate through 2027.

Efficient capital structure

To maximize long-term value creation, they aim to balance capital allocation. While company continues driving consistent profitable growth through investing in the organic growth of business.

Market activity

The image below shows current information about the company's activities for 2021 year (Figure 2.2).

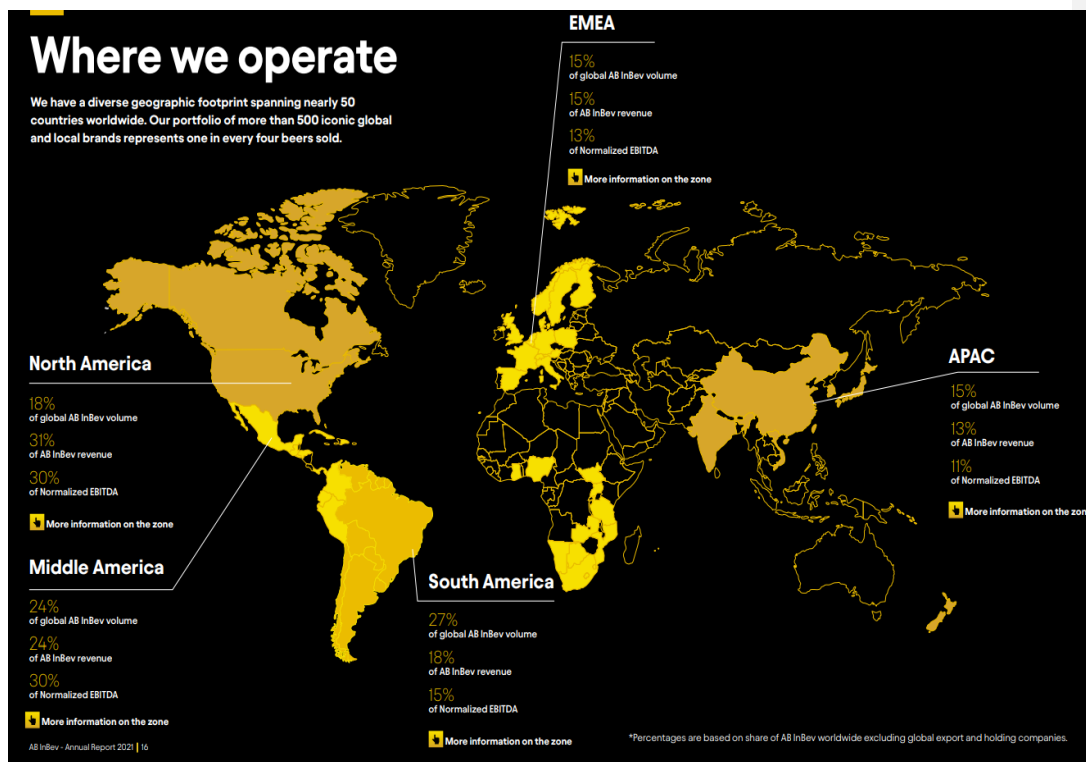


Figure 2.2 – AB InBev market place in 2021 [20]

Risks and uncertainties

Under the explicit understanding that this is not an exhaustive list, AB InBev's major risk factors and uncertainties are listed below. There may be additional risks

which AB InBev is unaware of. There may also be risks AB InBev now believes to be immaterial, but which could turn out to have a material adverse effect. Moreover, if and to the extent that any of the risks described below materialize, they may occur in combination with other risks which would compound the adverse effect of such risks. The sequence in which the risk factors are presented below is not indicative of their likelihood of occurrence or of the potential magnitude of their financial consequence.

AB InBev's business, financial condition, cash flows and operating results have been and may continue to be negatively impacted by the COVID-19 pandemic. AB InBev has experienced disruptions to its ability to operate its production facilities in some countries, and in the future, it may experience further disruption to its ability to operate its production facilities or distribution operations as a result of regulatory restrictions, safety protocols, social distancing requirements and heightened sanitation measures. AB InBev has also experienced constraints in its ability to source beverage containers and disruptions in the availability of transportation services and labor in certain markets, and may experience further disruption to its supply chain and distribution operations. Any sustained interruption in AB InBev's operations or its business partners' operations, distribution network or supply chain, or any significant continuous shortage of raw materials or other supplies could impact AB InBev's ability to make, manufacture, distribute or sell its products or may result in an increase in its costs of production and distribution. Sales of AB InBev's products in the on-premise channel have been significantly impacted by the implementation of social distancing and lockdown measures in most of its markets, including the closure of bars, clubs and restaurants and restrictions on sporting events, music festivals and similar events. Although sales in the on-premise channel improved as a result of the easing of social distancing and lockdown measures in many of these markets, such improvements have been, and may continue to be, impacted by the re-implementation of restrictions in certain markets due to the emergence and spread of new COVID-19 variants. Any future outbreak or recurrence of COVID-19 cases in other markets that have eased social distancing and lock down

measures may similarly result in the re-implementation of such measures and a further negative impact on our sales. If the COVID-19 pandemic intensifies and expands geographically, or efforts to curb the pandemic are ineffective, its negative impacts on AB InBev's sales could be more prolonged and may become more severe. Deteriorating economic and political conditions in many of AB InBev's major markets affected by the COVID-19 pandemic, such as increased unemployment, decreases in disposable income, declines in consumer confidence, or economic slowdowns or recessions, could cause a further decrease in demand for its products. Furthermore, the ongoing economic impacts and health concerns associated with the COVID-19 pandemic may continue to affect consumer behavior, spending levels and consumption preferences. The impact of the COVID-19 pandemic on global economic conditions has impacted and may continue to impact the proper functioning of financial and capital markets, as well as foreign currency exchange rates, commodity and energy prices and interest rates. A continuation or worsening of the levels of market disruption and volatility seen in the recent past could have an adverse effect on AB InBev's ability to access, or costs of, capital or borrowings, its business, its liquidity, its net debt to EBITDA ratio, credit ratings, results of operations and financial condition. Compliance with governmental measures imposed in response to COVID-19 has caused and may continue to cause us to incur additional costs, and any inability to comply with such measures can subject AB InBev to restrictions on its business activities, fines, and other penalties, any of which can adversely affect its business. In addition, responses to the COVID-19 pandemic may result in both short-term and long-term changes to fiscal and tax policies in impacted jurisdictions, including increases in tax rates.

AB InBev's results of operations are affected by fluctuations in exchange rates. Any change in exchange rates between AB InBev's operating companies' functional currencies and the U.S. dollar will affect its consolidated income statement and balance sheet when the results of those operating companies are translated into U.S. dollar for reporting purposes as translational exposures are not hedged. Also, there can be no assurance that the policies in place to manage commodity price and

transactional foreign currency risks to protect AB InBev's exposure will be able to successfully hedge against the effects of such foreign exchange exposure, especially over the long-term. Further, the use of financial instruments to mitigate currency risk and any other efforts taken to better match the effective currencies of AB InBev's liabilities to its cash flows could result in increased costs.

AB InBev may not be able to obtain the necessary funding for its future capital or refinancing needs and may face financial risks due to its level of debt and uncertain market conditions. AB InBev may be required to raise additional funds for its future capital needs or to refinance its current indebtedness through public or private financing, strategic relationships or other arrangements and there can be no assurance that the funding, if needed, will be available or provided on attractive terms. AB InBev has incurred substantial indebtedness by entering into a senior credit facility and accessing the bond markets from time to time based on its financial needs, including as a result of the acquisition of SAB. The portion of AB InBev's consolidated balance sheet represented by debt will remain significantly higher as compared to its historical position.

AB InBev's increased level of debt could have significant consequences for AB InBev, including increasing its vulnerability to general adverse economic and industry conditions, limiting its flexibility in planning for, or reacting to, changes in its business and the industry in which AB InBev operates, impairing its ability to obtain additional financing in the future and limiting its ability to fund future working capital and capital expenditures, to engage in future acquisitions or development activities or to otherwise realize the value of its assets and opportunities fully, requiring AB InBev to issue additional equity (potentially under unfavorable market conditions), and placing AB InBev at a competitive disadvantage compared to its competitors that have less debt. AB InBev's ability to repay and renegotiate its outstanding indebtedness will be dependent upon market conditions. Unfavorable conditions, including significant price volatility, dislocations and liquidity disruptions in the global credit markets in recent years, as well as downward pressure on credit capacity for certain issuers without regard to those issuers' underlying financial

strength, could increase costs beyond what is currently anticipated. Such costs could have a material adverse impact on AB InBev's cash flows, results of operations or both. Further, AB InBev may restrict the amount of dividends it will pay as a result of AB InBev's level of debt and its strategy to give priority to deleveraging toward its optimal net debt to normalized EBITDA ratio of around 2x.

Changes in the availability or price of raw materials, commodities, energy and water, including as a result of currency fluctuations, constraints on sourcing and unexpected increases in tariffs on such raw materials and commodities, like aluminum, could have an adverse effect on AB InBev's results of operations to the extent that AB InBev fails to adequately manage the risks inherent in such volatility, including if AB InBev's hedging and derivative arrangements do not effectively or completely hedge against foreign currency risks and changes in commodity prices.

Certain of AB InBev's operations depend on effective distribution networks to deliver its products to consumers, and distributors play an important role in distributing a significant proportion of beer and other beverages. Generally, distributors purchase AB InBev's products from AB InBev and then on-sell them either to other distributors or points of sale. Such distributors are either government-controlled or privately owned but independent wholesale distributors for distribution of AB InBev's products, and there can be no assurance that such distributors will not give priority to AB InBev's competitors.

AB InBev relies on key third parties, including key suppliers, for a range of raw materials for its beer, alcoholic beverages and soft drinks, and for packaging material. The termination of or any material change to arrangements with certain key suppliers or the failure of a key supplier to meet its contractual obligations could have a material impact on AB InBev's production, distribution and sale of beer, alcoholic beverages and soft drinks and have a material adverse effect on AB InBev's business, results of operations, cash flows or financial condition. Certain of AB InBev's subsidiaries may purchase nearly all of their key packaging materials from sole suppliers under multi-year contracts. The loss of or temporary discontinuity of supply from any of these suppliers without sufficient time to develop an alternative source

could cause AB InBev to spend increased amounts on such supplies in the future. In addition, a number of key brand names are both licensed to third-party brewers and used by companies over which AB InBev does not have control. Although AB InBev monitors brewing quality to ensure its high standards, to the extent that one of these key brand names or joint ventures, companies in which AB InBev does not own a controlling interest and/or AB InBev's licensees are subject to negative publicity, it could have a material adverse effect on AB InBev's business, results of operations, cash flows or financial condition.

2.2 Analysis the financial indicators of the company Anheuser – Busch InBev

Financial Management is a vital activity in any organization. It is the process of planning, organizing, controlling and monitoring financial resources with a view to achieve organizational goals and objectives. It is an ideal way of controlling an organization's financial activities, such as fundraising, resource use, accounting, payments, risk assessment, and all other monetary matters.

In other words, financial management is the application of general management principles to a company's financial assets. Proper management of an organization's finances provides quality fuel and regular service to keep it running efficiently. If finances are not properly managed, the organization faces obstacles that can have serious consequences for its growth and development.

The pictures below set out the components of operating income and operating expenses, as well as the key cash flow figures (Fig. 2.3).

In report are presented results under five regions: North America, Middle Americas, South America, EMEA and Asia Pacific.

The tables in this management report provide the segment information per region for the period ended 31 December 2021 and 2020 in the format down to Normalized EBIT level that is used by management to monitor performance.

For the year ended 31 December				
Million US dollar				
	2021	%	2020	%
Revenue¹	54 304	100%	46 881	100%
Cost of sales	(23 097)	43%	(19 634)	42%
Gross profit	31 207	57%	27 247	58%
SG&A	(17 574)	32%	(15 368)	33%
Other operating income/(expenses)	805	1%	845	2%
Normalized profit from operations (Normalized EBIT)	14 438	27%	12 723	27%
Non-underlying items	(614)	1%	(3 103)	7%
Profit from operations (EBIT)	13 824	25%	9 620	21%
Depreciation, amortization and impairment	4 771	9%	4 598	10%
Non-underlying impairment	281	1%	2 733	6%
Normalized EBITDA	19 209	35%	17 321	37%
EBITDA	18 876	35%	16 951	36%
Normalized profit attributable to equity holders of AB InBev	5 723	11%	3 807	8%
Profit from continuing operations attributable to equity holders of AB InBev	4 670	9%	(650)	1%
Profit from discontinued operations attributable to equity holders of AB InBev	-	-	2 055	4%
Profit attributable to equity holders of AB InBev	4 670	9%	1 405	3%
For the year ended 31 December				
Million US dollar				
	2021		2020	
Operating activities				
Profit from continuing operations			6 114	147
Interest, taxes and non-cash items included in profit			12 693	17 024
Cash flow from operating activities before changes in working capital and use of provisions			18 806	17 171
Change in working capital			2 459	592
Pension contributions and use of provisions			(375)	(616)
Interest and taxes (paid)/received			(6 197)	(6 391)
Dividends received			106	51
Cash flow from operating activities on Australia discontinued operations			-	84
Cash flow from operating activities			14 799	10 891
Investing activities				
Net capex			(5 498)	(3 687)
Acquisition and sale of subsidiaries, net of cash acquired/disposed of			(444)	(510)
Net proceeds from sale/(acquisition) of other assets			65	(292)
Proceeds from Australia divestiture			-	10 838
Cash flow from investing activities on Australia discontinued operations			-	(13)
Cash flow from investing activities			(5 878)	6 336
Financing activities				
Dividends paid			(2 364)	(1 800)
Net (payments on)/proceeds from borrowings			(8 511)	(8 294)
Payment of lease liabilities			(531)	(461)
Sale/(purchase) of non-controlling interests and other			(192)	2 086
Cash flow from financing activities on Australia discontinued operations			-	(6)
Cash flow from financing activities			(11 598)	(8 475)
Net increase/(decrease) in cash and cash equivalents			(2 677)	8 752

Figure 2.3 – AB InBev financial report 2021 [20]

The tables below provide a summary of performance for the period ended 31 December 2021 and 2020 (in million US dollar, except volumes in thousand hectoliters) and the related comments are based on organic numbers (Fig. 2.4).

AB INBEV WORLDWIDE	2020	Scope	Currency translation	Organic growth	2021	Organic growth %
Volumes	530 644	56	-	50 979	581 678	9.6%
Revenue	46 881	(193)	326	7 290	54 304	15.6%
Cost of sales	(19 634)	61	(119)	(3 405)	(23 097)	(17.4)%
Gross profit	27 247	(132)	207	3 885	31 207	14.3%
SG&A	(15 368)	100	(180)	(2 126)	(17 574)	(13.9)%
Other operating income/(expenses)	845	(187)	8	139	805	32.3%
Normalized EBIT	12 723	(218)	35	1 899	14 438	15.4%
Normalized EBITDA	17 321	(207)	96	2 000	19 209	11.8%
Normalized EBITDA margin	36.9%	-	-	-	35.4%	-118 bps

Figure 2.4 – Normalized EBITDA margin [20]

In 2021, normalized EBITDA increased 11.8%, while normalized EBITDA margin contracted 118 bps, reaching 35.4%.

Consolidated volumes grew by 9.6%, with own beer volumes up 9.7% and non-beer volumes up 8.7%, driven by a recovery year-over-year as the COVID-19 pandemic negatively impacted volumes in 2020.

Consolidated revenue grew by 15.6% to 54 304m US dollar, with revenue per hectoliter growth of 5.5% driven by premiumization and revenue management initiatives. Combined revenues of global brands, Budweiser, Stella Artois and Corona increased by 17.6% globally and 22.9% outside of their respective home markets.

Consolidated Cost of Sales (CoS) increased 17.4%, and increased 7.2% on a per hectoliter basis, driven by anticipated transactional foreign exchange and commodity headwinds.

Consolidated selling, general and administrative expenses (SG&A) increased 13.9% due primarily to higher variable compensation accruals and elevated supply chain costs.

Consolidated other operating income/(expenses) in 2021 increased by 32.3% primarily driven by higher government grants and sales of non-core assets. In the

fourth quarter of 2020 and in the second quarter of 2021, Ambev, recognized 481m US dollar and 226m US dollar income in Other operating income respectively related to tax credits in Brazil. The net impact is presented as a scope change and does not impact the presented organic growth. Additionally, Ambev recognized 118m US dollar of interest income in Finance income in 2021 (2020: 315m US dollar) related to these credits. Underlying profit attributable to equity holders and underlying EPS were positively impacted by 165m US dollar after tax and non-controlling interest (30 December 2020: 325m US dollar). Ambev's tax credits and interest receivables are expected to be collected over a period exceeding 12 months after the balance sheet date. As of 31 December 2021, the total amount of such credits and interest receivables represented 960m US dollar.

Liquidity position and capital resources presented at the Tables 2.2 – 2.4.

Table 2.2 - Cash flow from operating activities

Million US dollar	2021	2020
Profit/(loss) from continuing operations	6 114	147
Interest, taxes and non-cash items included in profit	12 693	17 024
Cash flow from operating activities before changes in working capital and use of provisions	18 806	17 171
Change in working capital	2 459	592
Pension contributions and use of provisions	(375)	(616)
Interest and taxes (paid)/received	(6 19 7)	(6 39 1)
Dividends received	106	51
Cash flow from operating activities on Australia discontinued operations	-	84
Cash flow from operating activities	14 799	10 891

Cash flow from operating activities reached 14 799m US dollar in 2021 compared to 10 891m US dollar in 2020. The increase primarily results from higher profit and changes in working capital for 2021 compared to 2020 as results for 2020 were negatively impacted by the COVID-19 pandemic.

Table 2.3 - Cash flow from investing activities

Million US dollar	2021	2020
Net capex	(5 498)	(3 687)
Acquisition and sale of subsidiaries, net of cash acquired/disposed of	(444)	(510)
Net proceeds from sale/(acquisition) of other assets	65	(292)
Proceeds from Australia divestiture	-	10 838
Cash flow from investing activities on Australia discontinued operations	-	(13)
Cash flow from investing activities	(5 878)	6 336

Cash outflow from investing activities was 5 878m US dollar in 2021 compared to a cash inflow of 6 336m US dollar in 2020. The decrease in the cash flow from investing activities was mainly due to the exceptional 10 838m US dollar proceeds from the divestiture of the Australian business reported in 2020 and higher net capital expenditures in 2021 compared to 2020.

Table 2.4 - Cash flow from financing activities

Million US dollar	2021	2020
Dividends paid	(2 364)	(1 800)
Net (payments on)/proceeds from borrowings	(8 511)	(8 294)
Payment of lease liabilities	(531)	(461)
Sale/(purchase) of non-controlling interests and other	(192)	2 086
Cash flow from financing activities on Australia discontinued operations	-	(6)
Cash flow from financing activities	(11 598)	(8 475)

Net capital expenditures amounted to 5 498m US dollar in 2021 and 3 687m US dollar in 2020. Out of the total 2021 capital expenditures approximately 44% was

used to improve the company's production facilities while 41% was used for logistics and commercial investments and 15% was used for improving administrative capabilities and for the purchase of hardware and software.

Cash outflow from financing activities amounted to 11 598m US dollar in 2021, as compared to a cash outflow of 8 475m US dollar in 2020. The increase is primarily driven by higher dividends paid in 2021 and the issuance of a 49.9% minority stake in US-based metal container operations to Apollo for net proceeds of 3.0 billion USD in 2020. Proactive deployment of excess cash balances toward gross debt reduction resulted in a cash outflow of 8 294m US dollar and 8 511m US dollar in 2020 and 2021, respectively.

As of 31 December 2021, company had total liquidity of 22.2 billion US dollar, which consisted of 10.1 billion US dollar available under Sustainability-Linked Loan Revolving Credit Facility ("SLL RCF") and 12.1 billion US dollar of cash, cash equivalents and short-term investments in debt securities less bank overdrafts. Although company may borrow such amounts to meet liquidity needs, but they principally rely on cash flows from operating activities to fund the company's continuing operations.

2.3 Urgent orders and solving demand issues in AB InBev

In recent years, the attitude towards sustainable planning has changed somewhat. In the conditions of the modern world, it is necessary to adapt the business to urgent deliveries and to solve problems with the delivery of the repulsive conditions in which we are placed.

Business had just begun to adapt to the conditions of strict pandemic restrictions, when a new test arose - active military operations in the center of Europe. Prices have increase and supply chains have become more difficult to

manage, which is why the ability to react and change quickly is critical to business today.

The existence of a paying demand for a specific type of product of her theory automatically ensures its supply. In practice, most enterprises are not ready to engage in activities that do not correspond to their profile. In contrast to such enterprises, AB InBev implements a strategy of rapid response to market needs, aimed at meeting emerging needs in various areas as quickly as possible.

The main principle of their behavior is the selection and implementation of projects that are the most profitable in the current market conditions. Enterprises choosing a rapid response strategy are ready to immediately reorient production and change its scale in order to obtain maximum profit in the short term, despite the high specific costs caused by the lack of certain production specialization.

But there is no single optimal competition strategy that would suit any enterprise. Each enterprise should choose a strategy according to its size and market position. Large companies that have a leading position in any industry use strategies that are different from those used by small or medium-sized companies. But both small and medium-sized enterprises implement strategies that give them certain competitive advantages.

The main criterion for choosing a strategy of competitive advantages is the adaptation of one's own capabilities to specific market conditions. And in this regard, the basic strategies of competition act as a fundamental, general economic basis for the construction of practical actions of competitors.

AB InBev applies a strategy of rapid response to market needs, it has specific characteristics: it has a flexible product policy, with a high degree of product differentiation; has a highly qualified staff and a marketing service focused on finding highly profitable projects.

The strategy of rapid response to market needs allows you to receive the following advantages:

- obtaining excess profit at the expense of high prices for products;
- consumers became interested in using the products;

- a small number of substitute products;
- acquiring the image of an enterprise for which immediate satisfaction of customers' needs with the highest quality products is most important.

Direct-to-consumer is transforming business. Consumers are at the center of everything. So company is developing direct-to-consumer channels to provide the best experience across all beverage occasions. Direct-to-consumer portfolio is made up of fast-growing e-commerce platforms along with approximately 12,000 brick-and-mortar retail stores to create an ecosystem that has generated nearly 1.5 billion USD in revenues in 2021.

During the COVID-19 lockdowns, online channels saw significant growth. This year, e-commerce platforms have fulfilled 66 million orders, representing sales growth of 62%. As online penetration of beer sales increases, direct-to-consumer platform allows to connect one-on-one with each consumer, gaining detailed insights. This enables to personalize at scale, executing activations to drive higher consumer lifetime value.

As a big company, they are uniquely positioned to develop a sustainable, long-term direct-to consumer offering for three main reasons:

- Diverse portfolio of leading brands gives a differentiated value proposition, raises awareness and drives consumer adoption.

- Extensive logistics network, partnerships with millions of retailers and footprint of owned physical stores help to increase last-mile delivery efficiency, promote best-in-class service levels and ensure superior beer experiences.

- Technology seamlessly connects these elements into a single ecosystem that enables to rapidly expand to direct-to-consumer platforms.

AB InBev this year marked the five-year anniversary of Zé Delivery, a technology platform in Brazil that connects consumers with retailers to deliver cold beer straight to their doorsteps within 30 minutes.

In 2021, Zé Delivery monthly orders grew to record levels, doubling the number of orders compared to 2020. Zé Delivery is now available in roughly 300 cities across Brazil.

As a result of Zé's success, company is integrating all of direct-to-consumer services into the same structure in different markets. This includes platforms such as Zé Delivery, Pit Stop, Chopp Brahma Express, ModeloramaNow, Empório da Cerveja, Sempre Em Casa and Coolers Autonomos. AB InBev now has courier platforms live in 35 cities across South and Central America.

As company expand direct-to-consumer services into other countries, they are connecting with physical store footprint. For example, in Mexico enterprise is using Modelorama stores to create an omnichannel experience via Modelorama Now. PerfectDraft business in Europe had a successful year, surpassing 170 million USD in revenue in 2021. PerfectDraft is delivering a wide assortment of beers that consumers love with a pub-quality home draught experience. With more than 40 brands to explore and easy e-commerce ordering, the service seamlessly connects breweries to beer lovers' homes.

To make the delivery experience more sustainable, local and personal, Saveur Bière recently launched a new delivery service in Paris, France, that eliminates cardboard boxes and the need for shipping.

When receiving an urgent order, managers have to accept in a short time, which will be the most economically profitable and at the same time will meet the requirements of customers. Such as increasing the delivery batch, changing the order receipt date, changing the place of delivery, changing the product, etc.

In the company AB InBev, this happens quite often, since it is based all over the world, and beer is a product that is quite popular among buyers.

The company has been transforming supply chain from seed to sip. In 2021, combined Supply and Procurement functions to create one interconnected and streamlined Global Supply Team led by Peter Kraemer, Chief Supply Officer.

This year the new team worked through supply chain challenges, over delivering committed volumes and improving packaging efficiencies by 3% (Gross Line Yield) and productivity by 12%. Despite headwinds coming from commodities, labor and logistics challenges, supply chain remained resilient.

By innovating through discovery, development and the scaling of technology, AB InBev is able to deliver fresh beer to markets across the world while keeping sustainability as a top priority. For instance, they have implemented planning tools to provide visibility across the full supply chain from supplier to customer. This gives the ability to react to the many challenges of the COVID-19 pandemic and manage revenue while supporting the more than six million pubs, restaurants and family-run retailers that sell and serve products.

To better meet consumer needs and demand, the company established a supply security routine to connect different sales scenarios with available materials and the level of inventories by pack. Additionally, they are using artificial intelligence (AI) to perform critical tasks and to train colleagues through partnership with DeepHow, an AI-powered training platform for manufacturers and field-service teams.

Global Innovation and Technology Center (GITEC) team also helped to bring innovations to market at improved speed and scale year 2021, with an average of four months from ideation to launch, an 18% reduction compared to 2020. An example of this is Flying Fish Seltzer in South Africa, which took only 75 days from ideation to launch.

Two case studies have been established in collaboration with the logistics department of the manufacturing department of the company:

- The case of an urgent order which has not been provided neither in the monthly or weekly forecasts;
- The case of an urgent order that has just been sent in the weekly forecasts and not before in the monthly forecasts.

In the first case of an urgent order which was not provided in the forecasts and has been issued when sending a firm order, this process will give rise to a multitude of problems throughout the supply chain from the supplier of the raw materials to the final customer, many workstations and process will be directly impacted, namely:

- Creation of new Kanban cards with a priority label (for example a different color from the other Kanban cards) compared to those already circulating in the shop floor. A Kanban card is a visual representation of a work item. Translated from

Japanese, it literally means a visual (kan) card (ban). It is a core element of the Kanban system as it represents work that has been requested or is already in progress;

- The warehouse will be impacted due to the lack of raw material, so it will prompt the company to issue urgent orders in turn to its raw material suppliers; This will result in a high cost of the supplier and consequently an additional cost of raw material, over time and extra cost for the shipment.

- The preparation workstation will be directly impacted, since the first free producing machine will receive the Kanban card with the priority label which will imply a change of the set-up time that will require a lot of adjustment. Knowing that a high set-up time will involve additional costs for the company since this is a time when the machine is stopped and cannot produce an added value. In some cases of major emergency, the company can stop the production and passes Kanban cards with the priority label which will cause a bottleneck.

- In the side of the assembly: the work in progress will be increasingly high, which will impact the quality of finished goods; an extra cost will be added also due to the storage, over time of the manpower as well for shipment, all these elements will contribute to a high decrease in productivity, resulting in additional high costs for the company.

- Information flow will be additionally disrupted by the fact that an order should be prioritized than another, so the whole planning and scheduling part of the business is going to be impacted.

- The FIFO principle will no longer be applicable because of the inconvenience caused by the urgent order since the priority is given to the element of this order.

In the second cases the same workstations and process will be impacted except the first stage of the warehouse, since the company has already ordered the raw material from its suppliers.

When receiving urgent orders, the company faces such risks as:

1. Lack of raw materials for manufacturing the product.
2. Delays due to changes in production capacity.
3. Choosing the right mode of transport for urgent delivery.

4. Risk of losing important customers.
5. Loss of profit.
6. Loss of reputation.
7. Limited time for execution.

2.4 Chapter summary

Anheuser-Busch InBev SA/NV, commonly known as AB InBev, is an American- Belgian multinational drink and brewing company based in Leuven, Belgium. It has approximately 630 beer brands in 150 countries.

AB InBev's business, financial condition, cash flows and operating results have been and may continue to be negatively impacted by the COVID-19 pandemic. AB InBev has experienced disruptions to its ability to operate its production facilities in some countries, and in the future, it may experience further disruption to its ability to operate its production facilities or distribution operations as a result of regulatory restrictions, safety protocols, social distancing requirements and heightened sanitation measures.

AB InBev relies on key third parties, including key suppliers, for a range of raw materials for its beer, alcoholic beverages and soft drinks, and for packaging material. The termination of or any material change to arrangements with certain key suppliers or the failure of a key supplier to meet its contractual obligations could have a material impact on AB InBev's production, distribution and sale of beer. The loss of or temporary discontinuity of supply from any of these suppliers without sufficient time to develop an alternative source could cause AB InBev to spend increased amounts on such supplies in the future.

Analyzing the financial activity of the company In 2021, normalized EBITDA increased 11.8%, while normalized EBITDA margin contracted 118 bps, reaching 35.4%.

Consolidated volumes grew by 9.6%, with own beer volumes up 9.7% and non-beer volumes up 8.7%, driven by a recovery year-over-year as the COVID-19 pandemic negatively impacted volumes in 2020.

Consolidated revenue grew by 15.6% to 54 304m US dollar, with revenue per hectoliter growth of 5.5% driven by premiumization and revenue management initiatives. Combined revenues of global brands, Budweiser, Stella Artois and Corona increased by 17.6% globally and 22.9% outside of their respective home markets.

In order to adapt business to modern conditions, when the world changes at an unreal speed and the needs of customers grow every year AB InBev implements a strategy of rapid response to market needs, aimed at meeting emerging needs in various areas as quickly as possible.

Faced with the problems of modern urgent shipment AB InBev implements Zé Delivery, a technology platform in Brazil that connects consumers with retailers to deliver cold beer straight to their doorsteps within 30 minutes.

When receiving an urgent order, managers have to accept in a short time, which will be the most economically profitable and at the same time will meet the requirements of customers. Such as increasing the delivery batch, changing the order receipt date, changing the place of delivery, changing the product, etc.

When receiving urgent orders, the company meets such risks as:

1. Lack of raw materials for manufacturing the product.
2. Delays due to changes in production capacity.
3. Choosing the right mode of transport for urgent delivery.
4. Risk of losing important customers.
5. Loss of profit.
6. Loss of reputation.
7. Limited time for execution.

Below, in Chapter 3, we will consider the relevance and options for solving problems during urgent deliveries.

CHAPTER 3

DEVELOPMENT OF PROJECT SOLUTIONS FOR IMPROVING EXECUTION OF URGENT ORDERS OF AB InBev COMPANY

3.1 General information on solutions in the logistics service of urgent customer's orders, divided by the importance of regions

The importance of prioritizing order fulfillment makes it possible to increase profits. Companies need to understand which requests to respond to in the first place, and which do not bring much profit or, on the contrary, bring losses. When the AB InBev company receives an urgent order, first of all it is necessary to understand whether this order is relevant, that is why the company divided its profits by production regions, and their analysis will make it possible to provide urgent supplies first of all to the area that brings more income.

It is necessary to start with an approach in which we will develop personal service strategies for each segment, after dividing them into groups. We will use ABC and XYZ analysis to segment the market regions of AB InBev.

ABC analysis is performed on the basis of revenues generated by each region of the company for the analyzed period:

- group A consists of the market, the share of which in the total number of consumers is up to 20%, and the share in the total income of the company is up to 80%;
- group B consists of the market, the share of which in the total number of consumers is up to 30%, and the share in the total income of the company is up to 15%;
- group C consists of the market, the share of which in the total number of consumers is up to 50%, and the share in the total income of the company is only 5%.

Category A region is served first and the greatest amount of attention and effort of managers is spent on it. Category B region is serviced second and requires less attention, and category C region is the last.

Based on the stability of the relationship, the XYZ Analysis is created.

I will segment AB InBev's regions into groups (Table 3.1).

Table 3.1 – Segmentation of regions by order and revenue

Regions	Income from region per year, million US dollars	Number of orders per year			
		1 quarter	2 quarter	3 quarter	4 quarter
North America	16 257	25 400	30 362	28 352	22 725
Middle Americas	12 541	28 305	32 100	30 650	29 745
South America	9 494	32 146	38 165	36 947	36 951
EMEA	8 032	19 473	20 158	19 684	16 892
Asia Pacific	6 848	20 412	22 356	20 157	18 724
Global Export and Holding Companies	1 133	247	196	275	215
AB InBev Worldwide	54 304	130 600	137 667	136541	125836
Company expenses:					
1. Salary: 2 256 million US dollar/year					
2. Communication: 610 million US dollar/year					

We calculate the ABC analysis:

1. We sum up the income from all customers to calculate the total income of the AB InBev company (Table 3.2).

2. We will calculate the specific weight of each region in the total income of AB InBev. To do this, divide the income from each region by the total income and multiply by 100%. The results are given in column 3 of Table 3.2.

3. Place in order of decreasing specific weight by income (from higher to lower). The organized list is placed in columns 4 and 5 of Table 3.2.

Table 3.2 – ABC analysis

Primary list			Ordered list				
Regions	Income from the region per year, million US dollars	specific weight of the region in the total income, %	Regions	specific weight of the region in the total income, %	specific gravity in an ascending manner	jump in specific gravity	ABC
North America	16 257	29,94	North America	29,94	29,94	6,85	A
Middle Americas	12 541	23,09	Middle Americas	23,09	53,03	5,61	B
South America	9 494	17,48	South America	17,48	70,51	2,69	B
EMEA	8 032	14,79	EMEA	14,79	85,3	2,18	B
Asia Pacific	6 848	12,61	Asia Pacific	12,61	97,91	10,52	C
Global Export and Holding Companies	1 133	2,09	Global Export and Holding Companies	2,09	100	0	C
AB InBev Worldwide	54 304	100	AB InBev Worldwide	100	-		

4. The specific weight jump is calculated as the difference between the specific weights of the previous and next region, according to the ordered list (column 6 of Table 3.2). "0" is placed opposite the last client, because he does not have the next client. Jumps in specific gravity are placed in column 7 of the Table. 3.2.

5. Distribution of analyzed clients into groups A, B and C (column 8 of Table 3.2)

Therefore, each group of customers is determined before the jump in specific gravity, that is, from the minimum value to the next maximum. In our case, specific gravity jumps = 5,61; 10,52.

We will carry out the following calculations for XYZ - analysis.

1. We will calculate the average number of orders for each client. We add up the number of orders for each period and divide by the number of periods (column 2 of Table 3.3).

2. The coefficient of variation of orders (transactions) by individual customers (column 3 of Table 3.3) is calculated according to the formula:

$$V = \frac{\sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}}}{\bar{x}} * 100\% \quad (3.1)$$

where x_i - number of orders or transactions with a certain region for the i -th period;

\bar{x} - average number of orders or transactions for all periods;

n - number of analyzed periods.

Table 3.3 - XYZ - analysis for AB InBev company

Regions	Average number of orders	Coefficient of variation	XYZ
1	2	3	4
North America	26 709,75	10,856	Y
Middle Americas	30 200	4,567	X
South America	36 052,25	6,405	X
EMEA	19 051,75	6,673	X
Asia Pacific	20 412,25	6,337	X

Global Export and Holding Companies	233,25	12,956	Y
-------------------------------------	--------	--------	---

3. Distribution into groups X, Y, Z is carried out as follows (column 4 of Table 3.3):

- group X includes clients whose relationships are stable and easily predictable ($0\% < v \leq 10\%$);

- group Y includes clients with whom there are some fluctuations ($10\% < v \leq 25\%$);

- group Z includes clients whose relationships are casual ($v > 25\%$).

The ABC-XYZ matrix is built on the basis of the ABC and XYZ analyzes (table 3.4)

Table 3.4 – Matrix ABC-XYZ

	A	B	C
X		Middle Americas, South America, EMEA	Asia Pacific
Y	North America		Global Export and Holding Companies
Z			

In summary, we can say that North America brings the company the most revenue, so they need the highest level of service. They should try to win their loyalty, make discounts, develop individual programs for each consumer. The reason for the not entirely unstable consumption is related to the seasonality of the company's goods, certain conditions should be created for encouragement. The company can attract balances from other regions to meet urgent orders, use faster delivery methods by involving air transport, the cost of order fulfillment speed will be covered by profit, and the company will get more satisfied customers and increase revenue.

Middle Americas, South America, EMEA regions bring average revenue for companies compared to other regions, they should be kept and well serviced and respond quickly to changing demands and urgency, as their stability brings good profit to the company. When receiving an urgent order, it is very important to provide the necessary order on time so as not to lose stable customers.

Global Export and Holding Companies and Asia Pacific for the company bring less profit among other regions, it is necessary to ensure that it does not bring losses to the company.

Although Asia Pacific generates little revenue, but this region is consistently placing orders, so their loss will lead to a loss of stable revenue. It is necessary to provide the necessary list of services with quality service. It should be noted that costs for these regions must be controlled.

Global Export and Holding Companies should spend less on this region and can sacrifice certain services for this group to provide quality, urgent supply to more profitable regions.

Profitability is determined as follows:

1. We will divide the salary costs equally between all regions - you need to divide the total salary for the year by the number of regions (column 2 of Table 3.5).

Table 3.5 – Profitability

Regions	Expenses for a single region, million dollars	Total number of orders	Communication costs for region, thousand dollars	Total costs for servicing one client for region, thousand dollars	Profit from region, million dollars
North America	376	106 846	12 282	12 658	16 244,3
Middle Americas	376	120 800	13 887	14 263	12 526,7
South America	376	144 209	16 577	16 953	9 477
EMEA	376	76 207	8 760	9 136	8 022,9
Asia Pacific	376	81 649	9 386	9 762	6 838,2
Global Export	376	933	107	483	1 132,5

and Holding Companies					
Amount		530 644	70 000	-	54 241,6

4. Table 3.1 shows data on the company's annual expenses for communications.

5. Based on the number of orders in each region, you can calculate the costs of communications:

- we count the number of all orders (for all quarters and for all regions) (column 3 of Table 3.5);

- we determine the company's expenses for communication with 1 client (divide the expenses for communication for the year by their total number, multiply by the number of orders and multiply by 100%) (column 4 of Table 3.5)

6. Total service costs consist of salary costs calculated for each region and costs of communications with it (column 5 of Table 3.6).

7. We determine the profitability of the region (the difference between annual income and total service costs (column 6 of table 3.5).

To sum up, we can say that all regions bring good profits to the company. Companies should continue to develop each region and try to meet their needs.

It can be said that customer service and customer satisfaction are applied in the process of logistics management, it means that logistics management combines all stages into one process, starting from procurement and ending with delivery to the final customer, which ultimately aims at customer satisfaction as well as optimization company results.

3.2 Design proposals for the organization of logistics service for urgent orders of AB InBev

All successful business leaders recognize the vital importance of efficiently organized logistics. Continuous logistics service is a key element to meet customer requirements. It is important for the company to organize logistics services.

Speed and reliability are the most important parameters for the competitive environment in logistics systems, that is, the main task is to provide available items ordered by customers, even in changing circumstances. Customer satisfaction and service quality are among the success indicators that define the consumer's perspective.

In the era of modern decisions regarding the acquisition and transfer of information, information systems play an increasingly important role in the implementation of enterprise processes. Due to the increase in the volume and complexity of electronic commerce, information systems are the only way to accurately manage the flow of goods to the customer. Logistics information systems are an important prerequisite for effective operational logistics of the enterprise. Without the interactive transmission of current information, logistics flows cannot be properly ensured. Not only evidence-based input and business analysis, but also user experience databases play an important role in logistics decision-making and option selection. That is why the company long ago started implementing various information systems to facilitate and improve its business. The company has its own delivery in Brazil, which takes place online and is delivered directly to the customer's home. Buying online is associated with an increased risk of customer dissatisfaction with the delivered product and the need for its replacement or refund. That is why it is effective for the company to monitor and reduce the risk of dissatisfaction. There is a need for a better understanding of consumers when it comes to their urgent orders, especially when it comes to large retailers.

AB InBev has many branches around the world and it is sometimes very difficult to track orders, which leads to the loss of customers. When receiving an order from a client, it is important to check whether it will be fulfilled on time, whether there are enough stocks, whether the transport is available for its shipment, and to constantly maintain contact with the client in case of changes and provide

information on the fulfillment of the order. Many employees from different departments are involved in all these operations. It is very important that communication and problem solving happen quickly. Such a quick response is possible in the presence of a common information system.

Currently, a lot of time is spent on finding, clarifying information, checking the availability of reserves in the warehouse, agreeing on the possibility of changing the production plan, and transferring information to the client. The main customers of the company are not people who buy beer once, although the company is developing in this direction to provide purchase services directly from the warehouse. Currently it is implemented only in Brazil, due to the fact that each country has its own laws regarding the sale of alcohol, it is difficult to implement it in the entire market where the company operates. Mainly, goods are bought by retailers, large stores and distributors, to whom buyers turn, they come to the store and choose the goods from the shelves, therefore immediately receiving the goods that have expired and for which there is a sharp cut in demand is very important for maintaining profits.

You are probably familiar with the situation when each department of the company uses different software, which is not always compatible with each other, so you have to manually enter the same data into the system several times. This takes up valuable time, and errors and inaccuracies during such information entry are simply inevitable. Therefore, quite often production planners do not know the exact amount of inventory in warehouses, and accountants do not have access to information when a certain employee goes on vacation.

Based on the results of the research, it is possible to make a proposal for the implementation of a joint module for AB Inbev. Since the company operates in the market of Europe, Africa, Asia and America and tries to satisfy the needs of customers as much as possible, it should implement a program that will help to unite all departments into one large database system. So that each employee can find information about the order and product balances in the warehouses of his region. An example of such a system at the moment are ERP system (Enterprise Resource Planning System), which will help to integrate its own system into a single system

that will provide better services and help keep track of stocks. (Figure 3.1). The company can also develop its own application similar to this one.

ERP is an organizational strategy for integrating production and operations, human resource management, financial management and asset management, focused on the continuous balancing and optimization of enterprise resources through a specialized integrated application software package that provides a common data and process model for all areas of activity.



Figure 3.1 – ERP system [43]

ERP systems with the participation of the Big Four companies, in the 2000s there was a consolidation of suppliers, a significant number of ERP systems for small and medium-sized businesses appeared, the most famous suppliers of which were the Sage Group and Microsoft.

As a characteristic feature of the ERP strategy, there is a fundamental approach to using a single transactional system for the vast majority of operations and business processes of an organization, regardless of the functional and territorial disunity of

their places of origin and passage, the obligation to bring all operations into a single database for subsequent processing and receipt real-time balanced plans.

The modular principle of the organization allows you to implement ERP-systems in stages, sequentially putting into operation one or more functional modules, as well as choosing only those that are relevant to the organization. In addition, the modularity of ERP systems allows you to build solutions based on several ERP systems, choosing from each of the best modules in its class.

Some of the modules are necessary for almost every enterprise, as there are basic business processes, such as financial management, sales, personnel, procurement, etc. However, there are also specialized solutions for various industries and services.

Financial modules, primarily the general ledger, are considered by many practitioners to be the central components of the ERP system, and the formation of financial statements using the ERP system is considered one of the actually mandatory conditions for the positive results of the due diligence procedure.

Among the financial ERP modules there are many different functional blocks, in different systems and different versions, their various layouts are distinguished, among the most common (by organizational units):

- accounting: general ledger, accounts receivable (debtors), accounts payable (creditors), consolidation;
- accounting and management, controlling: cost and income accounting by origin, by product, by project, costing;
- treasury: liquidity management, cash flow management (including bank accounts and cash desk), interaction with banks, debt and borrowing management;
- financial and managerial: fixed assets management, investment management, financial control and risk management.

Also, sometimes financial planning and management of key performance indicators are included in the financial modules of ERP systems, but the main developers supply separate specialized software products for these functions.

One of the fundamental differences between ERP as a strategy and the use of separate applications for MRP II and payroll automation was the idea of close integration of information about labor resources for the possibility of operational planning and management of operations, taking into account information about the availability of personnel, the ability to accurately calculate costs by origin and products in accordance with information on the compensation of the personnel involved.

The modules of the operating block cover the activities of the organization to create products and services and the necessary functions to ensure these processes. While the HR and finance modules are fairly generic across organizations, many of the operational modules are more industry-specific, as approaches to resource transformation vary across industries. In most systems, the following groups of operating modules have been formed:

- Logistics: procurement, supplier relationship management, supply chain and transportation management, inventory management, warehouses, inventory;

- Production: specification management (Bill of materials; in discrete industries) and recipes (in Process manufacturing; in chemical, metallurgical, food and a number of others), production planning, product accounting, production program management;

- Providing: management of maintenance and repairs of equipment, capacity planning, transport management;

- Sales: pricing, processing and configuration of orders, sales, after-sales service.

ERP system technologies will help to optimize and speed up sales, marketing, service and operational processes of the organization. It includes a set of ready-made tools and processes for different areas and business models. Company data is entered under the ready-made template and a common corporate portal is obtained, which unites and simplifies communication within the company. The corporate portal contains everything you need to organize joint work. The product is a complete management system of the company, which combines the resources of the enterprise with various divisions. That is, all the necessary resources, units, functions and other

tools necessary for effective work are located in one computer system. Access to information is given to all units at the enterprise, which significantly simplifies work and ensures information exchange.

The basis of the program is the embedded ERP system, which is configured for communication with customers, every request entering this system goes to the employees of the region in which the order needs to be fulfilled and has several stages of execution.

1. The first stage is displayed as a "New" order. That is, the order has just arrived at the company.

2. The second stage is "in work", which means that the manager has accepted the order and is working with it.

3. The third stage is "completed", the order is processed and ready for shipment.

4. The fourth stage is "shipped". The order is sent to the client in a pre-arranged way.

5. The fifth stage is "received", with the help of this stage you can track the provision of the service, this stage is set by the customer after receiving the order.

It is also possible to connect various communication channels to the system, such as mail and other convenient methods of correspondence, as well as telephony. That is, with the help of the contact center, employees will be able to divide appeals and they will be immediately displayed in the system, and clients will continue to communicate as they are used to and as convenient for them.

Received orders are quickly displayed in the system (Figure 3.2) and all employees can see the order fulfillment process.

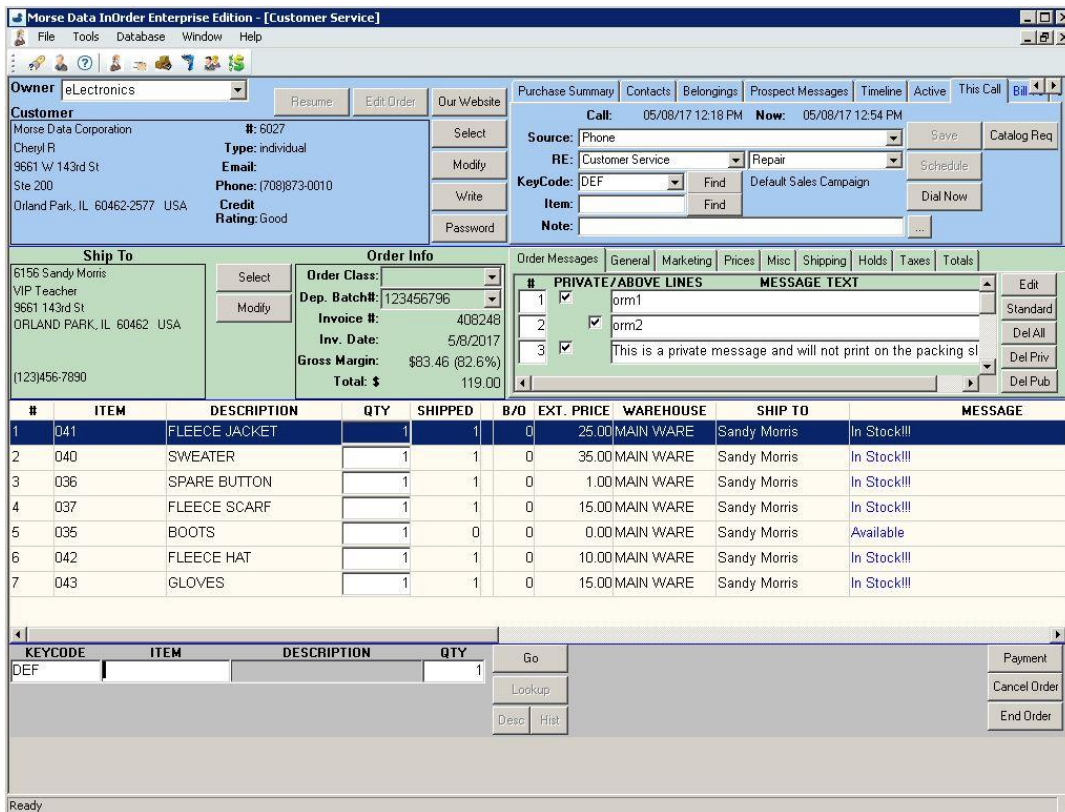


Figure 3.2 – Example of ERP system [40]

It is also possible to track the productivity of each worker and the amount of work done, determine the action plan for each part and set deadlines, which is very important when receiving urgent order. (Figure 3.3).

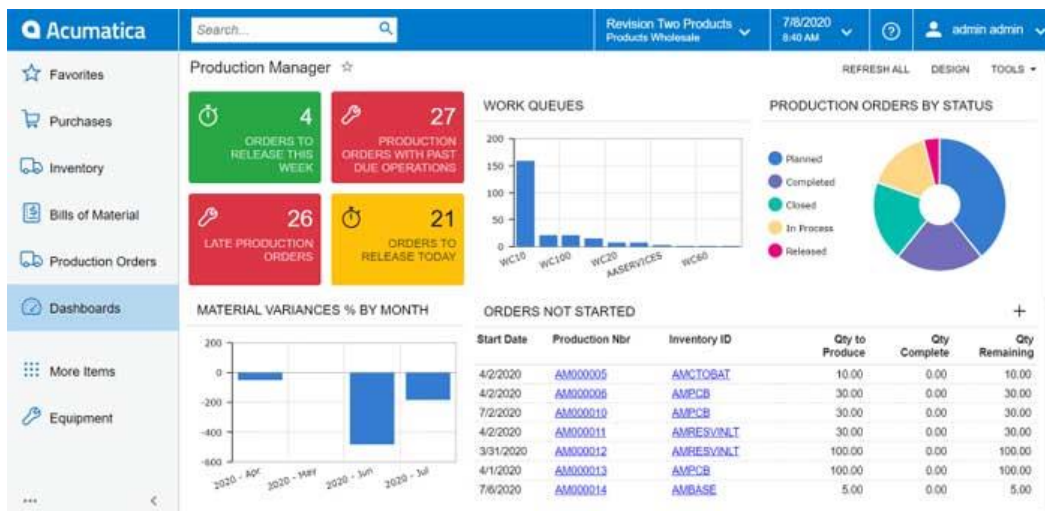


Figure 3.3 – ERP solutions for personal [47]

In the system, companies can install the function of urgent orders, which will immediately appear in the responsible persons, as in the example of Figure 3.4.

To implement this ERP system, the company should conduct an analysis of the effectiveness of investments in this project.

The relationship between customer satisfaction and logistics management has many indicators; one of the most important indicators is the cost of the product. To obtain correct information, the company should conduct an analysis that aims to reduce costs from suppliers to the end consumer, taking into account quality and time. The two main indicators of customer satisfaction are costs and waiting time. Both indicators of consumer satisfaction refer to the logistics process, which leads to receive of cheap variant.



Figure 3.4 – Urgent orders in ERP system [47]

How can an ERP system improve the company's work?

- significantly speed up document flow between departments;
- get quick access to information;
- effectively manage the work of remote departments, branches, and employees.

It is especially relevant for large enterprises in which branches are distant from each other (located in different cities or even countries and continents). Yes, various accounting methods and computer systems can be used in such divisions, and in order not to get confused in all this, ERP is used. With the help of the Internet, it is easy to get access to the necessary information, and the unified multi-currency system helps to reduce the number of working personnel and simplify accounting processes.

In the other hand implementing new technologies, such as the ERP system: which is a software used by many companies to gather all the information of the enterprise, and its requires the involvement of several departments within the enterprise itself and its various stakeholders, to establish a direct transfer of purchase and manufacturing information between the enterprise and its various stakeholder.

A Lean ERP system could be also a solution for the urgent orders, which integrates the benefits of Lean Manufacturing and ERP into a unique initiative

through the development of ERP modules that offer lean manufacturing tools in their ERP systems, such as the electronic Kanban which the basic functionalities of Kanban system are kept at the level of electronic Kanban.

3.3 Evaluation of the effectiveness of the implementation of the logistics service system for consumers at the AB InBev enterprise

It is necessary to determine for which products it is worth creating insurance stocks, and for this it is recommended to regularly review the KVI-basket, products of group A (the top category, the stock of which must be kept). It is equally important to take into account the change in the structure of group A.

To evaluate the effectiveness of the implementation of the logistics service system, we determine the discount rate, which allows us to estimate the income from future investments

Discount rate = 10%

Let's calculate the discounted cash flows using the cash flows and the investment rate. Discounted cash flow is a concept of the time value of money, it is quite relevant, as the value of money is constantly changing. (column 5, Table 3.8)

$$(3.1) \quad PV_i = CF/(1+r)^i$$

where PV_i - the current cash flow of the i -th period;

CF - cash flows;

r - the discount rate.

Calculation of current cash flows:

Settlements are made in thousand US dollar currency:

$$PV(1) = 95\,700 \cdot (1+0.1)^{-1} = 87\,000;$$

$$PV(2) = 120\,800 \cdot (1+0.1)^{-2} = 99\,835;$$

$$PV(3) = 150\,300 \cdot (1+0.1)^{-3} = 112\,923;$$

$$PV(4) = 220\,300 \cdot (1+0.1)^{-4} = 150\,488;$$

$$PV(5) = 280\,600 \cdot (1+0.1)^{-5} = 174\,231.$$

After determining the discounted cash flow for each period, we calculate its amount using the formula:

$$\Sigma CF (PV) = PV(1) + PV(2) + PV(3) + PV(4) + PV(5) \quad (3.2)$$

$$\Sigma CF (PV) = 87\,000 + 99\,835 + 112\,923 + 150\,488 + 174\,231 = 624\,477 \text{ th. } \$$$

1. Calculate the NPV.

NPV shows the amount of profit that awaits project participants.

In finance, net present value (NPV) is defined as the sum of the present values (PV) of the input and output payments (costs and revenues) associated with an investment or project throughout its lifetime. The change in the value of money over time means that the net present value depends not only on the amount of expenses and income, but also on the time at which these payments occur and the interest rate at which the payments are discounted. Often, this term also describes the appropriate method of investment evaluation, which, according to international standards of business planning, is one of the main indicators of the economic efficiency of investment projects.

The interpretation of the net present value depends on the objectives of the investment analysis and the chosen discount rate. For example, if discounting occurs when using the rate of return for investments with a similar degree of risk, then:

NPV > 0 means that the investigated investment promises above-average returns,

at NPV < 0 these returns will be lower than average,

at NPV = 0, the investigated investment does not differ from the average one.

If the project does not allow a one-time investment, but a consecutive investment of financial resources for m years, then the formula for calculating NRV is modified as follows:

$$NPV = \sum CF (PV) - IC \quad (3.3)$$

where NPV - net present value;

$\sum CF (PV)$ - sum of the discounted cash period;

IC – investment.

$$NPV = 87\,000 + 99\,835 + 112\,923 + 150\,488 + 174\,231 - 600\,000 = 24\,477 \text{ th.}$$

\$

The data is displayed in the Table 3.8.

Table 3.8 - Calculation of NPV

Years	Sum investments, thousand dollars	Cash flows, thousand dollars (CF)	Discount rate, 10%	Discounted (pure) money flows, thousand dollars	Cumulative discounted income, thousand dollars (NPV)
	-600 000				-600 000
2021		95 700	$1/(1+0,1)=0,90$	87 000	-513 000
2022		120 800		99 835	-413 165
2023		150 300		112 923	-300 242
2024		220 300		150 488	-149 754
2025		280 600		174 231	24477
Amount		867 700		624 477	

Примечание [Is1]:

2. PI profitability index (profitability index).

The profitability index is an index of the efficiency of the investment project, it shows the level of income per unit of costs, that is, how effective the investment will be - the greater the value of this index, the higher the monetary return on investment in the project.

The profitability index is calculated according to the formula:

$$PI = \Sigma CF (PV) / IC \quad (3.4)$$

If $PI > 1$ then the project is accepted, if $PI < 1$ then the project is rejected, and if $PI = 1$ project is neutral.

When evaluating projects with the same amount of initial investment, the PI criterion is fully consistent with the NPV criterion.

$$PI = 624\,4777 / 600\,000 = 1.04$$

3. Simple payback period.

The payback period determines how much time is needed to cover the costs of the project or to return funds, investments by the enterprise at the expense of funds received through the main type of activity from this project.

Investments 600,000 thousand dollars.

In the first year, the income is 95,700 thousand dollars, that is, the investment will not pay off.

In the second year, the income was 120,800 thousand dollars, that is, in two years the income was 216,500 thousand dollars, which is less than the amount of investments.

In the third year, the income was 150,300,000 dollars, that is, in three years, the income amounted to 366,800,000 dollars, which is less than the amount of investments.

In the fourth year, the income was 220,300 thousand dollars, that is, in four years, the income was 587,100 thousand dollars, which is less than the amount of investments.

In the fifth year, the income was 174,231,000 dollars, that is, for five years, the income amounted to 761,331,000 UAH, which is more than the amount of investments.

The payback period is simple = 4 + (remaining debt to the investor at the end of the third year) / cash flow for the fourth year.

Simple payback period = $4 + 12,900/174,231 = 4.07$ years.

4. Calculate the discounted payback period.

The discounted payback period is the term for which project implementation costs are repaid through revenues discounted at a given interest rate.

The discounted payback period is always longer than the simple payback period at the discount rate.

The discount rate is the minimum allowable return on invested capital that can be obtained from alternative investments with the same level of risk.

The discounted payback period allows you to determine the profitability of the project, rank various projects, and highlight projects with a quick payback. The method is based on the fact that the more time, the higher the probability of losses in the project.

Investments 600,000 thousand dollars.

In the first year, the net cash flow is 87 000 thousand dollars, the investment will not pay off.

In the second year, the net cash flow was 99 835 thousand dollars i.e., for two years, the discounted income amounted to 186 835 thousand dollars, which is less than the amount of investments.

In the third year, the net cash flow was 112 923 thousand dollars, i.e., over three years, the discounted income amounted to 299 758 thousand dollars, which is less than the investment amount.

In the fourth year, the net cash flow is 154 488 thousand dollars, i.e., for four years, the discounted income was 454 246 thousand dollars, which is less than the investment amount.

In the fifth year, the net cash flow is 174 231 thousand dollars, i.e., for 5 years, the discounted income was 628 477 thousand dollars, which is more than the investment amount.

Discounted payback period = $4 + (\text{remaining debt to the investor at the end of the fourth year}) / \text{net cash flow for the fifth year}$.

Discounted payback period = $4 + 145 754 / 174 231 = 4.84$ years.

5. Internal rate of return.

The internal rate of return is an interest rate that shows the profitability of an investment, it is not affected by external factors.

Let's calculate by the selection method.

NPV for a discount rate equal to 10%, NPV = UAH 24,477,000.

Now let's assume that the discount rate is 15% and calculate the NPV.

$$\text{NPV} = 95\,700(1+1.5)^1 + 120\,800(1+1.5)^2 + 150\,300(1+1.5)^3 + 220\,300(1+1.5)^4 + 280\,600(1+1.5)^5 - 600\,000 = 38\,280 + 19\,328 + 9\,619,2 + 5\,639,68 + 2\,873,34 - 700\,000 = -524\,259,78 \text{ th. } \$$$

If at a rate of 10% the NPV is positive, and at a rate of 15% it is negative. So the internal rate of return IRR will be within 10-15%.

6. Let's find the internal rate of return IRR

The interest rate at which the company's future income and the cost of the investment are compared. The term "internal" emphasizes the fact that this interest rate is a characteristic of the investment and does not depend on the environment, for example, on market interest rates, cost of capital, inflation.

The method of evaluating investments, which is based on the internal rate of return, consists in comparing the IRR with the minimum acceptable profitability (eg, the marginal cost of capital). If the IRR is less than the minimum acceptable rate of return, then the investment should be rejected.

IRR is usually used to evaluate the feasibility of investments or projects. The higher the IRR indicator, the more desirable the implementation of the project is. For example, if all projects require the same initial cost, then the project with the highest IRR is the best and should be implemented first.

The IRR is calculated according to the formula:

$$\text{IRR} = r_a + (r_b - r_a) * \text{NPV}_a / (\text{NPV}_a - \text{NPV}_b) \quad (3.5)$$

$$\text{IRR} = 10 + (15 - 10) * 24\,477 / (24\,477 - (-524\,259,78)) = 10,2\%$$

The internal rate of return is a relative (percentage) indicator, it is an indicator of the efficiency, quality and profitability of investments independent of the scale of the project. This distinguishes the IRR from the net present value, which is an indicator of the value or size of the investment and is measured in monetary units of the initial period of the project.

Therefore, in order to make a final decision by the general director of the company, it is necessary to prepare information about this project and make a calculation of the main indicators for obtaining information about the feasibility of implementing an investment project:

- Net discounted income (NPV) for 5 years,
- Profitability (profitability) index (PI),
- Payback terms are simple and discounted,
- Internal rate of return (profitability) (IRR).

3.4 Chapter summary

According to the above calculations, we see that all regions bring income to the company. The company should continue to cooperate with them at the highest level. The North America region brings the company the most revenue, so they need the highest level of service and the response to urgent orders for this region must be at the highest level. The Middle Americas, South America, EMEA regions generate average revenue for companies compared to North America, they should be held and well served as these regions are very stable. Global Export and Holding Companies and the Asia Pacific region for the company brings less profit among other regions, therefore, when receiving an order that cannot be fulfilled, whether it is necessary to sacrifice production for other customers, you must first make sure how profitable it will be and whether it is appropriate to fulfill the order.

AB InBev has branches and production facilities all over the world. Now, each branch has its own system, with the help of which employees can process customer orders, provide information about product balances in their own warehouse, analyze financial transactions, determine the effectiveness of a certain product, and more. But all these operations are limited only to a certain region, that is, the same information on clients cannot be obtained by an office located in a neighboring city or neighboring country.

To avoid this, AB InBev should implement a joint module. Such a system is currently an ERP system, which will help to integrate its own system into a single system that will provide better services and help track inventory. Thus, upon receiving an urgent order, employees will be able to react more quickly, exchange information with each other more quickly, have an accurate idea at which stage of the order execution and which departments should be involved to fulfill the order, will be able to constantly and easily maintain contact with customers and inform about changes and make easier decisions problems faced by production when changing production plans, changing delivery, purchasing, etc.

ERP technologies will help to optimize and accelerate the sales, marketing, service, procurement and operational processes of the organization. It includes a set of ready-made tools and processes for various fields and business models.

To implement this project, I conducted an implementation efficiency analysis.

We get the following indicators: the payback period is 5 years, the profit is 24,477 thousand dollars, the internal rate of return is 10.2%, the profitability index is 1.04%

So, the project is successful and should be considered by the company. The efficiency of implementing a logistics service system has a positive indicator, as the company will pay back its investment, and most importantly, the project will bring the company future profits due to improved response to urgent orders.

CONCLUSIONS AND RECOMMENDATIONS

The importance of real-time decision-making in today's globally-connected supply chain ecosystem cannot be more real.

Real-time data and insights not only afford businesses the opportunity to view and track up-to-the-minute needs and demands from customers, it also helps them plan and manage any potential slowdowns or bottlenecks across the entire length of their supply chain stream.

Real-time visibility into overall demand can also help businesses identify trends or fluctuations in customer need for parts or products, allowing them to adjust production plans and/ or plant/ product line allocations ahead of these fluctuations to significantly impact production output and business outcomes. For example, real-time demand and supply planning capabilities can help a business in France detect a downward trend in demand in Germany, and accordingly reallocate materials and resources to not only adapt to the trend, but make the most of it while also actively preventing overstocking and wastage.

It is possible to achieve truly intelligent supply chain planning.

To succeed in an increasingly competitive global market, businesses must adapt effectively and look for simple, practical ways to connect their supply chains from start to finish. This process of achieving connected supply chain planning involves the following steps:

1. Integrate supply chain planning with enterprise planning.
2. Sense, anticipate, and manage customer demand.
3. Always retain the flexibility to cope with change.
4. Complying with Approved Supplier Program.

The modern market requires enterprises to constantly search for the most effective technologies for organizing and managing production activities. The manufacturer must be ready under any conditions for urgent fulfillment of consumer orders and quick response to changes in demand.

There may be times when you need to purchase a product or service immediately due to an emergency situation. During times of crisis, there can be many considerations that need to be made.

The main principles for emergency procurement and supply chain preparedness remain the same no matter the event, whether it be a force of nature, pandemic or epidemic.

Road freight transport typically dominates in urban delivery operations. However, an increasing number of trials and commercial operations have started in the past 10 years attempting to use non-road modes in a wide range of cities including: Paris, Berlin, Madrid, Amsterdam and others. The research establishes the existing scale of rail freight in two comparable cities (London and Paris/Ile de France) and compares the development process in terms of the stakeholders, the infrastructure and planning issues and the nature of the operations.

In short, the importance of real-time decision-making in today's globally-connected supply chain ecosystem cannot be more real.

At the EU level attention on the possibility to shift at least some traffic from road to rail (or perhaps to use rail in combination with clean vehicles making the last mile delivery) has been increased by the EU White Paper on Transport (European Commission, 2011).

In general rail is a little used mode for urban freight distribution, particularly in relation to flows of consumer goods towards the latter stages of the supply chain. Rail has been involved in urban freight activities for a number of years but complex requirements and obstacles have often prevented the operations from becoming a long-term success. However, although some schemes failed, others succeeded and have become valuable examples of how rail can be successfully incorporated in European urban supply chains.

On the other hand, space and infrastructure limitations present in urban areas also pose a barrier to a potential intermodal operation while limited relative environmental advantage of rail over road, are also often argued. Often rail freight terminals are situated close to the city centers while the shippers and receivers of

intermodal freight are based in the outer areas of the city with good connection to highway intersections.

Other barriers leading to limited opportunities for urban rail freight include perceived high costs of rail infrastructure and related systems, limited physical flexibility, land pressure and the lack of available capacity on the infrastructure due to growing passenger rail traffic.

Road transport has the highest share of freight mode in most ITF countries (International Transport Forum.)

In 37 out of these 51 countries, road transport is the predominant mode; in 35 of these countries road transport represents more than 50% in the modal split. In only 14 out of 51 ITF countries is a non-road transport mode the dominant transport mode.

Inland waterways represent the highest modal share in the Netherlands, coastal shipping in Norway and Japan and pipelines in Azerbaijan, Armenia and Belarus, but these are relatively rare cases.

Real-time data is increasingly in demand among customers, and that means logistics companies will need to focus on it. There are now a large number of startups whose solutions provide supply chain transparency, providing technology that facilitates rapid response to change, allowing companies to use real-time data. Such data includes traffic patterns, weather conditions in a specific area, the condition of roads or access roads to ports, which allows for the optimization of delivery routes.

A successful supply chain depends on information and communication as much as it does on transportation. Day-to-day decisions are often shaped by exceptions and disruptions in the delicate balance between supply and demand. To stay abreast, supply chain managers must be able to track the movement of goods along the supply chain, which includes the ability to quickly identify bottlenecks or other problems. This information helps managers decide whether to reroute products, reassign employees, workstations, or equipment, lay off or relocate production, increase or decrease supplier orders, or take other actions. In doing so, they can often mitigate supply chain challenges caused by sudden changes such as shifting consumer demand.

Managers must make decisions and react quickly. To support the decision-making process and improve efficiency, companies use a number of supply chain management applications

Urgent international delivery is air delivery. Urgency means that no more than two or three days pass from the moment the order is placed until it is received by the recipient. Given the huge distances, it will be possible to meet such deadlines only if you use air transportation.

A simple example. A Ukrainian company selling goods in the USA on Amazon and/or other marketplaces (Ebay, Etsy, Walmart, etc.) found that it had not taken into account the pace of sales and the volume of remaining goods. As a result, there was a real prospect of stop activity and, as a result, deterioration of its position compared to competitors. What is the way out? Urgently deliver your goods to the warehouse in the USA. Therefore, it is necessary to use urgent air delivery of goods.

Real-time supply by sea

The sea carries more than 80 percent of the world's traded goods, most of which sail inside 40-foot-long steel containers stacked by the thousands atop some of the largest vessels ever built.

Sea delivery is the best solution when it is necessary to deliver goods in bulk, complying with the terms and rules of customs clearance of the cargo upon import into the country, and to optimize costs as much as possible.

This method is not fast, it is not suitable for urgent transportation, but it takes about 35-40 days, which can be very profitable if you plan in advance. If the terms are short, you can use other methods of cargo delivery.

But there are short sea freights that can save time and costs. Short sea shipping, abbreviated as SSS, is the maritime transport of goods over relatively short distances, as opposed to the intercontinental cross-ocean deep sea shipping.

A study was conducted at AB InBev company.

Anheuser-Busch InBev SA/NV, commonly known as AB InBev, is an American- Belgian multinational drink and brewing company based in Leuven, Belgium. AB InBev has a global functional management office in New York City,

and regional headquarters in São Paulo, London, St. Louis, Mexico City, Bremen, Johannesburg and others. It has approximately 630 beer brands in 150 countries.

AB InBev's brand portfolio includes highly popular beer and soft-drink brands. The company classified its brands as Global Brands, International Brands, and Local Champions.

In December, company announced new global purpose: “We Dream Big to Create a Future with More Cheers”.

After analyzing the financial indicators, the following research results were obtained that in 2021, normalized EBITDA increased 11.8%, while normalized EBITDA margin contracted 118 bps, reaching 35.4%.

Consolidated volumes grew by 9.6%, with own beer volumes up 9.7% and non-beer volumes up 8.7%, driven by a recovery year-over-year as the COVID-19 pandemic negatively impacted volumes in 2020.

Consolidated revenue grew by 15.6% to 54 304m US dollar, with revenue per hectoliter growth of 5.5% driven by premiumization and revenue management initiatives. Combined revenues of global brands, Budweiser, Stella Artois and Corona increased by 17.6% globally and 22.9% outside of their respective home markets.

Consolidated Cost of Sales (CoS) increased 17.4%, and increased 7.2% on a per hectoliter basis, driven by anticipated transactional foreign exchange and commodity headwinds.

Consolidated selling, general and administrative expenses (SG&A) increased 13.9% due primarily to higher variable compensation accruals and elevated supply chain costs.

Consolidated other operating income/(expenses) in 2021 increased by 32.3% primarily driven by higher government grants and sales of non-core assets.

Company wanted to choose a strategy of competitive advantages is the adaptation of one's own capabilities to specific market conditions. And in this regard, the basic strategies of competition act as a fundamental, general economic basis for the construction of practical actions of competitors.

AB InBev applies a strategy of rapid response to market needs, it has specific characteristics: it has a flexible product policy, with a high degree of product differentiation; has a highly qualified staff and a marketing service focused on finding highly profitable projects.

They implemented Direct-to-consumer business. Consumers are at the center of everything. So company is developing direct-to-consumer channels to provide the best experience across all beverage occasions. Direct-to-consumer portfolio is made up of fast-growing e-commerce platforms along with approximately 12,000 brick-and-mortar retail stores to create an ecosystem that has generated nearly 1.5 billion USD in revenues in 2021.

When receiving an urgent order, managers have to accept in a short time, which will be the most economically profitable and at the same time will meet the requirements of customers. Such as increasing the delivery batch, changing the order receipt date, changing the place of delivery, changing the product, etc.

In the company AB InBev, this happens quite often, since it is based all over the world, and beer is a product that is quite popular among buyers.

The company has been transforming supply chain from seed to sip. In 2021, combined Supply and Procurement functions to create one interconnected and streamlined Global Supply Team led by Peter Kraemer, Chief Supply Officer.

After analyze ABC – XYZ analyze of AB InBev company we can say that all regions bring good profits to the company. Companies should continue to develop each region and try to meet their needs.

AB InBev has many branches around the world and it is sometimes very difficult to track orders, which leads to the loss of customers. When receiving an order from a client, it is important to check whether it will be fulfilled on time, whether there are enough stocks, whether the transport is available for its shipment, and to constantly maintain contact with the client in case of changes and provide information on the fulfillment of the order. Many employees from different departments are involved in all these operations. It is very important that

communication and problem solving happen quickly. Such a quick response is possible in the presence of a common information system.

Based on the results of the research, it is possible to make a proposal for the implementation of a joint module for AB Inbev.

So that each employee can find information about the order and product balances in the warehouses of his region. An example of such a system at the moment are ERP system.

ERP system technologies will help to optimize and speed up sales, marketing, service and operational processes of the organization. It includes a set of ready-made tools and processes for different areas and business models.

That is, all the necessary resources, units, functions and other tools necessary for effective work are located in one computer system. Access to information is given to all units at the enterprise, which significantly simplifies work and ensures information exchange.

A study of the relevance of the ERP system implementation at the enterprise was conducted. We get such results: the payback period is 5 years, the profit is 24,477 thousand dollars, the internal rate of return is 10.2%, the profitability index is 1.04%

So, the project is successful and should be considered by the company. The efficiency of implementing a logistics service system has a positive indicator, as the company will pay back its investment, and most importantly, the project will bring the company future profits due to improved response to urgent orders.

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