

1 – The Industry:

In a **historical perspective**, logistics started in ancient Greece. Logistics actually comes from the word “logos,” which means reason or rationality. The job of the first logisticians was actually to make sure the goods came to the right place at the right time. However, logistics as we know it today begun in the scenario of war, in the second world war. There was a growing demand to have shipments of goods to warzones that were hard to reach. And so after the war logisticians brought their knowledge and expertise from the war to the private sector in the 1950s. [11]

And thus the need for delivery and storage of goods grew larger and the individuals and businesses started expecting to get goods faster, cheaper and more flexible. And there the concept of RAM (Reliability, Availability and Maintainability) Logistics was born as a way to **fulfill the need for trust in the providing of products**. This allowed for global exports and development of some business models such as outsourcing became possible. The **added value delivered raised** tremendously as manufacturers, retailers and even private vendors **had now the possibility to sell to every part of the globe for relatively affordable prices in a relatively fast way**. [14]

This created a huge network of stakeholders that, by definition, support the industry of logistics and transportation. These are, not only warehouse managers and workers of the supply chain industry but regular people like you and me that interact daily as customers. However the main **stakeholders** that drive this industry are the suppliers (these include companies such as DHL and CTT), governments, as these allow for the trade between nations and must always be accountable for the trade to happen. And lately environmental partners have been intervening with an active role in this industry.

The development of this industry allowed for an “everything readily available for relatively cheap” society we know and love today. And made possible realities such as online shopping (and the deriving expression of “Physical Internet” as online services have such a huge impact on the physical reality of this sector), exotic world wide products accessible in convenience stores, restructuring of the manufacturing process to cost effective and availability focus (for instance in the production of fabrics, where the production process literally goes around the world before reaching the store).

The most common business models in this sector in a business to business (B2B) perspective are:

- **LSP** (or Logistic Service Provider), these are freight forwarders. Usually 3rd and 4th party service providers who serve retailers, manufacturers and wholesalers
- **Carriers**, these are goods transported in bulk by trucking, rail, sea and even air. This type of freight differs from the first as they usually serve the companies who are LSPs, and serve as a type of broker. [8]
- **CEP** (or Courier Express Parcel) serve not only manufacturers but retailers and other companies as well. This is usually the most profitable business model among the 3.

On the other hand of the referred business models only CEP performs services in a Business to Consumer (B2C) segment. [1]

As we saw previously the growth of the internet had a high impact on this sector, but this is certainly not the only **role of IT** here:

- **Decision support systems** are an essential need for everyday use of organizations in the industry of logistics and transportation. Such uses can be: **Estimate demand, stock management**
- **Communicating with clients**, products and services **suppliers** as well as governments and tax collector authorities such as customhouses. It is increasingly important for the end user to know about the products and services being delivered. For instance, when I order a product from an online store I want to always know where the product I ordered is since it left the warehouse until it reaches my door.
- **Optimization of routes** is an increasingly important theme in the cost effectiveness of the whole process, as well as a way to help on the stakeholder decision making as well as the end user decision making (For instance will I buy this product with lower price or do I buy the more expensive other one with faster delivery?).

2 – The Present GRC

To assess the main generic concepts, frameworks and requirements for governance, risk or compliance (GRC) in the industry, the largest logistics company worldwide, DHL, and their practices are examined as a reference.

The primary goal of the compliance management system of DHL is to prevent possible violations or to detect them early so that appropriate measures can be taken. The continuous analysis of the Group-specific risk profile is of fundamental importance for the alignment and further development of the system. The focus here is on topics such as bribery and corruption, competition and antitrust law, and fraud and embezzlement. The results of compliance audits and findings from reported violations are also incorporated into the ongoing improvement and further development of the system. Regular training for employees and managers is a key component of the compliance management system, strengthening a compliance culture and raising the awareness of each individual for compliance issues. Managers are expected to live up to their role as role models and pass on the guidelines to employees and business partners. A total of approximately 240 regular audits by Group Internal Audit with a direct reference to compliance aspects are carried out each year. As a supplement to the Group's internal monitoring system, these audits support ongoing compliance activities, serve to identify further compliance risks and the continuous development of the Compliance Program. [2]

As a German stock corporation, Deutsche Post AG declares compliance with the German Corporate Governance Code (DCGK) on an annual basis. This Code presents essential statutory regulations for the management and supervision of German listed companies and contains internationally and nationally recognized standards for good and responsible corporate governance. [3] Concerning risk management, DHL developed their own software platform called DHL Resilience360. Customers besides DHL are for example BMW, Bayer and ZF. DHL Resilience360 is an innovative **supply chain risk management software** platform that helps businesses predict, assess and mitigate the risk of supply chain disruptions. DHL Resilience360's risk mitigation tools provide businesses with the information they need for supply chain visualization, trade compliance and to help provide near real time monitoring of incidents that have the capability to disrupt supply chains. [4]

The main tasks of data privacy management are to make employees and managers even more aware of the issue and to ensure that the Group Privacy Policy is applied throughout the Group. Standardized data privacy controls have been implemented in the processes of all divisions with the aim of achieving additional transparency and comparability. In addition, there is a central process for reporting data privacy incidents. Moreover, modules such as online seminars on various data protection topics, such as the secure handling of personnel or customer data, further raise employee awareness. For managers training on the Group Privacy Policy is mandatory. [4]

The most relevant ISO standards for the transportation and logistics industry are ISO 9001 (standard for Quality Management Systems) and ISO 14001 (standard for Environment Management Systems). DHL has received the external certifications ISO 9001 as well as ISO 14001 for its global management system.[5] Additionally, some other ISO standards might be relevant for logistics companies depending on their focus. ISO/TS 16949 describes the quality management system requirements for supply chain in the automotive industry. ISO 22000 defines requirements necessary for a food safety risk management system. ISO 13485 is a specific standard for medical devices. ISO/TC 104 is confined for the freight holders and specifies determinations in regards to delivery compartments, from their volume and measurements to the way toward stacking and emptying.[6] A standard concerning the whole supply chain is ISO 28000. The requirements of ISO 28000 include the examination of all important aspects in order to increase security throughout the supply chain. The areas affected are financing, production, information management, infrastructure for packaging, storage and the transport of goods between the various means of transport and delivery points.[7]

3 – The Vision:


As we saw in section 1, the **goal** of the **Transportation and Logistics industry** is to provide reliable, fast and cheap deliveries while targeting green transportation solutions. So the role of **digital transformation** is more evident than ever. Its adoption has been seen in 3 main application areas: - **Decision support systems, communications and Optimization of routes and processes**. One plausible vision for this industry relies on **automation** of decisions, communications, logistics and deliveries. To achieve this goal, many processes are going to be converted through a **digitalization**. The use of **Artificial Intelligence** and optimization models [15] allow **improvement** in transportation **efficiency** and help in the **logistics** decision-making process, respectively. The rise of **Internet of Things (IoT)** [15] will enable transporters (trucks, trains, aeroplanes) to continuously send telemetry data about routes, speed, fuel. In terms of optimization we have seen a rise on the adoption of **robots** to automate processes such as **warehouse logistics** and **short distance deliveries**. We also have observed the use of different **geographic information systems** and optimization techniques to improve the delivery routes. Additionally, as the use of **renewable energy** is a current tendency. The usage of **electric and hydrogen vehicles** instead of the conventional fossil fuels will rise. They combine the **reliability** of combustion engines with a **reduced carbon print**.

The importance of timing in delivery services has never been so evident. 41% of consumers are willing to pay a charge for same-day delivery while nearly a quarter (24%) of shoppers said they would pay more to receive packages within a one-or two-hour window of their choosing [18]. The high demand for same-day delivery cannot be overstated [20]. However, most retailers are falling short of this expectation [19].

With the context of this industry in mind, we founded Fastro. Fastro is a **Transportation and Logistics** company that focuses on **automated, ultra-high-speed, transparent, reliable shipping and warehousing efficiency**. We aim to deliver our services in **medium and short distances**. The concretization of this involves a **network of warehouses** that are connected via a TransPod [16]. (This is a novel technology for **Ultra-High-Speed Tube Transportation** based on Electromagnetic propulsion to **ship goods between cities**.) As well as an **automated vehicle fleet** to handle the **last mile deliveries**. To do so, we will make use of **automated systems** in the **logistic processes** in the warehouses. These systems use **artificial intelligence** and **robots** to **organize packages** and **handle all packing processes**, as well as an **IoT sensor network** that allows us to **monitor** everything that's happening in the warehouses. Within each warehouse, we will have a **transpod station** and a set of robotic arms (much like the car production robots nowadays) to **perform cargo shipping processes**. In this way, we can **merge the autonomous "driving" of Transpod with loading/unloading process automation**, reducing costs, improving efficiency, and most important, decreasing stalling times. **Smart beacons** are deployed across at the infrastructure to keep track of in-transit cargo ships. Thus, **customers can track, in real-time, the position of their packages**. In warehouses, all objects transmit information about their current status and storage location. Intelligent delivery solutions collect precise information about the delivery status of a package. For the last mile deliveries, we will deploy **autonomous delivery robots** [17] such as **drones** and **wheeled robots**. They will be used for **parcel delivery**, especially in remote areas or in the rush hour traffic jams of the metropolises to cut on costs. As we saw in section 1, **CEP** is the most profitable business model in this context, so that is the focus of our business. The main business revenues are mainly, collection, packing, delivery fees and additional tracking information. For instance, a customer can pay an additional fee to receive real time tracking. Additionally, it is possible to obtain revenue from data monetization: selling anonymized statistical data for studies or other industries. **Predictive algorithms** will keep track of the latest trends to shorter customers' waiting time, and in a partnership with sellers, we intended to deploy a package cache policy. To take advantage of **modern information systems** and to allow for the proper development of the propositions described, we will have an **integrated management system** empowered by **Artificial Intelligence and the IoT sensor network**. This will allow us to automate **cargo waggons load balancing** and **congestion control** (reduce speed or adjust Transpod departure time to **avoid congestion** at a specific warehouse). This integration approach will also allow us to avoid duplication of effort, making more effective use of senior management time, using resources to implement and manage systems in a more efficient manner, achieving more cost efficient certification and reducing audit fatigue. For the proper functioning of the enterprise we will follow commun standards such as: **ISO 9001** for integrated quality management; **ISO 14001** to establish, implement, maintain and improve an efficient environmental management system and **ISO 45001** for

occupational health and safety. As well a Transportation specific standard **ISO 28000** which includes the examination of all important aspects in order to increase security throughout the supply chain.

4 – The BMC:

The Business Model Canvas		Designed for: 	Designed by: GSI- group J3 and J4	On: 01/05/2020 Iteration: 2
Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
<ul style="list-style-type: none">investorsgovernment, authoritiescertification bodiesindustry (e-commerce..)payment processorsend userssoftware & hardware provider (IoT, Blockchain...)ICT Research centersPacking industry	<ul style="list-style-type: none">service managementdata management and analyticsoperation managementintegrating new tech (Blockchain & automation)	<ul style="list-style-type: none">fast deliveryhigh qualitycheap priceIntegrated storage and delivery servicesreal-time monitoring (internal & external traceability)transparency and trustworthy (for use of standards, norms and certifications)process control flexibilitysmart decision support (data driven approach)resource efficiency (financial & environmental)highly scalableeco friendly (no fossil fuels)	<ul style="list-style-type: none">customizable deliverycustomer service (personal, telephone and online support)customer feedbacktraceability, supportdata dashboard	<ul style="list-style-type: none">People with time constraintsmass market (individual customers & businesses)producerretailers
	Key Resources <ul style="list-style-type: none">vehicles (trucks, drones)Transpod gridinfrastructure (warehouses, offices, lockers)delivery & warehouse robotspersonel (driver, researchers)IT know-howinternet (5G)Investment capital		Channels <ul style="list-style-type: none">advertisementB2B marketingwebsite, social media, emailindustry & research associationsAPP (for traceability, support, data dashboard, in app communications, notifications)Chatbots	
Cost Structure		Revenue Streams		
<ul style="list-style-type: none">real estate infrastructurevehicle fleetsoftware developmentoperating cost (daily operation & maintenance)cost of data analysis and storagehuman resources salariescost of certifications and auditing		<ul style="list-style-type: none">collection feecharge for use of storagepackaging feedelivery feetracking feebrokerage feedata monetization		

5 – The Future GRC Challenges:

Description for Design Factors (DF1 to DF10) and Focus Areas:

We are an IT-centric organization, focused on innovation thus our organization will continuously keep up with the latest technology trends. We opted for **innovation and differentiation** as the **main enterprise strategy archetype**. However, we focus on client service stability and we try to adopt new technologies and trends that can substantially withstand our business value without compromising **stability**. Cost leadership is not too relevant in our case since we are trying to obtain competitive advantage by providing a premium transportation service. Having the lowest cost of operation is significantly relevant, however having the lowest cost of operation is not our main approach to stepping away from competitors. Finally, growth and acquisition are less relevant since we intended to provide a premium transportation service.

The aforementioned enterprise strategy results in the corresponding enterprise goals. On the one hand, **business and product innovation**, a **portfolio of competitive products and services** and **managed business risk** are the most important goals. In addition, we see our human resources as an essential part of our philosophy, hence their **skills and motivation** (and as a result their productivity) are key to our business. On the other hand, quality of information for management and process cost are neglected.

In the field of IT risks, we identify four major categories strongly affecting our business. Besides the more generic categories containing **IT expertise**, **data management** and **logical attacks**, **technology based innovation** is the most concerning factor. As stated before, we see ourselves as innovators and therefore mainly **firstmovers to the market**. Missing out on breakthrough innovation poses therefore the biggest threat to our organization as it forces us to be a follower or even a slow adopter, resulting in the loss of our status in the industry. Consequently, IT related incidents (such as data loss etc.) and failed implementation of new innovations or respectively the inability to exploit these new technologies are the most serious issues. The highly sensible data we process and manage forces us to not outsource any kind of service related to our IT. In general, IT has a mostly **strategic and supportive role** in the organization as it does not directly create value for the customer.

Concerning compliance requirements, we do not expect many changes in the future, leading to mostly normal importance in line with practice to date.

By having an mostly agile development process, we are able to focus on collaboration, customer feedback and small rapid releases in an iterative approach. Thus, the process enables us to inherit constant change and target end-to-end business solutions and fast delivery.

Summary analysis:

Looking at the top 5 most important Governance and Management objectives concerning all design factors we have respectively **BAI06**, **AP012**, **EDM03**, **BAI10** and **DSS04**. Contrasting with the most important ones on the second step: **AP004**, **DSS04**, **AP008**, **DSS02** and **BAI06**.

Governance Objectives:

One of the most important governance and management objectives are: **EDM03**: Ensured Risk Optimization. IT plays a big role in our company, since it supports the business value creation, thus it is crucial to ensure that IT related risks are well understood and do not exceed the enterprise risk tolerance. Moreover, the impact of IT risks is identified and managed due to its intrinsically relevance.

Management Objectives:

Regarding BAI (Build, Acquire and Implement), **BAI06** is the most important goal since it enables fast and reliable delivery of change to business. This stays in line with our continuous hunger for innovation. In practice, these objectives state that our organization should evaluate, prioritize and authorize change requests to determine the impact in the business. The **AP004** reflects that continuous trend pursuit and proactive identification of

innovation opportunities such as high-speed inter-country cargo ships transportation. Ultimately, one of our goals is to obtain competitive advantage through transportation innovation, better customer experience by providing faster long-distance transportation and by maximizing the operational effectiveness and efficiency of every warehouse management process. Much of that innovation is concerned about full automation of loading and packaging organization inside warehouses. Since we intend to provide a different service from competitors, it is necessary to create models and practices that describe how standards, guidelines and procedures (from warehouse automation to unmanned drones for last-mile delivery), thus, without astonishment **APO03** is reported as one of the most important goals regarding Align, Plan and Organize. Our organization has higher IT costs and infrastructures: from Transpod grid infrastructure to robots, warehouse sensors and high-skill staff to perform maintenance. We are dealing with a high payback time and therefore, all risk scenarios should be concerned, since we intended to minimize all bad decisions that can affect or extend that payback time. Thus, **APO12** COBIT management objectives focus on continuously identifying, assessing, and reducing I & T related risk. Additionally, **BAI10** stresses the need to provide sufficient information about services in order to enable the service to be effectively managed. In other words, our management priorities should focus on the impact of changes and how to deal with service incidents. This is crucial to our business, since delivery time is our ultimate goal. Being able to deal with incidents allows us to minimize the response time and adapt rapidly in the event of a significant disruption. For instance, in the presence of cargo ships delay, warehouse's energy failure. Thus, we rank **EG01** and **EG02** as the most important enterprise goals. This is the main reason why **DSS04** is classified as the most important objective from Deliver, Service and Support Domain. Lastly, cybersecurity incidents are a very relevant threat to our organizations. Thus, it is a priority to make sure the security robustness of the IT infrastructure. Therefore, **DSS05** management objective is marked by COBIT as relatively important for our organization.

On the other hand, we observed that **APO06**, **BAI04** and **BAI09** represent the less important COBIT objectives. Since our business strategy is to keep up with state-of-the-art technologies and solutions there is less importance to forecast future needs on business requirements, to that end BAI04 is considered not a top priority objective for our organization. Due to highly IT cost and the IT centric approach, prioritization of spending is less important since more than 90% of total capital will be applied to the IT infrastructure. With that in mind, COBIT clearly points out that **APO06**, related to managed budgets across the enterprise, is the least objective according to our business strategy.

The most important challenges regarding GRC of having a complete automated solution to reduce idle times and improve efficiency and rapidly adoption of state-of-the-art techniques are:

- **Ensuring risk optimization** (EDM03): As this is a high risk project we should keep a close watch on the IT risk appetite and tolerance;
- **Managing risk and innovation** (APO12 and APO04): Managing the IT risk in relation to the risk project will be a quite hard balance to make. And achieving a competitive advantage by exploiting I&T developments and emerging technologies come with a risk and managing the innovation is also a big challenge;
- **Managing IT changes** (BAI06): One of the focuses of this project is to be reliable and so, the management of IT changes should be very carefully assessed to ensure no negative impact in stability or integrity (of the environment);
- **Managing the project** (BAI10): Realizing the defined project and reducing risks of unexpected delays will not be a serious task to handle.
- **Managed continuity** (DSS04): The focus of the business is in fast deliveries and as so adapting rapidly to change is going to be a significant challenge. This is a long term project with high initial investment, managing the continuity of the business is also a crucial task to make sure this company ever sees profit.

References:

- [1] <https://www.pwc.com/gx/en/transportation-logistics/pdf/the-future-of-the-logistics-industry.pdf>
- [2] <https://www.dpdhl.com/de/ueber-uns/human-rights-policy/compliance-management.html>
- [3] https://www.dpdhl.com/content/dam/dpdhl/de/investors/governance/governance-berichte/DPDHL_Geschaefte_sbericht_2019_Corporate_Governance.pdf
- [4] <https://www.dpdhl.com/content/dam/dpdhl/de/media-center/responsibility/dpdhl-bericht-zur-unternehmensverantwortung-2015.pdf>
- [5] <https://www.dpdhl.com/de/presse/pressemitteilungen/2018/dhl-freight-erhaelt-zertifizierung-fuer-globales-managementsystem.html>
- [6] <http://www.logisticsminded.com/certifications-and-standards-in-logistics/>
- [7] <https://www.qms.net/iso-28000/>
- [8] <https://www.mckinsey.com/industries/travel-transport-and-logistics/our-insights/creating-value-in-transportation-and-logistics>
- [9] <https://www.forbes.com/sites/sarwantsingh/2016/09/22/future-of-logistics-5-technologies-that-will-self-orchestrate-the-supply-chain/#4fe066f55a63>
- [10] <https://www.linkedin.com/pulse/courier-express-parcel-cep-industry-how-e-commerce-helping-kumar/>
- [11] <https://www.southernfulfillment.com/a-brief-history-of-logistics-and-the-modern-transport-company/>
- [12] <https://www.idc-dxusecases.com/industry/transportation-and-logistics/>
- [13] <https://www.iso.org/isoiec-27001-information-security.html>
- [14] <https://en.wikipedia.org/wiki/Logistics>
- [15] M.Grazia Speranza, Trends In Transportation And Logistics, European Journal of Operational Research(2016), <http://dx.doi.org/10.1016/j.ejor.2016.08.032>
https://e-tarjome.com/storage/panel/fileuploads/2019-03-12/1552384471_E10790-e-tarjome.pdf
- [16] https://www.sciencedirect.com/science/article/pii/S187770581733583X/pdf?md5=b356cd53989f2504ad25e97b65827fd9&pid=1-s2.0-S187770581733583X-main.pdf&_valck=1
- [17] <https://www.starship.xyz>
- [18] <https://www.conveyco.com/delivery-statistics/>
- [19] <https://www.efulfillmentservice.com/wp-content/uploads/2017/09/State-of-Ecommerce-Order-Fulfillment-Shipping.pdf>
- [20] <https://www.invespcro.com/blog/same-day-delivery/>