DIGITAL GREECE: THE PATH TO GROWTH

TRANSPORTATION & LOGISTICS INDUSTRY DIGITAL STATE

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1. Identifying the perceived digital maturity of the Greek Transportation & Logistics Industry

Transportation and logistics companies are on the cusp of sweeping change. To successfully react to internal and external challenges, the Transportation and Logistics companies must disrupt their current modus operandi and leverage new digital capabilities. Recognizing the increased significance of digital, we see that key industry players around the world actively pursue a digital agenda. In this context, Greek Transportation and Logistics executives surveyed by Accenture highlighted that digital is already part of their DNA, but further improvements need to be made if they are to maintain their competitiveness against their international peers[1].

Overall Perceived Digital Maturity
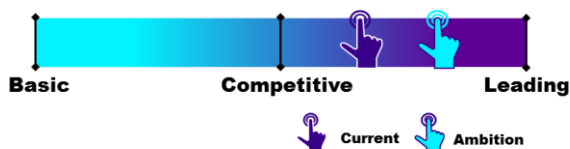
Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 1: *Overall Perceived Digital Maturity - Transportation & Logistics Industry (Current State - Ambition)*
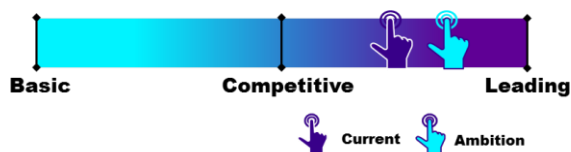
Digital Skills

Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 2: *Perceived Digital Skills Maturity - Transportation & Logistics Industry (Current State - Ambition)*
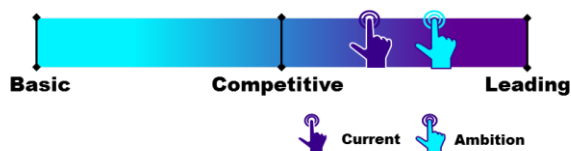
Digital Technologies

Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 3: *Perceived Digital Technologies Maturity - Transportation & Logistics Industry (Current State - Ambition)*

Digital Accelerators

Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 4: *Perceived Digital Accelerators Maturity - Transportation & Logistics Industry (Current State - Ambition)*

Zooming into the Greek Transportation and Logistics industry, surveyed executives appear to recognize the role of digital and understand themselves to perform above market competitive practices. This indicates that their companies have already embarked on their digital transformation and appear quite ambitious about their future outcomes.

Breaking down the perceived digital maturity score into its levers we get a better understanding of the key drivers of the overall maturity and the effort that must be applied for the digitalization of the industry. The participating companies understand that a digitally-savvy workforce can act as an enabler of increased productivity. This is depicted by their current market-competitive performance regarding their **digital skills** maturity and their willingness to make a significant leap within the next five years.

With regards to their **digital technologies** lever, Greek Transportation and Logistics companies perceive themselves to have already leveraged several technological capabilities that will help them rotate to digital. In fact, they appear to have adopted leading practices and foresee short room for improvement. As per the survey results, Transportation and Logistics companies in Greece recognize the value of digital and are heavily invested in unified platforms and cybersecurity.

Finally, as reported by our survey results, the Greek executives view their maturity related to the industry's digital accelerators to be performing above par relative to international competitors. This indicates that Transportation and Logistics companies operate within a complex ecosystem, which has already embraced digital leading practices to enable the ease of doing business.

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[1] The performed analysis and the respective conclusions were based on data recorded through the "Questionnaire of Perceived Digital Maturity", launched on December 19, 2016 and remained open until January 30, 2017

1.1 Evaluating the Greek Transportation & Logistics Industry's digital maturity

To add an objective layer of analysis, we examined secondary data against the executives' opinions, in order to extract additional insights. To evaluate the Greek Transportation and Logistics industry's digital maturity and identify the primary factors that can drive economic growth in their digital economic output, we have applied the Digital Economic Opportunity Index (DEOI).
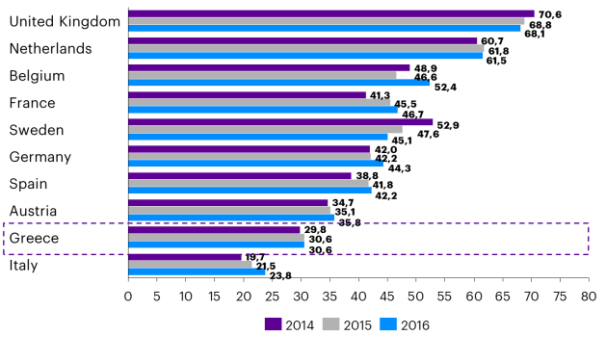
Source: Oxford Economics, Accenture analysis

Figure 5: Transportation & Logistics Industry Digital Economic Opportunity Index from 2014 to 2016

Our analysis for the Greek Transportation and Logistics companies with regards to their digital maturity suggests that the Greek companies score near the bottom of our analysis compare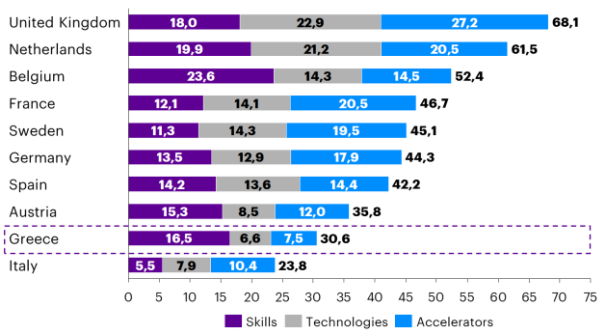d to their European peers over the last three years (2014 to 2016). Specifically, since 2014 the Greek industry has made little progress, increasing its digital maturity by less than one point.

Source: Oxford Economics, Accenture analysis

Figure 6: Transportation & Logistics Digital Economic Opportunity Scores per country

The dissection into the three levers that make up the Digital Economic Opportunity Index, namely, digital maturity, digital skills, digital technologies and digital accelerators are represented in the following graph (Figure 6).
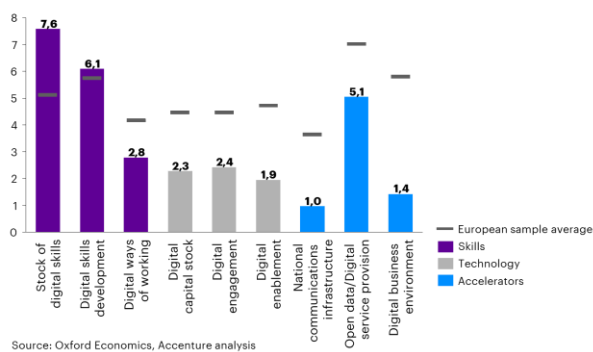
Source: Oxford Economics, Accenture analysis

Figure 7: Transportation & Logistics Industry - Digital Economic Opportunity Index Components breakdown

In order to understand the key drivers of the Digital Economic Opportunity Index, we zoom into the nine sub-components that paint a clearer picture of the factors that have led to the overall low score exhibited by the Greek Transportation and Logistics companies (Figure 7).

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By closely examining the *digital skills* lever, the Greek industry appears to be close to its European peers. The "stock of digital skills" pillar contributes the most to the overall score, indicating that digital skills within the sector are above the average of other European industry peers. The "digital skills development" components also scores above average, suggesting that Greek companies have invested in improving and furthering the digital skills of their workforce. The low score in "digital ways of working", reflects a relatively poor commitment to digital talent recruitment. In addition, it appears that the Greek Transportation and Logistics industry has adopted limited digital practices to facilitate its workforce's mobility, scoring about 1.6 points below its competitors.

Even though the digital skills lever scores quite well, the *digital technologies* lever appears to be scoring severely behind. Our further analysis indicates that although Greek companies have made investments in digital capabilities, there is significant room of improvement under the "digital capital stock" pillar. At the same time their customer engagement and internal company collaboration methods are not fully utilizing digital tools and means and the Greek companies seem to have yet to fully adopt enabling technologies like Internet of Things, cloud computing and big data analytics. Consequently, the "digital engagement" and "digital enablement" components have the greatest distance to cover in order to reach the European average of approximately 5 points.

Finally, zooming into the digital accelerators lever, it is evident that Greek Transportation and Logistics companies are lagging their European peers, signifying that the business environment in Greece today is not conducive to their digitalization. Factors such as the inflexible regulatory framework and traditional industry practices that have not yet changed make it harder for Greek companies to reap the full benefits of digital.

1.2 Defining the contribution of digital to the Transportation & Logistics industry's economic output

Accenture's analysis on the contribution of digital to the economic output of Transportation and Logistics industry, reveals the importance of fostering the digital transformation of the sector to promote economic growth. The overall digital inputs contribute 10,6 percent to the industry's Gross Value Added (GVA)[2], equal to €1,19 billion. This score is 9,7 percentage points below the sample average and positions the Greek industry at the very bottom among the sampled countries. Opposite Greece, at the top of our industry analysis, we find the US Transportation and Logistics industry, which currently exhibits the highest contribution of digital to its GVA, with a digital output estimated to cover 30,3 percent of the industry's GVA. Focusing on the European countries, it appears that the UK and Germany are at the top, scoring at a 27,5 percent and 20,7 percent of their digital potential.

Source: Oxford Economics, Accenture analysis
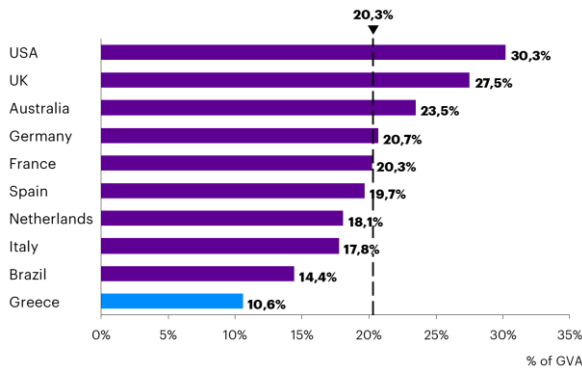
Figure 8: Transportation & Logistics Digital Economic Value Index 2016

2 Transportation & Logistics Industry – Rotation to Digital

There is wide-spread evidence that all industries are impacted by digital. In fact, as per Accenture research, "every business is a digital business". However, as each industry is also unique, its digital rotation puts the emphasis on different parts of the value chain, which we refer to as "digital pivot points".

What are the digital pivot points?

Companies organize their business activities against value chains that typically consists of strategy, production, sales and customer services and operations. There is widespread evidence that all industries are impacted by digital. However, as each industry is also quite unique, its respective digital rotation places emphasis on different areas of the value chain. These areas are referred to as digital pivot points.

This below mentioned value chain (see Figure 9) will be used as our framework to identify the digital "pivot point(s)" of the Greek industries.

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[2] Gross value added (GVA) is a productivity metric that measures the contribution to an economy, producer, sector or region. Gross value added provides a dollar value for the amount of goods and services that have been produced, less the cost of all inputs and raw materials that are directly attributable to that production. The relationship between GVA and GDP is defined as:
GVA + taxes on products - subsidies on products = GDP, or restated as:
GVA = GDP + subsidies - (direct, sales) taxes

Digital Strategy

See
digital as a key consumer/technology trend for their business

Plan
their strategies around digitalization and digitization and dedicated budget

Act
to promote digitalization internally and externally (i.e. CDO, digital teams, cooperate with start-ups...)

PLAN

Digital Production

Design
innovative product via digital technologies or approaches (open innovation)

Build
products and services with the aid of digital technology

Run
streamlined activities by using digital solutions like cloud, mobility, analytics

MAKE

Digital Customer

Engage
with customers via digital means (social media, personalized offer)

Sell
products and services through multiple on/offline channels

Serve
customers by enabling digital secure self-services

SELL

Digital Operations

Assess
digital/IT infrastructure and capabilities status (i.e. cybersecurity)

Improve
operating efficiency and effectiveness through digital deployment

Renew
resources via digital (crowdsourcing workforce, hire new talent)

OPERATE

Figure 9: The typical Value Chain

2.1 Industry Clustering

According to our analysis on how digital impacts the Greek industries' value chain, we have placed the Greek Transportation & Logistics industry within the first group of the Greek industries, the "traditional" industries (see Figure 10).
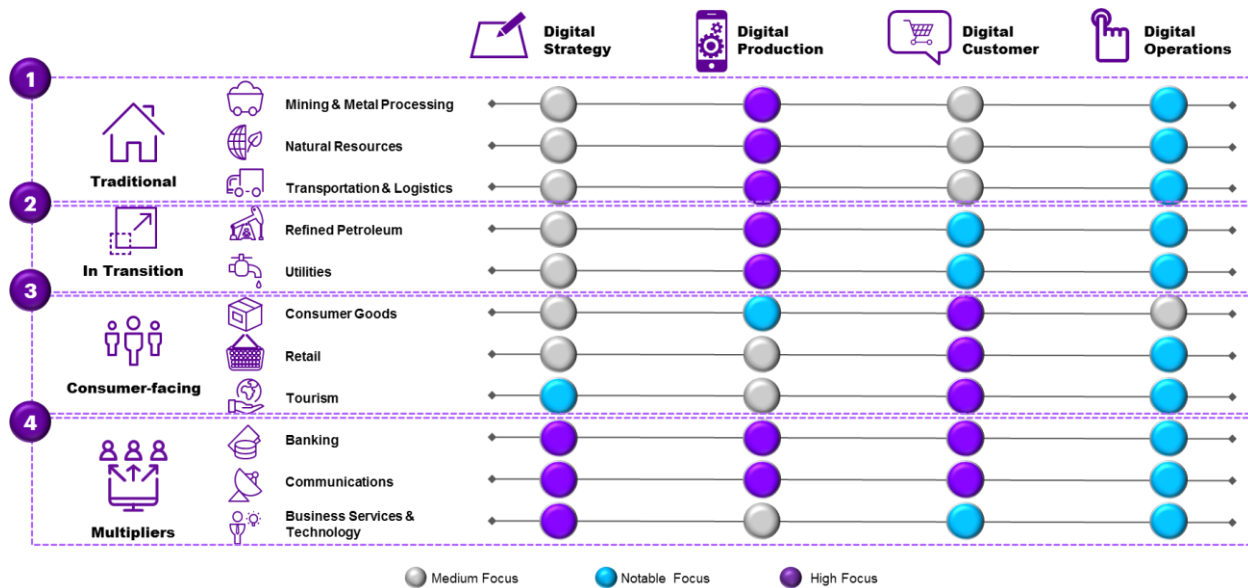
Figure 10: The Clustering of the Greek industries

Enterprises that belong to this group, are typically asset-heavy organizations, require large amounts of capital to establish and operate and their production is dependent on heavy industrial machinery. Their workforce demonstrates a different composition and set of characteristics from that across the other industry groups. Their production and operations are heavily dependent on a large number of field workers. The focus of their digitalization is primarily targeting production and operations. Six digital themes influence the "traditional" industries as presented in the Figure 11 below. The description of the digital themes is presented in Figure 13.
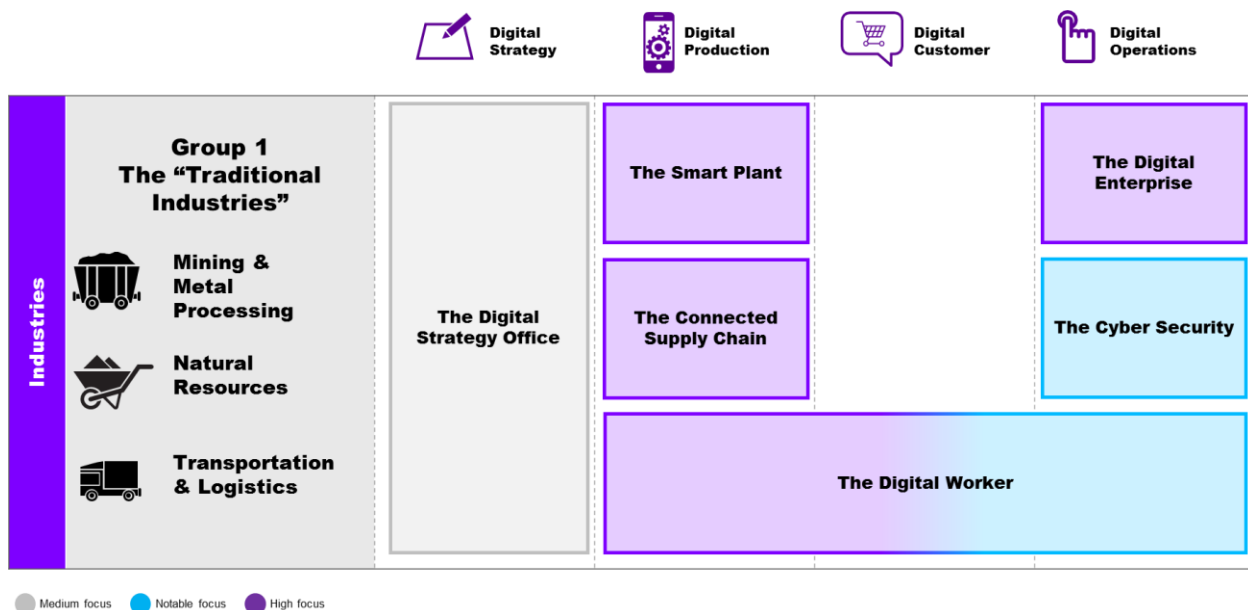
Figure 11: The "Traditional" industries

International best practices suggest that, at the core of their digital rotation, Transportation and Logistics companies have embraced digital technologies, to gain better oversight on their operations, and utilize the data captured to streamline their delivery times and offer new services to their customers. Figure 12 illustrates elements of the above.

Product Development
Secure and reliable design and engineering collaboration with strategic partners across geographies in a follow-the-sun model that shortens the product development lifecycle, improves product quality, and allows for rapid scale of product development capacity

Consumer Insights
Customer driven interactions across channels including mobility, social media, and web-surfing are leveraged and integrated with analytics platforms to create 1-to-1 understanding of customer needs and wants, industry trends and market developments

Plant-Floor Mobility
Plant floor Supervisors on mobile platforms having real-time access to performance data with a direct link to the Manufacturing Control Tower

Logistics Control Tower
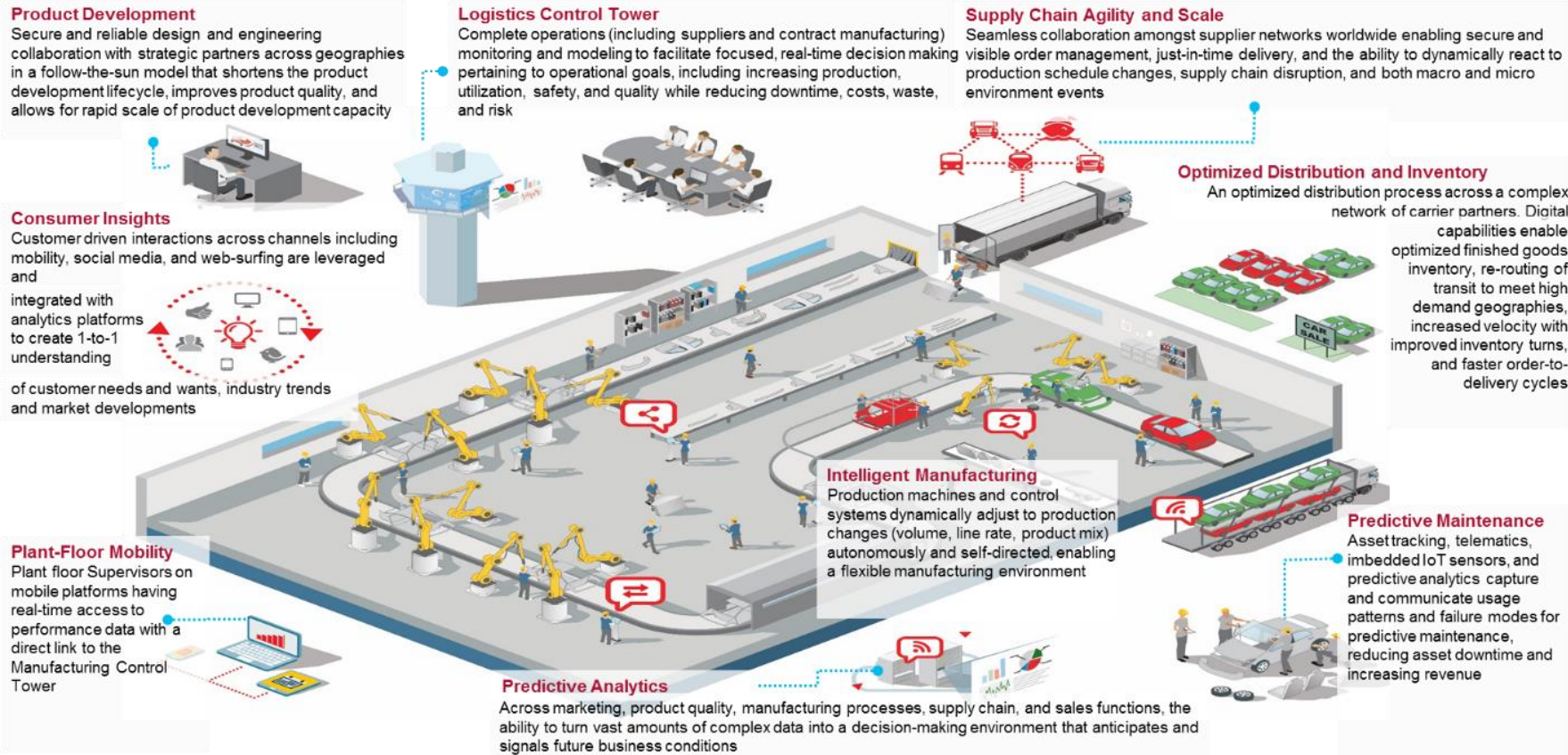Complete operations (including suppliers and contract manufacturing) monitoring and modeling to facilitate focused, real-time decision making pertaining to operational goals, including increasing production, utilization, safety, and quality while reducing downtime, costs, waste, and risk

Intelligent Manufacturing
Production machines and control systems dynamically adjust to production changes (volume, line rate, product mix) autonomously and self-directed, enabling a flexible manufacturing environment

Predictive Analytics
Across marketing, product quality, manufacturing processes, supply chain, and sales functions, the ability to turn vast amounts of complex data into a decision-making environment that anticipates and signals future business conditions

Supply Chain Agility and Scale
Seamless collaboration amongst supplier networks worldwide enabling secure and visible order management, just-in-time delivery, and the ability to dynamically react to production schedule changes, supply chain disruption, and both macro and micro environment events

Optimized Distribution and Inventory
An optimized distribution process across a complex network of carrier partners. Digital capabilities enable optimized finished goods inventory, re-routing of transit to meet high demand geographies, increased velocity with improved inventory turns, and faster order-to-delivery cycles

Predictive Maintenance
Asset tracking, telematics, imbedded IoT sensors, and predictive analytics capture and communicate usage patterns and failure modes for predictive maintenance, reducing asset downtime and increasing revenue

Figure 12: Digital Transportation & Logistics

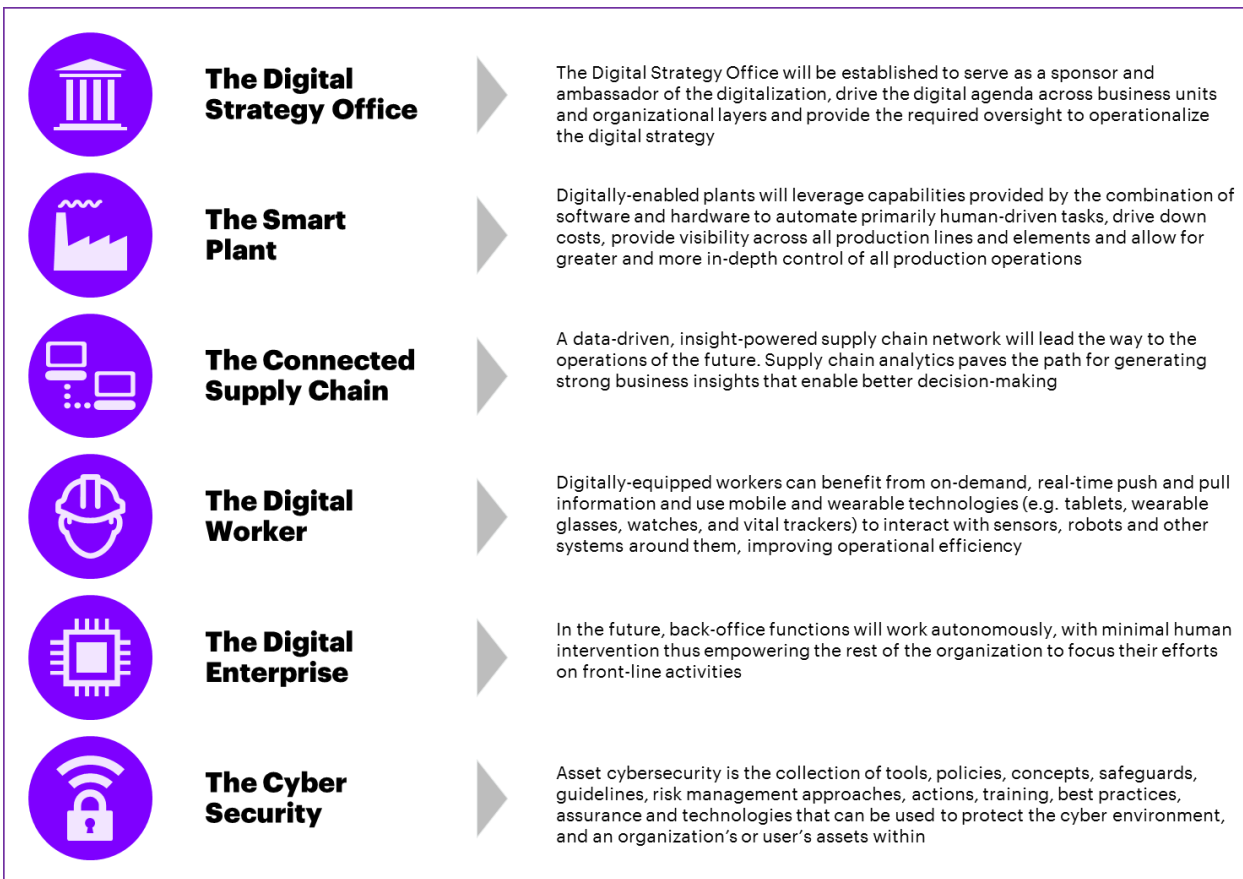| The Digital Strategy Office		The Digital Strategy Office will be established to serve as a sponsor and ambassador of the digitalization, drive the digital agenda across business units and organizational layers and provide the required oversight to operationalize the digital strategy
The Smart Plant		Digitally-enabled plants will leverage capabilities provided by the combination of software and hardware to automate primarily human-driven tasks, drive down costs, provide visibility across all production lines and elements and allow for greater and more in-depth control of all production operations
The Connected Supply Chain		A data-driven, insight-powered supply chain network will lead the way to the operations of the future. Supply chain analytics paves the path for generating strong business insights that enable better decision-making
The Digital Worker		Digitally-equipped workers can benefit from on-demand, real-time push and pull information and use mobile and wearable technologies (e.g. tablets, wearable glasses, watches, and vital trackers) to interact with sensors, robots and other systems around them, improving operational efficiency
The Digital Enterprise		In the future, back-office functions will work autonomously, with minimal human intervention thus empowering the rest of the organization to focus their efforts on front-line activities
The Cyber Security		Asset cybersecurity is the collection of tools, policies, concepts, safeguards, guidelines, risk management approaches, actions, training, best practices, assurance and technologies that can be used to protect the cyber environment, and an organization's or user's assets within

Figure 13: Digital Themes

2.2   Digital Pivot Points

Contextualizing these observations with industry's executives, we have identified the creation of value-added services like analytics-as-a-service and the streamlining of transportation activities as the primary areas for digital attention. In addition, the digitalization of their warehousing and logistics facilities are secondary areas of attention. Figure 14 illustrates the emphasis on the different pivot points for the Transportation and Logistics industry.
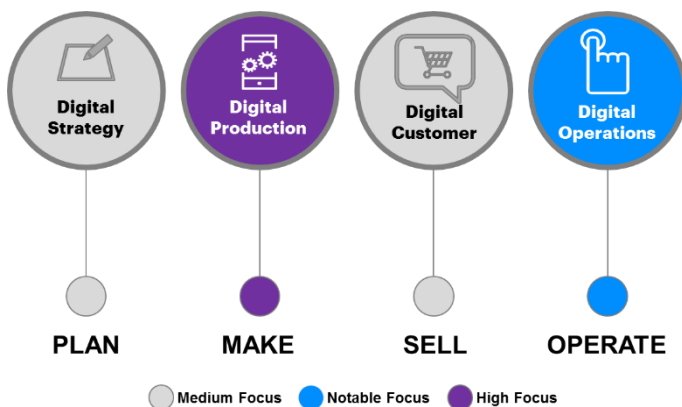

Figure 14: Transportation & Logistics Industry - Digital Pivot Points

2.3   Initiating the digital transformation

With global best practices as our reference point, we propose a set of initiatives that will accelerate the industry's digital rotation. It is evident that not all initiatives may be applicable for all

organizations within this industry; indeed, digital initiatives are recommended to be selected in accordance to the different strategy, business model, size, available budget and most importantly, each company's own digital aspirations and vision. The initiatives that follow, are broken down into tactical, which we call **"tactical moves"** and disruptive, which we call **"cut new ground"**. In addition, they are linked to the digital themes presented previously that influence the specific group of industries. The classification of the identified initiatives is depicted in Figure 15.
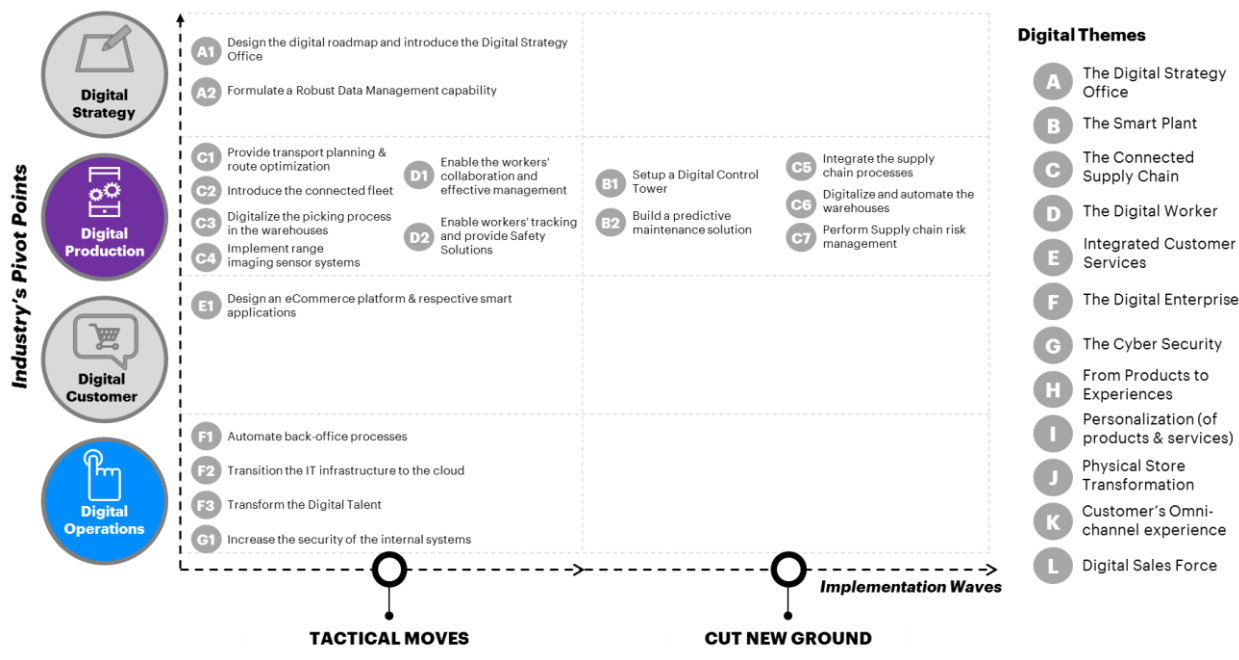
Figure 15: Classification of Suggested Initiatives Across Three Dimensions

A description of the proposed initiatives is presented in the table below:

#	Digital Initiative	Description	Value Chain Area
A1	Design the digital roadmap and introduce the Digital Strategy Office	Design and implement a digital roadmap that will incorporate all digital initiatives to be undertaken by the organization and set up the Digital Strategy Office that will be responsible for the effective operationalization of the digital roadmap	Digital Strategy
A2	Formulate a Robust Data Management capability	Formulate a robust data strategy and data management process that will involve a set of initiatives around building an effective data architecture, data quality management, as well as data security	Digital Strategy
B1	Setup a Digital Control Tower	Setup a Digital Control Tower that shall offer a set of planning and execution capabilities that can be organized as a centralized shared service. The Control Tower will integrate the supply chain processes and tools, will continuously monitor the execution of operations activities, will provide visibility to performance metrics, perform 'what if' analysis, and dynamically respond to changes. The Digital Control Tower shall focus on delivering a specific set of business outcomes - targeting improvements in costs, inventory, quality, customer service, and asset utilization	Digital Operations
B2	Build a predictive maintenance solution	Design, build and operate a predictive maintenance/service solution based on device data from installed equipment and fleet vehicles. The solution shall harness and analyze data from the organization's machines, engines and vehicles and	Digital Production

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#	Digital Initiative	Description	Value Chain Area
		transmits the resulting insights to the organization to enabling this to anticipate problems, proactively schedule maintenance and help the organization manage their fleets more efficiently	
C1	Provide transport planning & route optimization	Leverage big data and analytics for transport planning and building a predictive network that includes route optimization	Digital Production
C2	Introduce the connected fleet	Implement telematics and smart sensors on the organization's fleet to get real-time supply chain visibility, effectively manage risk and help verify insurance claims, improve internal communication and customer service, and to locate delivery points and avoid congestion	Digital Production
C3	Digitalize the picking process in the warehouses	Deploy augmented reality, wearable technologies and big data analytics to digitalize the picking process. In more detail the picking staff shall be equiped with wearable AR devices for the picking process. The devices will provide digital navigation to find the right route and item more efficiently and the overall picking errors rate and search time will be reduced	Digital Production
C4	Implement range imaging sensor systems	Implement range imaging sensor systems to compute necessary shipping capacities, to optimize packing structures, and to scan shipment sizes in order to control sorting systems or to determine spaces	Digital Production
C5	Integrate the supply chain processes	Design a platform that will integrate all supply chain processes, i.e. order capture, payment processing, shipping, tracking, customer relationship management systems and more and will provide end-to-end visibility. Its cloud-based web app will allow for easy access between mobile devices and computers	Digital Production
C6	Digitalize and automate the warehouses	Introduce semi-automated operations and intelligent robotics to optimize intra-warehouse movements (i.e. smart robots can bring the product shelves to a warehouse worker, rather than a worker walking to the shelves. The robots can also locate the items in a customer's order, move the products around warehouses and help get packed boxes to a final loading dock)	Digital Production
C7	Perform Supply chain risk management	Analytics can synthesize data from a wide array of sources—such as social media, blogs, weather forecasts and news sites—to keep logistic providers apprised of local developments in politics, the economy and nature. Equipped with this insight, logistic providers can better evaluate supply chain risk and shape a resilience plan	Digital Production
D1	Enable the workers' collaboration and effective management	Deploy mobile worker application and equip workers with wearable devices for optimize task scheduling, dispatching and completion	Digital Operations
D2	Enable workers' tracking & provide Safety Solutions	Leveraging wearables and analytics solutions to capture, analyze and communicate critical information to and from workers, enable worker location tracking, detect workers' fatigue or man-down situation and send environmental alerts (i.e. unknown gas detected by sensor) or location alerts (i.e. Proximity to equipment, moving vehicle,	Digital Operations

#	Digital Initiative	Description	Value Chain Area
		hazardous / restricted zone) to protect workers' health and safety	
E1	Design an eCommerce platform & respective smart applications	Design and introduce an eCommerce platform and the respective applications that shall provide online, automated booking and documentation processing with option for value-added services upsell, cargo track and trace capabilities, real-time schedule access and notification of schedule changes, invoicing and payment processing between customers and transport providers, insurance offers and claims processing and trade management and regulatory reporting	Digital Customer
F1	Automate back-office processes	Digitalize and automate end-to-end internal processes (i.e. finance, sourcing & procurement) powered by artificial intelligence (robotics) and big data analytics	Digital Operations
F2	Transition the IT infrastructure to the cloud	Move the IT infrastructure to the cloud to improve efficiencies, enable the seamless integration of business processes and provide immediate, on-demand access to the latest solutions and approaches and ready-to-deploy environments for creating and delivering innovative business strategies and products	Digital Operations
F3	Transform the Digital Talent	Define the new digital roles, capabilities and skillset, assess the active workforce and design digital traning sessions to digitally upskill and reskill the organizations' personnel according to their personnal development needs	Digital Operations
G1	Increase the security of the internal systems	Strengthen internal systems and incorporate increased security measures such as multilayered authentication and internal control processes to strengthen security and comply with increased regulations	Digital Operations

In addition to the suggested set of initiatives that each individual organization can undertake to accelerate their digital rotation, another set of digital initiatives has emerged. These cross-organizational initiatives carry the potential to be undertaken by the relevant stakeholders, in order to support the digitalization of all Greek industries. Such initiatives can cover a wider breadth of digitalization, enabling faster and more pervasive digital rotation.

These initiatives have been also recorded in full detail in the main study for the Digital Strategy for Greece and consist part of the first strategic axis "Fix the brilliant basics" and in the second strategic axis "Government 2.0". In terms of consistency and completeness, these are presented also below:

- Introduce a common interface of the main registries to achieve continuous updating of data (i.e., demographic, tax, insurance data) and unique entry of new records (1st strategic axis "Fix the brilliant basics").
- Implement the electronic identification (eID) initiative to ensure the ubiquitous identification of a person across all digital channels (1st strategic axis "Fix the brilliant basics").
- Enforce the application of electronic signatures and certifications is vital for safe digital services (1st strategic axis "Fix the brilliant basics").
- Digitalize prioritized services to businesses and citizens (e-procurement extension, e-licensing, e-invoicing / payments, start-up, online interconnection of cash registers) (2nd strategic axis "Government 2.0").

2.4   Global Leading Practices

- **Case Study – DHL, Audi and Amazon**

Audi, DHL and Amazon have partnered to create a revolutionary delivery service system, called Audi Connect Easy Delivery, that delivers packages to wherever a consumer's Audi is. Customers who use Amazon Prime in Munich and own an Audi car, should install a mobile application to their smartphone. On the day delivery is scheduled, the application sends the precise coordinates of the Audi vehicle to DHL. The DHL driver will receive a single-use digital access code that pops the trunk, and the code will expire as soon as the luggage compartment (or the delivery window) closes. After the delivery has taken place successfully, the car owner receives an informative email. According to Audi, the system protects the Audi driver's personal data and the security of the car itself. As the program expands, Audi owners will also be able to arrange letter and package pickup direct-from-boot.

Source: http://www.bbc.com/autos/story/20150424-audi-amazon-and-dhl-partner-for-direct-to-boot-package-dropoff

- **Case Study – DHL: Augmented Reality Program**

DHL Supply Chain began rolling out the next phase of its Vision Picking Program in late 2016, following a successful trial of the augmented reality technology in the Netherlands. During the three week trial of 2015, warehouse staff in Bergen op Zoom was equipped with head mounted displays such as Google Glass and VuzixM100. The displays showed the respective task information during the picking process, including aisle, product location and quantity. Overall, 10 order pickers used the equipment and picked more than 20.000 items, fulfilling 9.000 orders within the given time frame. As a result, staff was able to operate much faster and error free improving the efficiency of the picking process by 25 percent.

Since the trial, DHL and partners Google, Vuzix and Ubimax have refined the vision picking solution and DHL is now expanding the program across different industry sectors on a global scale, forging another step forward for augmented reality solutions in logistics. Throughout 2016, the smart glasses were piloted across various industries such as technology, retail, consumer and automotive industries. The data available from these pilots will further determine the technology's potential for broader implementation. The pilot sites are spread across the United States, Mainland Europe and the United Kingdom, with the Ricoh facility in Bergen op Zoom, the Netherlands, where the solution was first tested, being the launch site for this new exploration phase.

"We are excited to further test and develop vision picking as a solution that can be readily available to our customers. More importantly, this technology is not just one step towards digitalizing manual processes on the shop floor, it also takes us one step closer towards Industry 4.0. Testing technologies like augmented reality, robotics and Internet of Things will continue to be a big part of our DNA," said John Gilbert, CEO Supply Chain..

Source:
http://www.dhl.com/en/press/releases/releases_2016/all/logistics/dhl_rolls_out_global_augmented_reality_program.html

2.5   Maximizing the Transportation & Logistics industry's economic output (GVA)

Our econometric analysis suggests that by 2021 the accelerated digital rotation for the Transportation and Logistics industry is expected to result to a slight increase in the economic output by 1,36 percentage points equal to approximately €170,2 million[3]. The projected GVA uplift is a product of macroeconomic analysis assuming a 10% increase on the industry's digital maturity (Figure 16).

Source: Oxford Economics, Accenture analysis
Figure 16: Transportation & Logistics GVA Uplift as % of the 2021 GVA baseline, (Million Euros, %)

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[3] 2021 Gross Value Added is calculated from Eurostat data using Oxford Economics projected growth rates. The spill-over effect to the economic performance of other industries is not included in this figure.