



DIGITAL GREECE: THE PATH TO GROWTH

REFINED PETROLEUM INDUSTRY DIGITAL STATE

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1. Identifying the digital maturity of the Greek Refined Petroleum Industry

A study ran by Accenture with Refined Petroleum strategy executives, highlighted the common perception that digital transformation will change the industry for years to come. 98 percent of surveyed Chief Strategy Officers (CSOs) agree that new technologies will rapidly change their industry in the next 5 years, but only 24 percent of the executives believe that their companies are prepared for sudden industry disruption to a very large extent.¹ Identifying the necessity for digital transformation, our study recognizes that companies most ready for disruption will focus intensively on partnerships and collaboration to push their digital agenda. In this context, their Greek counterparts which were surveyed by Accenture, also acknowledge the opportunity behind accelerating their digital transformation to remain competitive at an international level.

Overall Perceived Digital Maturity



Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 1: Overall Perceived Digital Maturity - Refined Petroleum Industry (Current State - Ambition)

Concentrating on the Greek Refined Petroleum industry, surveyed executives² perceived their companies to be executing their digital transformation on par with their industry’s global market. They have recognized the burning digital platform and have already embarked on the first steps towards digitalization (Figure 1).

Digital Skills

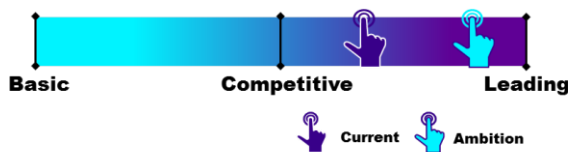


Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 2: Perceived Digital Skills Maturity - Refined Petroleum Industry (Current State - Ambition)

If we examine the underlying levers of the digital maturity score, we see that survey participants consider themselves to perform at the market-competitive level of other major players, with regards to their **digital skills** maturity. Even though as stated during our workshops there seems to be an adequate supply of digital talent in the industry, Greek companies shall accelerate their efforts to upskill their existing workforce and attract additional digital workers (Figure 2).

Digital Technologies



Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 3: Perceived Digital Technologies Maturity - Refined Petroleum Industry (Current State - Ambition)

With regards to the **digital technologies** lever, Greek Refined Petroleum companies perceive themselves to have already leveraged several technological capabilities that will help them rotate to digital. It is worth noting that while petroleum companies in Greece recognize the value of investing in digital infrastructure, they mostly want to employ digital technologies to improve their Customer Experience and Interaction lever, that demonstrated the greatest improvement ambition (Figure 3).

Digital Accelerators



Source: Questionnaire of Perceived Digital Maturity, Accenture Analysis

Figure 4: Perceived Digital Accelerators Maturity - Refined Petroleum Industry (Current State - Ambition)

Finally, according to our survey results, the Greek executives view their maturity related to the industry’s **digital accelerators** to be performing on par with international competitors. The ambition of those surveyed is to work towards achieving an environment that is less restrictive and rigid,

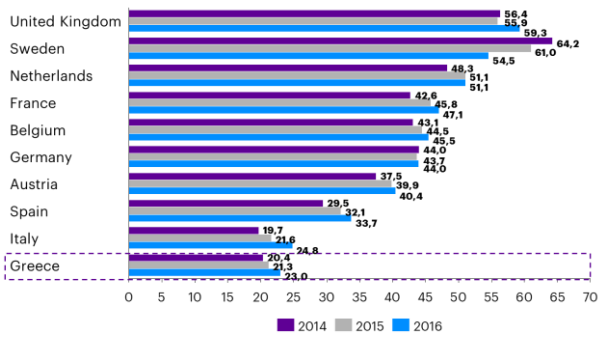
¹ Accenture Institute for High Performance, “Thriving on Disruption”, 2016

² 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

providing companies room to grow and invest in their internal capabilities through the greater adoption of digital technologies (Figure 4).

1.1 Evaluating the Greek Refined Petroleum Industry’s digital maturity

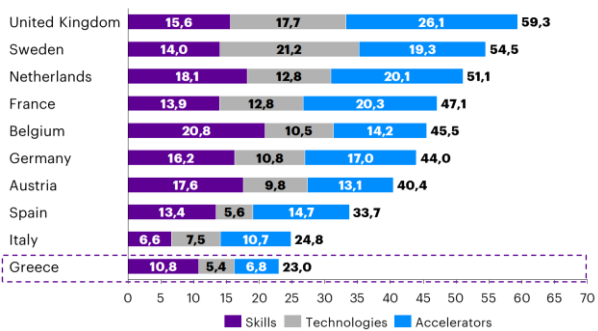
To add an objective layer of analysis, we examined secondary data against the executives’ opinions, in order to extract additional insights. To evaluate the Greek Refined Petroleum industry’s digital maturity and identify the primary factors that can drive economic growth in their digital economic output,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



Source: Oxford Economics, Accenture analysis

Figure 5: Refined Petroleum Industry Digital Economic Opportunity Index from 2014 to 2016

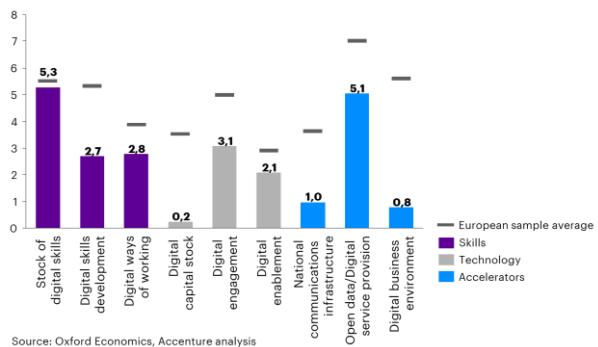
Our analysis for the Greek Refined Petroleum companies with regards to their digital maturity suggests that the Greek companies score at the bottom of our analysis compared to their European peers over the last three years (2014 to 2016). Specifically, since 2014 the Refined Petroleum industry has taken a stepped approach in the right direction, increasing their digital maturity by approximately 2,6 points (Figure 5).



Source: Oxford Economics, Accenture analysis

Figure 6: Refined Petroleum Digital Economic Opportunity Scores per country

The breakdown into the three levers that make up the Digital Economic Opportunity Index, namely, digital maturity, digital skills, digital technologies and digital accelerators is represented in the following graph (Figure 6).



Source: Oxford Economics, Accenture analysis

To further analyze the key drivers behind the Digital Economic Opportunity Index, we deep dive into the nine underlying components to get a more in-depth view of the factors that contribute to the poor performance of the Greek Refined Petroleum industry (Figure 7).

Figure 7: Refined Petroleum Industry - Digital Economic Opportunity Index Components breakdown



Zooming in on the **digital skills** lever, the Greek Refined Petroleum industry appears to be close to its European peers on the “stock of digital skills”, but far less competent in the “digital skills development” component, reflecting a relatively poor commitment to digital worker training and a limited emphasis on digital talent recruitment. In addition, it appears that the Greek

Refined Petroleum industry has adopted limited digital practices to facilitate its workforce’s mobility (i.e. remote access to enterprise IT systems), scoring about 2,7 points below its European competitors.



Even though the digital skills lever scores moderately well, the **digital technologies** lever appears to require considerable effort to reach a market-competitive level. Our in-depth analysis indicates that Greek companies are scoring very poorly with regards to their “digital capital stock”, indicating they have made very minimal investments in hardware and software assets.

At the same time, their customer engagement and internal company collaboration methods are not leveraging digital tools and capabilities, scoring at approximately 2 points below their peers. Furthermore, the Greek Refined Petroleum companies seem to have yet to fully adopt enabling technologies like IoT, cloud and big data analytics.

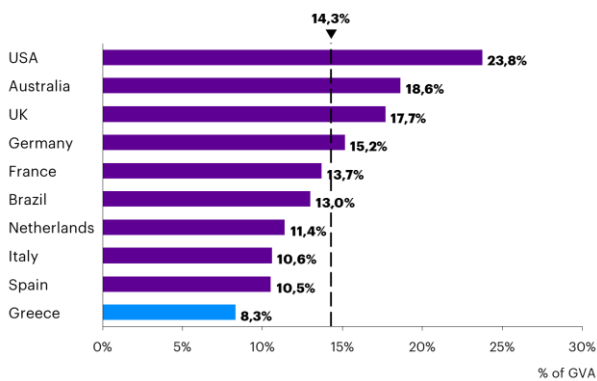


Looking at the **digital accelerators** lever, it is apparent that Greek Refined Petroleum companies are lagging their European peers, suggesting that the market conditions and the business environment in Greece today is not only hindering, but may also be contributing negatively towards their digitalization. Heavy regulation and rigid policy-making with regards to data protection and sharing may also inhibit also the Greek industry from unlocking digital’s value.

protection and sharing may also inhibit also the Greek industry from unlocking digital’s value.

1.2 Defining the contribution of digital to the Refined Petroleum industry’s economic output

Our analysis with regards to digital contribution of the Refined Petroleum industry to the Greek economy, indicates that the overall digital inputs contribute to 8,3 percent of the industry’s Gross Value Added (GVA)³ and are equal to €61,4 million⁴. This scores a full 6 percentage points below the sample average and positions the Greek Refined Petroleum industry at the bottom among the European peers that we examined.



Source: Oxford Economics, Accenture analysis

Figure 8: Refined Petroleum Digital Economic Value Index 2016

Opposite Greece, at the top of our industry analysis we see the US Refined Petroleum industry, which currently exhibits the highest contribution of digital to its GVA, with a digital output estimated to cover 23,8 percent of the industry’s GVA. Looking at the rest of the European counties, it appears that the UK and Germany Refined Petroleum industries are leading the pack, performing at a 17,7 percent and 15,2 percent of their digital potential (Figure 8).

³ 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

⁴ This number does not include the contribution of the retail sales of fuel

2. Refined Petroleum Industry – Rotating 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.

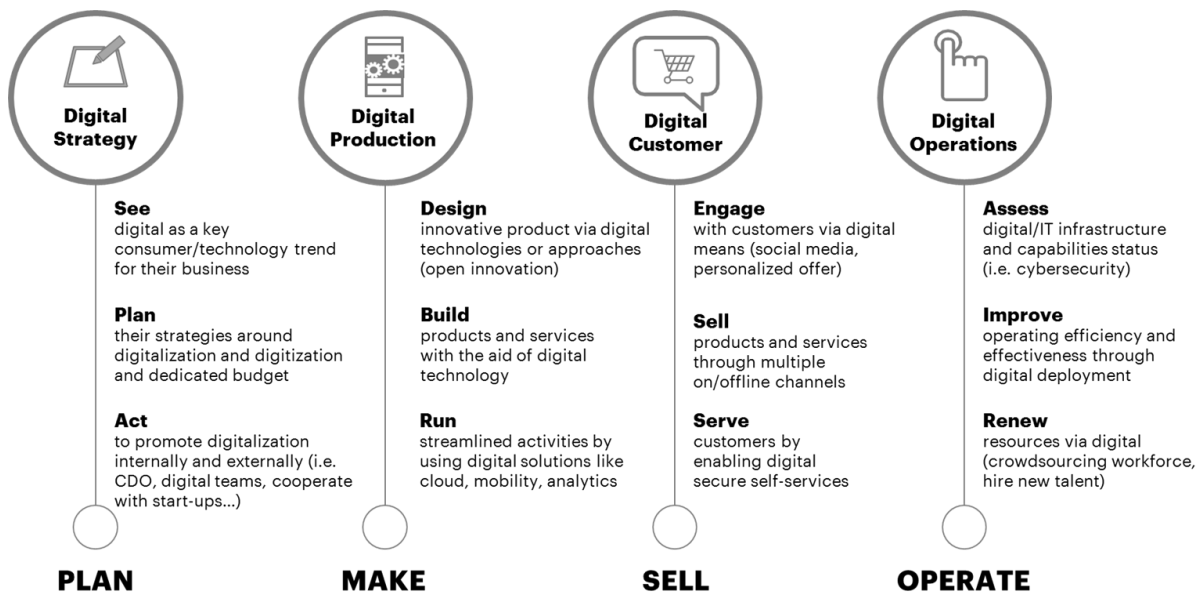


Figure 9: The typical Value Chain

2.1 Industry Clustering

According to our analysis on how digital impacts the Greek industries' value chain, we have placed the Greek Refined Petroleum industry within the second group of the Greek industries, the "In-transition" industries (see Figure 10).

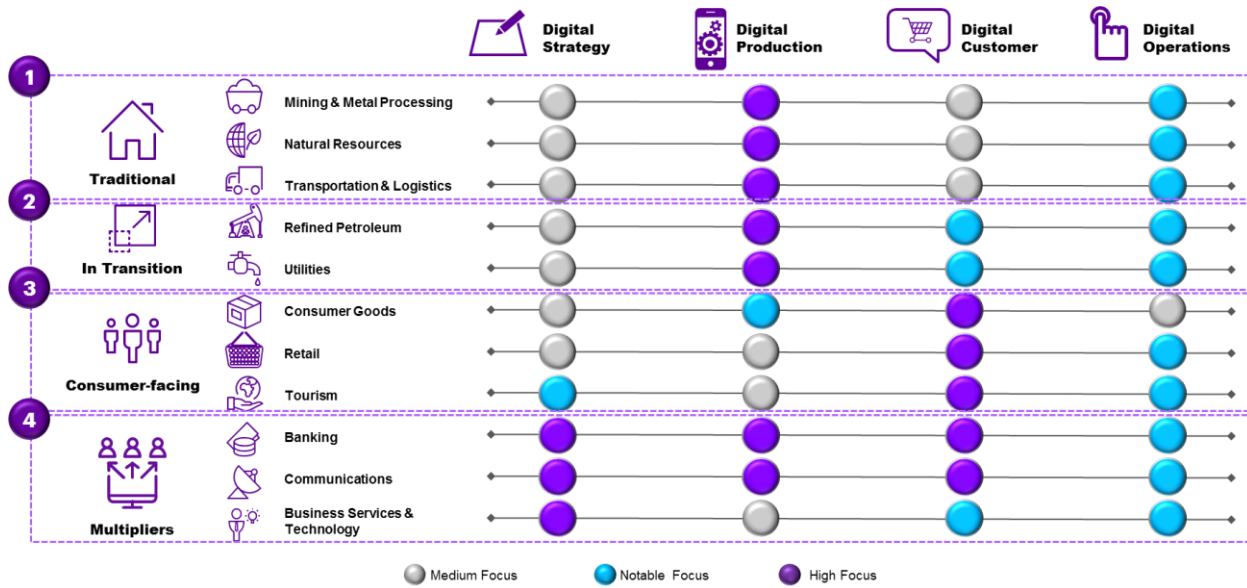


Figure 10: The Clustering of the Greek industries

The "In-transition" industries appear similar in characteristics with the "Traditional" group. However, in parallel with focusing on the digitalization of their production, these industries are starting to place significant emphasis and become more involved with their end-customers. Seven digital themes influence the "in-transition" industries as presented in the Figure 11 below. The description of the digital themes is presented in Figure 13.

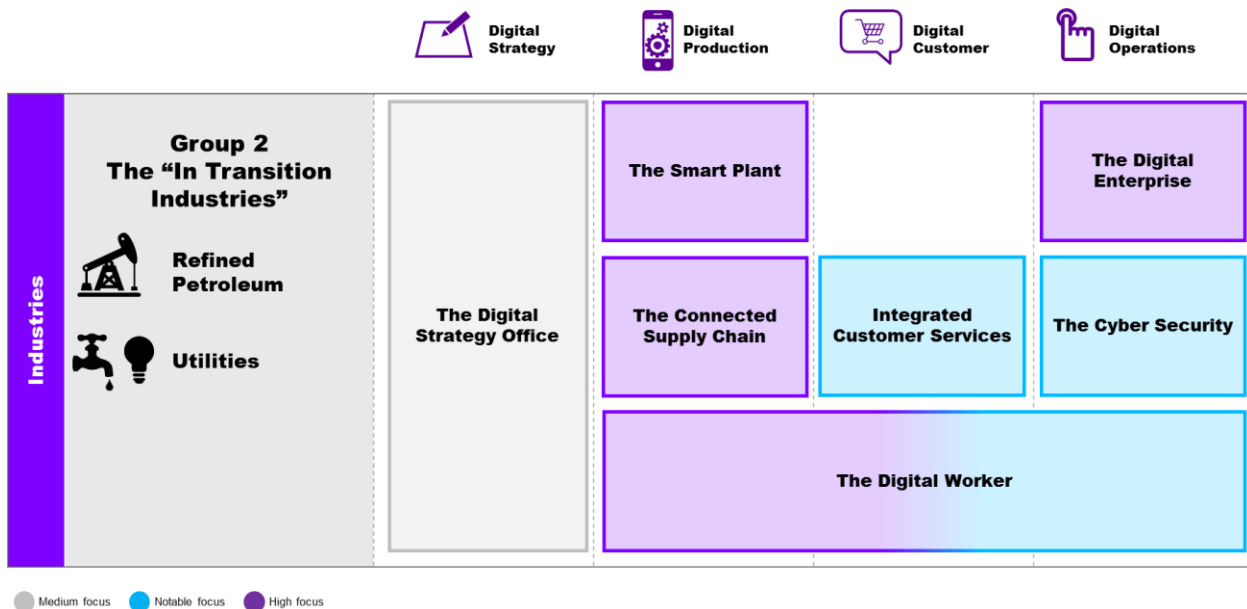


Figure 11: The "In-transition" industries

International best practices suggest that, at the core of their digital rotation, Refined Petroleum companies have embraced digital technologies, to reduce costs, make faster and better decisions and boost their productivity. Figure 12 illustrates elements of the above.

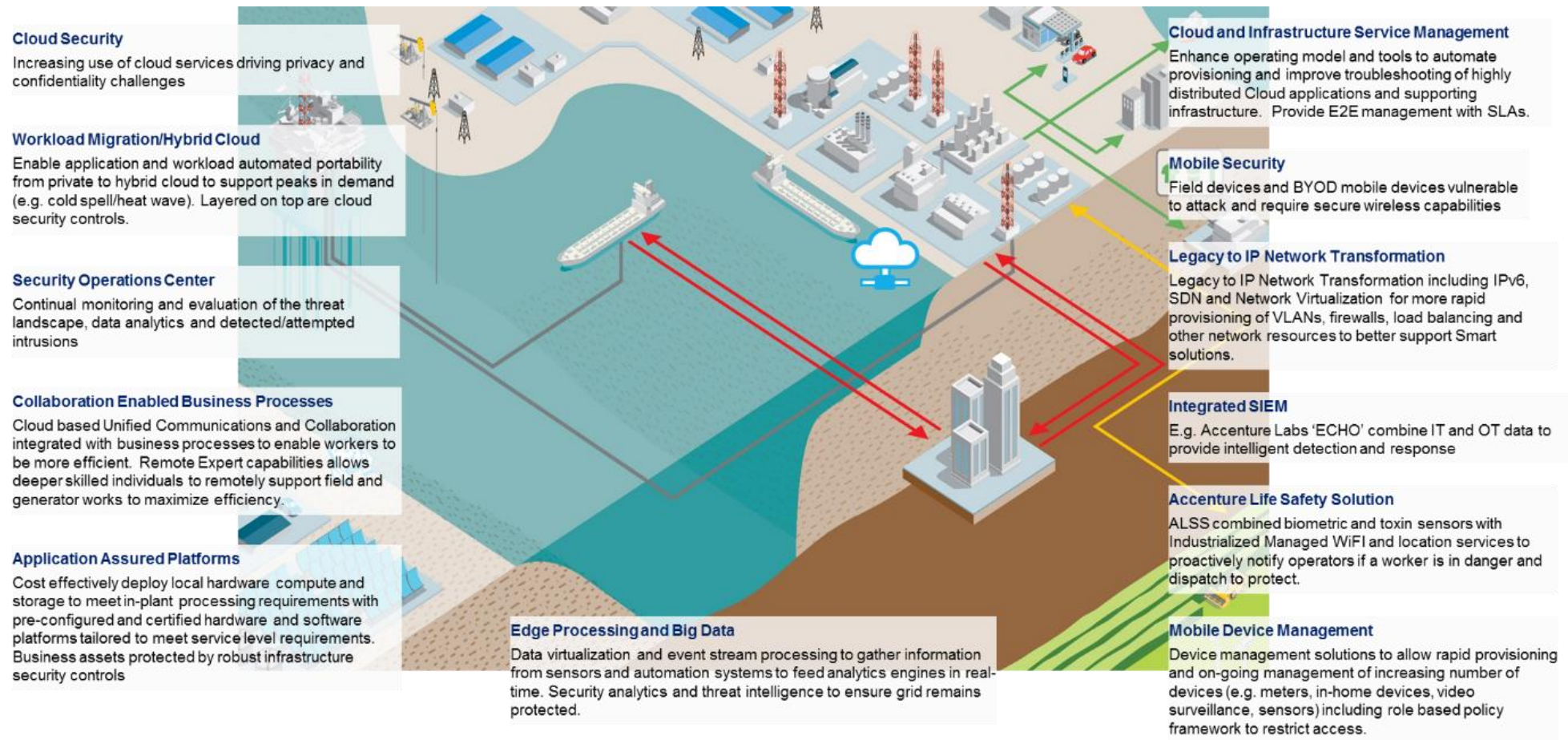


Figure 12: Digital Refined Petroleum

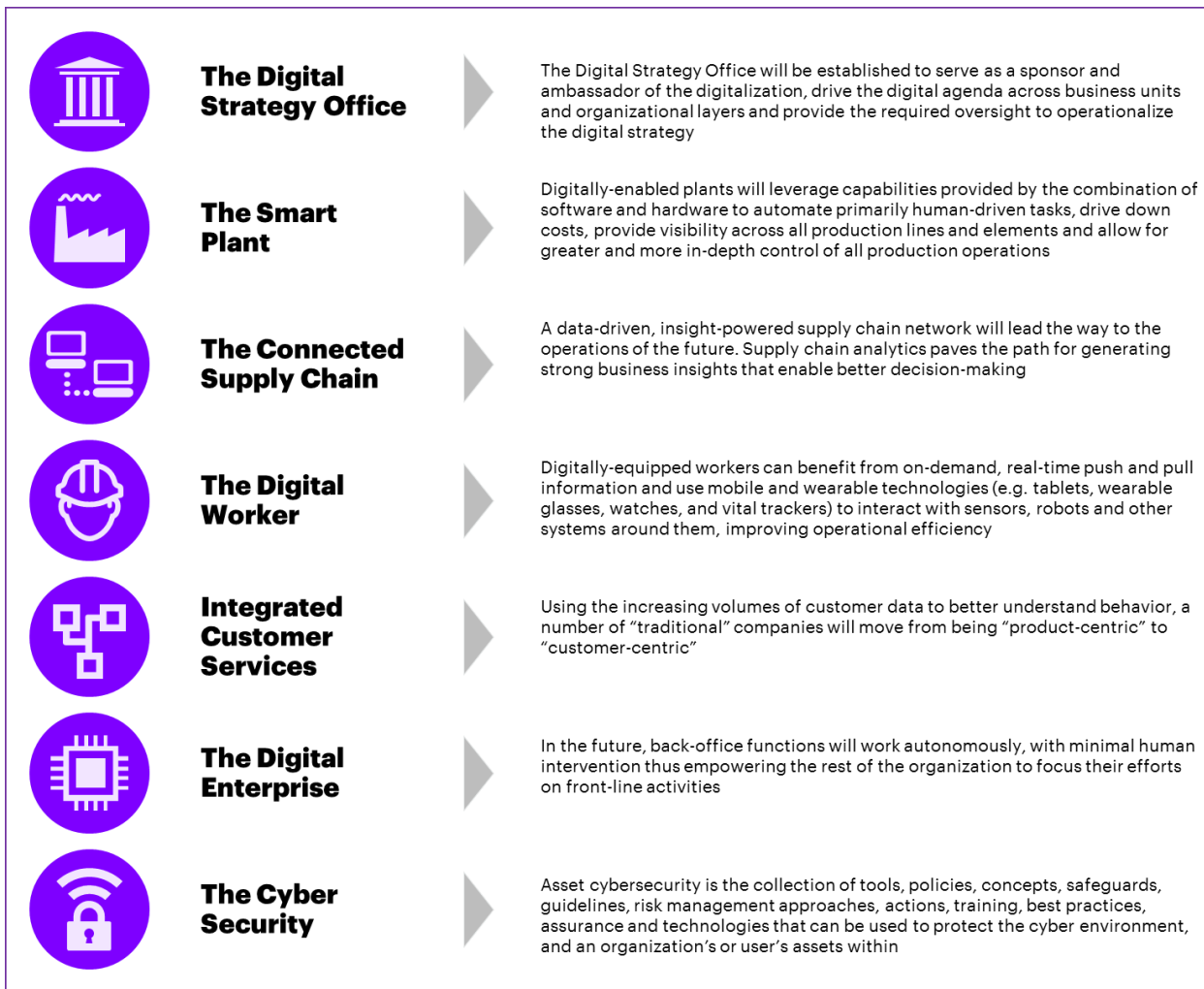


Figure 13: Digital Themes

2.2 Digital Pivot Points

Contextualizing these observations with industry's executives, we have identified the automation of their internal operations and the provisioning of additional services through their retail gas

stations as the primary areas for digital attention. Figure 14 illustrates the emphasis on the different pivot points for the Refined Petroleum industry.

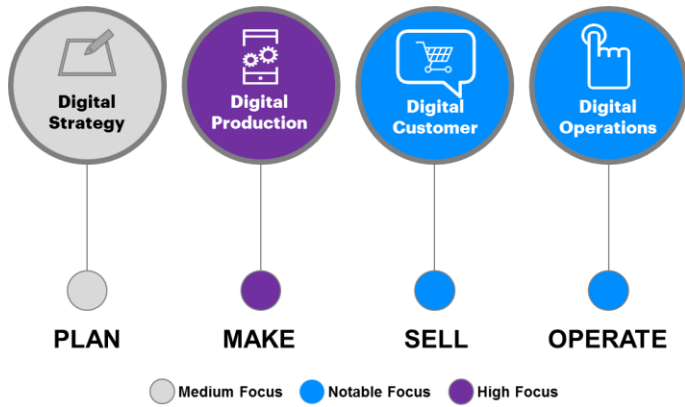


Figure 14: Refined Petroleum Industry - Digital Pivot Points

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.

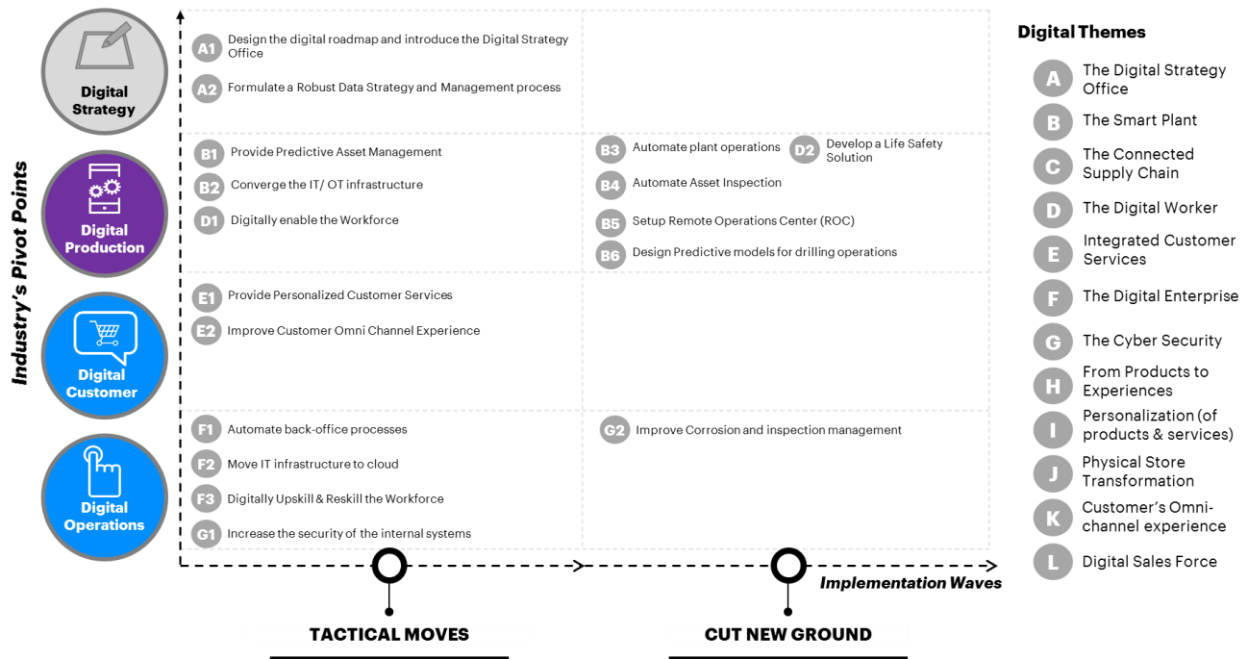


Figure 15: Classification of Suggested Initiatives Across Three Dimensions

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 Strategy and Management process	Formulate a robust data strategy and data management process that will involve a set of initiatives around building effective data architecture, data quality management, as well as data security	Digital Strategy
B1	Provide Predictive Asset Management	Deploy smart and connected sensors on the organization's assets to collect asset data in the field. The collected and aggregated data will create a comprehensive database of all company assets located at well sites, plants, facilities, and other locations and to get real-time insights into their performance	Digital Production
B2	Converge the IT/ OT infrastructure	Link OT, IT layers and devices or systems that are currently separate via leveraging the Internet of Things (IoT), which connects objects to internet infrastructure via embedded computing devices	Digital Production

#	Digital Initiative	Description	Value Chain Area
		such as radio frequency identification (RFID) chips and sensors	
B3	Automate plant operations	Implement automation techniques (i.e. robotics) to control systems regarding operating equipment such as compressors, heat exchanges, boilers and furnaces, switching power grids and other applications with minimum human intervention. The deployment of connected sensors (wellsite automation) can gather tank level measurements across multiple wellsites, trigger automated relief valves, and request liquid-hauling truck drivers automatically based on the optimal driving route	Digital Production
B4	Autonomate Asset Inspection	Introduce unmanned aerial systems (i.e. drones) and autonomous robots to monitor and inspect infrastructure assets with no human intervention, i.e. off-shore rigs, pipelines, etc.	Digital Production
B5	Setup a Remote Operations Center (ROC)	Setup a Remote Operations Center (ROC) that will control operations and make decisions in real time (based on data collected from multiple assets), with limited physical presence on well sites. Engineers within the ROC will be able to optimize operations and prevent failures by leveraging advanced algorithms to evaluate the impact of multiple decision-making scenarios and selecting the best solution	Digital Production
B6	Design Predictive models for drilling operations	Leverage big data analytics to design analytical models with regards to drilling operations (e.g. reservoir models, drilling plans and production profiles) that can analyse bigger, more complex data, and deliver faster, more accurate results, even at a very large scale	Digital Production
D1	Digitally enable the Workforce	Leverage wearable solutions and analytics solutions to capture, analyze, communicate critical information to and from workers, and improve operational performance by supporting fact-based decisions in near real-time and remotely monitor. Immediately notify of a safety issue and direct workers to personalized, location-based evacuation path	Digital Production
D2	Develop a Life Safety Solution	Leverage smart sensors, personal monitoring systems, wearables and analytics to design a Life Safety Solution that will incorporate a set of services to help manage worker safety, i.e.: <ul style="list-style-type: none"> - Understand who is associated with each machine and where they are located in the plant – Check In/Check out process - Provide continuous visibility regarding exposure to unhealthy doses of hazardous substances per person – H2S, LEL and O2 - Provide a “Man-down” functionality - Provide Panic button functionality, etc. 	Digital Production
E1	Provide Personalized Customer Services	Deploy big data analytics to analyze customers' purchase patterns and develop personalized offers. Provide cross-sell and up-sell services, including tyre pumps and maintenance check-ups, parcel pick-up points, food sales etc. according to the customer's profile to enhance their experience	Digital Customer
E2	Improve Customer Omni Channel Experience	Design applications that will personalize customer experiences with the aim of profiting from increased engagement levels and improved	Digital Customer

#	Digital Initiative	Description	Value Chain Area
		loyalty. The application shall support customers in locating the nearest gas station, reserve a pump and check the availability of a car wash or other services. Petrol pumps, store point-of-sale terminals and the company's loyalty programme can all be interconnected, allowing customers to pay for fuel directly from their checking accounts	
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	Move IT infrastructure to cloud	Move the IT infrastructure to the cloud, in order to simplify the process of integrating supply chain data with multiple standards, formats and communications channels and improve the supply chain efficiency. The cloud will also enable the organization to easily connect with an ecosystem of external partners (i.e. suppliers, brokers, etc.) and facilitate transactions such as uploading orders or checking order status, booking or downloading invoices	Digital Operations
F3	Digitally Upskill & Reskill the Workforce	Design training sessions through leveraging digital solutions to effectively build digital workforce talent and skills	Digital Operations
G1	Increase the security of the internal systems	Strengthen internal systems and incorporate increased security measures as multilayered authentication and internal control processes to strengthen security and comply with increased regulations	Digital Operations
G2	Improve Corrosion and inspection management	Design a corrosion and inspection management service that will ensure safe operations, uninterrupted production and integrity of static assets	Digital Operations

2.4 Global Leading Practices

- **Case Study - BP and GE: Industrial Internet with Predix Platform**

BP and General Electric are cooperating to gain insights from data analysis to facilitate the already highly complex process of oil extraction. With exploration targeting new frontiers in ever more demanding and challenging locations with increasing water depths, companies such as BP are looking to deploy advanced technologies to enable access to these reserves.

GE assists BP to harvest and manage large volumes of data from sensors installed on its offshore machines with the ability to vary the amount of data being captured based on operating status and when a potential problem is identified so that an accurate diagnosis can be made and preemptive interventions taken. BP's objective is to eliminate defects in operations, and this solution ultimately allows BP to take a more proactive approach to maintenance, whilst having additional insights to manage risk. The Predix software developed by GE, connected over 650 wells, via the Industrial Internet of Things. The oil well software (Predix) gathers data from sensors monitoring vibrations, temperature, pressure and other well properties and machinery status. Predix stores, contextualizes, helps visualize the data, and provides the BP workers with real-time insights.

The synthesis of big data and engineering excellence constitutes the backbone of GE's offering in the oil and gas sector. The sector presents many challenges, but with the advent of big data and the Industrial Internet there is much scope to eliminate variability of performance and increase up-time in oil and gas exploration and extraction.

Source: http://www.ge.com/europe/downloads/MM_CaseStudies_OilandGas_BigData_BP_v2.pdf

- **Case Study - BP and Accenture**

BP's fuels and convenience retail business has selected Accenture to assist in better understanding the needs of its customers and create a more innovative and competitive customer experience. The main business challenges BP was facing were: i) Fuel demand was declining in core markets leading to stiff competition, ii) Consumer's needs were changing with high expectation of relevant offers and personalized treatment, and iii) There was a need to focus on convenience sales to increase share of wallet.

Accenture leveraged digital tools and advanced customer analytics models to help BP transform the customer experience and improve its product and service offering. Initially, the project focused on Europe with options to be extended over time. Accenture's approach helped BP to have a single view of the customer, have better customer segmentation and targeting and to be smarter on investment and resourcing decisions and to improve marketing ROI. By leveraging the analytics transformation program, BP achieved 60% incremental margins. To deliver this service, Accenture leveraged its Analytics Innovation Centre in Greece and its Global Delivery Network in India.

Source: <https://newsroom.accenture.com/industries/energy/bp-chooses-accenture-to-help-transform-customer-experience-at-the-fuel-pump-using-digital-and-advanced-analytics.htm>

2.5 Maximizing the Refined Petroleum industry's economic output (GVA)

Our econometric analysis suggests that by 2021 the initiation of the digital rotation for the Refined Petroleum industry is expected to result to a moderate increase in the economic output by 1,53 percentage points equals to approximately €12,6 million⁵. 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: Refined Petroleum GVA Uplift as % of the 2021 GVA baseline, (Million Euros, %)

⁵ 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.

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