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Articles include:

Supply chains go digital

Despite challenges, opportunities
abound for GCC chemical companies

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Introduction



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Welcome to the 28th edition of REACTION magazine. It's hard to believe we're almost halfway through 2019—the year has had a very tentative feel with all of the focus on prospective headwinds around trade wars, Brexit and global growth slowdown. Despite that, the mood within the industry remains cautiously optimistic and most global economic indicators have held up well—although, like many of you, I'll be watching forthcoming economic data from Germany very closely to see whether the recent slowdown was a blip or the start of a more pronounced slowdown in global trade.

In this issue, we bring you a discussion around digital supply chain solutions for chemical companies and we also look at the ongoing development within the GCC chemical industry.

As ever, our global chemical team remains active in the industry and I look forward to seeing many of you at the upcoming SCI Palladium Medal Dinner in New York.

If there are any other topics you would like us to cover in future editions of REACTION, please don't hesitate to contact us.

Throughout this document, "we", "KPMG", "us" and "our" refer to the network of independent member firms operating under the KPMG name and affiliated with KPMG International or to one or more of these firms or to KPMG International.



Contents



2

Supply chains go digital

Pressures on the chemical industry	4
Digital solutions to supply chain challenges	5
Your future state awaits	6
Embrace the supply chain evolution	6



8

Despite challenges, opportunities abound for GCC chemical companies

Growth in specialty chemicals	10
Growth in fertilizer	10
Digitalization drives global growth	11
Protectionism on the rise—challenges and opportunities?	11
Getting up to speed on the new mobility	12

Supply chains go digital

By Ricardo Tulkens, Ramanathan Venkataraman
and Jan-Pieter van der Maat

The chemical industry is entering a new era.

Customer demand for fast and efficient service is growing, with high expectations spreading from B2C to B2B markets. New technologies are forcing companies to transform their business models. And globalization is extending commercial networks, requiring a larger footprint.

A modern, digitized supply chain can be the chemical industry's answer to these challenges.

Introducing digital solutions to some of the chemical industry's most common supply chain issues can help organizations not only reduce costs, but also uncover growth opportunities.





Pressures on the chemical industry

Building a more customer-centric experience

The explosive growth of global e-commerce increased customer expectations. Just a few years ago, same-day delivery for consumer goods was unimaginable, yet now this service is standard in several markets. Furthermore, B2C e-commerce companies have enhanced their processes to absorb the increased shipping costs rather than passing them on to the consumer.

B2B businesses are starting to follow suit by determining strategic product locations and the ideal number of warehouses to best serve customers' needs. This strategy can help chemical companies win and retain B2B customers by offering the same level of service that B2C retailers provide.

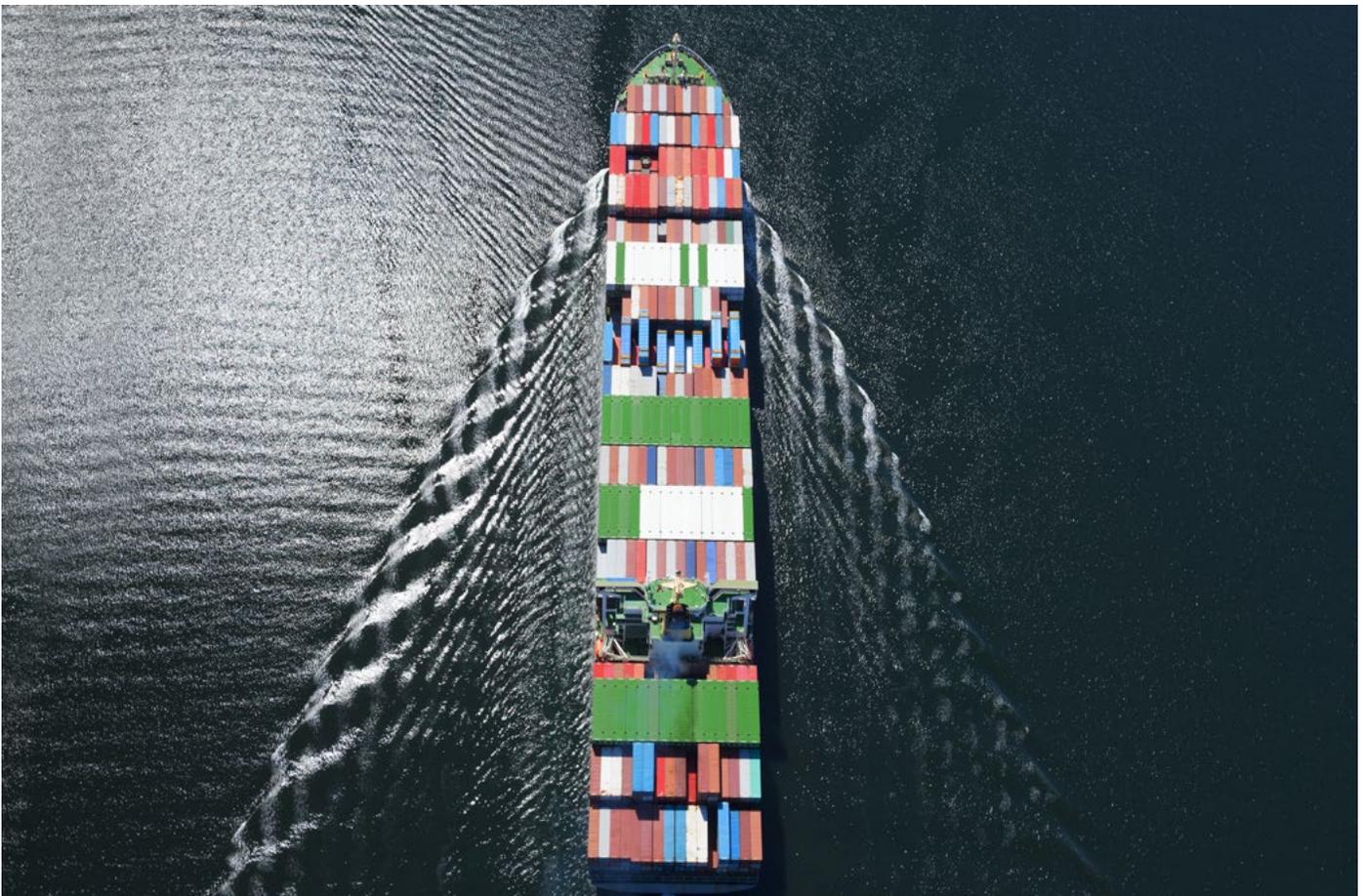
Expanding into emerging markets

When companies enter emerging markets, they increase pressure on prices, revenues and profits. The chemical industry already

endures thinning operating margins with supply currently outpacing demand, so to compete successfully in new markets, organizations must structure their supply chains to address local and global competition.

Data and technology provide valuable oversight and help chemical companies meet the demands of several markets and a wider range of customer segments, which will likely, in turn, allow them to achieve growth on a global scale.¹

¹ Demand-driven supply chain 2.0, KPMG International, May 2016, <https://assets.kpmg/content/dam/kpmg/pdf/2016/05/demand-driven-supply-chain.pdf>





Digital solutions to supply chain challenges

The digital tools transforming supply chains

Just as B2C organizations have made use of digital technologies, chemical companies can take advantage of the data they collect to transform their supply chains and outperform the competition. Advanced analytics, the Internet of Things (IoT), robotics and artificial intelligence (AI) offer opportunities to facilitate growth by lowering the cost of current (or future) services.

For example, AI optimizes logistics operations through smart robots that receive, assemble and ship customer orders. Using real-time sales data, AI can also predict likely future orders and deploy robots to the determined distribution center. This improves delivery times and reduces the need for human input in the supply chain, which increases safety, efficiency and transparency.²

An optimized supply chain also delivers new opportunities to chemical companies, including a greater range of products and services that target different customer segments.

A differentiated approach to supply chain networks

The traditional supply chain network positioned its manufacturing and shipping centers in the most cost-efficient locales to gain a competitive advantage. Today, the shift toward customer centricity encourages companies to optimize their supply chains by creating regional ecosystems and a key factor will likely be the establishment of end-to-end supply chain integration.

Rather than investing in a single large facility, companies need to create a localized network of smaller outsourced partners. Supply chain network partnerships, especially third-party network providers, help chemical companies leverage necessary resources and manage logistics more effectively. This model can provide an optimal service level that promises next-day delivery with a guarantee that every delivery will be supplied on time and in full.

Achieving expedited delivery requires a wide range of tools that can prepare data, visualize different angles on existing data and provide

new insights into customer behavior. Leveraging these capabilities allows chemical companies to speed up the process of optimization and receive the following benefits:

- Higher frequency of network strategy—strategy initiated more often with readily available dashboards, analytics and models
- Improved speed of strategy execution—faster execution based on created approach and materials
- Reduced network due to readily available material—data and dashboard reused for other scopes in the business
- Improved visualization—interactive dashboards collect, combine and present data effectively
- Undiscovered and real-time insights—find new opportunities through data-driven insights.

Companies that realize these benefits can offer lower prices to customers, operate at lower costs and potentially gain a leading position in the market.

² Optimising the supply chain through digital transformation, *Risk & Compliance* magazine, January – March 2019, <https://advisory.kpmg.us/content/dam/advisory/en/pdfs/optimizing-supply-chain-digital.pdf>





Your future state awaits

Supply chain transformation starts with a strong plan:

1. Assess current state based on customer prioritization, number of shipments and shipment volumes.
2. Define initial distribution centers using customer gravity maps, the locations of strategic clients and initial storage locations.
3. Assess potential locations and assumptions for costs by defining possible scenarios and using optimization logic.
4. Create a future supply chain network based on a comparison of the different optimization scenarios and a critical assessment of the current state versus the desired future state.

Digital tools also allow companies to perform these assessments on a more frequent basis, ensuring the organization remains nimble in an ever-evolving market.

Case study—global chemical products manufacturer

A global producer of chemical products managed a centralized distribution network for its European packed products business. However, the organization suffered significant revenue leakage as competitors provided a delivery promise it could not match.

In addition, an impending driver shortage in mainland Europe demanded the organization streamline processes and alleviate congestion at their key production facilities.

KPMG conducted a customer gravity analysis in Tableau to identify potential stock point locations and redesigned the supply chain network with a hub and spoke model. Our team also optimized the prospective network by developing a constraint network model in Advanced Interactive Multidimensional Modeling System.

Then our team assessed the impact of each stock point on the current network and found critical stock points impacted more than 80 percent of customers.

The organization also saw a significant increase in “on time in full” delivery success, with a jump from 74 percent to 95 percent.

These supply chain enhancements positioned the company to welcome new customers, see greater retention of current customers and realize a lower churn rate.



Embrace the supply chain evolution

Companies survive and thrive on growth, which comes from attracting and retaining customers as well as entering new markets. Leveraging emerging technologies to digitalize your supply chain will help your company keep pace with the current trends and may be possible with zero costs. By driving supply chain optimization, digital transformation can help chemical companies do a lot more for a lot less and generate sustainable growth in the age of the customer.



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Ricardo has more than 20 years of experience in translating a business strategy into operational execution. He mainly focuses on optimizing the various processes within large organizations such as the total supply chain, purchasing, production and storage and distribution.



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Despite challenges, opportunities abound for GCC chemical companies

By Paul Harnick

Among countries that are part of the Gulf Cooperation Council (GCC), the chemical industry is the second largest manufacturing industry, after refining, when measured by value added. According to the GPCA 2017 **Facts and Figures** report, it currently accounts for 3.1 percent of the GCC's GDP. It is also one of the largest global producers of basic chemicals and it continues to show growth.³ Indeed, the chemical industry is one of the fastest-growing industries in the GCC, with revenue growing 17 percent in 2017, the biggest single-year increase since 2011.⁴

³ <https://www.oilandgasmiddleeast.com/article-13332-chemical-industry-drives-gdp-growth>

⁴ <http://www.omanobserver.om/gcc-chemical-industrys-revenue-climbs-17pc-to-84bn/>





Growth in specialty chemicals

With continued volatility in oil prices and the benefits from cheap feedstocks declining, GCC chemical producers have had to explore new strategies and opportunities. In particular, the emergence of cheap feedstocks from other regions, such as the development of shale gas reserves in the US, has removed some of the traditional advantages experienced by GCC chemical producers. We expand on the emergence of shale gas reserves from the US in this [video](#). In response, they are transitioning toward higher-margin value-added specialty chemicals. These chemicals

have not traditionally been a major part of GCC production—in 2006 they accounted for just 1 percent of total GCC petrochemical production—but with the growth in emerging markets globally and the concurrent expansion of middle-class buying power, demand for specialty chemicals will likely increase.⁵

China's middle class is expected to make up more than three-quarters of the country's total population by 2022⁶ and by 2030, the Asia-Pacific region is expected to account for two-thirds of the global middle class.⁷ GCC chemical companies are

well placed geographically to take advantage of the Asia-Pacific markets and the specialty chemical industry will likely be a significant driver for GCC producers moving forward. The big challenge for GCC producers will be adapting to the significant changes required in their business models to successfully own, operate and manage specialty businesses.



Growth in fertilizer

Another opportunity for growth exists in fertilizer exports. In recent years, exports in this category have continued a strong pattern of growth seen over the past decade. With production expected to reach 38.7 million tons in 2018 and 44.8 million tons by 2025, fertilizer will likely remain a key element in GCC chemical production, particularly with the increased focus globally on ensuring food security and developing innovations in regional agriculture.⁸



⁵ <https://www.sadara.com/News?NewsArticle=Sadara%20Middle%20East%20Advantaged%20in%20Global%20Chemical%20Industry>

⁶ <https://www.businessinsider.com/chinas-middle-class-is-exploding-2016-8>

⁷ <https://www.nextbigfuture.com/2017/08/global-middle-class-growth-will-be-88-in-asia-for-next-five-years.html>

⁸ <http://www.omanobserver.om/record-growth-in-gcc-fertiliser-exports-in-2017/>



Digitalization drives global growth

In order to stay competitive in these emerging global markets, GCC chemical producers will need to embrace digitalization. The chemical industry globally is in a nascent stage when it comes to assessing how digitalization can drive significant business benefit, but companies are investing heavily in exploring ideas and change is likely to come rapidly. Digitalization offers chemical producers an opportunity to fundamentally improve the way they do business.

This is likely to move beyond the traditional focus on efficient plant design, operation and automating and monitoring production. Real-

time access to data about customer demand, production capacity and operational performance will likely enable faster decision-making capacity in pricing, production planning and supply chain management. Borrowing best practice from B2C businesses will likely see digitalization of the customer journey and experience enabling chemical companies to provide better services and offerings to consumers—driving cross-selling opportunities, maximizing profits and driving down costs.

This is supported by findings from KPMG's [2018 CIO survey](#), which shows that the top three

priorities for digital leaders are developing innovative new products, delivering stable IT and enhancing the customer experience. Worldwide, energy companies are less likely to maintain an enterprise-wide digital business strategy than those in other sectors (22 percent versus 32 percent for all industries). GCC chemical producers who adopt a clear digital strategy therefore have a comparatively open playing field for this new development and could jump ahead of their global competition as a result.



Protectionism on the rise—challenges and opportunities?

In 2017, the GCC exported approximately 80 percent of its chemicals and petrochemicals and GCC chemicals exports revenue increased to USD 55.6 billion. The global chemical industry has been built on the principles of free trade

and given the integrated nature of global supply chains, relies on the ability to move products freely across borders. Certainly, many global chemical companies have been concerned by the recent rise in protectionism around the world and

the more entrenched these issues become, the bigger the impact on the chemical industry is likely to be—including potentially relocating plants, restructuring supply chains and rethinking global business strategy.



Getting up to speed on the new mobility

The automotive industry is speeding toward a new era marked by electric-powered vehicles, autonomous vehicles and shared mobility. Even as global sales tick downward,⁹ individual vehicles will likely be used more intensively, spending less time parked and more time on the road, transporting people and goods in a growing number of ways. For chemical companies supplying the automotive sector, the new mobility will likely mean a dramatic shift in product portfolios, clients, end users and business models to address an industry ecosystem that's becoming larger, more dynamic and far more interconnected.

The growing adoption of electric, autonomous and shared vehicles will affect the number, type and amount of chemicals required by automotive OEMs, not to mention supply chains, aftermarkets and market structures. Electric vehicles will remain a strategic market for plastics and other lightweight materials. As for autonomous vehicles, it's been estimated that they could eliminate the 90–95 percent of road accidents¹⁰ caused by human error and lower accident rates could impact demand for materials related to repair and repainting. Autonomous vehicles might also need to be more visible on the road, however, with surfaces that are reflective across a broad range of wavelengths and weather conditions and this could create new markets for innovative paints and coatings.

In the face of these changes, GCC chemical companies may have to rethink their business models, reconsider key markets and recalculate the value propositions for every product in their portfolio. As with any disruption, there will be winners and losers. Companies that provide engine coolants, general lubricants, fuel additives and multigear transmission fluids for internal combustion engines (ICEs) might have to prepare for the possibility of slowing demand. Manufacturers of battery materials and high-performance polymers might plan for increased competition in growing markets. As always, chemical companies will also have to continue their efforts in enhancing regulatory compliance, improving operational efficiencies, identifying new markets and mapping their long-term expansion strategies. In the 26th edition of REACTION magazine, we take a deep dive into Mobility 2030 and how changing demand patterns in the automotive industry are likely to drive fundamental change into the chemicals supply chain over the coming years.

With all of the changes above, there are abundant opportunities for GCC chemical producers to find new ways to be successful in the coming years—if they can adapt quickly enough.

⁹ <https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/06/reaction-26-magazine.pdf>

¹⁰ <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>



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