OIDD-680

Operations Strategy Practicum

Spring 2019

(Revised January 15, 2019)

Locations: Scheduled sessions at Wharton will meet in **JMHH G-92** at 10:30 am – noon, on scheduled Wednesday dates. We will spend spring break in Europe (Germany and the Netherlands). Additional local trips will be scheduled on one or two Fridays to visit various companies reachable from the Philadelphia campus after spring break.

Dates: Spring Semester 2019

- Lectures, Case Discussions
- Visits to European and US manufacturing plants, logistics centers and service provider facilities
- Presentations by senior managers

Credit: 1.0 Credit Unit

Course Instructor

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Course Overview and Learning Goals

This course will focus on the management of operations at manufacturing and service facilities located within the US and Europe that are used either by domestic corporations or by foreign multinational companies. Our emphasis will be on the evolving patterns of

operations strategies adopted by firms for producing products, sourcing manufacturing, distributing products, delivering services and managing product design as well as on programs for enhancing quality, productivity and flexibility and managing technology. We will focus on the formulation and execution of such strategies for a collection of firms in the context of the current dynamics of global competition. The course will consist of a set of site visits and in-class sessions which include lectures, case discussions and management speakers who will describe their company's current strategy.

Our course is motivated by the fact that many manufacturing and service producing firms are re-examining the structure of their global supply chains, internal processes and sourcing strategy in response to the uncertainties and risks they face in these turbulent times. These adjustments are occurring against a backdrop of fundamental change to the environment in which companies operate. For decades a dominant strategy in manufacturing has been to outsource to low cost global suppliers. This has led to the transfer of millions of manufacturing jobs and development activities out of the US, Japan and Europe and into low labor cost countries such as China, India and Vietnam. Today this trend is being challenged by a movement by some companies to "re-shore" their manufacturing by bringing it back or at least moving it closer to their developed country market, i.e. by "near-shoring" to locations such as Mexico or Eastern Europe. At the same time many firms continue to select offshore locations for outsourcing of material inputs and services. Similar arguments for global sourcing and re-shoring can also be made for firms that act as suppliers of services such as Business Process Outsourcing, Customer Service Support, Product Design and Software Development. Moreover there have been major technology developments affecting production automation, logistics and smart, connected product designs which are contributing to this re-structuring. This has led many firms to adopt the strategy of Industry 4.0, which refers to the 4th industrial revolution, which is now underway. Against this backdrop of change, we are currently in an era where government policies concerning globalization and its impact on domestic employment have been questioned and challenged.

This course will consider the current status of operations strategy and process management primarily from the perspective of major multi-national firms, although we will also interact with startup companies. The goal is to provide the class with the opportunity to interact with senior executives from these companies, which are headquartered and/or operating in the US and Europe, to explore current thinking and state-of-the-art practices concerning their global operations. Experiential learning will be facilitated by providing students with the opportunity to observe company operations in action under the guidance of company management. These interactions will facilitate an exchange of ideas that will identify managerial challenges and concerns. It will also highlight current practices and intentions of participating companies. Moreover, the course will consider various models and frameworks that have been developed in the economics, public policy, operations and management literatures for dealing with strategies for global supply chain sourcing, technology management and process improvement. We will also consider how technology developments are impacting current operations strategy (e.g. automation, E-commerce, Internet of Things). Our objective is to develop an understanding of the drivers of operations strategy decisions, at present and in

the future, in order to identify opportunities for improvement and barriers to implementation.

We will explore these issues through the lens of visits to a specific group of multinational and emerging companies. The companies will be chosen to cover a range of manufacturing and service industries where global sourcing, productivity and coordination are key issues e.g. aerospace and defense, automotive, consumer electronics and computers, consumer products, entertainment, health care products, medical equipment, pharmaceuticals, logistics, and semiconductor. This course will build off of the learning based on a Global Modular Course on this topic that has been offered in Japan and from versions of the course that has been offered to students participating in the Wharton SiSF (Semester in San Francisco) program and to students in the regular full time program in Philadelphia.

Course Organization and Requirements

The course will include an intense week of company visits in Europe during the spring break (March 3 – March 9, 2019), several US company visits on Fridays, and several class sessions at Wharton. The class sessions to be held at Wharton will include lectures, case discussions and guest speakers. Students will be responsible for travel expenses (flight to Germany and for the land arrangements in Europe and the US). We estimate that these expenses will be about $2,400 for the course (for the full semester, shared occupancy, excluding the cost of the flight to Germany – based on last year). ***It will be necessary to register for the course (as a 1 CU course), and pay a deposit fee for the expenses in order to reserve your place in the course.*** Enrollment will be limited due to capacity restrictions imposed by the companies that we will be visiting. Those interested in registering for the course will be required to fill out a short survey concerning background and interests.

Pre-requisites

Students taking this course should have completed at least one of the OIDD core courses, i.e. OIDD 611, "Managing the Productive Core of the Firm: Quality and Productivity" or OIDD 615, "Managing the Productive Core of the Firm: Operations Strategy", or an equivalent course, or have had work experience or have taken prior courses that are related to operations and supply chain management.

Grading and assignments

Grades are based on (1) class participation which includes class discussions, contribution to the group reports and attendance to the company visits (25%); (2) analysis of 2 assigned cases, each requires an individual, written report (25%); (3) A background report concerning one of the companies and their industry, that we will visit, and an after-site visit report for that company based on observations from the visit. (25%); This will be a group report; and (4) a final, individual paper offering reflections on what you observed and learned during the site visits (25%). If you miss any of the company visits your participation grade will be reduced.

Attendance at all of the company site visits is mandatory.

Canvas Site

https://canvas.upenn.edu/courses/xxxx

Course Schedule

We will be visiting companies in the European Union (Germany and the Netherlands) during spring break in March. We will visit the following companies in the cities of Frankfurt, Koblenz, Dusseldorf, Eindhoven, Rotterdam and Amsterdam.

- Canyon Bicycles
- Zalando
- Henkel
- VDL-NedCar (Mini)
- DAF Trucks
- Thermo Fisher
- Hutchinson Ports
- Royal Dutch Shell
- Friesland Campina
- Royal Philips

Schedule: Wharton study tour, Germany & the Netherlands

The following schedule is subject to change.

Session	Date	Topic and Readings
1-A	**January 23** **10:30 am -noon**	**Course Introduction – Operations Strategy** This session will present the goals and requirements for the course. We will then review the course schedule. Finally, we will introduce a framework for operations strategy that highlights the following concepts that will be covered in the course either in class sessions or through company visits: o Global Manufacturing Sourcing o Supplier Relationships and Coordination o Logistics and Distribution o Technology and Capacity Planning o Supply Chain Risk Management o Agility, Flexibility Strategies o Environment and Sustainability o Lean operations and continuous improvement • **Readings** o M. Fisher, "What is the Right Supply Chain for Your Products", Harvard Business Review, 1997. o H. Lee, "Triple A Supply Chain", Harvard Business Review, 2004.
1-B	**January 23** **10:30 am -noon**	**Plant Tours and Industry Background** This session will introduce the Plant Tour Analysis tool that will be applied in our site visits by the student teams. We will also discuss the industry background reports that each team will prepare. Each team will be required to distribute their background report prior to the site visit and a summary of the site report after each visit. • **Reading** o R. E. Goodson, "Read a Plant – Fast", HBR, May 2002.
2	**January 30** **10:30 am -noon**	**Supply Chain Risk Management – Cisco Case Discussion** This session will introduce the concept of supply chain risk management. We will do so by discussing the case which describes the Cisco process and how it reacted to the Tohoku earthquake in Japan. We will review the presentation of James Steele, who was director of Cisco's

		Supply Chain Risk Management program at the time of the quake, who has provided an update on Cisco's response. • **Readings** o R. Anupindi, "Cisco Supply Chain Risk Management (SCRM) in Action: 2011 Tohoku Earthquake", (U. Michigan Case 1-429-284, 2013) o R. Anupindi, "Supply Chain Risk Management at Cisco: Response to H1N1 (U. of Michigan case 1-428-881), – read pages 2 through top of page 9. o D. Simchi-Levi , W. Schmidt and Y. Wei, "From Super Storms to Factory Fires: Unpredictable Supply-Chain Disruptions", HBR Jan-Feb, 2014. o D. Reynolds, "Lessons From Tohoku", Wharton Magazine, Winter 2012. o A. Pollack and S. Lohr, "A Japanese Plant Struggles to Produce a Critical Auto Part", New York Times, April 278, 2011. o K@W-Wipro, "Process Resilience is Becoming a Business Imperative", K@W, April 2014.
3	**February 13** **10:30 am -noon**	**Global Supply Chain Strategy – Sourcing and Location Decisions** We will review the current situation concerning global manufacturing sourcing, including the results of a recent Benchmark study. **Readings** o W. C. Shih "What It Takes to Re-Shore Manufacturing Successfully", , Sloan Management Review, Fall, 2014. o "Shifts in Cost Competitiveness Reshape Global Manufacturing", Sourcing Journal, September 05, 2014. o "Yen's Shifting Value Helps Japanese Carmakers Meet New Challenges", Knowledge@Wharton, April 01, 2014. o J. Endo, "Discussion paper of Nissan's Global Supply Chain Management Roles of Mother Plants and the Global Production Engineering

		Center in Japan, Revised February 16, 2015 (M. Cohen) o M. A. Cohen, S. Cui, R. Ernst, A. Huchzermeier, P. Kouvelis, H. L. Lee, H. Matsuo, Marc Steuber, A. Tsay "Benchmarking Global Production Sourcing Decisions: Where and Why Firms Offshore and Re-shore", , OID Working Paper, 2016.
4	**February 27** **10:30 am -noon**	**Industry/Company Reports and Trip Preparation** Each group will present a brief report that provides background information concerning their assigned industry and company that we will be visiting. Topics that could be included in this report include: current competitive trends, technology developments affecting both the product and processes, the regulatory environment, etc.
E-0	**Sunday** **March 3**	Arrival in Germany 7.00 pm: Opening Orientation Session
E-1	**Monday** **March 4**	**Canyon Bicyles** in Koblenz and **Zalando Operations** at Euskirchen Hotel near Cologne/Düsseldorf (Carnival!!!)
E-2	**Tuesday** **March 5**	**Henkel** in Düsseldorf and **NedCar** (BMW) in Born/NL Hotel in Eindhoven
E-3	**Wednesday** **March 6**	**DAF Trucks** and **ThermoFisher** Hotel in Rotterdam
E-4	**Thursday** **March 7**	**Hutchinson Port** in Rotterdam and **Shell** in Den Hague Hotel in Amsterdam
E-5	**Friday** **March 8**	**Friesland Campina** in Amersfoort and **Philips** In Drachten Hotel in Amsterdam Farewell Dinner in Amsterdam

E-6	**Saturday** **March 9**	Depart
5	**March 20** **10:30 am -noon**	**Case Discussion - Boeing: The Fight for Fasteners** We will discuss challenges associated with sourcing and supplier coordination encountered by Boeing in its 787 supply chain. Our focus will be on the procurment process and their interaction with suppliers of fasteners used in the assembly of the airplane. **Readings** o M. Lee and R. Anupindi, "Boeing: The Fight for Fasteners", by (U. of Michigan case 1-428-787, 2009) o C. S. Tang, and J. Zimmerman, "Mitigating New Product Development Risks – The Case of the Boeing 787 Dreamliner", Chapter 11 in M.S. Sodhi and C.S. Tang. *Managing Supply Chain Risk.* Springer. 2012
6	**April 3** **10:30 am -noon**	**Logistics Systems and Distribution Strategy** This session will present insights derived from analytical models and current practices for materials management, cross-docking, and warehouse automation. We will focus on issues associated with risk pooling, coordination and technology **Reading** o G. Cachon and C. Terwiesch, "Risk-Pooling Strategies to Reduce and Hedge Uncertainty", Chapter 15 "Matching Supply with Demand: An Introduction to Operations Management", 3rd edition, McGraw Hill

7	**April 12** **Friday** **Bethlehem PA**	**Corporate Visit to Walmart eCommerce distribution center in Bethlehem PA** We will learn about Walmart's eCommerce business and how they manage their fulfillment center.
8	**April 17** **4:30 pm -9:00 pm** **Bethlehem PA**	**Corporate Visit to Amerisource Bergen distribution center in Bethlehem PA** Managers from the company will provide us with an overview of the distribution strategy at Ameriscource Bergen. We will then have a tour of their state-of-the-art distribution center.
9	**May 1** **10:30 am -noon**	**Post visit– Group Presentations & Debrief** Each group will have 10 minutes to present a report of our visit to their assigned company. The reports will be based on the group's observations and application of the plant tour assessment tool (i.e. "Read a Plant Fast" by Goodson). The reports will be shared with the full class. Your report should consist of a Power Point Deck and brief written report that summarizes your observations and insights. Length should be less than or equal to 500 words Each student will have the opportunity to comment on lessons learned from the course. We will review highlights of our company visits and discuss key lessons learned.

Case Assignments (Individual assignments - 25% of your overall grade)

First Case Assignment - Cisco

On March 11, 2011 a major earthquake struck Tohoku Japan. It had a devastating impact on global supply chains. Read the case, **Cisco SCRM in Action: 2011 Tohoku Earthquake,** by Ravi Anupindi (Tauber Institute, U. of Michigan case 1-429-284, 2013) and also read **Supply Chain Risk Management at Cisco: Response to H1N1** (U. of Michigan case 1-428-881), – read pages 2 through top of page 9 for a description of Cisco's approach to risk management. Prepare a 750 word paper *(plus or minus 5%; double-spaced; put word count and your name at the top)* that addresses the following questions:

1. *What are the major challenges facing Cisco as result of supply chain disruptions caused by the earthquake?*
2. *How should Cisco manage the crisis?*
3. *What metrics should be used by Cisco to support Supply Chain Risk Management? What data would you need to estimate these metrics? At what organizational level (plant, product, supply chain, business unit) would it be appropriate to apply these metrics? What may be typical uses of these metrics?*
4. *How should Cisco mitigate the impact of the disruption to their supply chain? What tradeoffs and risks should they consider and how are these related to the metrics? In particular, how can the TTR metric be used to develop a mitigation stratgy?*
5. *Comment on Cisco's SCRM process and how they dealt with the Tohoku crisis. What are its major strengths? Do you see any weaknesses?*

You should also read the following articles (posted on Canvas) as you prepare your answers to the case:

1. D. Reynolds, "Lessons From Tohoku", Wharton Magazine, January 26th, 2012,
2. D. Simchi Levi, "From Super Storms to Factory Fires: Managing Unpredictable Supply-Chain Disruptions", Harvard Business Review, Jan-Feb 2014.
3. A. Pollack and S. Lohr, "A Japanese Plant Struggles to Produce a Critical Auto Part", New York Times, April 2, 2011.
4. K@W-Wipro, "Process Resilience is Becoming a Business Imperative", K@W, April 2014.

Read the case and think about the assignment questions. We will discuss this case in class on **Jan. 30**. James Steele, who was director of Cisco's SCRM program at the time of the quake, has provided us with a report on how Cisco's SCRM system actually operated during the crisis. We will review his comments in our discussion of the case. Your paper is due on **TBD**, posted on Canvas.

Second Case Assignment - Boeing

Boeing encountered an unusual supply chain problem during its 787 Dreamliner product development and manufacturing process, related to a small and unlikely source of difficulty, namely shortages and delays in the supply of fasteners needed to hold the airframe together. Read the case, **Boeing: The Fight for Fasteners,** by Moses Lee and Ravi Anupindi (Tauber Institute, U. of Michigan case 1-428-787, 2009) and prepare a 750 word paper *(plus or minus 5%; double-spaced; put word count and your name at the top)* that addresses the following questions:

1. *What were the causes of the fastener crisis at Boeing? How was the problem ignored for so long? What effect did the 787 Dreamliner project have on fastener supply?*
2. *What are the key elements of the Fastener Procurement Model (FPM)?*
3. *Describe the material, information, and financial flows between Boeing, fastener manufacturers (suppliers) and Tier-1 partners under FPM.*
4. *Evaluate FPM from the perspective of Boeing, fastener manufacturers, Tier-1 partners, and other stakeholders.*
5. *Critique the approach taken by Boeing in implementing FPM. What problems has Boeing encountered in rolling out the FPM?*
6. *What are some of the costs, benefits and risks associated with a "customer managed inventory" strategy such as FPM.*

You should also read the article by Chris Tang, and Josh Zimmerman, **Mitigating New Product Development Risks – The Case of the Boeing 787 Dreamliner**, Chapter 11 in M.S. Sodhi and C.S. Tang. *Managing Supply Chain Risk.* Springer. 2012, as you prepare your answers to the case.

Read the case and think about the assignment questions. We will discuss this case in class on **March 20**. Your paper, which includes answers to all 6 questions, is due on **TBD**, posted on Canvas.

Industry Background and Site Visit Report (Team assignment - 25% of your overall grade)

Each team will be assigned to a company that we will be visiting during the semester. Prior to the visit, the team will prepare and present or distribute a report that provides background information concerning their assigned industry and the company that we will be visiting. Topics that could be included in this report include: current competitive trends, technology developments affecting both the product and processes, the regulatory environment, etc. The team will then use the plant tour assessment tool (i.e. "Read a Plant Fast" by Goodson) to prepare a report based on the visit. The reports will be shared with the full class after the visits. Group formations and preferences are due on **January 30**. Please submit your group membership (3-4 members) and your first two choices for the background and post-visit reports. Each group will present their industry /company background report to the class in our pre-tour session on **Feb. 27**.

A session devoted to group reports based on observations from the the visits will be held on **May 1.** Each group will have 10 minutes to present a report of our visit to their assigned company. The reports will be based on the group's observations and application of the plant tour assessment tool (i.e. "Read a Plant Fast" by Goodson). The reports will be shared with the full class.

Your report should consist of a Power Point Deck and brief written report that summarizes your observations and insights. Length should be less than or equal to 500 words.

Final reflection paper (Individual assignment - 25% of your overall grade)

This individual assignment is an opportunity to reflect on what you have learned in the course and through the site visits. It is worth 25% of your grade and is due on **TBD**, posted on Canvas. You should respond to the following questions.

1. *We have visited companies that are among the most successful in their industry. What are the most important factors, policies and/or decisions that have led to their success? Is there a common theme or strategy across these companies?*
2. *How have these companies succeeded, even though they are operating in an environment (Germany, the Netherlands) where wages and other costs are high?*
3. *What where the main causes for offshoring production in the US? How can US government policy i) strengthen the industrial sector and/or ii) encourage the re-shoring of manufacturing to the US? i.e. What advice would you give to President Trump?*

Our guideline for length is 750 words, roughly three pages, although this is a recommended, but not required, length; your paper can be either shorter or longer, as long as it captures your thoughtful reflections on your experience in the course.

Schedule: Wharton study tour, Germany
March 3 to 9, 2019

Date	Visit	Address	Transfer / distance	Hotel
Sunday March 3, 2019	**<u>Arrival day</u>**			Hilton Garden Inn The Squaire, Am Flughafen 60549 Frankfurt am Main
Monday March 4, 2019 07.30 9.00 - 12.00 12:00 - 3.00 3.00 - 5.00 5:00	Transfer from hotel to Canyon Visit of **Canyon Bicycles** Transfer to Zalando Visit of **Zalando (confirmed)** Transfer to hotel	Canyon Bicycles Karl-Tesche-Straße 12 56073 Koblenz Zalando MGL Regioparkring 25 41199 Mönchengladbach	300 km 3 hrs 230 km 2,5 hrs	me and all hotel düsseldorf Immermannstraße 23 40210 Düsseldorf Tel. +49 211 54259 0

Date	Visit	Address	Transfer / distance	Hotel
Tuesday March 5, 2019				
9.00	Transfer to Henkel	Henkel Henkelstraße 67 40589 Düsseldorf	5 km 30 mins	
9.30 – 12.30	Visit of **Henkel**			
12.30 – 2.00	Transfer to Born	**Visiting address:** VDL Nedcar bv	86 km 1,5 hrs	
2.00 - 5.00	Visit of **VDL-NedCar (Mini)** Antwort von ah noch offen Ansprechpartner: Herr ReneVounckx	Dr. Hub van Doorneweg 1 6121 RD Sittard-Geleen (Born) T: +31 (0)46 489 44 44 F: +31 (0)46 489 54 44 E: info@vdlnedcar.nl		Holiday Inn Eindhoven Veldmaarschalk Montgomerylaan 1 Stadtzentrum Eindhoven 5612 BA Eindhoven Tel.: +31 (0)40 235 8248 | Fax: +31 (0)40 2358 229 reservations@eindhoven.holiday-inn.com
5.00	Transfer to Eindhoven		66 km 1 hr	

Date	Visit	Address	Transfer / distance	Hotel
Wednesday March 6, 2019				
08.00	Transfer to DAF Trucks	DAF Trucks N.V. Eindhoven	3 km	
		Sales Operations Department	30 mins	
10.00 - 11.30	Visit of **DAF Trucks**	Hugo van der Goeslaan 1. 5600 PT Eindhoven		nhow Rotterdam 4* Wilhelminakade 137, Feijenoord, 3072 AP Rotterdam (Angebot liegt vor) Holiday Inn Express Rotterdam Central Station
12.15 - 12.45	Transfer to Thermo Fisher	Thermo Fisher	km	Weena 129
		Achtseweg Noord 5	mins	Rotterdam, 3013 CK
		5651 GG Eindhoven		+31-10 820 9980
		The Netherlands		
1.00 - 4.00	Visit of **Thermo Fisher**			Hotel New York (Angebot liegt vor)
				Koninginnenhoofd 1
				3072 AD Rotterdam
				info@hotelnewyork.nl
			112 km	info@nybasement.nl
4.00	Transfer to Rotterdam		1.5 hrs	+31 (0)10 – 439 05 00

Date	Visit	Address	Transfer / distance	Hotel
Thursday March 7, 2019				
7.30	Transfer to Hutchison Ports	Hutchison Ports ECT Euromax Maasvlakteweg 951	59 km 1.5 hrs	
09.00 - 12.00	Visit of **Hutchison Ports**	Port number 9830 3199 LZ Rotterdam (Maasvlakte) P.O. Box 7400 3000 HJ Rotterdam T (31-181) 37-7377		
12.15 - 1.45	Transfer to Royal Dutch Shell	**Shell headquarters** Carel van Bylandtlaan 16 2596 HR Den Haag The Netherlands	75 km 1.5 hrs	DoubleTree by Hilton Amsterdam Centraal Station 4-Sterne-Hotel Oosterdoksstraat 4, Stadtzentrum von Amsterdam 1011 DK Amsterdam (angefragt)
2.00 - 5.00	Visit of **Royal Dutch Shell**	**Postal address:** PO box 162 2501 AN Den Haag The Netherlands Tel. +31 70 377 9111		
5.00	Transfer to hotel		54 km 1 hrs	

Date	Visit	Address	Transfer / distance	Hotel
Friday March 8, 2019				
07:30	Transfer to Friesland Campina	Central Office Friesland Campina	64 km	
		Stationsplein 4	1 hrs	
9.00 - 12.00	Visit of **Friesland Campina**	3818 LE Amersfoort		
		P.O. Box 1551		
		3800 BN Amersfoort		
		Tel: +31 (0)33 713 33 33		
12.15 - 1.45	Transfer to Philips	Philips Consumer Lifestyle B.V.,	150 km	
		Oliemolenstraat 5	2 hrs	
2.00-5.00	Visit of **Royal Philips**	9203 ZN Drachten Niederlande		
		Telephone: **+31 20 59 77777**		
			.	
4.00 - 6.00	Transfer to hotel		167 km	
			2,5 hrs	

06.30 7.00	Departure to restaurant Dinner		(via A7 – Hoorn)	
Saturday March 9, 2019		Individual Departure		

Companies:

Canyon Bicycles

In 1985, the company was founded as specialist shop for bikes under the name „Radsport Arnold GmbH“ by Roman Arnold. In 1996, the first bikes were launched under the brand Canyon. In 2001, the company changed from a retailier zu a bicycle manufactuer under the new new company name Canyon Bicycles GmbH. The bikes are only available via direct online sales. In 2006, Canyon presented its new corporate design which won several awards in 2007 (European Design Award for Corporate Design, red dot design awards for Corporate Design and the Webdesign, iF Industrie Forum Design for the Corporate Design).

Zalando Logistics Mönchengladbach

Zalando is a multinational e-commerce company that specializes in selling shoes, clothing and other fashion and lifestyle products online. The company was founded in Germany in 2008 by Robert Gentz and David Schneider, initially under the name Ifansho and since then has expanded to offer its retail services in a total of fourteen European countries.

Currently, Zalando is operationally active in Germany, Austria, Switzerland, France, Belgium, the Netherlands, Italy, Spain, Poland, Sweden, Denmark, Finland, Norway and the UK. The company’s headquarters are in Berlin. Zalando initially specialized in the sale of footwear but has since grown to encompass other areas of fashion, lifestyle and sports.

Henkel

Henkel AG & Company, KGaA, is a German chemical and consumer goods company headquartered in Düsseldorf, Germany. It is a multinational company active both in the consumer and industrial sector. Founded in 1876, the DAX 30 company is organized into three globally operating business units (Laundry & Home Care, Beauty Care, Adhesive Technologies) and is known for brands such as Loctite, Persil, and Fa amongst others.

In the fiscal year 2017, Henkel reported sales of over 20 billion euros and an operating profit of 3.055 billion euros. More than 80 percent of its 53,700 employees work outside of Germany.

VDL Nedcar

The origin of VDL Nedcar dates back to the 1960's when DAF (now DAF Trucks) started with the production of passenger cars in Born, Limburg, in the south of the Netherlands.

As of 1 January 2013 the name changed into VDL Nedcar. Since 2014 the production of the MINI Hatch started followed by the MINI Convertible in 2015 and the MINI Countryman in 2016. As of August 2017, VDL Nedcar also started production of the BMW X1.

DAF Trucks N.V.

Since 1996, DAF is part of PACCAR, a global technology leader in the design, manufacture and customer support of Kenworth, Peterbilt and DAF trucks. PACCAR also provides financial services and information technology and distributes truck parts to its principal business.

The core activity is the development and production of light, medium and heavy-duty commercial vehicles. They offer tailor-made solutions for every application. Reliable, durable, efficient, with class leading driver comfort and backed by first class services.

DAF works according to the 'Built-to-order' principle. This means that all vehicles are built to satisfy each customer's individual wishes. DAF is driven by quality to ensure highest vehicle uptime and maximum return.

Thermo Fisher

Thermo Fisher is an American biotechnology product development company located in Waltham, Massachusetts. Its focus is on providing analytical and laboratory worldwide and has offices and operations in many countries, notably the U.S. and in Europe. Thermo Fisher Scientific Inc. (NYSE: TMO) is the world leader in serving science, with revenues of more than $20 billion and approximately 70,000 employees globally.

Our mission is to enable our customers to make the world healthier, cleaner and safer. We help our customers accelerate life sciences research, solve complex analytical challenges, improve patient diagnostics, deliver medicines to market and increase laboratory productivity. Through our premier brands – Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific and Unity Lab Services – we offer an unmatched combination of innovative technologies, purchasing convenience and comprehensive services.

Hutchison Ports ECT Euromax

The ECT Euromax terminal is one of the most advanced and environment-friendly container terminals in the world. The automated terminal is located at the northwesterly corner of the Maasvlakte, almost directly on the North Sea. The ECT Euromax terminal has been especially designed for the fast, safe and efficient handling of the very largest container ships. The depth along the quay is 16.65 meters; as the size of container vessels increases, the port basin can easily be further deepened to 19.60 meters. The cranes at the ECT Euromax terminal have a reach of 23 containers wide. Similar to the ECT Delta terminal, Ultra Large Container Carriers are not hindered by locks or tides; they are moored alongside the quay within an hour of entering the port.

Royal Dutch Shell

Shell is an international energy company that aims to meet the world's growing need for more and cleaner energy solutions in ways that are economically, environmentally and socially responsible.

The operations are divided into our businesses: Upstream, Integrated Gas and New Energies, Downstream. The Projects & Technology organization manages the delivery of Shell's major projects and drives our research and innovation.

The Projects & Technology organization manages the delivery of our major projects and drives research and innovation to develop new technology solutions. It provides technical services and technology capability for our Integrated Gas, Upstream and Downstream activities. It is also responsible for providing functional leadership across Shell in the areas of safety and environment, contracting and procurement, wells activities and greenhouse gas management.

FrieslandCampina

FrieslandCampina produces and sells consumer products such as dairy-based beverages, infant nutrition, cheese and desserts in many European countries, in Asia and in Africa via its own subsidiaries. Dairy products are also exported worldwide from the Netherlands. In addition, products are supplied to professional customers, including cream and butter products to bakeries and catering companies in West Europe. FrieslandCampina sells ingredients and half-finished products to manufacturers of infant nutrition, the food industry and the pharmaceutical sector around the world.

FrieslandCampina has branch offices in 34 countries and employs 23,675 people. FrieslandCampina's products find their way to more than 100 countries. The Company's central office is based in Amersfoort, the Netherlands. FrieslandCampina's activities are divided into four market-oriented business groups: FrieslandCampina Consumer Dairy, FrieslandCampina Specialised Nutrition, FrieslandCampina Dairy Essentials, FrieslandCampina Ingredients.

Royal Philips

Moving into a new century, Philips remained fully committed to innovation. Reflecting its focus on health and well-being, the company introduced the Ambient Experience in 2002. This innovative solution improves hospitals' workflow and patient care by integrating architecture, design, dynamic lighting and sound. Other milestones include, in 2006, the first commercial launch of a 3D scanner, providing unprecedented image quality for CT scans.

In 2012, Philips introduced the AlluraClarity interventional X-ray system, which offers excellent visibility at low X-ray dose levels. Recent innovations include the development of the Philips Smart Air Purifier and and Philips Azurion, the next-generation image-guided therapy platform that enables clinicians to perform a wide range of routine and complex procedures, helping them to optimize interventional lab performance and provide superior care.