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VOLKSWAGEN GROUP: DRIVING BIG BUSINESS WITH BIG DATA[1]

Ten million cars in annual sales by 2018 – that was the goal. The Volkswagen Group (VW Group) had set out a firm-wide "Strategy 2018," which outlined the objective of making "Volkswagen the most successful and fascinating automaker in the world by 2018 (see Exhibit 1)." The company also detailed the key enablers of this strategy, and innovation and technology stood at the top of the list. In this exercise, it would be your responsibility to leverage information technology, especially "big data", to help the VW Group achieve this lofty goal. To that end, your team had been asked to propose one priority initiative that would help the company make significant progress towards its objective. Your team would be expected to present your ideas at the upcoming executive meeting, and compete with other teams. High value would be placed on creativity and innovation. At the same time, the proposal needed to be realistic and feasible.

COMPANY BACKGROUND

VW Group was founded in Wolfsburg, Germany in 1937. The initial goal was producing small-engined, economically feasible vehicles for the mass market. Those plans had to be put on hold after the outbreak of World War II. When operations resumed in the 1950s and 1960s, VW Group experienced significant growth. The company launched several new models, and sales began to climb. The revenue generated, combined with the government's stake in VW Group, allowed the company to expand its operations. In 1965, the company acquired Auto Union GmbH from Daimler-Benz, and later merged it with another manufacturer, NSU Motorenwerke AG, to create a new firm, Audi NSU Auto Union AG (Audi AG).[2]

Over the next 20 years, VW Group introduced some of its most successful models, including the Passat, the Polo and the Golf (see Exhibit 2). Building on this momentum, the firm continued to grow through internationalization and acquisition. In 1984, VW Group formed a joint venture in China and started producing and selling vehicles there. A second joint venture was formed in 1991. Together, these joint

[1] *This case has been written on the basis of published sources only. Consequently, the interpretation and perspectives presented in this case are not necessarily those of Volkswagen Group or any of its employees.*
[2] *VW Group, www.volkswagenag.com/content/vwcorp/info_center/en/publications/2010/05/chronicle.bin.html/binary storageitem/file/HN7e_www2.pdf, accessed February 1, 2014.*

ventures allowed VW to access this large and high-growth market. Over the next 30 years, China became VW Group's largest sales market. With a share of 20.8 per cent of the Chinese passenger car market and sales of 2.8 million vehicles in 2012, the Volkswagen Group also became the market leader in China.[3]

In the 1990s, VW Group acquired three luxury brands: Bentley, Lamborghini and Bugatti. The company also expanded its product offering to include commercial vehicles, and introduced service offerings like financing, leasing and fleet management. VW Group continued to grow at an impressive rate, with established manufacturing plants in a number of countries across the world, including Mexico, China, India, Russia and the United States. In 2012, VW Group continued its expansion by merging with long-time partner Porsche and acquiring high-performance motorcycle company Ducati. In 2013, VW Group had operations in over 150 countries, and had become a leading auto manufacturer in the world.[4]

CURRENT ORGANIZATION

In its current form, VW Group consisted of two primary groups: the Automotive Division and the Financial Services Division (see Exhibit 3). The Automotive Division housed two primary business areas: "Passenger Cars and Light Commercial Vehicles" and "Trucks and Buses, Power Engineering." The activities of the Automotive Division focused on the development of vehicles and engines, the production and sale of vehicles, and the development of various parts and machinery. While the group aggregated its various automotive brands for the purposes of financial reporting, each brand had its own stand-alone strategy, and keeping them separate in the eyes of the customer was important to the group.

In 2012, VW Group's sales reached over 9.3 million vehicles. Volkswagen passenger cars stood as the most popular, with 4.85 million units sold in 2012, followed by Audi (about 1.30 million units) and Škoda (727,000 units). Sales of VW Group's various brands can be found in Exhibit 4. The majority of sales took place in Europe (about 4.18 million vehicles), followed by Asia-Pacific (about 3.19 million units), South America (about 1.08 million units) and North America (896,000 units). However, if the sales of VW China were included, Asia-Pacific became the top performing market, with sales of over 5.7 million units. Worldwide sales revenue in 2012 was over €192 billion, placing VW Group in third place behind Toyota and General Motors (GM). After the cost of sales was taken into account, gross profit in that year was over €35 billion, and the final profit after tax for 2012 was over €21 billion (see Exhibit 5).[5]

While the financial performance of the VW Group as a whole was impressive, the group recorded mixed results in the U.S. market. In 2010, VW launched a new Jetta made in Mexico, which was expected to be tailored to American tastes. In 2011, it opened a new plant in Chattanooga, Tennessee, producing an Americanized version of its Passat sedan, which was cheaper than the previous model imported from Europe. These localization strategies allowed VW to double its sales between 2009 and 2012. However, making cheaper models compromised the cars' perceived quality. For example, the company used less expensive plastics, and did not equip some new models with the independent rear suspension that provided the fun-to-drive feel for which VWs had become known. These changes frustrated some long-time VW fans. The brand also suffered from mediocre quality rankings. In J.D. Power's 2013 initial quality study, the VW brand ranked below average, well behind Chevrolet, Honda, Toyota and Hyundai.

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[3] *VW Group. www.volkswagenag.com/content/vwcorp/content/en/investor_relations/Warum_Volkswagen/Marke_ Focus.html, accessed February 1, 2014.*
[4] *VW Group, www.volkswagenag.com/content/vwcorp/info_center/en/publications/2013/03/Factbook2013.bin.html/ binarystorageitem/file/Factbook_2013.pdf, accessed February 1, 2014.*
[5] *VW Group - 2012 Annual Report.*

Facing these significant challenges, in January 2014, the head of VW's works council and a member of the supervisory board openly criticized the company's U.S. strategy, citing an anemic sales force and a lack of sufficient variety in its models. He also pointed out that there was a misalignment between the brand's U.S. offerings and the tastes of the American drivers: "The worm has to taste good to the fish, not the fisherman. Sometimes I have the impression that it's the other way around with us."[6]

THE 2018 STRATEGY

Eager to claim the No. 1 spot in the global automotive industry, VW Group put forward an ambitious target: the company would reach annual sales of 10 million vehicles worldwide by 2018. This goal would be enabled by activities in four areas: first, deploying intelligent innovations and technologies to become a world leader in customer satisfaction and quality; second, increasing unit sales, in particular, by capturing an above-average share of the development of the major growth markets; third, increasing its return on sales before tax to at least 8 per cent to ensure that the group's solid financial position and ability to act were guaranteed, even in difficult market periods; and fourth, becoming the top employer across all brands, companies and regions.[7] Innovation and technology were at the top of the agenda, and the VW Group was willing to make a sizable investment in this area. In 2011, VW Group spent 5.4 per cent of its budget on research and development (R&D), significantly more than either of its top competitors, GM and Toyota.[8] In 2012, VW invested $12.5 billion in R&D, topping the world's R&D ranking.[9]

THE PROMISE OF BIG DATA

One of the IT trends garnering significant attention during this time period was *big data*. As defined by the McKinsey Global Institute, big data referred to datasets whose size was beyond the ability of typical software tools to capture, store, manage and analyze.[10] The ubiquity of network connectivity, combined with proliferation of sensor-enabled devices, had led to an explosion of data available for analysis. Data could also be mined from online activities ranging from eCommerce to social networking. This robust IT climate presented a unique opportunity for firms to analyze and capitalize on the data available, setting the stage for big data to become a key basis of competition and growth for individual firms.

Procter and Gamble Inc. (P&G), for example, had set out to become the most technologically enabled firm in the world. To achieve this goal, P&G's CEO called for the integration of digital technology and advanced analytics into every aspect of P&G's activities and operations. One example was *Consumer Pulse*, which scanned customer comments online, categorized them by individual brand and displayed them on the screen of the relevant individual, thus allowing the firm to react in real time to public relations issues. Another example of the way data was being used within the organization involved the

[6] *William Boston and Neil E. Boudett, "VW Labor Rep Blasts Car Maker's U.S. Strategy: Casts Doubt on Management's Growth Targets," Wall Street Journal, accessed January 25, 2014.*
[7] *VW Group – 2011 Annual Report.*
[8] *www.autoblog.com/2011/08/15/vw-ranks-1-in-randd-spending/, "VW ranks #1 in R&D spending," accessed February 1, 2014.*
[9] *CNN, http://money.cnn.com/gallery/news/companies/2013/11/21/top-companies-rd/ "World's top companies for R&D," accessed February 1, 2014.*
[10] *McKinsey Global Institute, "Big data: The next frontier for innovation, competition, and productivity," 2011, www.mckinsey.com/insights/business_technology/big_data_the_next_frontier_for_innovation, accessed January 20, 2014.*

deployment of iPads across P&G manufacturing plants, which allowed employees to download data from the production line in real time so executives could monitor the aggregate performance of the firm.[11]

THE UPCOMING EXECUTIVE MEETING

You and your team members had been tasked with the challenge of creating and presenting one initiative that would demonstrate significant potential to help VW Group achieve its 2018 Strategy. Big data was expected to be a key component of that initiative. The Executive Committee expected each presentation to include an outline of the initiative, a description of its expected benefits and costs, and a discussion of the implementation plan and appropriate risk mitigation strategies. At the conclusion of the meeting, the committee members would select the most promising initiative and would discuss their decision rationale.

[11] *McKinsey Global Institute, "Inside P&G's digital revolution," 2011, www.mckinsey.com/insights/consumer_and_retail/inside_p_and_ampgs_digital_revolution, accessed January 20, 2014.*

EXHIBIT 1: VW GROUP STRATEGY 2018

"Our Strategy 2018 focuses on positioning the Volkswagen Group as a global economic and environmental leader among automobile manufacturers. We have defined four goals that are intended to make Volkswagen the most successful and fascinating automaker in the world by 2018:

- Volkswagen intends to deploy intelligent innovations and technologies to become a world leader in customer satisfaction and quality.
- The goal is to increase unit sales to more than 10 million vehicles a year; in particular, Volkswagen intends to capture an above-average share of the development of the major growth markets.
- Volkswagen intends to increase its return on sales before tax to at least 8% so as to ensure that the Group's solid financial position and ability to act are guaranteed even in difficult market periods.
- Volkswagen aims to become the top employer across all brands, companies and regions; this is necessary in order to build a first-class team.

We are focusing in particular on the environmentally friendly orientation and profitability of our vehicle projects so that the Volkswagen Group has the right products for success even in more challenging economic conditions. At the same time, this will mean that capital expenditure remains at manageable levels. Our attractive and environmentally friendly range of vehicles, which we are steadily and judiciously expanding, and the excellent position enjoyed by our individual brands in the markets worldwide, are key factors allowing us to leverage the Group's strengths and to systematically increase our competitive advantages. Our activities are primarily oriented on setting new ecological standards in the areas of vehicles, powertrains and lightweight construction. Our modular toolkit system, which we are enhancing on an ongoing basis, allows us to constantly improve production efficiency and flexibility, thus increasing the Group's profitability.

In addition, we want to expand the Volkswagen Group's customer base by acquiring new, satisfied customers around the world. In addition, we aim to increase satisfaction among our existing customers. We shall continue the measures we are currently taking to improve our productivity and quality regardless of the economic situation and without any time limit. Key elements include standardizing processes in both the direct and indirect areas of the Group and reducing throughput times in production. Together with disciplined cost and investment management, these efforts play a major role in ensuring that we reach our long-term profitability targets and safeguard solid long-term liquidity."

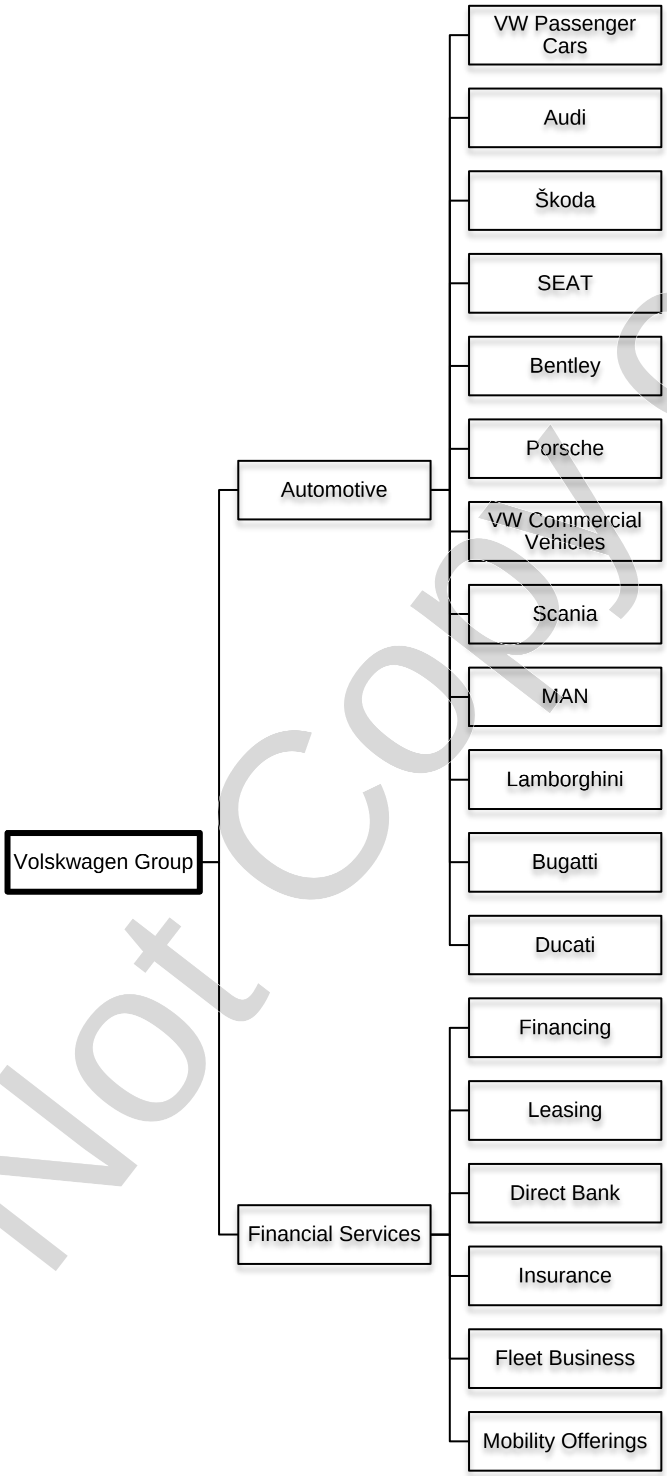
Source: www.volkswagenag.com/content/vwcorp/content/en/the_group/strategy.html

EXHIBIT 2: VOLKSWAGEN PASSENGER CARS - WORLDWIDE PRODUCTION BY VEHICLE TYPE, 2012 VERSUS 2011 (IN THOUSANDS OF VEHICLES)

MODEL	UNITS (2012)	UNITS (2011)
Passat / Santana	1,309	1,149
Jetta / Bora	1,061	900
Golf	826	914
Polo	712	810
Gol	502	513
Tiguan	453	356
Fox	198	161
Touran	152	161
Up!	142	13
Beetle	108	21
Tourag	78	80
CC	68	-
Sharan	48	50
Suran	38	48
Scirocco	34	42
Polo Classic / Sedan	15	13
Eos	11	23
Phaeton	10	11
Parati	6	8
Total	**5,772**	**5,272**

Source: VW Group, 2012 Annual Report

EXHIBIT 3: VW GROUP – MAJOR BRANDS AND BUSINESS FIELDS, 2012



Source: VW Group, 2012 Annual Report

EXHIBIT 4: VW GROUP - SALES BY BRAND, 2012 VERSUS 2011 (IN THOUSANDS OF VEHICLES)

BRAND / BUSINESS FIELD	UNITS SOLD (2012)	UNITS SOLD (2011)
Volkswagen Passenger Cars	4,850	4,450
Audi	1,299	1,543
Škoda	727	690
SEAT	429	362
Bentley	9	7
Porsche	62	-
Commercial Vehicles	437	441
Scania	67	80
MAN	134	25
VW China	2,609	2,201
Other	-1,279	-1,438
Volkswagen Group	**9,345**	**8,361**

Source: VW Group, 2012 Annual Report

EXHIBIT 5: VW GROUP INCOME STATEMENT – JANUARY 1, 2012, TO DECEMBER 31, 2012

€ million	2012	2011
Sales revenue	**192,676**	**159,337**
Cost of sales	-157,518	-131,371
Gross profit	**35,158**	**27,965**
Distribution expenses	-18,850	-14,582
Administrative expenses	-6,223	-4,384
Net other operating income	1,426	2,271
Operating profit	**11,510**	**11,271**
Share of profits and losses of equity-accounted investments	13,568	2,174
Other financial result	414	5,481
Financial result	**13,982**	**7,655**
Profit before tax	**25,492**	**18,926**
Income tax income/expense	-3,608	-3,126
Profit after tax	**21,884**	**15,799**
Noncontrolling interests	168	391
Profit attributable to shareholders of Volkswagen AG	**21,717**	**15,409**

Source: VW Group, 2012 Annual Report