

DMITRY ALENUSKIN  
ANDREAS SCHOTTER

## BMW OF NORTH AMERICA: DREAM IT. BUILD IT. DRIVE IT.

*Any customer can have a car painted any color that he wants so long as it is black.*  
Henry Ford

### Introduction

In early January 2012, Joseph Wierda, BMW's X3 Product Manager, reviewed the latest sales numbers of the popular X3 Series compact SUV. He was, in particular, interested in the effects of BMW's customization program called "Dream It. Build It. Drive It." on both unit sales and overall profitability. This new integrated sales and marketing program allowed customers to create a fully customized BMW X3 SUV and have it delivered to their driveway in only a few weeks. The program scored some important points with the media. For example, Martha Stewart, a U.S. TV personality, customized her X3 live on her popular show called *The Martha Stewart Show*.

Just two years earlier, in 2009, the idea of the customization program came at a time when the global financial crisis had hit consumers hard, and most households were putting large ticket item purchases on hold. During the same period, fuel prices reached \$4 per gallon. Consequently, BMW's North American overall sales had plummeted by 30% compared to 2008, and SUV sales were down a staggering 55%.

The new customization program was a departure from the traditional North American car purchasing model, where consumers were accustomed to buying a car and driving it off the dealership's lot right away, after typically receiving some generous discounts or other incentives. Wierda wondered if the program should be extended across all BMW product lines and, if so, what this meant for the regional and global manufacturing strategy, sales and distribution strategy, and the overall competitive positioning of BMW in North America. He needed to make up his mind before the next management meeting at the end of the month where he had to present the proposal to Ludwig Willisch, the recently appointed CEO of BMW North America. This proposal would have far-reaching internal and external effects.

### The U.S. Automotive Industry

The automotive industry had traditionally been the largest manufacturing sector in the United States, averaging about 3.6% of total GDP. Sales data for new cars in America represented one of the key economic indicators. In 2011, the U.S. auto industry was estimated to be a \$500 billion industry, employing more than eight million people.

Just three years earlier, in December 2008, American auto sales dropped by 37% compared to the year before as a result of the 2007/08 global financial crisis. During the same month, the "Big Three" auto companies (General Motors, Ford Motor Company, and Chrysler) applied for emergency loans totaling \$34 billion combined. The argument was that these loans would help avoid laying off up to three million people. In January 2009, the U.S. Congress approved this unprecedented emergency bailout. Most of the money was used to provide consumer loans and new consumer incentive programs in order to stimulate sales.

In exchange for government loans, the “Big Three” promised to consolidate operations and accelerate production of more fuel-efficient (greener) vehicles. Most of the loans were scheduled for cash repayment, but some of the debt was converted into government-owned equity. Many legendary brands subsequently disappeared, including Pontiac, Mercury, Saturn, and Hummer. Germany’s Daimler AG announced that it would discontinue its ultra-luxury Maybach brand. The bankruptcy of Chrysler in May 2009, and its subsequent acquisition by Fiat Group of Italy, opened a new era of foreign ownership in the U.S. automotive industry.

In 2010/11, the U.S. auto market showed some signs of recovery. While only 10.4 million new cars and trucks were purchased in 2009, the worst year since 1982, the recent sales increases were mainly credited to serving pent-up demand, a strengthening labor market, and increased consumer credit availability. In 2011, U.S. sales of new vehicles reached 12.7 million units, the best result since 2007.<sup>1</sup> Sales for 2012 were projected to reach 13.8 million units, close to what many experts considered a nonbubble sales volume of around 14–15 million cars.<sup>2</sup>

In terms of local manufacturing volume, the U.S. was third in the world with a record low of 5.7 million new motor vehicles produced in 2009. During the same year, Japan built 7.9 million cars and China 13.7 million. Just a decade earlier, however, in 1999, the U.S. dominated the global car industry, manufacturing more than 13 million new vehicles, more than Japan and China combined at the time.<sup>3</sup>

Recent volume increases in China were mostly driven by first-time buyers, government incentives, rural subsidies, and reduced sales tax for fuel-efficient vehicles. While the Chinese market was growing at an impressive rate of 40% annually,<sup>4</sup> major U.S. carmakers were still struggling at home.

## U.S. Auto Fleet

In 2011, the United States had 254 million registered passenger vehicles and 205 million licensed drivers.<sup>5</sup> The number of cars, along with the average age of the U.S. fleet, had increased steadily since 1960, indicating an increasing number of vehicles per household.

Recently, however, changes in consumer behavior could be observed. Price-sensitive Americans tended to keep their cars longer. The average age of vehicles in the United States was approaching a record of 11 years. Although a government-run \$3 billion “Cash for Clunkers” vehicle replacement program had a temporary effect on new car sales in 2009, most of the U.S. fleet was still aging.<sup>6</sup>

With 6.5 million new light-duty trucks on the road, the pickup truck was the most popular vehicle in America. It remained the best-selling category with an increase of 11.6% from 2010 compared to the car and SUV categories.

In 2011, the best-selling vehicle in the United States was the Ford F-Series pickup (584,917 units sold). Another popular American workhorse was the Chevrolet Silverado (415,130). Heavy sales hitters among sedans were the Toyota Camry (308,510) and Nissan Altima (268,981). Ford Escape (254,293) was a favorite among compact SUV buyers.

Although only 647,943 midsize SUVs were sold during 2011, this segment saw the largest year-on-year increase with a 45% jump. On the other hand, large luxury cars (such as the BMW X5) sold 68,211 units throughout the year, showing a 23% decrease.<sup>7</sup>

In 2011, BMW outsold its long-time rival Mercedes-Benz and became the top-selling U.S. luxury brand. Throughout the year, BMW sold 247,907 cars and SUVs, 2,676 more than Mercedes. Both automakers saw their sales rise about 13% for the full year.<sup>8</sup> Toyota’s Lexus (198,552 units sold in 2011) was the top-selling luxury car brand in 2010, as it had been since 2000.

The average transaction price for new vehicles in the United States fluctuated from \$29,000 to \$31,000 depending on the month, according to TrueCar.com, the authority on new-car pricing. Winter months tended to yield higher prices due to increased shopping activity, manufacturer incentives, and clearance sales.

## U.S. Car Distribution

In 2011, the U.S. was home to 17,000 new passenger car and truck dealers with approximately 37,500 points of sale (franchises). Direct manufacturer car sales were prohibited in most states because of stringent franchise and distributorship laws based on a regulatory system that dated back to the 1950s. In fact, it was a criminal act for any manufacturer to sell a new vehicle through anyone other than one of state-licensed new-car dealers. State franchise laws protected dealers' substantial investment in real estate and assets like showrooms and service facilities.<sup>9</sup>

However, senators in some states recognized the need for change facing the auto industry and proposed to revise the law. These resolutions had not been passed yet, but it was a popular topic generously supported by the Alliance of Automobile Manufacturers.

Auto dealers operated on relatively low gross profit margins in the 7%–15% range for new vehicles, and manufacturers often restricted dealers' markups over the invoice cost. Inventory was usually paid for by a low-interest loan from manufacturers. Also, dealers were financially supported by "hold-backs," which were additional discounts of around 1% to 2% of the vehicle's wholesale price. A holdback was designed to provide better vehicle availability by reimbursing the cost of the loan in order to keep the car in inventory, a critical enabler of the traditional car purchasing process.

The Internet changed the way people bought cars. One-click access to information about the features of comparable cars and the best available prices put pressure on dealers' profitability. In late 2011, more than 70% of purchases originated from online research, and it became much easier for consumers to shop around.

In recent years, people drove fewer miles and less frequently overall because of a combination of high costs, increased urbanization, improved alternative travel options, and changing perspectives on car ownership. One of the most fundamental social trends affecting the future of the automobile was the declining interest in cars among young people, who were becoming increasingly more environmentally conscious and unresponsive to traditional advertising. Walking, cycling, and riding public transit travel became more socially acceptable, and in some groups even prestigious.<sup>10</sup>

## BMW Background

BMW AG or Bayerische Motoren Werke (Bavarian Motor Company) was established in 1918 as a successor of Rapp Motorenwerke, an engine supplier for military aircraft. The first BMW engines set more than 30 world flight records, and this achievement became a symbol of the company. In fact, the existing BMW logo was first introduced in 1920 as a circular design of an aircraft propeller using the two Bavarian national colors: blue and white.

The Treaty of Versailles, signed in 1918 following World War I, put BMW out of the aircraft engine business for three years. As a post-WWI disarming measure, German manufacturers were not permitted to produce armed aircraft, tanks, or armored cars.<sup>11</sup>

Although BMW returned to aircraft engine manufacturing in 1922, the Versailles ban inspired product line extensions that included air brakes, motorcycles, and railway cars. The first BMW motorcycle, named R 32, was built in 1923. The fast-growing popularity of cars based on Henry Ford's pioneering efforts (also in Germany) triggered an expansion into automotive manufacturing. The compact three-cylinder, 15-horsepower Dixi was the first BMW car in 1928. It sold more than 18,000 units. This achievement marked a new chapter in BMW history.

During World War II, BMW manufactured motorcycles, aircraft engines, and missiles for the German army. After the war was over, the company lay in ruins. Most of the factories were destroyed during air raids. The remaining plant in Eisenach was nationalized during the Soviet occupation and for seven years manufactured copycat BMWs, mainly pre-war 326 models carrying BMW's logo but without involvement of the Bavaria-based company.

Another three-year ban on engine production following WWII caused a serious downsizing of BMW's manufacturing capacity. Agreements with the U.S. army restricted BMW operations to bicycles, spare parts, and agricultural equipment, yet BMW provided repairs for U.S. army vehicles.

BMW returned to motorcycle production in 1948 and cars in 1951 but with little success. In the 1950s, BMW came close to being acquired by Daimler-Benz. Under the leadership of Herbert Quandt and the support of factory workers, BMW remained independent and entered into the so-called roaring '60s with a strong product line. The company's flagship 1600 model sold more than 330,000 units.

In the 1970s, the famous BMW 3, 5, and 7 Series were introduced. BMW's product strategy changed by requiring each update to include major technological improvements rather than simply design modifications.

In 1990, BMW formed a joint venture with Rolls Royce. Eight years later, BMW purchased all rights to the Rolls Royce logo and brand name but no other assets from the Volkswagen Group, which had acquired the plants and facilities and the Bentley name in a bidding war shortly before. In 1994, BMW bought British Rover Group PLC as part of an expansion strategy into new market segments, including SUVs and compact cars. After six years of losses, BMW sold Rover to Ford for a symbolic price of ten pounds. BMW kept the rights for the MINI brand and successfully relaunched the iconic model in 2002 with a revolutionary marketing strategy based on fashion, trendiness, and total customization. By 2011, BMW had successfully expanded the previously single-model brand by also offering MINI convertibles, MINI station wagons, and MINI SUVs.

BMW took a stand in environmental leadership by introducing its "Efficient Dynamics Concept" in 2000. According to this new initiative, all engines produced by the BMW Group had to have lower emissions than their predecessor generations.

By late 2011, the BMW Group was a large multinational company with a global presence and a market capitalization of €45 billion. The Quandt family owns 47% of the company stock and the remaining 53% is publicly traded on the Frankfurt Stock Exchange. Headquartered in Munich, BMW sold cars in 130 countries and had 25 manufacturing facilities in 14 countries. In the same year, BMW Group posted the highest unit sales ever, selling more than 1.6 million cars.<sup>12</sup>

**Exhibit 1. BMW Group Sales of vehicles by Region and Market, in 1,000 Units**

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Rest of Europe	443.6	432.2	357.3	369.3	405.7
Asia*	159.5	165.7	183.1	286.3	375.5
North America	364.0	331.8	271.0	298.3	341.3
Germany	280.9	280.9	267.5	267.2	285.3
Great Britain	173.8	151.5	137.1	154.8	167.5
Other markets	<u>78.9</u>	<u>73.8</u>	<u>70.3</u>	<u>85.3</u>	<u>93.7</u>
Total	1,500.7	1,435.9	1,286.3	1,461.2	1,669.0

\*Including automobiles from the joint venture BMW Brilliance

Source: BMW Group 2011 Annual Report.

**Exhibit 2. BMW Group Revenue by Region, in €Million**

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Rest of Europe	22,395	20,693	16,989	18,581	20,956
Asia/Oceania	7,353	7,523	8,495	14,776	19,216
North America	12,161	12,461	11,724	12,966	12,905
Germany	11,918	10,739	11,436	11,207	12,895
Other markets	<u>2,191</u>	<u>1,781</u>	<u>2,037</u>	<u>2,947</u>	<u>2,885</u>
Total	56,018	53,197	50,681	60,477	68,857

Source: BMW Group 2011 Annual Report.

**Exhibit 3. BMW Group Key Financial Indicators**

	<u>2011</u>	<u>2010</u>
Gross margin, %	21.1	18.1
EBITDA margin, %	16.9	14.5
EBIT margin, %	11.7	8.5
Pre-tax return on sales, %	10.7	8.0
Post-tax return on sales, %	7.1	5.4
Pre-tax return on equity, %	30.9	23.4
Post-tax return on equity, %	20.5	15.6
Equity ratio—Group, %	22.0	21.7
Automotive, %	41.1	40.9
Financial services, %	8.7	7.1
Coverage of intangible assets, PPE by equity, %	160.2	145.4
Return on capital employed		
Group, %	25.6	19.1
Automotive, %	77.3	40.2
Motorcycles, %	10.2	18.0
Return on equity		
Financial services, %	29.4	26.1
Cash inflow from operating activities, € million	5,713	4,319
Cash outflow from operating activities, € million	-5,499	-5,190
Free cash flow of automotive segment, € million	2,133	4,471
Net financial assets of automotive segment, € million	12,287	11,286

Source: BMW Group 2011 Annual Report.

## BMW of North America

BMW established its U.S. office in Woodcliff Lake, New Jersey, in 1975. From simple distribution functions, it quickly advanced to full-scale operations. In 2011, BMW of North America sold the full product line of all three BMW Group brands, provided financial services, marketing, R&D, and manufactured six different models locally.

North America was the biggest market for the BMW Group. Sales results for 2011 were impressive across all three brands. Three hundred and five thousand BMWs, Rolls-Royces, and MINIs rolled to new owners in the United States. BMW X3 was the most popular model of the year in the luxury compact SUV segment, selling 27,793 units, which reflected a record year-on-year increase of a whopping 450%. For 2012, BMW was planning to introduce 14 new models—the biggest product rollout in company history.

## BMW Dealerships

In 2011, the BMW dealer network in the U.S. consisted of independent companies operating under strict BMW brand guidelines. The company used the term “BMW Passenger Car Centers and BMW Sports Activity Vehicle Centers (SAV)” to describe its sales centers. Altogether, there were 338 passenger car and SAV centers, 138 motorcycle retailers, 104 MINI, and 30 Rolls-Royce Motor dealers. BMW of North America also operated its own dealership in Manhattan that served as a national flagship sales center.

Partnerships between the dealers and BMW were based on financial incentives, marketing support, and corporate training. For example, the average discount percentage on a new BMW in December 2011 was 11.2% off the manufacturer’s suggested retail price (MSRP), which averaged \$3,694 per vehicle.<sup>13</sup> Apart from discounts, all dealers regularly received sales and service training and marketing support. Point-of-sales advertising for the BMW brand usually included a cash budget assigned to a dealer along with a partial reimbursement of direct advertising expenses.

Unlike many other car manufacturers, BMW used a push distribution system based on territorial quotas, which were assigned annually depending on the previous sales performance of each franchise dealer. For example, Mercedes Benz (Daimler AG), in addition to franchise dealerships, used a network of its own vertically integrated retailers who shared the same inventory without territorial quotas.

Mercedes accepted customized orders and embedded its desired features in standard vehicles planned for production. For example, a GLK compact SUV scheduled for assembly in Bremen, Germany, for May 5 could get any number of customized add-ons until May 1 and be delivered to a customer in North America by late June.

## Marketing at BMW

BMW had an evolutionary approach to marketing and advertising. It often used movies to promote its latest vehicle. For instance, in the James Bond movie *Golden Eye* (1995), the sporty Z3 was featured for a few minutes, marking the first public appearance of this model. The subsequent interest in the new Bond car was enormous, and the company ended up selling 300,000 Z3s.<sup>14</sup> In the next Bond movie, titled *Tomorrow Never Dies* (1997), a flagship executive sedan BMW 750iL was shown multiple times, but here it was also operated via a futuristic mobile phone. The car became a key element of the story. Then, in *The World Is Not Enough* (1999), BMW put 007 behind the wheel of a Z8 luxury convertible. Although James Bond met his match in this roadster, the \$128,000 Z8 sold only 5,703 cars. This marked the end of BMW's James Bond engagement.

From 2001–2003, BMW continued using the movie industry for promotion and released *The Hire*, a series of short films directed by several renowned filmmakers. Hollywood star Clive Owen played the lead character in eight episodes. Each series featured the story of a professional driver who tests the performance of various BMW models in extreme situations. The project became an instant success while being viewed more than 100 million times. However, in 2005 the project was suspended due to its high production costs.

In 2011, BMW came back to Hollywood in the latest episode of a popular blockbuster, *Mission Impossible 4—Ghost Protocol*, where BMW featured the X3 and 6 Series convertible and also showed the i8, the futuristic concept car scheduled for production in 2014.

While BMW of Europe was participating in F1 sponsorship, BMW of North America focused on yachting. For eight years, BMW was involved in the America's Cup, one of the world's most recognizable yacht races. In 2010, BMW's ORACLE Racing trimaran won the 33rd Cup. The benefits of this involvement went beyond marketing. Both companies developed breakthrough solutions in the fields of carbon composite construction and structural engineering that were then directly applied to automotive development.

In 2006, a BMW dealer in Los Angeles, California, got involved in a billboard battle with Audi. In response to Audi's challenging "Your Move BMW" campaign, BMW of Santa Monica put up a billboard featuring the M3 Coupe with a headline "Checkmate." The content of billboards quickly became viral and was reproduced in blogs and on social media.

The battle moved to national TV campaigns with the "Joy of Riding" from BMW and the "Supply and Demand" campaign from Audi. BMW ads also included frisky comparisons with Mercedes and Jaguar. The TV commercial dueling between Subaru, Audi, and Bentley became classics.

In 2012, BMW's global marketing planned to reinvigorate the tagline "Joy," whereas BMW of North America planned on adopting the slogan "The Ultimate Driving Machine" that was first introduced in the 1970s.

As a part of hands-on brand experience, BMW of North America offered courses at its Performance Center Driving School in Spartanburg, South Carolina. For tuition of up to \$5,000, anybody could take various driving courses for top-line BMW cars or motorcycles.

## BMW Manufacturing

The BMW Group Production Network consisted of 25 sites across 14 countries on five continents. The main BMW manufacturing sites were located in Germany. The home of MINI and Rolls Royce production was in Great Britain. BMW's sport and touring motorcycles were manufactured in Berlin under the BMW Motorrad brand, and motocross and enduro bikes were manufactured in Italy at Husquvarna, a subsidiary acquired in 2007 for €93 million. The company had local assembly operation for the 3, 5, 7 Series and X3 using completely knocked-down (CKD) components in Thailand, Russia, Egypt, Indonesia, Malaysia, and India.

## Plant Spartanburg

BMW's plant in Spartanburg, South Carolina, was opened in July 1994 to manufacture the 3 Series vehicles for a quickly growing North American market. Since then, the BMW Group had invested more than \$6 billion in the Spartanburg facility over the years. The facility became the second largest BMW production plant outside of Germany. In 2005, the plant was redesigned to accommodate a new production system line called "OneLine" that enabled the production of SUVs, roadsters, and sedans on the same assembly line. In 2011, the plant employed more than 7,000 workers with an average daily production of 1,000 cars.

Plant Spartanburg produced six different BMW models: the 318i, Z3, Z4, X5, X6, X3, and their variants. The U.S. plant was the only X3 and X6 production site in the world. The company also announced that in 2014 it would expand the X-model family with the X4, a sport activity crossover based on the X3 SUV.

In 2011, the BMW plant in Spartanburg produced 276,065 vehicles for local and export sales. This represented an increase of 73% over the previous year. More than 70% of the vehicles produced in Spartanburg (192,813) were exported, making the BMW Group the largest automotive exporter to the non-NAFTA countries. A new round of investment in 2012–2013 was scheduled to increase plant capacity to 350,000 vehicles per year.

The global footprint reduced the negative impact of the economic downturn for BMW since it could partially shift some of its volume to less-affected emerging markets. The ability to react quickly and increase or decrease production for various markets was a major factor for BMW North America in turning the recession year 2008 into the highest production volume year ever in its history. "With flexible production processes and a flexible supply chain, we were able to increase the daily production volume by more than 30% to meet demand," said Josef Kerscher, President of BMW Manufacturing.<sup>15</sup>

The Spartanburg plant was a state-of-the-art engineering facility that generated its own power, and offered fully equipped medical facilities including an on-site pharmacy. It also provided 24-hour security and firefighting personnel.

In the past five years, the plant had lowered energy consumption by 48%, halved water consumption, reduced CO2 emissions by 44%, and waste output by 65%.<sup>16</sup>

## Mass Customization

Mass customization was commonly known as "using flexible processes and organizational structures to produce varied and individually customized products and services at the price of standardized mass-produced alternatives."<sup>17</sup> For the automotive industry, mass customization meant simultaneous combination of large-scale volume production with the flexibility of a large variety of made-to-order runs involving a large number of small lot sizes.

As the automotive industry matured, almost all the major brands had tried to combine the benefits of high-volume mass production and configuration variety offerings to satisfy the individualistic needs of consumers at lower costs. However, only a few carmakers had been successful.

For example, in 1999 GM launched its Yellowstone program in Brazil aiming to build small cars by using mass customization and co-design with suppliers. The program failed in less than a year due to strong resistance from the United Auto Workers union, who saw modularity as a potential threat to U.S.-based jobs by making it potentially easier to shift production to low-labor-cost countries.

Nevertheless, the concept of mass customization was appealing. It allowed manufacturers to customize products at lower costs, reduced overheads, and produced higher margins. For customers, it heralded the benefit of finding exactly what they wanted without paying exorbitant premium prices. Dealers would not have to finance large inventories. Joseph Wierda explained: "When customers buy a vehicle off the lot, it is likely that they have to pay for something that they don't really want. For example, a navigation system—a customer doesn't want it—they have their own portable one—but the car in a color they like at the dealer's lot is only available with navigation. With mass customization, customers get exactly what they want for the price they expect."

BMW sensed that as consumers became more informed, they also shifted to more personalized individualistic products, seeking manufacturers that could provide precisely what they wanted. Tailored solutions became a new dimension in the marketing, where buyers could select among a high number of optional features to fit their individual needs using Web-based purchasing systems.

“The situation today is determined by: Here’s a car, where’s the customer for it?” said Holger Groitzsch, a BMW executive. He further stated; “We want to turn it around and say ‘Here’s the customer, where’s the car for him?’”<sup>18</sup>

Many experts considered mass customization to be a truly customer-driven initiative that represented an organic evolution from traditional market-driven inventory-based systems. However, there were a number of supply chain issues that, so far, had been hard to solve for most manufacturers.

Critical success factors in achieving the vehicle customization at lower costs included flexible manufacturing systems, product modularity, and reconfigurability in order to reduce time-to-market, enhance product appeal, and maintain costs at the lowest possible level.<sup>19, 20</sup>

Another operational challenge was managing the pool of suppliers who had to be able to combine flexibility and short lead times for customized products at reasonable costs. At the same time, the potential range of optional choices had to be carefully monitored in order not to explode the number of product variants beyond a manageable or cost efficient number.

A successful transition to customer-driven business also involved the ability to streamline communication between everyone involved in manufacturing and to solve supply problems in real time. Rapid communication with strategic trading partners had to include the intelligence to direct relevant data to assigned units and respond immediately to orders, changes in configuration, and fluctuating demand.<sup>21, 22</sup>

## **Customization at BMW**

BMW has been in the mass customization business since 1992 when it first launched the BMW Individual Program, which was later followed by an introduction of the KOVP concept. KOVP, or “customer-oriented sales and production process,” was first introduced in 2000. This initiative enabled on-schedule vehicle deliveries and afforded a high degree of flexibility in making vehicle equipment changes until very late in the production process.

The heart of the KOVP concept rested in the transparency of the production chain. BMW used a vehicle identification and location system that made it possible to automatically identify, collect, and document vehicle movement during and after the assembly process. Each vehicle transmitted a location identification signal every four minutes, which was acquired by in-house antennas. As a result, vehicles could be located on a workstation display, allowing adherence to schedules and last-minute modifications if needed.

BMW’s Individual Program offered individual trimmings for the high-end 7 Series sedans and 850 sport coupes. Since then, this program had been extended in order to serve the needs of clients who wanted to deviate from standard specifications, particularly with interior designs and colors of their cars. “The BMW Individual Program caters more to high-end customers who order something that is beyond what is typically available,” said Wierda.

Wierda explained that in Europe the BMW Individual Program was available for any model, but in the U.S. only for the 6 and 7 Series. “In Europe, customers who buy these kinds of vehicles are willing to spend. The same model that retails for \$60,000 in North America retails for €60,000 in Europe. Europeans are accustomed to pay more for cars and they are likely to order more trimmings,” he explained.

The most common BMW Individual trimming options included expensive leather and wood for the interior, advanced sound and video systems, aerodynamic exterior enhancements, and unique body colors.



#### Exhibit 4. Customer-Oriented Sales and Production Process (KOVV)

##### New Vehicle Location System

*A new vehicle location system—up to now in use at the Dingolfing and Munich plants—will now be introduced at all vehicle plants of the BMW Group.*

Satisfied customers are a must for a premium manufacturer such as the BMW Group. For about three years now, the so-called customer-oriented sales and production process (KOVV) has been in operation at the BMW Group, which enables on-schedule vehicle deliveries and affords a high degree of flexibility in making vehicle equipment changes till the very end.



Transparency during the whole process of the production chain is a major KOVV component. And here is where the vehicle location again provides a considerable advancement. The new vehicle identification and location system makes it possible to automatically identify, collect, and document vehicle movements during and after the production process. Parked vehicles or vehicles removed from the line can thus be located quickly and safely—within the production as well as in the entire area from F1 (initial engine activation) to F2 (transfer to sales). Transponders in the vehicles transmit an identification signal every four minutes for the location, which is acquired by antennas. So-called ports are mounted above the shop floor doors and at the plant entrances.



Even vehicle movements outside of the actual production areas can be reliably registered. The magnetic field of the ports causes the transponder to transmit a signal to the nearest antennas. They in turn supply vehicle position information to the localization server in the form of a time signal. The server then computes the location of the vehicles from the individual time information of the antennas.

##### Location at the Push of a Button

Workers at the assembly line can locate vehicles via the Intranet screen on their workstation display—so to speak—at the push of a button. The system has been field-tested in Dingolfing since the beginning of 2003; in the fall of last year, this was followed by the Munich plant. The results were positive: Thanks to the new location system, the realization of the strived-for adherence to schedules could be supported lastingly. In Regensburg, the system is just being commissioned as of this writing; the plant in Leipzig is equipped with it from the very beginning. At the end of last year, it was decided to also expand this KOVV measure to the international plants. As a result, all assembly areas will have the necessary prerequisites to ensure a 95% adherence to schedules by all worldwide plants starting in 2006.

Source: Siemens AG, [www.automation.siemens.com/simatic-sensors-static/ftp/bmw\\_ortung\\_e.pdf](http://www.automation.siemens.com/simatic-sensors-static/ftp/bmw_ortung_e.pdf) (retrieved on May. 25, 2012).

While all the advantages of preplanned customized orders seemed obvious for car manufacturers, they were hard to achieve, simply because most American car buyers did not have the patience to wait.

For example, only 2% of Toyota's top-selling models in the U.S. were sold on a preordered basis. In general, the customized approach worked much better for premium brands. Lexus sold all of its flagship models in the U.S. on a custom-order basis only. When Audi succeeded in promoting its "Exclusive Program" that allowed customers to choose nonstandard colors and certain other features, Audi's preordered volume increased to 14% in 2010, up from 5.4% a year earlier.

However, Audi of America did not build its future strategy on mass customization. The company believed that significant business success from introducing discipline in the complexity of offerings was critical. "Too much complexity makes it difficult for individual dealers to stock the cars customers want at any given moment. We

don't eliminate choice, but we don't let it spiral out of control," Brad Stertz, Audi's Corporate Communications Manager, wrote in an e-mail statement. "Most customers, based on our experience, are happy with the available options packages or the Audi Exclusive Program. Hence, we will continue with our current strategies."



## The BMW X3

The X3 was a compact crossover SUV with a 5-door wagon body style. The first generation of the X3 (E83) was introduced in 2003. In 2011, the redesigned F25 model replaced it.

The F25 X3 was available in the U.S. with a 3.0-liter inline six-cylinder gasoline engine, either normally aspirated or with a twin scroll turbocharger only. The premium xDrive35i model (\$42,700 MSRP) used a 300-horsepower turbocharged engine, and the xDrive28i (\$37,100 MSRP) had 240 horsepower. According to the U.S. Environmental Protection Agency (EPA) estimation, the base six-cylinder engine operated at 25 mpg and the turbo version at 26 mpg. All U.S. market vehicles came with an 8-speed automatic transmission. All X3s were equipped with BMW's xDrive all-wheel drive system.

BMW used parts from the 3 Series sedan in making the X3. For example, its rear suspension system came from the E46 330xi all-wheel drive model.

**Exhibit 5. Luxury Compact SUV, U.S. Sales in 2011 (Selected Models)**

<u>Model</u>	<u>Specs</u>	<u>MSRP (min)</u>	<u>Image</u>	<u>Units Sold in 2011, CAGR, %</u>
BMW X3	4 WD (included) 3.0L engine 240 or 300 h.p. 8-speed AT	\$37,100 or \$42,700		27,793 (+457%)
Mercedes GLK 350 SUV	4 WD (included) 3.5L V6 engine 268 h.p. 7-speed AT	\$38,755		24,310 (+16%)
Audi Q5	AWD, Quattro (included) 2.0L or 3.2 L TFSI engine 211 h.p. or 270 h.p. 8-speed AT	\$36,950 or \$43,000		24,908 (+5.9%)
Acura RDX	AWD (included) 2.3L engine 240 h.p. 5 speed AT	\$32,895		15,195 (+1.04%)
Infiniti EX 35	RWD 3.5L V6 engine 297 h.p. 7-speed AT	\$35,800		6,030 (-27.4%)
Lincoln MKX	FWD or AWD 3.7L V6 engine 305 h.p. 6-speed AT	\$39,545 or \$41,395		23,395 (+6.6%)

Source: Photo, specs, and sales statistics: company courtesy.

Wierda described the target customers for the X3: “There are a few different types of typical X3 buyers: you have people who are new to the luxury market. It could be people in their 20s, 30s, or 40s who are stepping out of domestic or nonpremium SUVs, and BMW falls in their price range. Then you have young families who need an SUV with space but they don’t need a large one because their kids are still too little. Then you have empty nesters who are downsizing their SUVs because they no longer need all the extra space, but have money to afford luxury.”

## **Dream It. Build It. Drive It.**

Out of 242,000 BMWs sold in the U.S. in 2009, only 15% were customized. In Europe, about half of all BMWs were built according to buyers’ specifications. The new strategy devised by BMW’s U.S. headquarters promised to increase this number to 40% by 2015.<sup>23</sup>

The new marketing program introduced for the X3 model in 2010 was called: “Dream It. Build It. Drive It.” and it was meant to be a completely new way to connect with customers.

Patrick McKenna, Communications Manager at BMW, explained why BMW chose the X3 for this project: “We picked the X3 for this project because it was a new product, and because any new BMW only comes every seven years so the lifecycle is pretty long. When you consider adding something to a product, you can only do so when there is a completely new product involved.”

“This program encourages customers to customize their own vehicles. Americans are very different from the rest of the world. Especially in the area when you want something, you want it immediately. That’s why we had to create something different as compared to the European custom strategy. We needed something different,” added Wierda.

On the other hand, car dealers claimed that corporate executives overestimated the actual customer impatience factor. “It’s an issue that has been created mostly by the dealers and hypercompetitive nature of our business. It’s all about a sense of urgency and now, now, now. My experience is that customers actually do not mind waiting,” said Dimitri Kotsalis, General Manager of a BMW dealership in Vancouver, BC.

The concept of BMW’s new campaign included the engagement of customers at all three stages of the sales process: from the initial surfing on the Internet, where customers “dream” about the car; to the second stage, which involved individual customizing—or “building”—and finally the last stage, which culminated in delivery and, finally, “driving” it.

The website interaction included features for individual online customization for the future vehicle in the form of a wish list. Potential customers could experience the excitement of not only buying his or her new car, but also building it. For example, BMW offers 500 side-mirror combinations, 1,300 front bumpers, 5,000 seat combinations, or 9,000 center consoles. This, of course, was a major challenge for production because parts came from more than 170 suppliers located in the U.S. and abroad.<sup>24</sup>

Online customization was not new to the automotive industry. Most manufacturers offered a website where customers could design their own vehicles and then send the configuration to local dealers for order processing.

However, most customers did not have the opportunity to actually see their vehicles being built. BMW decided to go the extra mile and extend the concept of online customization in order to address the issue of impatience in American car buyers by making the wait a more pleasurable experience. BMW decided to install video cameras along the assembly line and broadcast the process of how an X3 comes to life. By being able to access a website called “Your X3 on the Assembly Line,” BMW buyers could trace seven major assembly stages of their new vehicle at the factory at South Carolina.

“We really tried to create something special that had never been done before. The technology of stitching all these camera shots was something truly unique,” commented Ken Bracht, Customer Relations Manager at

BMW of North America. “Providing a video like this is a great way for keeping people excited about the process and waiting for the arrival of this new vehicle,” he said.<sup>25</sup>

BMW recorded the assembly process of 450 vehicles a day using 14 cameras, and the videos needed a few days of processing, including checking them for errors.

“We had concerns about the bandwidth and we wanted to ensure that the bandwidth the cameras need is not going to cause any problems with the production and quality control systems. Tests proved to be successful and showed us that we can do it for every car on a production line for the U.S. market,” said McKenna.

Once the video quality was deemed fully acceptable, it automatically went to the personal pages of the individual customers hosted on BMW of North America’s website. Customers could view the footage by creating a “My BMW” account on [bmwusa.com](http://bmwusa.com) and entering their X3 order number or VIN. The video did not have an expiration date, giving consumers round-the-clock access to the assembly footage, and the video could also be downloaded and shared with interested friends and family members.

Implementation of the “Dream It. Drive It. Build It.” program required significant adjustments at the plant in Spartanburg, in BMW’s supply chain, and its IT system. Apart from installing cameras on the assembly line, BMW moved the complete production of the redesigned X3 from Europe in order to reduce the delivery time for the U.S.

Magna Steyr Fahrzeugtechnik, a division of Magna International that had been building X3s for BMWs for five years at its Graz, Austria, plant, was no longer manufacturing this model. With a \$750 million investment, the assembly line for X3 was moved to South Carolina and was completely integrated into the existing manufacturing facility.

As a result, the delivery time for the new X3 in the U.S. dropped from seven to two-to-three weeks. Wierda commented: “In theory, a new car showed up two weeks after it was ordered. But it could be longer if we needed to ship it, for example, to Seattle. This would mean an extra ten days. This was a dramatic improvement from 2009 when it would have taken another five weeks of ocean and other transit time, making a customization program for BMW’s U.S. customers just not attractive. Now we took the transit time out of the equation.”

Audi and Mercedes offered similar customization programs, but their waiting times for delivery in the U.S. varied between 8 and 16 weeks.

On the other hand, German buyers now had to wait at least an extra month or more for their X3s because of the production relocation to South Carolina. In 2012, delivery times in Germany took up to five months, whereas U.S. customers got their orders in just a few weeks, according to consumer reports.

The main reasons behind the decision to choose X3 as the only model for the “Dream It. Drive It. Build It.” marketing initiative were the dramatically dropping U.S. sales for the previous generation of X3 and the new value proposition for the all-new model. For example, at the end of 2009, the X3 sales were the worst among all BMW models—the overall compact SUV group had declined by 86%, and dealers had sold only 182 cars in October, a far cry from the usual 1,200–1,600 units previously.

Wierda explained: “For some people, the design of the interior of the previous X3 was not luxurious enough. Although we made some changes



Source: Anthony Monahan ([www.anthonymonahan.com](http://www.anthonymonahan.com)).

on the previous model, the new generation gave us the opportunity to make really big improvements. We came out with a completely new interior—more spacious, more functional more luxurious. New functionality, high performance at a lower price was our catch phrase.”

This seemed to work, since the new X3 became one of the best-selling models for the BMW Group in 2011. “This project increased customer pride and the excitement that comes with the car even before they take the delivery. Among all X3s produced for the U.S. market in 2011 (27,793 cars), 42% of the customers had an active account to access the video, and of those 42%, 50% shared their video on Facebook,” said McKenna.

To further the success of this project, BMW focused on new media, and targeted women. The new X3 launch became the biggest project for building a new online presence. Apart from developing an interactive website for potential X3 buyers, BMW also created an app for Apple’s mobile advertising network called iAD. The interactive app allowed iPhone and iPod touch users to configure and customize their vehicles directly on their mobile devices.

Other marketing channels included women’s glossy magazines, and TV appearances with celebrity Martha Stewart. Women’s campaigns targeted empty nesters and women executives who were looking for a new car but had no need to put children in the back.

“In 2010–2011, we were able to take advantage of cars being produced locally and give customers an opportunity to spec their cars exactly as they want it and get it delivered fast,” Wierda said, discussing how the X3 became one of the most successful compact luxury SUVs in North America.

But not everyone was happy with the custom-build options from BMW, especially at some of the dealerships. “The majority of our customized vehicles are the result of the lack of supply rather than of customer demand. Yes, our profits would be higher for customized vehicles, but you have to be careful here. Of course, you can custom build a vehicle and make it a unique value proposition, but any other dealer can order the same vehicle and make it the same unique value proposition. The same rules apply to all dealers and everybody would happily take a deal away from me for a few hundred dollars. When somebody comes in and wants to customize a vehicle and a salesperson has the opportunity to move him to something that is already available, which is slightly different than the desirable option, the salesperson will always try to do so. Because a salesperson wants to make sure he secures a deal today. If you have an opportunity to do that with the vehicle that is on the ground, you can get a deposit or a credit application on the same day and the deal is done,” said dealership GM Kotsalis.

However, Kotsalis agreed with the potential benefits of the “Dream It. Build It. Drive It.” program by reducing his inventory costs and property footprint. “It would be great for urban dealers and especially in places with insane real estate prices like Vancouver, New York, or San Francisco. From that perspective, everything that we can do to lessen the footprint, and to decrease the number of vehicles we have to keep in stock, and the amount of money that we spend on interest for maintaining the inventory will drive our business forward.”

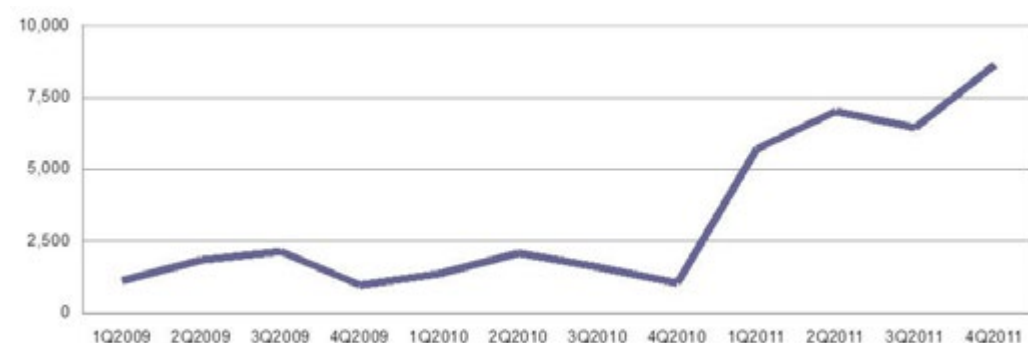
Joseph Wierda was contemplating: should the BMW of North America Group expand its “Dream It. Build It. Drive It.” campaign to its flagship X5 full-size SUVs in order to revitalize the models declining sales? Or should BMW use the campaign for the new X4 launch planned for 2014? Was the personalization aspect overrated? How many more SUVs could we sell with gas prices potentially reaching \$5 a gallon?

**Exhibit 6. BMW North America Sales Performance 2009–2011**

	<u>Y 2009</u>	<u>Y 2010</u>	<u>1Q2011</u>	<u>2Q2011</u>	<u>3Q2011</u>	<u>4Q2011</u>	<u>Y 2011</u>
1 Series	11,182	13,132	2,383	2,210	1,979	2,260	8,832
3 Series	90,960	100,910	19,138	24,724	26,704	23,805	94,371
Z4 Roadster and Coupe	3,523	3,804	584	1,450	898	547	3,479
5 Series	40,109	39,488	13,053	12,234	12,709	13,495	51,491
6 Series	3,549	2,418	255	857	1,105	1,686	3,903
7 Series	9,254	12,253	2,762	2,688	2,300	3,549	11,299
<b>BMW passenger cars</b>	<b>158,577</b>	<b>172,005</b>	<b>38,175</b>	<b>44,163</b>	<b>45,695</b>	<b>45,342</b>	<b>173,375</b>
X3	6,067	6,075	5,710	7,015	6,442	8,626	27,793
X5	27,071	35,776	7,694	8,201	10,152	14,500	40,547
X6	4,787	6,257	1,037	1,710	1,685	1,760	6,192
<b>BMW light trucks SUV</b>	<b>37,925</b>	<b>48,108</b>	<b>14,441</b>	<b>16,926</b>	<b>18,279</b>	<b>24,886</b>	<b>74,532</b>
<b>BMW brand</b>	<b>196,502</b>	<b>220,113</b>	<b>52,616</b>	<b>61,089</b>	<b>63,974</b>	<b>70,228</b>	<b>247,907</b>
Cooper /S Hardtop	28,129	29,658	6,476	8,629	5,740	7,222	28,067
Cooper /S Convertible	6,206	7,022	1,018	1,597	1,380	969	4,964
Cooper /S Clubman	10,890	8,398	1,546	2,404	1,567	1,327	6,844
Coupe	0	0	0	0	0	953	953
Crossover	0	575	3,301	4,845	3,132	5,405	16,683
<b>MINI brand</b>	<b>45,225</b>	<b>45,653</b>	<b>12,341</b>	<b>17,475</b>	<b>11,819</b>	<b>15,876</b>	<b>57,511</b>
<b>TOTAL North America</b>	<b>241,727</b>	<b>265,766</b>	<b>64,957</b>	<b>78,564</b>	<b>75,793</b>	<b>86,104</b>	<b>305,418</b>

Source: BMW North America.

**Exhibit 7. BMW X3 Sales, 2009–2011, Units**



Source: BMW North America.



## Exhibit 8. X3 Matchup\*


facebook  Home Profile Account

BMW USA on Facebook 525,270


### X3 MATCHUP


Build an X3 that matches the one at the end of the ad during football's epic game and win. Start your build below.

**YOUR BUILD** **WATCH THE AD** [Create a random build](#)





**STEP 1**  
Choose an exterior color and wheel.

 Vermilion Red Metallic

 17" Double V Spoke Wheels

**STEP 2**  
Choose an interior leather and trim.

 Leather Renzo's Magma

 Brushed Aluminum Trim

**STEP 3**  
Select your options.

☒ SPORT SEATS ☒ PANORAMIC MOONROOF ☐ X-LINE EXTERIOR TRIM

☐ HEAD-UP DISPLAY ☐ SHADOWLINE TRIM ☐ XENON HEADLIGHTS

[CONTINUE](#)

\*The X3 Matchup was a Facebook game that let people guess the configuration they'd seen featured in the Superbowl TV spot to win an X3 of their own.

Source: Anthony Monahan ([www.anthonymonahan.com](http://www.anthonymonahan.com)).

## Notes

- <sup>1</sup> Carlos Gomez, "Global Auto Report," *Scotia Economics*, Dec. 22, 2011. [www.scotiacapital.com/English/bns\\_econ/bns\\_auto.pdf](http://www.scotiacapital.com/English/bns_econ/bns_auto.pdf) (retrieved on Jan. 17, 2012).
- <sup>2</sup> Tom Krisher, "US Auto Industry to Post Good Sales Year," *Associated Press*, Jan. 2, 2012.
- <sup>3</sup> "2011 Production Statistics," *International Organization of Motor Vehicle Manufacturers*. <http://oica.net/category/production-statistics/> (retrieved on Jan. 17, 2012).
- <sup>4</sup> "China Overtakes US as World's Biggest Car Market," *The Guardian*, Jan. 8, 2010. <http://www.guardian.co.uk/business/2010/jan/08/china-us-car-sales-overtakes> (retrieved on Jan. 17, 2012).
- <sup>5</sup> "National Transportation Statistics 2011," *Bureau of Transportation Statistics, U.S. Department of Transportation*. [www.bts.gov/publications/national\\_transportation\\_statistics/pdf/entire.pdf](http://www.bts.gov/publications/national_transportation_statistics/pdf/entire.pdf) (retrieved on Jan. 17, 2012).
- <sup>6</sup> Lacey Plache, "Auto Sales Forecast 2011," *Edmunds Auto Observer*. [www.autoobserver.com/assets/Auto%20Sales%20Forecast%202011.pdf](http://www.autoobserver.com/assets/Auto%20Sales%20Forecast%202011.pdf) (retrieved on Apr. 12, 2012).
- <sup>7</sup> "Auto Sales Market Data Center," *The Wall Street Journal*. [http://online.wsj.com/mdc/public/page/2\\_3022-autosales.html?mod=mdc\\_h\\_econhl](http://online.wsj.com/mdc/public/page/2_3022-autosales.html?mod=mdc_h_econhl) (retrieved on Jan. 19, 2012).
- <sup>8</sup> "BMW Beats Mercedes in Luxury-Sales Showdown," *Driver's Seat Blog, WSJ.com*. <http://blogs.wsj.com/drivers-seat/2012/01/05/bmw-beats-mercedes-in-luxury-sales-showdown/> (retrieved on Jan. 20, 2012).
- <sup>9</sup> Gerald R. Bodisch, "Economic Effects of State Bans on Direct Manufacturer Sales to Car Buyers," *Economic Analysis Group (EAG), Antitrust Division, U.S. Department of Justice*, May 2009. [www.justice.gov/atr/public/eag/246374.htm](http://www.justice.gov/atr/public/eag/246374.htm) (retrieved on Jan. 22, 2012).
- <sup>10</sup> "The Future Isn't What It Used To Be," *Victoria Transport Policy Institute*, Nov. 6, 2011. [www.vtpi.org/future.pdf](http://www.vtpi.org/future.pdf) (retrieved on Jan. 22, 2012).
- <sup>11</sup> "The Avalon Project: Documents in Law, History, Diplomacy," *Yale Law School, Lillian Goldman Law Library*. [http://avalon.law.yale.edu/subject\\_menus/versailles\\_menu.asp](http://avalon.law.yale.edu/subject_menus/versailles_menu.asp) (retrieved on Jan. 24, 2012).
- <sup>12</sup> "BMW Group Annual Report 2011." [www.press.bmwgroup.com/pressclub/p/pcgl/download.html?textId=152361&textAttachmentId=186357](http://www.press.bmwgroup.com/pressclub/p/pcgl/download.html?textId=152361&textAttachmentId=186357) (retrieved on Apr. 12, 2012).
- <sup>13</sup> "Edmunds.com's December True Cost of Incentives®: BMW and Mercedes-Benz Make Final Plays for Luxury Sales Crown." <http://www.edmunds.com/about/press/edmundscoms-december-true-cost-of-incentives-bmw-and-mercedes-benz-make-final-plays-for-luxury-sales-crown.html> (retrieved on Jan. 25, 2012).
- <sup>14</sup> "5th Gear—James Bond Cars Special." [www.youtube.com/watch?v=Flodhus\\_I8U](http://www.youtube.com/watch?v=Flodhus_I8U) (retrieved on Jan. 25, 2012).
- <sup>15</sup> "BMW Plant Spartanburg A Transforming Factory Speaker: Josef Kerscher, President, BMW Manufacturing." Automotive News Manufacturing Conference, September 6, 2009. [www.autonews.com/assets/html/09\\_anmc/pdf/pres\\_kerscher.pdf](http://www.autonews.com/assets/html/09_anmc/pdf/pres_kerscher.pdf) (retrieved on Jan. 25, 2012).
- <sup>16</sup> "BMW Group Expands U.S. Plant in South Carolina," *BMW Group Corporate News*, January 12, 2012. <https://www.press.bmwgroup.com/pressclub/p/pcgl/pressDetail.html?outputChannelId=6&id=T0124314EN> (retrieved on Jan. 25, 2012).
- <sup>17</sup> C. W. Hart (1996). *Made to Order. Marketing Management*, 5(2), 12–22.
- <sup>18</sup> John Reed, "Benefits of a Showroom Bypass," *Financial Times*, May 2, 2011. [www.ft.com/intl/cms/s/0/300b6f90-74e6-11e0-a4b7-00144feabdc0.html](http://www.ft.com/intl/cms/s/0/300b6f90-74e6-11e0-a4b7-00144feabdc0.html) (retrieved on Jan. 30, 2012).
- <sup>19</sup> J. Mula, R. Poler, J. P. García (2004). "Supply Chain Production Planning in a Mass Customization Environment," *Second World Conference on POM*. [http://lcl.uniroma1.it/dspace/bitstream/123456789/84/1/File\\_569.pdf](http://lcl.uniroma1.it/dspace/bitstream/123456789/84/1/File_569.pdf) (retrieved on Feb. 1, 2012).
- <sup>20</sup> Peter Frederikson, "Flexibility and Rigidity in Customization and Build-to-Order Production," *Industrial Marketing Management*, #34, 2005. [www.sciencedirect.com/science/journal/00198501/34/7](http://www.sciencedirect.com/science/journal/00198501/34/7) (retrieved on Feb. 1, 2012).
- <sup>21</sup> Jerry Wind, "Customerization: The Next Evolution in Mass Customization," *Journal of Interactive Marketing*, Vol. 15, Issue 1, Winter 2001. [www.sciencedirect.com/science/article/pii/S1094996801701715](http://www.sciencedirect.com/science/article/pii/S1094996801701715) (retrieved on Feb. 1, 2012).
- <sup>22</sup> Frank Piller, "Mass Customization: Providing Custom Products and Services with Mass Production Efficiency," *TUM Business School*. [www.downloads.mass-customization.de/joft06.pdf](http://www.downloads.mass-customization.de/joft06.pdf) (retrieved on Feb. 1, 2012).
- <sup>23</sup> Chris Reiter, "BMW Hopes Impulsive Americans Order Cars a la Carte," *Bloomberg*, May 14, 2010. [www.bloomberg.com/news/2010-05-13/ipod-adapter-1-350-moonroof-bmw-tries-a-la-carte-with-impatient-america.html](http://www.bloomberg.com/news/2010-05-13/ipod-adapter-1-350-moonroof-bmw-tries-a-la-carte-with-impatient-america.html) (retrieved on Feb. 4, 2012).
- <sup>24</sup> Joann Muller, "BMW's Push for Made-to-Order Cars," *Forbes Magazine*, September 27, 2010. [www.forbes.com/forbes/2010/0927/companies-bmw-general-motors-cars-bespoke-auto.html](http://www.forbes.com/forbes/2010/0927/companies-bmw-general-motors-cars-bespoke-auto.html) (retrieved on Feb. 4, 2012).
- <sup>25</sup> "The Story Behind the Building of your BMW X3." [www.youtube.com/watch?v=5g-hbqAhaL8](http://www.youtube.com/watch?v=5g-hbqAhaL8) (retrieved on Feb. 3, 2012).