

MOBILITY ENGINEERING

DECEMBER 2013

**FIRST
ISSUE**

AUTOMOTIVE, AEROSPACE, OFF-HIGHWAY

A quarterly publication of **SAE**
INTERNATIONAL and **SAE INDIA**

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"The cheapest part is the part you don't need," said CMF-A chief Gérard Detourbet in India. (Reuters)

The new Renault-Nissan plant for low-cost Datsun cars in Chennai provides an opportunity to explore a tale of two modular system approaches.

by Bertel Schmitt

In hot Oragadam in India, and in Wolfsburg, Germany, engineers and executives have bet the future of their companies on something little boys already do routinely. They build cars out of **Lego** kits. Both at **Volkswagen** and at **Renault/Nissan**, the bet is that these kits will help propel unit sales beyond the 10 million mark. This is where the similarities end.

Students and faculty at engineering schools in Japan used to call it the "Lego principle:" Break down a car into modular building blocks, and revolutionize the way cars are developed and built. Develop once, run anywhere.

Building cars is not quite child's play yet, but several large OEMs are working their way toward that elusive ideal. The company that springs to mind when thinking about cars from kits is Volkswagen, while the Renault-Nissan Alliance rarely finds itself at the top of the cars-from-kits awareness scale.

Engineers in Wolfsburg all seem to age prematurely. White hair belongs on the head of a senior Volkswagen engineer/executive like the VW logo on their building. The charismatic and outspoken Gérard Detourbet, on the other hand, looks much younger than his PR head-

shot, and he definitely does not look his 67 years as we meet in a thankfully well air-conditioned **Hyatt** in an otherwise sweltering Chennai, India.

Detourbet greets the challenge of his lifetime in India, and it invigorates him. Brought back from retirement, the former program director of Renault's MO platform arrived in India in January 2012 to fulfill a dream. Other engineers may dream of supercars; Detourbet dreamed of "building a smaller car, smaller than the smallest car we have in the Alliance. In my mind, I started working on it four years ago."

In reality, work started in spring last year. The car will be launched in 2015. Detourbet, his boss Carlos Ghosn, and with him the whole Renault-Nissan Alliance hope it will succeed where **Tata's** Nano failed, that it will finally set off India's mass motorization. The hopes are pinned on an ultra-low-cost car, sold under Nissan's revitalized **Datsun** logo.

"It won't be a car on a 25-year-old platform that was amortized several times already," Ghosn promised in Chennai. "It will be totally modern, totally new. It won't be localized, it will be local, designed and built in India."

Ghosn won't say more than that the price of the car will be "not far from the entry competitor." India's car-crazy media did the math and arrived at around \$3680, converted from 240,000 rapidly depreciating rupees.

Common Modular Family

How can you hit such a price point and still make money? By using Renault/Nissan's new Common Modular Family (CMF) architecture. And by putting Detourbet in charge of the project. Underpinning the **Dacia** line, Detourbet's MO platform helped save Renault's bacon in an im-

ploding European market and elsewhere.

Under the CMF architecture, the car is divided into five modules, explains Renault's Engineering Chief, Jean-Michel Billig, in Paris: "Engine compartment, front underbody, rear underbody, cockpit, and the electronic architecture, each with between one and three big modules to choose from."

After getting to work in earnest in March 2012, Detourbet and his small team of engineers, working out of the Alliance's tech center near Chennai, not only developed a completely new car in a time "it normally takes to do a derivative" as Detourbet mentioned. While they were at it, they also developed the complete modular architecture the new car will be based on.

CMF is split into three families. CMF-A, developed by Detourbet, is the basis for the Alliance's entry level and sub-mini models. CMF-B will be for cars the size of a Renault Clio. CMF-C/D will buttress vehicles the size of the Nissan Rogue, Qashqai, and X-Trail, or Renault Espace, Scénic, and Laguna. The first CMF-C/D Nissans will appear by the end of 2013, with the Renaults to follow a year later. CMF-A will hit the Indian market in 2015. A first prototype should appear at the Delhi motorshow in Spring 2014. CMF-B based units will appear "at a later date," as I heard in Yokohama.

"The best way to reduce the cost of a car is to reduce the number of its parts," said Detourbet. "You get a car that costs less to engineer, it is easier to assemble, and it has less to go wrong." A lot of Detourbet's time is spent chasing down unnecessary complexity. Where other air conditioners have a multitude of knobs and buttons, Detourbet's A/C only has one knob. Detourbet uses the same rear-view mirror on the left and the right. "Engineers create a lot of things that are never used by the customer, they don't make cars for the customer; they make cars for themselves. The secret is to make what is expected, by the customer, and not more."

Countering blandness

Like many revolutions, modular architectures can meet resistance among the establishment. The most common counterpoints are that modules lead to even blander cars, fed from a common parts bin, and that if something goes wrong, it will be the mother of all recalls.

In Paris, Billig "strongly denies" the notion of increasing boredom. "CMF standardizes all that is not visible, which allows us to put money and investment into what is visible. An



"It won't be a car on a 25-year-old platform that was amortized several times already," said Renault/Nissan CEO Carlos Ghosn at the tech center near Chennai, India.

underbody adds nothing to the brand, so let's standardize it and take the money to make more attractive and more seductive cars."

Ulrich Hackenberg, the Board Member for Technical Development at Audi AG and all other VW Group brands, says the concept leads to better quality. Instead of making 130 different versions of the same engine, there is only one version, which will be tested again and again in each new car that uses it. "I don't think there is any car maker in the world that does such intensive testing of its components [as VW]," Hackenberg claimed.

Detractors like to say that "modules are just another word for platform." Semantics indeed play a big role in the modular business, and this is where the Renault-Nissan Alliance needs help.

"CMF is not a platform," espoused a Nissan press release this summer. "A platform is a horizontal segmentation; a CMF is a cross-sector



In July in Delhi, Nissan unveiled the first new Datsun car for the 21st century that will go on sale in India in early 2014.

Building cars from Legos



“Other companies may be working on these systems, but they don’t have enough brands to effectively make use of them,” said Volkswagen R&D Chief Ulrich Hackenberg.



“An underbody adds nothing to the brand,” said Renault Engineering Chief Jean-Michel Billig.

concept.” The release did not reach Nissan’s CEO Carlos Ghosn. He happily called CMF-A “a platform,” a discrepancy promptly noted by an irritated Indian media. The 67-year-old Detourbet also does not want to switch to the new nomenclature, and insists on calling his brainchild “a modular platform.”

There is no such Gallic verbal laxness in Wolfsburg. Here, the matter is firmly in the hands of Teutonic terminology. Volkswagen spokesman Christian Buhlmann gives a 90-min presentation about the true doctrine of MQB. Fortified by 78 PowerPoint charts, Buhlmann has given the talk “so often that I could give it in my sleep,” as he says.

According to Buhlmann, Volkswagen “changed from a platform approach to a modular strategy when Professor Piech was still CEO,” i.e. in the 1990s. In Volkswagen’s belief system, platforms went out with the advent of PQ35, which it calls a modular system. That modular system is now likewise being sent to pasture, displaced by Volkswagen’s “Baukasten” or “assembly kit” architecture. Volkswagen is a whole generation ahead of the competition—at least as far as semantics go.

Dramatic development cost reductions

In the low-cost-car department, on the other hand, Volkswagen is not bursting with urgency. “We are working on a low-cost car,”

Hackenberg disclosed. “We are at the beginning, in the design phase, but we know what we have to do.”

Deservedly or not, Volkswagen has turned into the benchmark of modularization. To the delight of VW’s Investor Relations, MQB has become the topic of many research notes, where analysts escape the tedium of EBITA to venture into the exciting world of parts numbers. The professional should read the research with caution.

A recent **Morgan Stanley** note crowned Volkswagen as king of the modular realm, followed by **Toyota**—never mind that little or nothing is known about Toyota’s New Global Architecture (TNGA), except that the first new TNGA cars should appear by 2015. If you are really friendly with Toyota’s Tokyo spokesfolk, you may hear that “even we don’t know what TNGA is all about.” Which most likely is true.

A widely circulated note by **Bernstein Research** set out to debunk Volkswagen’s claim that, with MQB, its cars will cost 20% less to produce—never mind that Volkswagen never claimed this. Sure, savings between 20 and 30% have been mentioned both by Volkswagen and Nissan. Even Toyota, while saying little or nothing about its modular system, mentioned savings in the same neighborhood. The question is: 20% of what? Of R&D? Very doable. Of parts purchases? Achievable. Of the whole car? Probably not.

“As far as development costs are concerned, the reductions can be dramatic, 20 to 25% for sure,” said Billig, and he continued that “by buying a million instead of 300,000 parts, purchasing should be able to make big savings.” The exact number Billig refuses to know, claiming that he is “not in purchasing.”

Modular the way to go

The back-of-the-envelope number is that the development of a new car costs a billion dollars, “or rather a billion Euro,” as Buhlmann interjected in Wolfsburg. A modular system could shave off 200 to 300 million from that number, dollars or euros. A rule from the back of the same



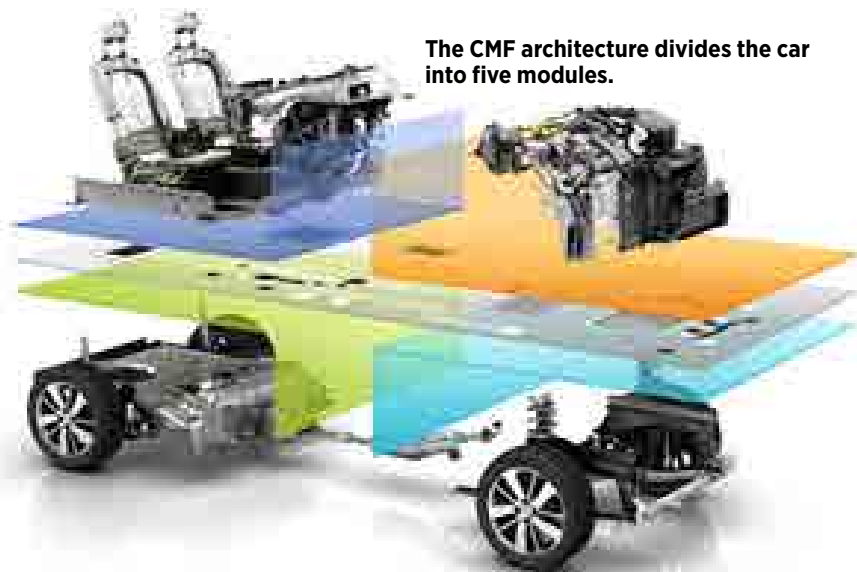
“The CMF concept does not require additional changes in the production process,” said Tsuyoshi Yamaguchi, Renault-Nissan Alliance Director responsible for engineering.

envelope says that 60% of the cost of a car is in the plant, 20% in parts, and 20% labor. Both Billig in Paris, and his Yokohama-based colleague Tsuyoshi Yamaguchi, Alliance Director responsible for engineering, say that a modular system does not change that equation in a material way, hinting at a possible weakness of the Volkswagen approach.

With the factory the biggest line item, you want to keep an eye on it. MQB and its three-letter brethren at Volkswagen require a completely and expensively re-engineered plant. Multiply this by 26 plants in Volkswagen’s worldwide empire. Nissan’s Chennai plant does not look like anything special, and Yamaguchi cheerily concedes that point: “The CMF concept does not require additional changes in the production process.”

Criticized by analysts, Volkswagen stopped naming numbers. Buhlmann asked reporters not to mention any money when they are about to interview the R&D Chief. Hackenberg studiously avoids the topic. He does not venture any closer to the hot potato than mentioning that parts runs can now “go up to six million a year,” and he leaves the rest as an exercise to the student.

As much as Renault/Nissan’s big modules and Volkswagen’s kit approach may differ, all agree that there is no future without these systems. “For us, there is no other option than



The CMF architecture divides the car into five modules.



No costly re-engineering needed for the new Datsun at the Renault-Nissan plant in Chennai, India.

being successful with the CMF strategy,” said Renault’s Billig in Paris. In Yokohama, his colleague Yamaguchi-san sees car makers without a modular system “at a huge disadvantage. Even if they have scale, they cannot enjoy it.” In Wolfsburg, Hackenberg says that “other companies may be working on these systems, but they don’t have that variety of brands to effectively make use of it.”

In Tokyo, Toyota’s Executive Vice President, Mitsuhsa Kato, lifts the kimono of silence a little and says that “considering the ever intensifying competition among global OEMs, the time is now requiring us to develop more-attractive products and to do so in a smarter and more efficient way than ever before. This is what TNGA is all about.” ■