

THE FUTURE OF THE CAR

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Electronic age forces wholesale rethink

Manufacturers are facing up to the risk of their products becoming increasingly marginalised, reports **John Reed**

Bill Ford, a member of one of the car industry's founding dynasties, last week delivered a dire warning of "global gridlock" for vehicle traffic.

In a speech in Barcelona, Ford Motor's chairman said that with the number of vehicles on the world's roads set to quadruple to about 4bn by 2050, carmakers needed to work with other industries and governments or risk seeing cars lose their basic function of getting people from A to B.

"Now is the time for all of us to be looking at vehicles on the road the same way we look at smart phones, laptops, and tablets: as pieces of a much bigger, richer network," Mr Ford said at the Mobile World Congress, an electronics industry gathering.

In Germany, an Audi senior executive was sounding a similar warning of automotive dystopia – along with the same call for collective action, empowered by new communications and computing technology.

"If we don't do anything, it will be a huge risk for the automotive industry because people might say, 'I'm fed up – I don't want to spend three or four

hours a day in traffic,'" Peter Schwarzenbauer, Audi's head of sales, told the Financial Times. "I think it's in our interest to keep people mobile."

Audi is sponsoring research into future urban transport solutions, and studying proposals such as the use of "intelligent" road surfaces that route cars smoothly through cities, depending on the time of day.

In China, General Motors is preparing to deploy the EN-V, its tiny two-seat, self-driving experimental car, in the country's largest "eco-city" on the outskirts of Tianjin. "As cities become densely populated, the appeal of owning a car is being threatened because of parking, congestion, and viable alternatives like public transport," says Chris Borroni-Bird, GM's director of advanced technology vehicle concepts.

None of these companies look as if they need to sound so pessimistic. Ford is reporting bumper profits and recently paid its first dividend in five years to shareholders, including Mr Ford's family. Audi sold more than 1.3m cars last year, recording its fastest growth ever. GM's net earnings last year reached a record \$7.6bn.

But the world's car industry is in a volatile mood as it gathers for this week's Geneva motor show. Alongside the forecasts of continuing record sales for this quintessentially global sector, there is a sense of vigilance, even paranoia among producers. Advances in information tech-



Jams today: it is in carmakers' interests to keep people mobile rather than mired in a 'global gridlock' as car numbers quadruple by 2025 Getty

nology, manufacturing, and the materials used in cars are offering producers seemingly boundless opportunities to develop new products.

However, with these come bigger than ever risks of miscalculating what consumers want, and betting on the wrong technology.

The range of options open to carmakers is unprecedented. Modular construction tech-

niques are redefining the industry's venerable practice of platform-sharing by allowing automakers to build cars of many different sizes and specifications in the same place, while sharing cost-saving commonality under their skin.

Advances in computer-modeling and materials such as plastics and steel mean these cars can reach the market faster than before, in lighter, more

flexible and more attractive form than ever.

Carmakers say that the rise of smart phones and social networking is transforming the way people see cars, and what they want from them.

Consumers are demanding the same connectivity, ease of use, and speedy updateability from vehicles as they have come to expect from their mobile phones.

"Consumers are seeing less value in some of the traditional areas of the automotive sphere – like powertrains – and putting more value on the convenience and comfort elements," says Franck Leveque, an automotive analyst with Frost & Sullivan, the consultancy.

Here, congested China could offer a glimpse of the future of

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The Future of the Car

Feelgood factors to the fore in the connected cockpit

In-car technology

Consumer demand is driving developments in comfort and 'wellness', writes **John Reed**

As car companies push the limits of what the communications and computing technology in their vehicles can – or might reasonably be expected – to do, a new frontier is emerging: "wellness" behind the wheel.

Ford, for example, is developing as part of its Sync in-car system a feature for people with diabetes that uses a breath sample to test a driver's or passenger's blood sugar and warns them if they need an insulin shot.

The company is developing another service for people with allergies that can warn drivers

about areas with high pollen counts and route the car away from them, or automatically close the car's external vents.

"We see health and wellness as a big part of the future," says Pim van der Jagt, Ford's technical leader of active safety and driver assistance systems.

That Ford is developing these features attests to the technological leaps being made in wireless communications and cloud connectivity, and the seemingly limitless new horizons that these are opening up in cars.

It also reflects buyers' changing expectations of cars. "Consumers are placing less value on some of the traditional areas of the automotive space, such as power trains, and more value on convenience and comfort elements," says Sarwant Singh, a partner with Frost & Sullivan, the consultancy.

Carmakers and suppliers are now trying to devise services that drivers will value and pay for, while forging partnerships with external suppliers and service providers that will keep them ahead of the game.

Ford was one of the first in the industry to offer in-car communications and assistance systems with its Sync system, developed with Microsoft. The computing company says cars are becoming the third most important computing device after smartphones and tablets.

Ford says its focus on in-car technology reflects demand from younger consumers in particular.

The emphasis on higher-end entertainment systems is increasing, says Mr van der Jagt. "There is a trend of a new generation coming up that has much less interest in the car itself."

Audi reached similar conclusions after conducting its "Future Kids" survey. Young people, says Peter Schwarzenbauer, Audi's head of sales, "are saying they expect to be able to do in their cars whatever they can do with their handheld devices. They don't care whether it's part of the car, or

A new generation is much less interested in the car itself than in entertainment systems

the car just enables handheld devices to receive data out of the cloud."

At the Consumer Electronics Show in Las Vegas this year, Audi showed a version of its forthcoming A3 in which the driver had a head-up display of

traffic and other information, and his passenger another display to make video calls, surf the internet or watch movies. The projections could be manipulated with the swipe of a hand.

The German premium brand's "human-machine interface" team in Ingolstadt now has about 75 technicians working on in-car technology – experimenting with new features, testing them in customer clinics and overseeing translation into more than 20 languages.

As "distracted driving" becomes more of a concern, the industry is mindful of regulations. US safety officials recently released long-awaited guidelines on what the industry should and should not offer in cars.

Audi, like its German premium rivals BMW and Mercedes-Benz, already offers head-up displays in its top-end

models to project vital information in front of the driver's eyes while they focus on the road.

To minimise distraction, Audi's engineers have developed a touchpad system that allows drivers to enter letters into the car's navigation and communications system at the touch of a finger.

Audi devised the feature originally for its A8 in 2010 and is now introducing it across its range, with versions that recognise writing in Arabic, Cyrillic and Mandarin. The next step, the brand's engineers say, will be a touchpad with "active haptic feedback". This feature, normally used for blind people, will allow drivers to feel buttons or text lines without taking their eyes off the road.

For carmakers, cloud connectivity in cars is also opening the way for longer and richer service relationships with customers

– and the revenues that come from that.

Nissan last year announced a strategic relationship with Microsoft to develop a dealer management system for use in its cars. Toyota said it was working with Salesforce.com, a US cloud-computing company, to offer a service on its plug-in hybrid and electric vehicles that will provide drivers with maintenance tips, or warn them if they need to recharge.

As cars "know" more than ever before about drivers and passengers, the connected car will open up big new commercial possibilities, but will also raise privacy issues.

Mr Schwarzenbauer says consumers will accept the new technology if the knowledge that carmakers acquire about them makes their lives easier but, he warns, "it's a mistake to misuse this information".

Microvehicles on fast track to bypass megacity gridlock

Urban transport

Growing congestion is prompting radical innovation, writes **John Reed**

China witnessed in August 2010 what has been described as the worst traffic jam in history.

In Hebei province, a combination of roadworks and a high volume of coal trucks heading to Beijing halted vehicles for at least 11 days. One journalist who was there wrote that the normally hectic expressway was so quiet he could hear crickets chirruping nearby. As it happens, 2010 was

also the year that China overtook the US as the world's largest car market. That year, too, Beijing's city government introduced a lottery for licence plates to limit the number of new cars.

Carmakers are watching the growing congestion in emerging countries with alarm, coupled with a sense that if they think creatively, they can exploit business opportunities from an increasingly urbanised world.

Bill Ford, Ford Motor's chairman last month warned of the danger of "global gridlock" as the number of cars rises from about 1bn to a projected 4bn by 2050. He said carmakers must work with governments and industries such as telecommunications

to find solutions to urban congestion, or risk their products becoming obsolete.

About 70 per cent of the world's population is projected to live in cities by 2050, up from about half today. The problem is not

Ford estimates the cost of congestion in the UK alone will rise to \$35bn a year by 2025

confined to emerging countries such as China: Ford estimates the economic cost of congestion in the UK alone will rise to \$35bn annually by 2025.

"We know from the US

and Europe that vehicle ownership and usage are affected by population density," says Chris Borroni-Bird, General Motors' director of advanced technology vehicle concepts. "As cities become more densely populated, the appeal of owning a car is threatened because of the lack of parking, congestion and viable alternatives such as public transport."

At GM, Mr Borroni-Bird heads the team that developed the EN-V, GM's two-seat electric, networked vehicle, which it showed at the 2010 Shanghai World Expo. The car is designed to communicate with other vehicles and public infrastructure, enabling it to navigate, avoid crashes and find parking autonomously.

For now, the EN-V is

experimental and would only work in a controlled environment where it was surrounded by similarly wired vehicles. GM last year secured such laboratory conditions when it signed a memorandum of understanding with China's largest "Eco-City", on the outskirts of Tianjin, where it will deploy the next generation of the car.

The EN-V, says Mr Borroni-Bird, will lend itself for use as a second car or in car-sharing schemes. "It might not be something you own," he says.

Other carmakers are devising blueprints for urban vehicles and services, typically with electric drivetrains and in-car technology that connects them to the surrounding city.

BMW's new BMW i sub-brand was formed in the Munich carmaker's brainstorming sessions about a "megacity" vehicle. The venture's first two cars, the electric i3 and plug-in hybrid i8, will launch in 2013.

The company, like its rivals, is also devising services that offer casual car use or meld car travel with public and other forms of transport.

"The future of transport is door-to-door mobility," says Sarwant Singh, a partner with Frost & Sullivan, the consultancy. "This will be led through more connectivity and convergence of the mobile information technology industry with the car industry, but will be largely enabled using the smartphone."

Manufacturers such as Volkswagen and Honda are developing microvehicles for big cities, including

scooters, bicycles and electric carts. VW last year unveiled the NILS, a single-seat electric concept car just 3 m long and 0.39 m wide



The next generation of GM's EN-V is set to take to the road in China

Bloomberg

that it said could meet most German commuters' needs.

Carmaking executives reiterate Mr Ford's view that the threat of global gridlock will be addressed only if the industry joins forces with other sectors and governments to find common solutions.

"I honestly believe we need a broader approach than just talking about the car," says Peter Schwarzenbauer, Audi's head of sales. "I would call it a mobility

system, and the car is just part of the whole issue."

However, most industry analysts and many carmakers point out that while two-wheelers and microvehicles have a viable global niche, most consumers in countries such as India and China who can afford to buy a car typically make their first car the roomiest four-seater they can afford.

John Miles, a member of the UK Automotive Council, which recently pub-

lished a study on "intelligent mobility", thinks much of the technology needed to pilot cars smoothly in big cities is already within reach.

An anarchic, Darwinian approach – under which the best technologies win out – is likelier than a top-down solution imposed by decision-makers.

"Our conclusion is that it's all going to happen on its own – but not fast enough," says Mr Miles.

Electronic age forces radical rethink by manufacturers

Continued from Page 1

driving. Carbuyers there, many of whom spend hours stuck in traffic, have long valued and been prepared to pay more for interior trim and entertainment features than for big engines.

Whereas in the past many drivers upgraded to a bigger or more powerful engine as soon as they could afford it, Toyota speaks of a trend among its customers of "rightsizing" – consumers opting for an economical small engine, but bumping up the body size or infotainment features in their cars.

Software giant Microsoft, which works with a range of automakers including Ford, Nissan and Toyota, says that cars are becoming the world's third most important computing devices, after phones and tablet computers.

With the rise of cloud computing, cars can increasingly be connected seamlessly to drivers' homes and workplaces.

The mobile internet, as some carmakers call it, will allow manufacturers, dealers, and others to offer a

range of location-based and relevant services to drivers.

This promises the industry a rich source of potential new business, but also the threat of a consumer backlash if drivers feel their privacy is being violated. "We are highly conscious of the potential sensitivity," says Patrick Hofstetter, a digital technology specialist with Renault, which plans to ask drivers whether they

Toyota speaks of 'rightsizing' – opting for a small engine but larger body or infotainment extras

are comfortable with their location being provided to third parties.

The challenges of technological change, globalisation, and environmental change such as lightweight construction and electric vehicles are driving carmakers into partnerships with each other and outside the industry.

But amid all of the industry's blue-sky thinking

about finding big-bang "mobility solutions", some scepticism is in order.

There is reason to doubt that the call by executives such as Mr Ford for collective action by policymakers and industry to address growing congestion will be heeded; witness, for example, Europe's long struggle to agree on common standards just for the plugs used in battery-powered cars.

And while GM and other carmakers are experimenting with microvehicles designed for developing-world megacities, many drivers in countries such as China and India upgrade into cars as soon as they can afford to – and typically the roomiest model they can afford.

Competitively priced, modestly equipped, roomy saloon cars are the mainstay of Volkswagen's Skoda value brand and Renault's entry-level cars, both of which are finding favour in emerging markets.

Basic mobility, it seems – as opposed to "mobility solutions" – never goes out of style. Cars as we know them are not going away anytime soon.

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FT Special Reports Research 2012

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Your reply will be treated in the strictest confidence – the results will only be used in statistical format and you will not be contacted by any other company. As a token of our appreciation, every reader who completes and returns a questionnaire by Monday 26th March 2012 may enter the free prize draw to win £200 (or local equivalent).

Thank you for your help.

Michael Skapinker
Editor, Special Reports and Supplements

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	Company	Industry	Subject Area	Country
4-5 times per week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-3 times per week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Once a week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-3 times per month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Once a month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Less often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Q2 When conducting research for work purposes, which resources do you use? Please tick all that apply

Internal company resources e.g. Library	<input type="checkbox"/>
Online search engines e.g. Google	<input type="checkbox"/>
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Social media	<input type="checkbox"/>
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Other (Please specify)	<input type="checkbox"/>
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Q3 When quoting a research source, which of the following are most important to you? Please select up to three

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Relevance of information	<input type="checkbox"/>
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USE OF FT SPECIAL REPORTS

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About half	<input type="checkbox"/>	Don't know	<input type="checkbox"/>

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1	<input type="checkbox"/>	5-9	<input type="checkbox"/>
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Q6 Overall, how would you rate this FT Special Report?

Excellent	<input type="checkbox"/>	Fair	<input type="checkbox"/>
Very good	<input type="checkbox"/>	Poor	<input type="checkbox"/>

Q6a How often do you read FT Special Reports in the Financial Times newspaper?

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Kurdistan: Oil & Gas (8th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
The FT's Year in Finance (13th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
Cop 17 Analysis (13th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
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Ghana (15th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
Business Locations in France (16th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
Qatar (17th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
World retailing (19th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
Investing in South Korea (19th December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
The New Egypt (22nd December 2011)	<input type="checkbox"/>	<input type="checkbox"/>
Connected Business 2012 (25th January 2012)	<input type="checkbox"/>	<input type="checkbox"/>
The world 2012 'DAVOS' report (25th January 2012)	<input type="checkbox"/>	<input type="checkbox"/>
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Q10 Which subjects would you be interested in the FT covering (in future special reports)? Please write in

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They provide information I cannot find elsewhere/would not otherwise see	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Q13 In your own words, can you tell us the value to you in reading FT Special Reports? Please write in

Q14 Aside from general reading, in which, if any, of the following ways do you use FT Special Reports? Please tick all that apply

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To find out more about the industry I work in	<input type="checkbox"/>
To make better informed business decisions	<input type="checkbox"/>
To make my investment decisions	<input type="checkbox"/>
To find new business partners/to uncover new business opportunities	<input type="checkbox"/>
To prepare for a business trip	<input type="checkbox"/>
To prepare for meetings with clients or other contacts from the country or industry concerned	<input type="checkbox"/>
To incorporate into presentations, reports and other documents	<input type="checkbox"/>
To show to clients, suppliers or other contacts	<input type="checkbox"/>
In my role as a teacher/lecturer as teaching material	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>
None of the above	<input type="checkbox"/>

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USE OF SPECIAL REPORTS ONLINE

Q16 Did you know that FT Special Reports are also available on FT.com?

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2-3 times a week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Once a week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-3 times a month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Once a month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Less often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q17 In which of the following ways have you accessed FT Reports online? Please tick all that apply

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Click through from a link in an FT email	<input type="checkbox"/>
Click through from a link on FT.com	<input type="checkbox"/>
Click through from an advertisement on FT.com promoting Special Reports	<input type="checkbox"/>
Bookmarked page as a favourite	<input type="checkbox"/>
Typed in the URL from a report read in print	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>
None of the above	<input type="checkbox"/>

Q18 For what reasons do you access the FT Special Reports section on FT.com? Please tick all that apply

To find out about upcoming reports	<input type="checkbox"/>
For archiving/reference purposes	<input type="checkbox"/>
To search for reports on a particular country/industry/subject in addition to a report read in print	<input type="checkbox"/>
Prefer to read a report online than in print	<input type="checkbox"/>
Don't have access to a print copy of Special Reports	<input type="checkbox"/>
To access additional content relating to a report e.g. video, interactive graphics	<input type="checkbox"/>
To download a PDF of a report	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>
None of the above	<input type="checkbox"/>
Do not use FT.com to access FT Special Reports	<input type="checkbox"/>

Q19 What would make you use the Special Reports section on FT.com more frequently? Please tick all that apply

Improved search function	<input type="checkbox"/>
Reports being regularly updated with new content after being published	<input type="checkbox"/>
More interactive features	<input type="checkbox"/>
Better linking to further online content	<input type="checkbox"/>
An online community of other readers interested in the same subjects	<input type="checkbox"/>
Improved ability to share content with others	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>
None of the above	<input type="checkbox"/>

OTHER MEDIA CONSUMPTION

Q20a In which of these publications do you ever read or look at special supplements/reports? Please tick all that apply

	In Print	Online
Economist	<input type="checkbox"/>	<input type="checkbox"/>
Wall Street Journal	<input type="checkbox"/>	<input type="checkbox"/>
International Herald Tribune	<input type="checkbox"/>	<input type="checkbox"/>
Forbes	<input type="checkbox"/>	<input type="checkbox"/>
Fortune	<input type="checkbox"/>	<input type="checkbox"/>
Harvard Business Review	<input type="checkbox"/>	<input type="checkbox"/>
Bloomberg Business Week	<input type="checkbox"/>	<input type="checkbox"/>
The Times	<input type="checkbox"/>	<input type="checkbox"/>
The Telegraph	<input type="checkbox"/>	<input type="checkbox"/>
The Guardian	<input type="checkbox"/>	<input type="checkbox"/>
The Independent	<input type="checkbox"/>	<input type="checkbox"/>
Other Print (Please specify)	<input type="checkbox"/>	<input type="checkbox"/>
Other Online (Please specify)	<input type="checkbox"/>	<input type="checkbox"/>
None of the above	<input type="checkbox"/>	<input type="checkbox"/>

Q20b Which publication do you think runs the most informative special supplements/reports? Please tick one

	In Print	Online
Economist	<input type="checkbox"/>	<input type="checkbox"/>
Wall Street Journal	<input type="checkbox"/>	<input type="checkbox"/>
International Herald Tribune	<input type="checkbox"/>	<input type="checkbox"/>
Forbes	<input type="checkbox"/>	<input type="checkbox"/>
Fortune	<input type="checkbox"/>	<input type="checkbox"/>
Harvard Business Review	<input type="checkbox"/>	<input type="checkbox"/>
Bloomberg Business Week	<input type="checkbox"/>	<input type="checkbox"/>
The Times	<input type="checkbox"/>	<input type="checkbox"/>
The Telegraph	<input type="checkbox"/>	<input type="checkbox"/>
The Guardian	<input type="checkbox"/>	<input type="checkbox"/>
The Independent	<input type="checkbox"/>	<input type="checkbox"/>

Q21 Are you...?

Working full-time	<input type="checkbox"/>
Working part-time (including semi-retired)	<input type="checkbox"/>
Looking for work	<input type="checkbox"/>
Retired	<input type="checkbox"/>
Homemaker	<input type="checkbox"/>
Studying	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>

Q22 Which of the following best describes your position/ job title?

Owner/Partner	<input type="checkbox"/>
President/Chairman/CEO	<input type="checkbox"/>
Chief Operating Officer	<input type="checkbox"/>
Managing Director	<input type="checkbox"/>
Chief Financial Officer/Finance Director	<input type="checkbox"/>
Chief Information/Technology Officer	<input type="checkbox"/>
Other C-Suite title	<input type="checkbox"/>
Board Member	<input type="checkbox"/>
Departmental Director/Head of Department/Vice President	<input type="checkbox"/>
Other managerial level/executive	<input type="checkbox"/>
Technical Specialist	<input type="checkbox"/>
Consultant	<input type="checkbox"/>
Financial Professional (e.g. IFA, Broker, Trader, Investment/ Fund Manager, etc)	<input type="checkbox"/>
Professionally qualified (i.e. Doctor, Teacher, Engineer etc)	<input type="checkbox"/>
Administration/Clerical	<input type="checkbox"/>
Elected representative	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>

Q23 Which one of the following best describes the industry sector of your organisation? Please tick one only

Investment Banking	<input type="checkbox"/>
Other Banking	<input type="checkbox"/>
Investment/ Fund Management	<input type="checkbox"/>
Audit Services	<input type="checkbox"/>
Insurance/ Actuarial	<input type="checkbox"/>
Other financial services	<input type="checkbox"/>
Legal	<input type="checkbox"/>
Management consulting	<input type="checkbox"/>
Media	<input type="checkbox"/>
PR/ Marketing	<input type="checkbox"/>
IT	<input type="checkbox"/>
Telecommunications	<input type="checkbox"/>
Scientific/ Technical services	<input type="checkbox"/>
Retail/ Wholesale	<input type="checkbox"/>
Travel/ Tourism/ Leisure/ Entertainment	<input type="checkbox"/>
Other services	<input type="checkbox"/>
Construction	<input type="checkbox"/>
Transport/ Vehicle manufacture	<input type="checkbox"/>
Logistics	<input type="checkbox"/>
Utilities/ Energy/ Oil	<input type="checkbox"/>
Food/ Drink/ Tobacco/ Textile/ Clothing	<input type="checkbox"/>
Manufacturing	<input type="checkbox"/>
Engineering	<input type="checkbox"/>
Government/ Politics	<input type="checkbox"/>
Education/ Health	<input type="checkbox"/>
Charity/ Not for profit organization	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>

Q24 Does your job responsibility involve making decision about the purchase or lease (i.e. choosing the supplier or brand or authorising the payment) of any of the following type of goods or services? Please tick all that apply

IT equipment/systems/services	<input type="checkbox"/>
Telecommunication equipment/systems/services	<input type="checkbox"/>
Other office equipment	<input type="checkbox"/>
Aerospace	<input type="checkbox"/>
Industrial materials/ components	<input type="checkbox"/>
Fuel/Energy	<input type="checkbox"/>
Company vehicles	<input type="checkbox"/>
Business premises/sites	<input type="checkbox"/>
Banking	<input type="checkbox"/>
Investment/Brokerage	<input type="checkbox"/>
Financial Services	<input type="checkbox"/>
Auditing Services	<input type="checkbox"/>
Legal Services	<input type="checkbox"/>
Management consulting services	<input type="checkbox"/>
Advertising / Marketing / Public relations	<input type="checkbox"/>
Human Resources	<input type="checkbox"/>
Travel services	<input type="checkbox"/>
Logistics	<input type="checkbox"/>
Conferences/Exhibitions	<input type="checkbox"/>
Other	<input type="checkbox"/>
Not involved in purchase decision making	<input type="checkbox"/>

Q24a Which of the following broad areas are your main areas of activity at work? Please tick all that apply

General management	<input type="checkbox"/>	Strategy/ Strategic planning	<input type="checkbox"/>
Management of particular geographical regions	<input type="checkbox"/>		
Banking services	<input type="checkbox"/>	Financial advisory services	<input type="checkbox"/>
Accountancy/ Management accountancy	<input type="checkbox"/>		
Actuarial/ Insurance	<input type="checkbox"/>		
Investment/ Fund management	<input type="checkbox"/>		
Treasury	<input type="checkbox"/>	Other Financial	<input type="checkbox"/>
Legal	<input type="checkbox"/>	Sales	<input type="checkbox"/>
Marketing/ Advertising/ PR/ Communications	<input type="checkbox"/>		
E-Commerce/ Business systems	<input type="checkbox"/>		
IT/ Telecommunications	<input type="checkbox"/>	Scientific/ Technical Services	<input type="checkbox"/>
R&D/ Design	<input type="checkbox"/>	Procurement/ Purchasing	<input type="checkbox"/>
Logistics	<input type="checkbox"/>		
Premises/ Property management	<input type="checkbox"/>		
HR/ Training	<input type="checkbox"/>	Education/ Medical/ Health	<input type="checkbox"/>
Government/ Politics	<input type="checkbox"/>	Other	<input type="checkbox"/>
Not involved in purchase decision making	<input type="checkbox"/>		

Q25 How many people does the organisation that you work for employ worldwide?

Just myself/ 1 person	<input type="checkbox"/>	501-1,000	<input type="checkbox"/>
2-250	<input type="checkbox"/>	1,001-10,000	<input type="checkbox"/>
251-250 employees	<input type="checkbox"/>	10,001+	<input type="checkbox"/>

Q26 Which region do you currently live in?

UK	<input type="checkbox"/>	Middle East	<input type="checkbox"/>
Continental Europe	<input type="checkbox"/>	Africa	<input type="checkbox"/>
USA	<input type="checkbox"/>	Asia Pacific	<input type="checkbox"/>
Americas (excluding USA)	<input type="checkbox"/>		
Other (Please specify)	<input type="checkbox"/>		

Prize draw and mailing instructions on back

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2



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FOLD 5
(Tuck in to flap A)

FOLD 2

FOLD 3

FOLD 1

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Please fully complete the FT Special Reports Survey 2012 and enter your name, address and e-mail below if you wish to be entered for the prize draw. Closing date for postal entry is Monday 26th March 2012.

PLEASE WRITE IN BLOCK CAPITALS

Name

Address

.....

Postcode Country

Email

Mobile* ()

*** It is now possible to conduct market research through text messaging. If you are happy to participate in FT research via text messaging, please enter your mobile or cell phone number (including country code) above.**

The information you provide will be used by FT Group in relation to the prize draw and for market research purposes only. For the FT privacy policy visit www.ft.com/servicestools/help/privacy

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 3. Only one entry per person is permitted. Multiple or incomplete entries will be deemed to be invalid. Incomplete entries will not be eligible. All entries become the FT's property and will not be returned.
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 5. The winner will be required to confirm acceptance of their Prize within 5 working days and may be required to complete and return an eligibility form. If the Prize is declined, or unclaimed by the winner, or if the winner cannot be contacted from the details supplied, a supplementary winner may be drawn at FT's discretion and will be notified by letter/email. The original entry that was drawn will be forfeited.
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Hopes are pinned on flexible modularity

Manufacturing
Standardisation across models may offer big savings, says **Chris Bryant**

When Volkswagen's Audi brand lifts the veil on the latest incarnation of its A3 premium compact car at the Geneva motor show this week, there will be far more at stake than is customary even for the (re)launch of a popular vehicle.

With the A3, VW is firing the starting pistol on a grand experiment to boost the use of common components and design parameters across a wide range of segments and brands.

Known as the Modular Transverse Matrix, abbreviated in German to MQB, this vehicle platform will be replicated in dozens of VW, Audi, Skoda and Seat models over the coming years.

By using common building blocks to construct high-volume cars such as

the A3, VW Golf and VW Polo, the German carmaker aims to slash vehicle production costs by 20 per cent and manufacturing time by 30 per cent.

Platform sharing is not new. Carmakers, led by the likes of Toyota, have long used common platforms to cut the cost of mass-producing advanced vehicles.

But in the past, these platforms rigidly prescribed the dimensions of basic structural elements such as the floorpan and suspension. In contrast, modular construction allows far greater variation, say its proponents.

Modularisation requires that only a few elements and proportions remain constant. For VW, these include the distance between the accelerator pedal and front axle and the engine mounting position.

"As we're using modularity across multiple brands we had to come up with something that gives us maximum freedom to really design in an individual way," Achim Badstübner,

head of exterior design at Audi, says.

VW is simultaneously conducting an overhaul of its production facilities so that it will be possible to produce different MQB models, with different wheelbase dimensions, on the same assembly line.

Hubert Walth, head of production and logistics for VW passenger cars, described this standardisation of production tools and systems as a "revolution" in an interview this year with *Automobilwoche*, the German magazine.

Carmakers are attracted to modular construction because it reduces complexity, lets them to more easily customise vehicles for different regions and can allow for better technology and safety systems at lower cost in cheaper vehicles. The A3, for example, will have a multimedia touchpad previously found in the luxury A8 saloon.

But greater commonality is also a financial imperative for carmakers as they push ever deeper into

emerging markets and struggle to cope with the technological upheaval caused by the move to electric vehicles.

This in turn means that more vehicles are set to be built on fewer platforms even as the diversity of models produced on each platform increases.

Analysts at the Frost &

Modularisation can allow for better technology and safety systems at lower cost in cheaper vehicles

Sullivan consultancy last year estimated that by 2020 the 12 largest carmakers would cut the number of platforms from 223 in 2010 to 154, with the top 10 platforms accounting for more than 33m vehicles, or almost double 2010's figure.

General Motors last year said that by 2018 it planned to roughly halve the

number of vehicle platforms to 14. "More of our components will be common, and more of our vehicles will be on global architectures," Dan Akerson, GM chief executive, said.

In future, VW will rely primarily on four platforms, with most of its cars built on just two frames – the MQB for small front-wheel-drive cars and the MLB for larger cars.

Mercedes-Benz's future strategy is built around just three platforms: one for small cars, such as the new A-Class and B-Class, another for saloons and a third for sports cars.

However, as competition becomes fiercer and consumers more demanding, smaller-volume carmakers will be forced to collaborate to achieve the necessary economies of scale.

Evalueserve, a research firm, says the multi-faceted partnership agreed in 2010 between Daimler and Renault-Nissan "will serve as an example for carmakers looking to harness platform and procurement syn-

ergies without full operational integration".

For carmakers, the greatest risk is that a flaw in common architecture or processes necessitates the recall of millions of vehicles produced on a single platform, as Toyota discovered to its cost in 2009-10.

Moreover, carmakers must also ensure that vehicles remain sufficiently differentiated so that buyers do not feel short-changed if a high-end vehicle shares many components with a cheaper car.

Modularisation is also a challenge for suppliers, which must achieve sufficient scale and follow carmakers into emerging markets, or risk losing business.

Indeed, not everyone is convinced carmaking is on the verge of a technological and financial leap forward.

Max Warburton at Bernstein Research says modularisation is "simply a relatively new word for a very old, very obvious goal [of achieving] standardisation and commonality between different models".

Incentives to buy play a bigger role

Financing
Basic loans are no longer enough to woo customers, says **Chris Bryant**

In a business characterised by feverish excitement over the looks and performance of new cars, financing options might seem a rather prosaic topic.

But in the coming years the way car purchases are financed is set to become more important in helping to drive revenue growth in the industry.

As new technologies emerge, carmakers will have to offer innovative financial products to promote customer loyalty and support the long-term residual value of their vehicles.

The switch to new forms of mobility, such as car-sharing, will also force the industry to think far beyond the provision of basic car loans and corporate leasing.

Meanwhile, the adoption of electric vehicles and the roll-out of infrastructure to keep them running will also require carmakers to introduce new financing options.

Renault, for example, broke new ground when it announced that buyers of its new range of electric vehicles will sign a separate battery hire agreement, to reduce the purchase price and stop the car depreciating rapidly in value. Daimler's Smart brand is also set to rent lithium batteries with its new electric cars.

"The most interesting time for [automotive] financial services lie ahead; this will be an exciting period for financial and mobility services," says Klaus Entenmann, head of Daimler Financial Services.

An immediate priority for carmakers is to extend the provision of traditional car finance in emerging markets, where the bulk of growth in sales is set to occur.

According to the Finance & Leasing Association, 63 per cent of new cars were bought last year in the UK using dealer finance; in the US the figure is thought to be higher still.

But 75-80 per cent of consumers in China, the world's largest car market, still pay cash when buying new vehicles. "If you look at emerging markets such as Asia – and here I don't mean just China and India – there is huge potential," Mr Entenmann says.

But even in developed markets, there is room for carmakers to deepen financial relationships with clients. Volkswagen, for example, has begun to offer all-in-one packages covering insurance and other services.

"A pure financing solution is not sufficient any more; we are really successful when we offer additional products, such as for insurance and maintenance," says Lars-Henner Santelmann, a member of the board of Volkswagen Financial Services.

After-sales activity helps carmakers to retain a close relationship with customers, enabling them to win new sales and cross-sell products. Specialised automotive services are also

unlikely to be available at a local bank, giving carmakers an advantage.

In addition to greater simplicity, customers are also demanding more flexibility. This could be as basic as having a lower rate of interest at the start of loan repayments or the ability to switch to a different car model during the finance period.

But an increasing number of young people in cities are rejecting ownership altogether in favour of car-sharing pools or short-term rental.

Carmakers have responded by establishing their own car-sharing schemes, offering pay-as-you-go services metered according to usage and inclusive of petrol, tax, insurance and sometimes even parking charges. It remains to be seen, though, how great the take-up of such services will be.

In the meantime, car manufacturers are trying to lure new customers with private leasing packages that offer the comforts of ownership without the financial risk.

The new Mercedes B-Class, for example, is available, fully insured, for a flat monthly fee, with maintenance available as an optional add-on.

"By offering attractive, flexible products, we can win new and younger customers from new demo-

'The next development is to offer these products and services in the used segment'

graphic groups," Mr Entenmann says.

In the commercial leasing sector, carmakers are also offering products that mitigate various financial risks, such as when a company pays for cars that is later unable to use. For example, VW offers rental contracts of one to 12 months to businesses that have employees on short-term or trial-period contracts.

If these cars are later returned carmakers know they must have other sales outlets for them. Dealerships are therefore increasingly interested in second-hand sales and services.

"The next development is to offer these products and services for new cars in the used segment. If successful, this will be hugely important for [supporting] residual values," Mr Santelmann says. "The residual value risk lies in a carmaker getting the vehicle back during times of economic volatility. But if the car is continually reused, this risk can be overcome."

The rise of the "connected car" – incorporating multimedia, communication and web-enabled services – also offers great potential for innovation in financial services, particularly in fleet management.

A business that is able to monitor how safely employees drive could receive cheaper insurance premiums, for example. And technology that measures fuel efficient driving can help businesses cut fuel bills.

Cutting-edge materials inspire creativity

Vehicle design

Carmakers enjoy greater freedom and can adapt quickly to the whims of fashion, says **John Reed**

On holiday in the Caribbean a few years ago, Frank Stephenson, McLaren Automotive's chief designer, heard about the sailfish – described by the manager of the resort where he was staying as the fastest creature in the sea.

In Miami, on his way back home, Mr Stephenson bought a sailfish, took it to a taxidermist and then returned with it to the sports car maker's headquarters in Surrey, where McLaren's technicians painted it chrome and rocket red. Mr Stephenson's team then studied this McLarenised sailfish to see what made it so fast.

At the rear of the fish's torso, he explains, there are aerodynamic, teardrop-shaped bumps that smooth out the flow of water around the tail. Taking inspiration from the fish, McLaren applied similar "diblets" around the mirror arms of its supercar, the MP4-12C, to smooth airflow and reduce wind noise.

Mr Stephenson's flight of fancy will sound familiar to anyone who works in the industry. Designers are the resident eccentrics at car companies, the quirkily dressed, whimsical counterpoints to the stolid engineers rooted more firmly in the world of engineering tolerances, budget constraints, and safety and emissions regulations that must be built into cars.

However, McLaren's ability to take inspiration from nature – which Mr Stephenson calls

"biomimicry" – and apply it quickly also attests to the technological changes in modelling tools and materials that are giving car designers greater freedom than ever.

"It's a great time to be a designer," says Mr Stephenson, a veteran of the industry who designed the BMW X5, the new Mini and the Fiat 500. "The limit is your creativity, or how far you want to push the envelope."

One of the biggest additions to the car designer's toolbox in recent years has been computer-aided design.

While CAD is well established in the carmaking industry, design teams are learning to use it more effectively to take advantage of advancing technology and incorporate it quickly into their cars. This, in turn, is helping an industry accustomed to decade-long product cycles to adjust its vehicles to the whims of fashion at a speed more commonly associated with makers of smartphones and tablet computers.

Consumers expect a quick turnover of electronic products and no one wants to get stuck with yesterday's design, says Bill Viscic, analyst and senior editor with Edmunds.com, the US car-buying website.

An example of this, he says, is light-emitting diode (LED) lamps, which have enabled designers to make headlights smaller and to narrow the front end of cars. First seen on vehicles from premium carmakers such as Audi, LED lights have filtered down into the mass market at speed.

Designers are now deploying CAD to take advantage of new materials and manufacturing methods that allow them to give their cars features that until now would have been impossible.

Audi's A3, for example, which premieres in Geneva this week,



The McLaren MP4-12C's designer took inspiration from the aquatic world to smooth airflow over the car

has unusually sharp crease lines – bold enough to cast a sharp shadow on the side of the car.

Karim Habib, head of exterior design at BMW, says: "We are learning to use a very intelligent mixture of materials." In the past,

Consumers expect a quick turnover of products and no one wants to get stuck with yesterday's design

carmakers could not put steel and aluminium together – they would corrode – but the Munich carmaker's 7 Series now has an aluminium bonnet and doors and a steel side frame, he says.

Mr Habib's team is adjusting its

methods to make use of carbon fibre-reinforced plastic, which BMW will be using in its forthcoming BMW i hybrid and electric cars. Because the mix of materials expand and contract at different temperatures, leaving a gap, BMW is designing the exterior of the cars so that the surfaces overlap.

As well as using cutting-edge materials such as carbon fibre, the industry's engineers are learning to do new things with old ones.

The use of high-strength steel, explains Mr Viscic, means that A-pillars (the vertical pillars in front of the front doors), which need to be rigid for rollover protection, can also be sleeker and offer improved sightlines through the windscreen and side windows.

Improvements in the design of impact and crash absorption

points mean that carmakers can use more glass and less steel in cars' roofs.

Veteran designer Mr Stephenson recalls pushing the limits when he helped to reinvent the Mini for BMW. The car featured glass that wrapped around it ("like modern architecture", he says) and tail-lights inserted into holes punched in the rear bumper – both features then considered to be cutting-edge.

He talks about more fanciful concepts under development at McLaren: capturing the sun's energy to introduce "photoluminescent" features on the interiors of the company's cars.

Cars in the future, he says, might have surfaces that resemble skin and are capable of repairing themselves.

"It's all out there," he says. "It's up to us to figure it out."

Electric challenges spark cross-industry connections

Collaboration

Rapidly changing technology requires new alliances, finds **Chris Bryant**

One of the most idiosyncratic vehicles at the Frankfurt motor show last September was also one of the smallest.

Daimler, the German carmaker, and BASF, the world's largest chemical company, unveiled a two-seat concept car to showcase new lightweight and energy-efficient technologies.

The Smart Forvision's transparent rooftop solar cells and all-plastic wheels

embodied the collaborative potential of partnerships outside the traditional bounds of the car industry.

The rise of electric vehicles, the incorporation of more electronics and software into the "connected car" and the greater use of lightweight materials are forcing carmakers to seek out new partnerships and expertise.

Electronics companies, software programmers, chemical producers and utilities are pushing for a slice of car industry revenues, forcing carmakers to decide which technologies can be outsourced and where their core competencies lie.

A more advanced partnership in the material sector is the joint venture between

BMW and Germany's SGL Carbon, which manufactures carbon-fibre material for the i3 and i8, the carmaker's forthcoming electric vehicles.

BMW has long had considerable expertise in using small amounts of carbon fibre in its high-performance M-range but lacked the capability to manufacture efficiently the costly material in large volumes.

"We have a manufacturer that can supply us with huge volumes of carbon fibre in the joint venture... [and] was able to design a fibre that perfectly meets the needs of BMW," says Ulrich Kranz, head of BMW's Project i.

New alliances are evolving most rapidly in the development of batteries,

where the technological challenges are greatest; battery performance will be critical to consumer acceptance of electric vehicles.

An understanding of battery technology is particularly important for carmakers as it plays an integral role in vehicle power – traditionally the bread-and-butter of car making.

Analysts at Lux Research told clients in a recent note that strong partnerships were "critical for success" in advancing electric vehicles.

But carmakers may be forced to collaborate with battery suppliers, rather than wielding control over them.

General Motors is among several big carmakers working with LG Chem, the

South Korean conglomerate. LG supplies lithium-ion battery cells for the Chevrolet Volt plug-in electric car and last year the two companies took their partnership a step further by

Carmakers may need to collaborate with battery suppliers, rather than wielding control over them

announcing a joint venture to develop electric vehicles.

Similarly, Daimler has partnered with BYD, a Chinese maker of lithium-ion batteries and cars, to develop an electric vehicle;

it plans to unveil a design concept at this year's Beijing motor show.

The Stuttgart-based carmaker has also linked up with RWE, the German utility, to roll out electric vehicles in Berlin.

The two companies have formed a joint venture with Siemens, BMW, Bosch and utility EnBW to develop an open platform to simplify data exchange in electric vehicle-charging infrastructure.

Electronics, telecommunications and software companies are also redefining the traditional relationship of carmaker and supplier as they push into the connected vehicle field.

Meanwhile, carmakers are ramping up their presence at consumer electron-

ics and mobile technology trade shows to underscore their capabilities in this area.

Accenture, the consultancy, estimates the connected vehicle market will exceed \$70bn by 2015.

"Of course, there is a lot of interest in different parts of the value chain to get a slice of this business," says Marcello Tamietti, a car and industrial equipment expert at Accenture.

"The technology is evolving so rapidly that carmakers can't keep up. They are very good at producing cars, power trains, engines and security, but digital technology is not one of their core competencies, and they are looking to alliances to fill the gap."

Volkswagen's upmarket

Audi brand has formed a partnership with Nvidia, the chipmaker, to power its vehicle infotainment systems and digital instrument clusters, while rival Ford has a long-standing partnership with Microsoft.

General Motors and BMW are among carmaking members of the Genevi Alliance, which is developing a common open-source platform to improve access to the web and infotainment products in cars. Intel, the chipmaker, is also a member.

"The tech component in the car is increasing year on year," says Mr Tamietti. "Today, about 20 per cent of the value of a car is based on electronics, software and silicon. If you look at the high-end segment it's even more."



SHIFT_

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We'd like to congratulate our cousins, Renault, for having won Van of the Year 2012 with their innovative, electric, Kangoo Z.E. This, on the back of our very own Nissan Leaf winning Car of the Year 2011 places the Renault Nissan Alliance firmly in the driving seat worldwide when it comes to electric vehicles. Which gives Renault plenty of opportunity to return the plug.

