

Toyota's overstretched supply chain

The machine that ran too hot

The woes of the world's biggest carmaker are a warning for rivals

AS EXECUTIVES from Toyota, including the firm's boss, Akio Toyoda, squirmed before their tormentors in America's Congress this week, there was little public gloating from rival carmakers. Although it is Toyota that is currently in the dock after a crushing series of safety-related recalls across the world, competitors are only too aware that it could be their turn next. After all, there is not a single big carmaker that has not modelled its manufacturing and supply-chain management on Toyota's "lean production" system.

That said, there is a widespread belief within the automotive industry that Toyota is the author of most of its own misfortunes. In his testimony to the House oversight committee on February 24th, Mr Toyoda acknowledged that in its pursuit of growth his firm stretched its lean philosophy close to breaking point and in so doing became "confused" about some of the principles that first made it great: its focus on putting customer satisfaction above all else, and its ability "to stop, think and make improvements".

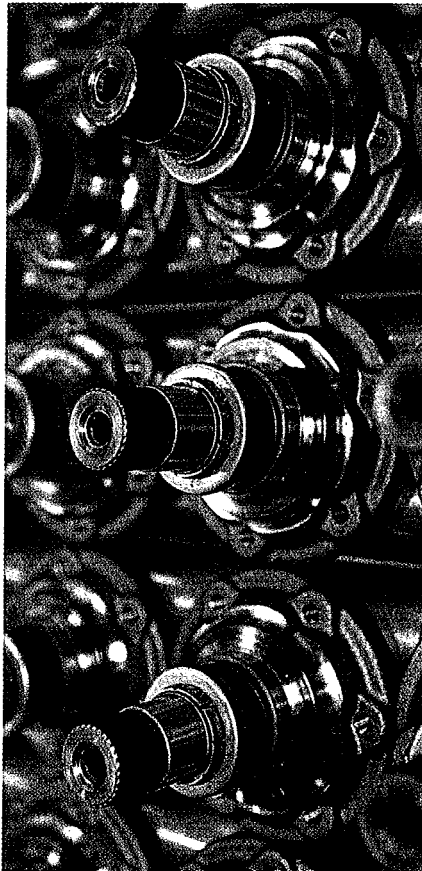
James Womack, one of the authors of "The Machine that Changed the World", a book about Toyota's innovations in manufacturing, dates the origin of its present woes to 2002, when it set itself the goal of raising its global market share from 11% to 15%. The target was "totally irrelevant to any customer" and was "just driven by ego", he says. The rapid expansion, he believes, "meant working with a lot of unfamiliar suppliers who didn't have a deep understanding of Toyota culture."

By the middle of the decade recalls of Toyota vehicles were increasing at a sufficiently alarming rate for Mr Toyoda's predecessor, Katsuaki Watanabe, to demand a renewed emphasis on quality control. But nothing was allowed to get in the way of another (albeit undeclared) goal: overtaking General Motors to become the world's biggest carmaker. Even as Toyota swept past GM in 2008, the quality problems and recalls were mounting.

The majority of those problems almost certainly originated not in Toyota's own factories, but in those of its suppliers. The automotive industry operates as a complex web. The carmakers (known as original equipment manufacturers, or OEMs) sit at its centre. Next come the tier-one suppliers, such as Bosch, Delphi, Denso, Continental, Valeo and Tenneco, who deliver big integrated systems directly to the OEMs.

Fanning out from them are the tier-two suppliers who provide individual parts or assembled components either directly to the OEM or to tier-one suppliers. (CTS Corp, the maker of the throttle-pedal assemblies that Toyota has identified as one of the causes of "unintended acceleration" in some of its vehicles, is a tier-two supplier whose automotive business accounts for about a third of its sales.)

On the outer ring of the web are the tier-three suppliers who often make just a single component for several tier-two suppliers. Although there are literally thousands of tier-two and tier-three suppliers around the world, their numbers have been culled over the last decade as the OEMs and the tier-one firms have worked



A vale of tiers

to consolidate their supply chains by concentrating business with a smaller number of stronger companies.

Toyota revolutionised automotive supply-chain management by anointing certain suppliers as the sole source of particular components, leading to intimate collaboration with long-term partners and a sense of mutual benefit. In contrast, Western carmakers tended either to source in-house or award short contracts to the lowest bidders. The quality Toyota and its suppliers achieved made possible the "just in time" approach to delivering components to the assembly plant. In his book,

Mr Womack quotes a Toyota supplier: "We work without a safety net, so we can't afford to fall off the high wire. We don't."

Most big car firms now operate in a similar way. Ford, for example, will often work with a tier-one supplier for up to three years before a new model comes off the production line to ensure that the design and manufacturing of important components is sound. So-called cross-functional teams from both firms strive to eliminate defects. Rather than always going for the low bid, carmakers now look at the total cost of a component, including potential interruptions to production and, further down the line, customer warranty claims if quality is not up to scratch.

By and large, the relationships between the OEMs and the tier-one suppliers run smoothly. When problems do crop up, it is usually with the tier-two and tier-three firms. A senior purchasing executive at one carmaker says that consolidation, the need to trim capacity and the shock to demand that began in mid-2008 have put the weaker parts of the supply chain under great strain: "Some of these are quite fragile businesses. There's a need for visibility, but we don't always have it. If something goes wrong, we need transparency and speed of communication to make sure it doesn't get to the customer."

A consequence of Toyota's breakneck expansion was that it became increasingly dependent on suppliers outside Japan with whom it did not have decades of working experience. Nor did Toyota have enough of the senior engineers, known as *sensei*, to keep an eye on how new suppliers were shaping up. Yet Toyota not only continued to trust in its sole-sourcing approach, it went even further, gaining unprecedented economies of scale by using single suppliers for entire ranges of its cars across multiple markets.

A senior executive at a big tier-one supplier argues that although Toyota's single-supplier philosophy served it well in the past, it took it to potentially risky extremes, especially when combined with highly centralised decision-making in Japan. "There's a trade-off," he says. "If you don't want duplication of supply you have to have very close monitoring, you have to listen to your supply base and you have to have transparency. That means delegating to local managers. With Toyota, it works well at the shop-floor level, but things break down higher up."

In the aftermath of Toyota's crisis, the industry is now asking itself whether sole-sourcing has gone too far. "It may be safer not to have all your eggs in one basket, but to have maybe three suppliers for major components who can benchmark each other," says another purchasing manager. Until very recently, Toyota was the peerless exemplar. For now, at least, it is seen as an awful warning. ■