

## IDEAS AT WORK 6.1

### *Tata Nano: The INR 100,000 Peoples' Car*

When Ratan Tata unveiled the complete prototype of the Tata Nano in January 2008 at the auto show in New Delhi, it opened up a new chapter in product development. The compact car, priced at USD 2,500 (INR 100,000), is a valuable experiment from which much can be learnt about the best practices in new-product development.

The product development team at Tata Motors had to meet three requirements for the new vehicle: it should (i) be low-cost, (ii) adhere to regulatory requirements, and (iii) achieve performance targets such as fuel efficiency and acceleration capacity. Balancing design changes with their cost implications is an important challenge in any new-product development project. Every design, therefore, had to cater to these three key requirements. Clearly, while the cost was very critical, the company was unwilling to make any compromises in other areas. Fuel economy is a major driver for selling a vehicle in India. It was also important to ensure that the car could be manoeuvred in city areas.

There is considerable value in having multiple stakeholders in a product development team. Ideas for the Nano came from unexpected sources and they were given due consideration before a decision was taken. For instance, in addition to the vendors, a small group of mechanics was part of the development phase. This group suggested an additional opening on the rear floor, which would provide access to the intake manifold and the starter. While the design team was trying to avoid this for cost reasons, the mechanics insisted on this change.

The design team had to redesign several aspects before the style could be frozen. The car's body was designed twice and the engine was designed thrice.

The floor and the seats were designed 10 times. There were two simultaneous concepts for the car's dashboard, with detailed designs and cost estimates. The Nano team eventually chose the concept they thought would look more attractive to the customer.

The Nano is not over-engineered like, say, the German cars. It is an example of frugal, cost-effective and relevant engineering. Several suppliers got involved in the project at a very early stage. This was perhaps one of the ways by which costs were reduced. Electronic sourcing has been another approach to cut costs.

Rane Group, which makes a rack-and-pinion steering system, focused on reducing the weight of the materials used by replacing the steel rod of the steering with a steel tube. This acted as a major cost reducer. Further, the product, which is made of two pieces, was redesigned into one piece to save on machining and assembling costs. GKN Driveline India, a subsidiary of global auto parts leader GKN, spent a year developing 32 experimental variants for the rear-wheel drive system and finally designed a smaller diameter of shaft, which made it lighter and saved on material costs. All the suppliers have similar stories and most of them were able to meet the target costs.

A good product development exercise has several features: unambiguous objectives for the project, the involvement of multiple stakeholders, the role of suppliers in cutting time, and cost and value engineering. We see several examples of these in the Nano project.

**Sources:** Based on material available at [http://tatanano.inservices.tatamotors.com/tatamotors/index.php?option=com\\_content&task=view&id=263&Itemid=207](http://tatanano.inservices.tatamotors.com/tatamotors/index.php?option=com_content&task=view&id=263&Itemid=207); and [http://tatanano.inservices.tatamotors.com/tatamotors/index.php?option=com\\_content&task=view&id=215&Itemid=207](http://tatanano.inservices.tatamotors.com/tatamotors/index.php?option=com_content&task=view&id=215&Itemid=207), accessed on 23 September 2008.

## 6.1 INDIA'S ROLE IN RESEARCH AND DEVELOPMENT

India is fast emerging as the global research and development (R&D) hub of the world. In 2006 alone, for example, 100 of the world's top R&D companies employed more than 15,000 scientists in India. Many multinational corporations are setting up their R&D labs in India. For instance, Sony Ericsson has established an R&D unit for mobile phones in Chennai. Dell has established its biggest research and development centre outside the United States in Bangalore. British aerospace major Rolls-Royce has tied up with the Indian Institute of Science (IISc), Bangalore, and Imperial College, London to work together on a new research project to develop alloys for use in "greener" aircraft engines.

The DaimlerChrysler Research Centre in Bangalore is involved with fundamental and applied research in avionics, simulation, and software development. Boeing is working with HCL Technologies to co-develop software for everything from navigation systems and landing gear to the cockpit controls for its upcoming 7E7 Dreamliner jet. Microsoft has built its largest development centre outside the United States in India. The University of