Strategic Cost Management Through Target Costing
A Case Study of Tata Nano

Strategic cost management is an integral part of profit planning and total management of enterprises. A cost management system is a management control and planning system with the primary objective of producing quality goods and services at the lowest possible cost. The introduction of the Tata’s small car Nano is a landmark in India and the world’s automobile history. The secret behind designing the Tata Nano is a concept called Target Pricing or Target Costing. This article highlights the concept of target costing and the various aspects of Tata Nano.

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In the present industrial scenario, increasing competition reduces the profit margin and business enterprises pay more attention to cost control and reduction as a way of sustaining or improving profitability. Cost control and cost reduction are not special exercises carried out each time the management notices that the profit margin has fallen. The goal of any cost system is to provide relevant and timely information to management. This information supports better management of corporate resources in production or provisions of services and improves competitiveness in terms of costs, quality and profitability.1

Strategic cost management is an integral part of profit planning and total management of enterprises. A cost management system is a management, control and planning system with the primary objective of producing quality goods and services at the lowest possible cost. The two major dimensions of cost management are: first, focus on value-added activities and elimination of non-value added activities; and, second, reduce consumption of cost drivers in value-added activities. Some of the important tools and techniques of cost management are activity-based costing, total quality management, benchmarking, life cycle costing, target costing, back flash costing, re-engineering, etc. Strategic cost management through target costing, focusing on direct materials, parts and overhead management through Activity-Based Costing (ABC) is

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The focus of Japanese management accounting in the recent years. It has helped many Japanese companies to reduce costs up to 30%.

**Concept of Target Costing**

Target costing is a program-management methodology that focuses on design and engineering efforts to deliver capital projects to meet a specific budget. Target costing is defined as a cost management tool for reducing the overall cost of a product over its product life cycle. Management utilizes this pricing technique to meet both the demands of its customers as well as company profit goals. Target costing is particularly popular among Japanese firms such as Toyota, Nissan, Toshiba and Daihatsu Motor in various industries such as automobile, manufacturing, electronics, machine tooling and precision machine manufacturing. As Japanese tastes became more diverse, assembly-oriented production grew in popularity. This growing demand for a diverse range of products shortened product life cycles. With shorter product life cycles, more focus is on the costs occurring at each phase (development, planning and design.) The allowable cost (maximum permissible manufacturing cost) is calculated by subtracting the targeted profit from the planned sales price. It is the estimated cost, based on market conditions.

The next step is to find out if the product can be manufactured at the most reasonable costs. It involves reducing the drifting cost (estimated cost with no target in mind) until it equals the allowable cost. The index used to set the target profit is usually the Return on Sales (ROS) and not Return on Investment (ROI), because of the ease of calculating ROS for each product and its strategic superiority over ROI. There are three methods for determining costs:

1. Profit Planning Method (Top-down)—It determines target cost by subtracting the target profit from the projected sales price. It is the estimated total cost for insuring target profit after considering the sales price of competitors.
2. Engineering Method (Bottom-up)—It determines target cost by considering the present level of technology, production facilities, delivery time and production volume of the company.
3. Combination Method—Target cost is determined by integrating the other two methods. About 57% of Japanese companies follow this method.

However, in the case of Tata Nano, Tata motors used the first method (Top-down) for profit planning because, first it decided the sale price of the car as Rs. 1 lakh and basing on that it planned for profit and cost structure of the product. Target costing represents a fundamentally different approach. It is based on three principles: (1.) Orienting products to customer affordability or market-driven pricing (2.) Treating product cost as an independent variable during the definition of a product's requirements, and (3.) Proactively working to achieve target cost during product and process development.

**Genesis of Target Costing**

Nowadays, product life cycles are getting shorter and shorter, quite often one or two years, sometimes even less than one year in high-tech industries. Consumers are
demanding new and diversified products at short intervals. Due to factory automation, robots and computer-controlled manufacturing systems are replacing the conventional production lines. What all these changes mean is that the traditional standard costing systems, which emphasize cost control in the manufacturing phase of the product life cycle, are no longer effective. With a one-year product life, controlling costs in the manufacturing phase is not possible. Once the product is developed and designed, there is a limit to how much cost-cutting companies can do at the manufacturing stage. Companies need to be equipped with accurate cost modeling techniques in order to manage their costs and ensure an acceptable profit margin. As competition increases, new product innovations must outpace product obsolescence. Most of a product’s costs are determined during the product design stage. Managing the cost of a product already in production can be achieved only by minimizing unfavorable cost variances from the product’s standard cost and by applying process improvements. After a new product is launched, the potential to reduce costs from the product’s perspective rapidly falls, costs must be managed early on in a product’s life. Target costing and ABC data can be used to achieve this. A new cost management concept has been developed and practised by world-class Japanese manufacturers to deal with the needs in the product development and design phase. As companies begin to realize that the majority of a product’s costs are fixed based on decisions made during the development of a product, the focus shifts to actions that can be taken during the product development phase.

**International experiences:** Japan, a tiny Pacific Ocean island, is the world’s second strongest economy after the US and target-costing practices originated in this country. The concept started emerging in Europe and the US only in the late 1980s. Toyota, for instance, was using target-cost management as early as 1963. An even earlier user, however, dating back to 1947, was General Electric. GE’s Lawrence Miles is commonly credited with inventing target cost management—though it was a streamlined version of today’s highly-evolved form.

**Dutch application:** According to research, about 59.375% of 32 sampled Dutch listed manufacturing firms use target costing or a related cost management method. These systems are called a variety of names and are used across industries, particularly assembly. They were adopted during times of higher competition and increased contingency.

**British application:** In the UK, there is the talk of Japanization of British industry, which has become a subject of interest in the UK, not only to management practitioners but

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**Box: Main Features of Target Costing**

- A market-driven technique, while standard costing is driven mainly by production and technology;
- Applied at the planning and design stages;
- A tool for cost reduction, not cost control;
- A strategic profit planning tool and not only cost management but issued as a bottom-up tool to attain the target profit set by the top management;
- An engineering-oriented technique of financial accounting measurements are not emphasized and it harmonizes with other Japanese management engineering techniques such as Value-Engineering (VE);
- Used for high variety/low volume products not mass production. Also, the current version works better in assembly-oriented industries rather than process industries;
- Requires better cooperation among the various departments.
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also to academics in various fields since the 1980s. Other adopters are German, Swedish and US firms. In Germany, firms like Mercedes Benz, Daimler Chrysler and Caterpillar, etc., have also been identified as adopters of target costing.

Objectives and Scope

In India, more than one billion people are residing, but only a section of the society—the so-called upper class and upper middle class, is having a four-wheelers. But, middle class people cannot afford a car. Even families with four or five members are trying to manage with two-wheelers despite risks related to road safety and weather conditions. However, the revolutionary Tata Nano is set to provide a great relief to these people. The launch of the Nano has been correctly timed with the economical growth. Right now, our economy is growing at 9% and overall Gross Domestic Product (GDP) is a trillion dollars. When calculating the per capita income of Indians the average income is $500 (approximately Rs. 18,000), which indicates that even a common man can afford the competitive price of Rs. 1 lakh of a Nano. This article is an effort to study the target cost management of Tata Nano and how they are managing the competitive cost, innovative ideas and cost reduction techniques.

Data Collection and Methodology

The main data collection relating to target costing management and Tata Nano is from secondary data sources. The data was collected through newspapers, annual reports, professional journals and Internet. Some of the information was also collected through a personal interview with Ratan Tata, that was available in the website of the company.

Target Cost Management and Tata Nano

Tata Motors is one of the largest automobile companies among the top players in India. During the financial year 2006-07 its revenue was $7.2 bn. More then four million Tata vehicles are running across India. Tata motors is the leader in the filed of commercial vehicles and the second largest in manufacturer of passenger vehicles in India and it is the world’s fifth largest medium and heavy truck manufacturer. Tata vehicles are being marketed in numerous countries in Europe, Africa, West Asia, South Asia, South East Asia and South America. Tata motors, has formed a joint venture with Fiat Automobiles to manufacture passenger cars, engines and transmissions in India for the domestic and global markets. Tata Motors’ international also has joint ventures with Daewoo Commercial Vehicle Co. Ltd., in South Korea; Hispano Carrocera, a bus and coach manufacturer, in Spain, Marcopolo, a body-builder of buses and coaches in Brazil and Thonburi Automotive Assembly Plant Company of Thailand. It has research centers in India, as well as in the UK and in its subsidiary and associate companies in South Korea and Spain.

The Peoples’ Car ‘Tata Nano’

The introduction of the Tata small car Nano is a landmark in India and the world automobile history. This is an indigenous automobile product from India. Despite the small size, it is a modern car capable of meeting Bharat III and Euro IV emission norms and safety standards. The Nano promises to be a potentially revolutionary innovation, delivering a car to huge segments of the market until now unable to afford one. Through skillful engineering, the Tatas have proved their capability to launch the world’s smallest car with their own target price.

It can be said that target costing and Tata Nano are synonyms. Tata Nano is one of the major projects launched by the Tata motors on January 10, 2008; it was initially

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started in 2003. It is one of the latest examples of the target cost management by an Indian automobile industry—how it fixed the target price according to market condition and, based on that, controlled the costs during designing and production stages of the product. The target price of Tata Nano was decided four years back as Rs. 1 lakh and the company maintained it in spite of increases in the prices of inputs. Priced at $2,500 or 1 lakh at the dealer level, the car is the cheapest four-wheeler in the world. The next cheaper car will be the Chinese QQ3, which costs $5,000. If we consider the Consumer Price Index for inflation, the cost of Tata Nano is less than half the price of Maruti 800 in 1983 which was available for Rs. 48,000. A quick, back-of-the-envelope indexation for inflation shows that if the Maruti 800 had been launched today, it would have been priced at Rs. 2,67,000. According to Ratan Tata, “My aim was that I would produce a certain number of cars and then I would create a very low cost, low break-even plant that a young entrepreneur could buy and that young entrepreneur could establish assembly operations”. 

Tata Nano’s Historical Perspectives
Tata Nano was one of the major dreams of Ratan Tata after the successful manufacture/launch of small truck ACE and Tata Indica. However, the real dream started on a rainy night of August 2003 in Mumbai, when Ratan Tata was driving back home form his office Bombay House in Flora Fountain and saw a young couple traveling along with their two children on a two-wheeler. He was shocked at the massive risks they were taking of traveling on a wet road. He started thinking about a safe four-wheeler for the common people. A week later, he went to his Tata Motors plant in Pune and he shared his thought with Managing Director Ravikant: his first query was whether they could convert a two-wheeler into a small car. It was the beginning of Tata Nano; after that, 500 engineers worked hard for the next four years and completed the dream of Ratan Tata—a car for the common people. Ratan Tata says, “Today, we have a people’s car, with an affordable cost and all the safety requirements and emission norms, to be fuel-efficient and low on emission. We are happy to present the people’s car to Indian people and we hope it brings joy, pride and utility of owning a car to many families who need personal mobility.”

The Team
At the south-west corner of the 160-acre facility, a home to the Engineering Research Center (ERC), a young chief engineer and his team of 500 peculiar engineers have struggled over the last four years, putting in 12-14 hours a day, six days a week to develop the dream car of Tata Nano. Girish A Wagh, who is 37 years old, was thinking of manufacturing a same type of car even five years back and already had some designs for the small car. He was also very closely involved with the design of the Ace, a four-wheeler from the Tata stables that serves as a load-carrier. E Balasubramoniam, the Head of Sourcing for the project, is a graduate from IIT Chennai. He was earlier with Maruti Udyog (now Maruti Suzuki). Nikhil Jadhav, 29, is the youngest member of the team. India Today: “Ratan's Revolution”, Vol. XXXIII, No. 3 January 15-21, P. 32.
team. He is an alumnus of IIT Mumbai and designer on the small car project. Abhay M Deshpande is Tata Motors’ Assistant General Manager, Vehicle Integration at the ERC. Deshpande, is in charge of vehicle integration, vehicle performance and chassis design. Rakesh Mittal is in charge of vendor development. He was earlier with Yamaha Motors.

Cost Reduction Strategy
After the analysis of data collected form various sources, the following cost reduction strategy was adopted by the Tata Motors.

Innovation and Redesigning
Innovation and redesigning are the key features of the Nano car and even Ratan Tata knows the importance of these; in fact, he suggested that the Nano should have only one windscreen wiper instead of the usual two. The design was outsourced from Italy’s Institute of Development in Automotive Engineering, which also designed the Indica a decade ago, but Tata himself ordered changes along the way. Tata, with his eye for detail and aesthetic sense, has made Nano look revolutionary. Tata wanted to deploy an indigenous engine, but dropped the idea as it did not meet the core team benchmark. The entire body was designed twice, while the engine was designed thrice. Every design was based on three key requirements—cost, regulatory requirements and acceptable performance standards.

Packaging Design
The basic architecture is the placement of engine below the rear seat—delivering cost and operational efficiency. Due to the rear engine, they saved space and they designed a new type of seat, cutting costs everywhere. The engine is driving wheels directly and they are saving engineering for the drive, resulting in saving in space of bonnet and also cutting down the cost. They put instrument cluster in the middle, not in front of the driver. This means the dashboard will look like the one in a left hand-driven vehicle. The car’s dashboard had two concepts running simultaneously. Both had detailed designs with respective cost estimates. There are many such innovations that are low-cost and future-oriented, yet they meet safety standards.

Outsourcing of Components
During the manufacture of Tata Nano, Tata Motors outsourced many components from various suppliers like Bosch for powering the car, Lumax for lights, Sona for steering, the engine, alternators, management systems and brakes come from Bosch, transmission comes from Birla’s Avtec Ltd., steel from its own Tata Steel, castings from Tata Metallics and batteries from Exide. All these components are different from those in other small cars and the companies are spending more time on R&D to cut the costs. Each and every component in the Nano was designed basing on the functionality, cost and performance requirement. All these components are supplied at very competitive price, which directly supports the target cost of the car.

Adoption of Target Costing
The secret behind designing the Tata Nano is a concept called target pricing or target costing. Once the features and functions are finalized, target costs are assigned to each and every component/system—transmission system, instruments, engine, body,
interiors, electrical systems. The sub-teams design the components/systems within the target cost. They are looking for every bolt and nut to minimize the cost of components/system. For example, the Nano has a variable transmission instead of the standard gears. It has instrument clusters which do not have anti-glare coating and does not use screws for fixing. Tata motors used first method profit planning (Top-down) because first it decided the expected selling price of the car at Rs. 1 lakh and based on that it approached profit and cost structure of the product.

Kaizen Costing
During designing and manufacturing Tata Nano, workers have been trained in Japanese manufacturing technique that calls for continuous improvement or Kaizen costing. A worker engaged in building Safaris observed that each day on an average, one front grille was broken when a worker leaned over to work on the engine and unintentionally scratched the grille with his belt buckle. Cost: about Rs. 2,500 a day and Rs. 9,12,500 a year. Tata designed a simple protective cover for the grilles, plus a slip-on fabric cover for belts and watches that is now used to cut down on expensive waste at each of Tata Motors’ factories.

Benchmarking with Maruti 800
Benchmarking involves the process of comparing the strategies of the world’s best establishments and analyzing and learning form their strategic approaches. Tata treated Maruti 800 car as a benchmark. In terms of acceleration and driveability, the wanted the Nano should at least be equal to the Maruti and in some areas it should exceed the Maruti. For that purpose, they used world class benchmarking to improve the quality with cost reduction at global level.

Experience from Tata Ace and Indica
During the designing and production of Nano, they were benefited from the experience of Indica and the Ace. Especially, the Ace, because it was another tight, cost-based exercise. Ace’s success convinced Tata Motors that a small car built frugally but practically, would sell. Nano was a concept that was in Tata’s mind even as Ace was being developed. In many ways, Ace is a pioneer to Nano and its success convinced him of its salability—an important facet for a listed entity with shareholders riding on it.

Supply Chain Management
Supply chain management refers to the management of upstream and downstream relationship with supplier and customers to deliver superior customer value at less cost to the supply chain as a whole. It includes procurement of inputs, manufacturing, assembling, transportation to warehouse, transportation from warehouse to retail outlet and finally transportation from retail outlets to the customers. On a strategic level, Supply Chain Network Design—locating plants, contract manufacturers, distribution centers and warehouses—is important because 70% of the cost of a supply chain is fixed at the design stage. Designing of Tata Nano is also based on the efficient supply chain management.

Great Combination and Cooperation
Tata Motors management had taken a great support and cooperation from all the angles. During the designing phase, it invited a small group of mechanics for future servicing
and repairing of the car. In addition, suggestions were closely watched by the experts tasked with cost control. They arranged early vendor integration program for various inputs and their redesigning and cut down the cost during the production period, which helped to maintain the target cost.

**Continuous Research and Development**

Tata Nano is a result of continuous research and development, related to designing or cost reducing strategy. An example of research is that they cut down the cost related to wheel—in a normal wheel, the mounting has four pins while Nano has only three. They have also reduced the thickness of the bumpers. Similarly, they are using e-sourcing to cut down the cost.

**Unique Features of ‘The People Car’**

The following are the unique features of designing and manufacturing of Nano car.

**Size and Design**

Nano is 3.1 meters long, 1.5 meters wide and 1.6 meters high. It is 8% smaller than Maruti 800, but it is 21% more spacious inside. The four doors can be opened and five people can be accommodated comfortably. The lean-design helped to minimize the weight and maximize fuel efficiency. In this model less use of steel, less components as compare to other cars and small engine with 100 different technological advancement are the unique feature of the car Nano. This is the latest example of target design and cost controlling.

**Environment and Pollution Standard**

It has a lower pollution level than a two-wheeler. According to Ratan Tata, the Nano has met all current legislative emission norms and can be upgraded to meet Euro IV norms. The People’s Car’s tailpipe emission performance exceeds regulatory requirements. The high fuel efficiency also ensures that the car has low carbon dioxide emissions, thereby providing the twin benefits of an affordable transportation solution with a low carbon footprint.

**World’s Cheapest and Smallest Car**

Nano is the world’s cheapest car mounted with an all-aluminum two-cylinder 623 cc, 33 bhp petrol engine, with a mileage of 20 km a liter. Earlier, Maruti 800 was the smallest car for the Indian middle-class family.

**Nano and Technical Revolution**

The Nano, the name itself is an indication of new high technology with small size. It is directly related to Nano technology of Bio-science.

**Different Marketing Segment**

Nano car is like Nirma of Indian market with the aim to reach common people. Even insurance coverage is available at a small price of Rs. 2,000 per annum. It is also creating new opportunities for financing agencies—they are planning different finance schemes for this product as per the requirements of the different sections of the society.
Domestic and International Challenges
Tata Nano creates new challenges for domestic as well foreign markets. In India, it creates huge opportunities for four-wheeler and two-wheeler market, because it is going to attract probable two-wheeler customers with its attractive features. It may also create a big competition for four-wheels, because none of the Indian companies as well as foreign companies, offers a car for such a competitive price within the reach of middle class family.

Creation of New Patents
Tata Nano’s unique design acquires new patents for the company. Tata Motors plans to acquire 34 patents for different features such as two-cylinder gasoline with single balancer shaft, etc.

Issues and Challenges
The following issues and challenges arise for the Tata Nano in the Indian environment.

Maintaining of Target Price
Tata Nano is one of the world’s cheapest and smallest cars after Chinese QQ3. Maintaining target-price proved to be a big challenge for Tata Motors.

Mounting of Input Costs
Input costs were one of the great challenges for the Tata motors. During the designing and production process of Nano, input costs increased frequently. However, the company designed various components especially for Tata Nano to maintain the target price. However, one wonders how this can be done in the future when input costs are bound to increase further.

Environmental Issues
Many environmentalists have opposed the manufacture of Tata Nano, because they believe that mass production of small cars (about 2.5 lakh cars every year) will create heavy pollution—automobile pollution is already a big problem for a country like India. Secondly, they think that our infrastructure (roads, etc.), is not in a position to absorb the large number of small cars, which are bound to create traffic problems in urban areas.

Figure: Issues and Challenges for Tata Nano
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Safety Issues
Many people believe that this small car is not up to the safety standards due to lightweight and use of aluminum and plastic frames. The sound reason is that the car has a rear engine and car driver is in the front due to which there may be a danger of heavy injuries to the driver and passengers. Normal cars have engines in the front and this provides an additional safety to the driver in case of accidents.

Servicing and Repairing Facilities
The design of this car is entirely different from that of other cars. This causes a doubt that the existing car mechanics are in a position to repair it. Creation of a good network of repairing centers is another challenge for the company.

Durability and Operational Efficiency
Durability of car is another issue in the Indian environment. The performance of Tata Nano more or less depends upon the condition of roads and traffic system. In urban areas, traffic is a big problem and it affects the operational efficiency of the car; similarly, in rural areas, the roads are not in a good position, which is one of the big challenges for the operational success of the small cars.

Global Competition
After the launch of Tata Nano, many other national and international automobile companies are also planning to promote a small car, which will a big challenge for the Tata Motors in the near future.

Tata Nano and Suggestion for Indian Companies
The Tata Motors convey the significant message to the Indian companies in the area of cost reduction and cost management. The first step is to adopt Kaizen costing for enhancing manufacturing innovation, then second step is to use target costing for research and development innovation. And finally for overall cost management adopt Green Kaizen during the production process. It also suggests target costing and Kaizen costing for sustainability and innovation. These two pillars can drive the bottom line of the Indian industry in the short run and long run. Along with the improvement of quality of product, they have to use target costing and Kaizen costing as a cost management process. Drivers such as automations, efficiency, adequate research, etc., will help the industry move up the value chain, which help in the sustenance within the industry. Similarly, elimination of all form of wastage and development of high level of efficiency in the manufacturing process will help Indian industries to remain competitive in the global market.

Conclusion
Finally, the outcome of the Tata Nano is a great opportunity for Indians, especially for Indian automobile industry. Because some of the competitors are doubting the survival of the project. According to competitors, it is impossible to complete a car with a price of Rs. 1 lakh. By the end of this year, Tata Motors is planning to launch its own financing scheme for the Tata Nano and it is planning for new distribution system for the rural and semi rural market. It is one of the benchmarks for the Indian and world automobile industry for the future research and development. Possibly, it will create new job opportunities in the area of marketing, financing schemes and automobile innovations and a new market segment in India as well as abroad.