Chapter 1

Introduction

1.1. Introduction:

Before going into definitions, it is important to know that target costing is not a costing system like full costing, direct costing or activity-based costing. Target costing is in fact a mistranslation of what is called “Genka Kikaku” in Japanese. Brausch (1994, 49) clarifies that the target costing system has not an impact on how costs of products are calculated, but rather affects the way in which costing information, already available, is used. In the early publications, other names were used for target costing systems such as “cost planning” and “cost projection systems”. In literature different definitions are given to target costing.

Generally speaking there are two issues in target costing. The first involves the determination of the target cost and the second focuses on achieving the target cost. Depending on the issues stressed, some authors use a narrow definition limiting target costing to one of the two processes - determination or achievement -, while others prefer to use a broad definition, referring to target costing as both the determination and the achievement of the target cost. Though, several other researchers focus on the purpose of target costing, i.e. to reduce the downstream costs of a future product. Cooper, stressing the process of determining the level of the target cost provides a first narrow definition. Cooper (1995 :10) describes target costing as the structured approach to determine the cost at which a proposed product with specified functionality and quality must be produced in order to generate the desired level of profitability at its anticipated sales price. A second class of narrow Tanaka (1993 : 22) mentions a first practice of target costing by Toyota around 1965 and Kato (1993 :70) refers to a thirty year history in the Japanese industry.
The definitions provided by Tanaka (1993:4) and Tani et al. (1994, 67), stressing the process of the attainment of the target cost. For them, target costing is concerned with simultaneously achieving a target cost along with planning, development and detailed design of new products. Third, Makido (1989:12) and Yoshikawa et al. (1993:25) assign a broader meaning to target costing by including processes, the determination and the achievement of the target cost. For instance, Yoshikawa et al. (1993:26) define target costing as the process established to set and support the attainment of cost levels expressed as product costs, which will contribute effectively to the achievement of an organization’s planned financial performance.

Finally, several others, such as Ansari & Bell (1997:10), Brausch (1994:21), Fisher (1995:25), Horvath (1993:16), Kato (1993:20), Lee et al. (1994:111), Monden & Hamada (1991:17) and Sakurai (1989), focus on the purpose of target costing in their definition, i.e. to perform cost reductions while designing and developing a future product in order to realize cost management of future products. For instance, Kato (1993:12) defines target costing as part of a comprehensive strategic profit management system that focuses on reducing the life-cycle costs of new products while also improving their quality and reliability. Hence, target costing should be distinguished from kaizen costing, another management accounting process, frequently described as complementary to target costing in Japanese companies. As mentioned before cost management can be realized for future products as well as for existing products. Monden & Hamada (1991:30) explain that target costing focuses on reducing the cost of a future product through changes in its design, while kaizen costing focuses on reducing the cost of an existing product through increased efficiency in the production process. In the terminology of our first chapter target costing is thus part of the management accounting process that collects, classifies,
summarizes, analyses and reports a special kind of management accounting information (i.e. target costing information) used to realize a special form of management control (i.e. to induce downstream cost management of future products). Hence, we define target costing as the process of determining the target cost for future products early in the new product development process and of supporting the attainment of this target cost during the new product development process, by providing target costing information to motivate design engineers to realize downstream cost management of future products in order to secure product profitability of the new product when being launched.

This target costing information, provided by the target costing system, consists mainly of the target sales price, the target profit margin, the target cost for the future product as well as the target costs for different components and/or functions of the product. This target costing information is decided on by top management, based on market information, the company’s profit requirements and cost information. Remark that our definition is a broad one, including both the determination and the attainment processes.

1.2. DEFINITIONSOFTARGET COSTING:

Cooper (1995 :21) Target costing is a structured approach to determine the cost at which a proposed product with specified functionality and quality must be produced in order to generate the desired level of profitability at the product’s anticipated sales price. Tanaka (1993 :17) Effort at the planning and development stages to attain a cost target set by management is called target costing, which is carried out mainly by the design divisions.
Tani et al. (1994 :20) Target costing is concerned with simultaneously achieving a target cost along with planning, development and detailed design of new products by using methods such as value engineering.

Makido (1989 :17) Cost reduction activity at the product planning stage involves two basic processes: extracting the target cost from the profit goal and evaluating the design activity with the intention of achieving the target cost.

Yoshikawa et al. (1993 :13) Target costing may be defined as the process established to set and support the attainment of cost levels, usually, but not exclusively, expressed as product costs, which will contribute effectively to the achievement of an organization’s planned financial performanceAnsari & Bell(1997 :20).

The target costing process is a system of profit planning and cost management that is price led, customer focused, design centered, and cross-functional. Target costing initiates cost management at the earliest stages of product development and applies it throughout the product life cycle by actively involving the entire value chain.

Brausch (1994 :20) Target costing is a strategic management tool that seeks to reduce a product’s cost over its lifetime. It presumes: interaction between cost accounting and the rest of the firm, a well-executed long-range profit planning, and a commitment to continuous cost reduction.

Fisher (1995 :33) Target costing is a systematic process for reducing product costs that begins in the product planning stage.

Horvath (1993 :10) Target costing is built on a comprehensive set of cost planning, cost management and cost control instruments which are aimed primarily at the early stages of product and process design in order to influence product cost structures resulting from market-derived requirements. The target costing process requires the cost-orientated coordination of all product-related functions.
Kato (1993 :17) Target costing is part of a comprehensive strategic profit management system that focuses on reducing the life-cycle costs of new products while also improving their quality and reliability. Lee, Jacob, (1994 :21) Target costing is a market-driven system of cost reduction, focused on managing costs at the development and design stages of a product.

Sakurai (1989 :18) Target costing can be defined as a cost management tool for reducing the overall cost of a product over its entire life cycle with the help of the production, engineering, R&D, marketing and accounting departments. Sakurai (1995 :18) Target costing is an effective tool for reducing material costs such as materials and parts, but it can also be used for reducing overhead.

However, our definition as well as the mentioned definitions from literature is rather general. None of the existing articles and papers lists the necessary conditions for target costing. Though different characteristics of target costing have been mentioned, some always recurring, while others only now and then (see Brausch (1994 :19), Cooper (1995 :17), Fisher (1995 :30), Kato (1993 :18), Kato, Böer& Chow (1995 :22).

Based on these descriptions, we developed a set of typical conditions of target costing that will be discussed more in depth in the next paragraphs.

To us, there are seven typical characteristics for target costing. These conditions are:

1. The target sales price is set during product planning, in a market-oriented way.
2. The target profit margin is determined during product planning, based on the strategic profit plan.
3. The target cost is set before the new product development process (NPD) really starts.
4. The target cost is subdivided (into target costs for components, functions, cost items or designers).

5. Detailed cost information is provided during NPD to support cost reduction.

6. The cost level of the future product is compared with its target cost at different points during NPD.

7. A general rule is aimed for that “the target cost can never be exceeded”.

As a concluding remark, I repeat, as discussed before that target costs are not the only elements that design engineers need to aim for when designing and developing a future product. As mentioned, the quality of the future product in terms of performance, features, reliability, etc. need to be considered as well as the time schedule of the NPD process. It is indeed the combination of the quality of the product, its cost level and the achieved time-to-market that interrelationship between target costing and new product planning. As shown, all elements influence each other and are mutually intertwined.

1.3. IMPORTANCE OF ‘TARGET COSTING:

Cooper and Slagmulder (1997: 2) point out that in contrast to the conventional cost management techniques, target costing adopts a feed-forward approach. The objective of target costing is to design costs out of products, and not to find ways of eliminating costs after the products enter production. Few firms can afford to ignore such a powerful mechanism to increase profits in today’s highly competitive environment.

The modern business environment is characterized by the intensification of global competition, the rapid pace of automation and computer technology, environmental and safety issues, short product life-cycle, consumers’ need for high
quality and innovative products at reasonable prices. In such a challenging environment, a company’s survival depends among other things on its capacity to produce and market innovative products that satisfy levels of quality and price expected by its market niche (Bonzemba & Okano 1998: 3).

Manufacturers face the difficulty of having to match the lower prices of global competitors and still offer the highest quality products customers demand (Helms, Ettkin, Baxter & Gordon 2005: 49). The goals of becoming and remaining internationally competitive in terms of price and quality are of utmost importance for the survival of the heavy vehicle manufacturing industry.

The financial success of any business in the long term depends on whether its prices exceed its costs sufficiently to finance growth, provide for reinvestment and yields satisfactory returns to its shareholders. Market forces influence prices significantly more, as competition increases and supply exceeds demand. To achieve a sufficient margin over its costs, a company must manage costs relative to the prices the market allows or the price the firm sets to achieve certain market penetration objectives (AICPA 2000).

Many companies have little flexibility when setting a price due to intense competition. Reducing a firm’s production costs may be the only source of increased earnings where selling price and profit margin are fixed by competitive pressures and management policies. Many companies have been forced to reduce their costs in order to survive the intense competition and pressure from customers to reduce prices (Schmelze, Geier & Buttross 1996: 26).

Sakurai (1989: 3) state that some people think of it in terms of cost reduction and cost control activities; others think of it solely as cost control. These authors define cost management in terms of the first interpretation, as it is their view that
those who insist on the second interpretation will lose ground in a period of low economic growth

Horngren, Foster and Datar (1997: 29) define cost management as the set of actions that managers take to satisfy customers while continuously reducing and controlling costs.

Similarly cost management is defined as a “proactive process of identifying causes of costs, with the objectives of managing and minimizing the total costs associated with the production of products and services to customers” (Accountancy SA, 2009).

The field of cost management has gone from stagnation to intense innovation. Cooper (1996:20) points out that companies need to be more proactive in the manner that costs are managed, as survival for many is dependent on their abilities to develop sophisticated cost management systems that create intense pressure to reduce costs across the entire value chain. Similarly, Roos and Chivaka (2008: 517) state that cost management is a key factor in the survival of organizations where innovative products at lower costs than competitors, together with ensuring the profitability of the firm needs to be achieved. According to Cooper and Slagmulder (1997: 1), firms must develop low cost, high quality products that have the functionality customers demand in order to generate the desired level of profits.

Lee (1994: 68) comments that by focusing on market position and product leadership, target costing enables companies to attain low costs which ensure low prices and thereby assists in maintaining market share. Cooper and Slagmulder (1997: 2) point out that target costing transmits the cost pressure that is placed on the firm by the market to all parties involved in the product design process. Through this pressure, target costing focuses the creativity of the firm’s designers on developing products that
satisfy customers and which can be manufactured at the desired target costs. Gopalakrishnan, Samuels & Swenson (2007: 41) state that target costing instills discipline by requiring new products meet their cost targets before being produced. Ansari et al (1997: 1) identify several success stories of firms implementing target costing. After facing an uncertain future in 1990, Chrysler management introduced target costing with the launch of the Neon program. The results of using target costing on the Neon were impressive:

• The Neon met customer requirements for safety and drivability by providing dual airbags and a powerful (132 cc) engine.

• The Neon was named Auto of the Year in 1994.

• The Neon a relatively short development time, going from product concept to market in 31 months.

• The Neon came in below its projected development and investment budget.

• The Neon was one of the few small cars that earned a positive return.

Other benefits Chrysler experienced as a result of implementing a target costing process include the following:

• The firms share price has gone from $10 per share in 1990 to $54 per share in 1995.

• Revenues have increased by 70 percent (since 1990).

• Market share in numbers of cars and trucks sold has increased by 2.1 percent (since 1990).

• Profits and cash flow have increased by nearly 400 percent (since 1990).

• The profit margin ratio has increased from 0.33 percent in 1990, to 7.1 percent in 1995.

Further, the target costing process has transformed the organization by creating a culture characterized by effective cross-functional teams; using simple
product/process design rules; basing engineering decisions on cost impact; using productivity enhancing production processes; eliminating expensive and time consuming changes to products; and early customer, supplier, and dealer input into product design. The Chrysler situation illustrates how target costing can improve a firm’s competitive position by reducing costs, improving quality, and reducing time between production and delivery to market (Ansari et al 1997: 2). The results of target costing have been impressive even in organizations that have not fully implemented target costing. In the case of Boeing, significant cost savings on the 777 planes were realised, even before a fully integrated costing system had been implemented. (Ansari et al 1997: 3). Value engineering is described by Cooper and Slagmulder(1997: 9) as “the primary technique used to find ways to decrease product costs while maintaining the functionality and quality the customer demands.”

1.4. THE RESEARCH PROBLEMS:

A research problem in general refers to some difficulty that a researcher experiences, in the context of either a theoretical or practical situation and wants to obtain a solution for the same.

Thus a research problem is one which requires a researcher to find out the best solution for the given problem i.e. to find out by which course of action the objective can be attained optimally in the context of a given environment. There are several factors which may result in making the problem complicated. For instance the environment may change, affecting the efficiencies of the courses of action or the values of the outcome: the number of alternative courses of action may be very large: Persons not involved in making the decision may be affected by it and react to it favorably or unfavorably etc.
The components of a research problem are as follows:

1] There must be an individual or a group which has some difficulty or a problem.
2] There must objective/s to be attained
3] There must be at least two courses of action available to a researcher
4] Research must answer the question concerning the relative efficiency of the possible alternatives.
5] There must be some environments to which the difficulty pertains.

1.4.1. Research Problem:

To collect empirical data through a questionnaire which assess the level of awareness of ‘Target Costing’ as a cost reduction technique in India and Libya.

This is of prime importance to begin with since though the understanding of ‘cost reduction’ and its requirement is understood universally, industries could have different ways of accomplishing it and also the nomenclature may differ. It is crucial for this comparative study to find this together in order to even attempt a research of the second research problem, which will then lead to testing the hypothesis and allow us to conclude either way.

The only way we can assess if the application and outcome differ in two countries in different developmental stages is to first ascertain whether there is awareness about ‘Target Costing’ among the business community, specifically in the heavy vehicle sector, which we are studying in this research.
1.4.2: ResearchProblem:

To collect empirical data through a common questionnaire that evaluates the similarities and/or differences if any in the application and outcome in two economies in different stages of development.

The second information crucial to test the hypothesis is to evaluate if the difference in the developmental stages of the two countries viz. India and Libya will or will not impact the application and the final outcome viz. achieving the ‘Asking Price’ by controlling manufacturing costs.

The questionnaire is specifically designed to seek answers to questions that determine if conditions extraneous to the industrial whether they are the political, social or economic scenario does have an impact on the functioning of the industry and so its profitability.

It is not as important to describe the political, social, economic conditions as to choose two diametrically different economies in completely different stages in their developmental stages and so the choice of the two countries experienced by me viz. India and Libya. My personally experiencing these two countries also eliminates any personal bias introduced by the study being done by two different people.

I do concede that there are other ways of testing the hypothesis e.g. comparing the direct results of the differences by specifically questioning and seeking answers to the political, social and economic environments of the two countries but for the purpose of this research I shall follow the belief that by choosing two countries in different developmental stages, I have automatically factored in the prevalent political, social and economic diversities of India and Libya, leading to a dependable empirical research and conclusion.
1.5. IMPORTANCE OF A COMPARITIVE STUDY:

Primarily, it gives us a “context” in which to see our own system—to bring out the underlying principles, and not just methods and techniques. It is a mirror in which to see ourselves.

Providing the comparative parameters are comparable, it gives us an insight into different ways of solving the same, or similar, problems. But, the comparative method must involve some way of making the cultural component explicit. Otherwise, we are dealing with anecdotal information. So, there has to be a comparative methodology.

Globalization involves a great deal of learning and borrowing from others—not always wisely. For instance, what about the so-called transitional economies, and the so-called developing countries?

The comparative method enables us to see ourselves as it were, from the outside. When you see how a country does something, it raises 2 questions: “Why don’t we do that? Why do we do what we do?”

1.6. SIGNIFICANCE OF THE STUDY:

Target costing and target cost management, according to literature, are often associated with Japanese companies. Empirical research into the practices of target costing has mainly been performed by Japanese researches for the Japanese situation. Few efforts have been made to investigate the relevance and occurrence of these practices in non-Japanese companies. The expectation is to find that the drivers for using these methods are not restricted to Japan and that target costing could also be used in a non-Japanese situation, although the actual application of such practices in other countries may be different from the typical Japanese way.
Furthermore most of the studies in other countries have been in the form of case studies, which does not allow a comparative study thereby neglecting to factor in the cause and effect similarities and/or dissimilarities resulting from differences in the economies. This comparative study gives us a more comprehensive picture of the practice of target costing as a cost reduction technique.

The target costing method works "backward" from traditional cost-plus methods and begins with a targeted sales price for a product. This price is set based on what the customer is willing to pay. It considers not only the preferred current selling price but also the later life cycle pattern of prices. This technique has key managerial implications. There is an ongoing controversies concerning weather the technique can be used as dictated in the vast amount of literature available about it and also are there any international differences in the application of target costing as well as the its desired results considering the challenges of global outsourcing along the supply chain. A strong market orientation is a prerequisite for target costing. The term too is seen as limited to the accounting domain and traditionally accountants have not been used to implement production changes, even though they have access to the cost data. This study is an attempt to research the actual functioning of the process of target costing over a period of time within an organization across the various functional departments and through different levels of the organizational hierarchy thereby providing a complete picture of not only the process itself but its execution and the variables if any due to the variances in factors e.g. different economies.

To further this objective I have chosen two unlike economies viz. India and Libya. Here the major consideration being to compare two economies in considerable variance with each other in terms of size, nature, managerial practices, manufacturing procedures and personnel handling.
The study of target costing has been done by many stalwarts as evident in the ‘Literature Review’. During my review of this expanse of the knowledge already researched about the subject I have not come across any study emphasizing on whether the ‘target costing’ process is implemented in the same manner across different economies and whether the dissimilar conditions existing within those economies affect the implementation of target costing and its results in any manner. I do believe that it is important as my contribution to the body of knowledge on target costing to have a fine focused study of the awareness and implementation of the process in corporate organizations in two specifically different economies across the spectrum of not only the personnel employed by the organizations but the other stakeholders crucial to the effectiveness of the system e.g. suppliers.

I have selected heavy vehicle companies, three indigenous to India and One in Libya. The purpose of this is to study the target costing process. Studying Theses industries enables the elimination of the variables prevalent within the manufacturing and sale of unlike products lending more stability and therefore dependability to the study.

The following is a summarized description of the economies of India and Libya.

**1.6.1. INDIA:**

According to Wikipedia, the economy of India is the tenth-largest in the world by nominal GDP and the third-largest by purchasing power parity (PPP) The country is one of the G-20 major economies and a member of BRICS. On a per-capita-income basis, India ranked 141st by nominal GDP and 130th by GDP (PPP) in 2012, according to the IMF. India is the 19th-largest exporter and the 10th-largest importer
in the world. The economy slowed to around 5.0% for the 2012–13 fiscal year compared with 6.2% in the previous fiscal. On 28 August 2013 the Indian rupee hit an all-time low of 68.80 against the US dollar. In order to control the fall in rupee, the government introduced capital controls on outward Investment by both corporate and individuals. India's GDP grew by 9.3% in 2010–11 thus, the growth rate has nearly halved in just three years. GDP growth rose marginally to 4.8% during the quarter through March 2013, from about 4.7% in the previous quarter. The government has forecast a growth rate of 6.1%-6.7% for the year 2013–14, whilst the RBI expects the same to be at 5.7%. Besides this, India suffered a very high fiscal deficit of US$ 88 billion (4.8% of GDP) in the year 2012–13. The Indian Government aims to cut the fiscal deficit to US$ 70 billion or 3.7% of GDP by 2013–14.[citation needed]

The combination of protectionist, import-substitution, and Fabian social democratic-inspired policies governed India for some time after the end of British occupation. The economy was then characterized by extensive regulation, protectionism, public ownership of large monopolies, pervasive corruption and slow growth. Since 1991, continuing economic liberalization has moved the country towards a market-based economy. By 2008, India had established itself as one of the world's fastest growing economies. Growth significantly slowed to 6.8% in 2008–09, but subsequently recovered to 7.4% in 2009–10, while the fiscal deficit rose from 5.9% to a high 6.5% during the same period. India's current account deficit surged to 4.1% of GDP during Q2 FY11 against 3.2% the previous quarter. The unemployment rate for 2010–11, according to the state Labor Bureau, was 9.8% nationwide. As of 2011, India's public debt stood at 68.05% of GDP which is highest among the emerging economies. However, inflation remains stubbornly high with 7.55% in August 2012, the highest am trade (counting exports and imports) stands at $606.7
billion and is currently the 9th largest in the world. During 2011–12, India's foreign
trade grew by an impressive 30.6% to reach $792.3 billion (Exports-38.33% &
Imports-61.67%).

1.6.2. LIBYA

The Economy of Libya depends primarily upon revenues from the petroleum
sector, which contributes practically all export earnings and over half of GDP. These
oil revenues and a small population have given Libya the highest nominal per capita
GDP in Africa. After 2000, Libya recorded favorable growth rates with an estimated
10.6% growth of GDP in 2010. This development was interrupted by the Libyan civil
war, which resulted in contraction of the economy by 62, 1% in 2011. After the war
the economy rebounded by 104, 5% in 2012, but it has yet to achieve its pre-war
level.

Libya had seen fantastic growth rate, however these proved unsustainable in
the face of global oil recession and international sanctions. Consequently the GDP per
capita shrank by 40% in the 1980s. Successful diversification and integration into the
international community helped current GDP per capita to cut further deterioration to
just 3.2% in the 1990s.

Libyan GDP per capita was about $40 in the early 1320's and it rose to $1,018
by 1967. In 1347 alone, per capita GDP rose by 42 percent.

This information clearly explains why a comparison of the target costing process in
these two countries would give us an interesting insight into the awareness, practice
and effects of target costing in two diverse economies.

The reasoning behind choosing the heavy vehicle company
TATA Motors, Ashoke Leyland and Eisher Motors, In India and Industrial Vehicles
Corporation[ Iveco], in Libya are that, Tata Motors, Ashoke Leyland and Eicher motors are highest sellers of heavy vehicles with the largest networks in India and therefore . Availability of the required data in the state of Maharashtra, in the boundaries of which, I will conduct my research. Industrial Vehicles Corporation - Libya is the only manufacturer of heavy vehicles in Libya, awarding it a monopoly status and therefore the only competition if faces , is from foreign manufacturers.

1.7.OBJECTIVES OF THIS STUDY:

The primary objective of the research is to compare the practice of cost reduction in both the selected countries viz. India and Libya in the heavy vehicles manufacturers for:

1] Awareness of the technique.
4] Perceived benefits and drawbacks of the method.
5] Success in achieving the ‘Desired Cost’ and therefore the ‘Asking Price’.

Thus giving us a comprehensive explanation of the method in which ‘Cost Reduction’ is practiced in India and Libya, enlightening us on the practice of target costing as a cost reduction technique and therefore a solution to achieving the ‘Desired Cost’ of a product automatically controlling the ‘Asking Price’ or the ‘selling Price needed to get the Required Profit’. With India being a large economy with a phenomenal growth rate owed to massive industrialization which in turn owes its profitability to competitive marketing of its products and services, the results could very well be utilized by a smaller economy as a learning tool for economic growth.
Target Costing as a tool for cost reduction, is not understood by the common truck buyer and who is of the opinion that the product is too expensive. This study clearly defines the efforts of the manufacturer to control costs and therefore offer the truck at its optimum price.

This objective will be achieved through, primary data collected from presenting the personnel in the organizational hierarchy of Tata Motors, Ashoke Leyland and Eisher heavy vehicles. The purpose of involving most of the levels of the hierarchy is to ascertain awareness, knowledge of practice and utility for profitability across levels dispelling the notion that the technique only has managerial implications which are frequently spoken and written about but implications for the lowest level assembly line technician too. This entails continuous education and monitoring by the management.

1.8. HYPOTHESIS OF THE STUDY:

The research hypothesis is a predictive statement that relates an independent variable to a dependent variable. Usually a research hypothesis must contain at least one independent and one dependent variable.

Hypothesis -I) The ability of the target costing technique to achieve the ‘Asking price’ by controlling the production cost differs in countries which are in different stages of development.

Hypothesis -II) The implementation of type of cost reduction methods in the automobile industry differs in countries which are in different stages of development.

Hypothesis -III) The factors affecting market positioning of automobile products differs in countries which are in different stages of development.
**Hypothesis -IV)** The duration of use of cost reduction technique is correlated with the appreciation on benefits and drawbacks of target costing in the countries which are in different stages of development.

It stands to reason that the level of industrialization of a nation has a direct relationship with the degree of sophistication in their business practices. Since manufacturing cost reduction is necessary in order to offer a product at a competitive price and therefore sustain the profitability of the industry. This research attempts to study the extent to which ‘Target costing’ as a cost reduction tool is immune to the developmental stage of the country.

1.9.**VARIABLES OF THE STUDY:**

1.9.1. **Dependent variables:**

1) Perception on achievement on asking price and achievement of required profit.

2) Type of method for cost reduction used.

3) Factors playing an important role in position product in the market.

4) Duration of use of cost reduction techniques.

1.9.2. **Independent variables:**

1) Country (India / Libya).

2) Education, experience of the employees.

3) Type of department.

4) Perception of key benefits of target costing methods.

5) Perception of drawback of target costing methods.
1.9.3. Chi-square test for independence of Attributes:

The Chi-Square test is known as the test of goodness of fit and Chi-Square test of Independence. In the Chi-Square test of Independence, goodness of fit frequency of one nominal variable is compared with the theoretical expected frequency. In the Chi-Square test of Independence, the frequency of one nominal variable is compared with different values of the second nominal variable. The Chi-square test of Independence is used when we have two nominal variables. The Chi-square test of Independence data may be in the R*C form. In the Chi-Square test of Independence, R is the row and C is the column. In the Chi-Square test of Independence, the test variable may be more than two.

1.9.4. Procedure in Chi-Square test of Independence:

To perform the Chi-Square test of Independence, first we have to calculate the expected value of the two nominal variables. We can calculate the expected value of the two nominal variables by using this formula:

\[
E_{i,j} = \frac{\sum_{i=1}^{r} O_{i,j} \sum_{k=1}^{c} O_{k,j}}{N}
\]

Where

\(E_{i,j}\) = expected value for Chi-Square test of Independence

\(\sum_{i=1}^{r} O_{i,j}\) = Sum of the \(i_{th}\) column in the Chi-Square test of Independence

\(\sum_{k=1}^{c} O_{k,j}\) = Sum of the \(k_{th}\) column in the Chi-Square test of Independence
N = total number in the Chi-Square test of Independence

After calculating the expected value, we will apply the following formula to calculate the value of the Chi-Square test of Independence:

\[ \chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}} \]

\( \chi^2 \) = Chi-Square test of Independence

\( O_{i,j} \) = Observed value of two nominal variables for the Chi-Square test of Independence

\( E_{i,j} \) = Expected value of two nominal variables for the Chi-Square test of Independence

Degree of freedom in Chi-Square test of Independence: In the Chi-Square test of Independence, the degree of freedom is calculated by using the following formula:

\( DF = (r-1)(c-1) \)

Where

\( DF \) = Degree of freedom for the Chi-Square test of Independence

\( r \) = number of rows in the Chi-Square test of Independence

\( c \) = number of columns in the Chi-Square test of Independence
1.9.5. Spearman's rank correlation:  
Spearman's rank correlation provides a distribution free test of independence between two variables. It is, however, insensitive to some types of dependence. Kendall's rank correlation gives a better measure of correlation and is also a better two sided test for independence.

Spearman's rank correlation coefficient is calculated as:

\[ \rho = \frac{\sum_{i=1}^{n} R(x_i)R(y_i) - n \left( \frac{n+1}{2} \right)^2}{\left( \sum_{i=1}^{n} R(x_i)^2 - n \left( \frac{n+1}{2} \right)^2 \right)^{1/2} \left( \sum_{i=1}^{n} R(y_i)^2 - n \left( \frac{n+1}{2} \right)^2 \right)^{1/2}} \]

- where R(x) and R(y) are the ranks of a pair of variables (x and y) each containing n observations.

1.10. LIMITATIONS OF THE STUDY:

- Every study has certain limitation warranting a need for further research in order to broaden the body of related knowledge. In the present case, the following are the limitations that the research is subject to by the nature of the material being studied:
- The geographical extent of the study – In the country of India will in this case have to be considered a representative sample. India is a very large country compared to Libya
- The two nations of India and Libya have been chosen for the study by virtue of the fact that I am familiar with both and have access to data in them.
- India and Libya have few similarities in terms of the way the countries function which may introduce unnecessary variables e.g. India runs its
industry differently while Libya do business differently, these were not matched previous to the study.

1.11. Chapters Scheme:

Chapter 1. Introduction

Chapter 2. Literature Review

Chapter 3. Theoretical Framework

Chapter 4. Research Methodology

Chapter 5. Empirical Data Analysis

Chapter 6. Conclusion and suggestions