Chapter 1
Introduction

1.1 Small and Medium Scale Enterprises in Gujarat

Lean manufacturing, or lean production, refers to a business concept wherein the goal is to minimize the amount of time and resources used in the manufacturing processes and other activities of an enterprise, with emphasis on eliminating all forms of wastage. Lean manufacturing/production that has been in widespread usage since the early 1990’s when Womack and Jones first used it to describe the Toyota production system. Lean manufacturing practice or production system of Toyota was initiated by the Japanese automaker under the strong leadership of its quality engineer Taiichi Ohno in 1988, later on he was became a popular as a father of lean manufacturing, and the new framework was implemented in manufacturing at the time of the financing deficit and economic crisis after World War II in Japan. Lean is identified as key manufacturing practices of SMEs which are active in Gujarat and provide significant revenue to the government of Gujarat and the country. The state of Gujarat is one of the highly industrialized states in India with its reputation as a very investor-friendly state. It has a proven track record of attracting large amounts of investment will be most favored investment destination in India (socio-economic review, Gujarat, 2015-16). In the current scenario of privatization and globalization, small scale industries facing tough competition thus the existence and growth of these industries will be a threatening challenge. Some industries consistently get growth under competitive conditions, while others do not. As a result, new opportunities and threats appeared on all types of industries in India (MSME Annual Report 2015-16). SMEs play an important role in the national economy, especially in the economy such as ours, which is growing.

According to the Economic Survey 2015-2016, Gujarat ranks second after Bihar on the list of fastest-growing state during the past seven years. Between 2005-06 and 2011-12, Gujarat registered an increase in gross domestic product (GSDP) of 9.98%, while Bihar recorded the highest growth rate of 10.17%. The growth of industries in Gujarat is very impressive and growing every year, which is also shown in the Figure 1.1 (Socio-Economic Review, Gujarat, 2015-16)
Lean operations are the very recent method of managing the business based on the principles of waste management while maximizing quality and flexibility. The main objective is to provide a perfect value creation from order entry to final delivery.

Lean manufacturing is a way to achieve excellence in manufacturing. Lean manufacturing is a philosophy, a production strategy and a set of techniques to meet customer needs with the minimum of all resources. Lean manufacturing tools eliminates the waste in the system, thereby reducing the manufacturing cost and time, WIP (work in progress) reduction, better space utilization, improved quality, increased customer satisfaction and ultimately increased productivity. Prime cost of manufacturing can allows an organization to be competitive in the market and become more profitable. Lean manufacturing practices have much attention as a practical world-class manufacturing due to the effective and continuous improvements in everyday work value (all you can produce money) . It also combines techniques like minimize waste and rework with effective machines, and also motivate for active participation of employees in the assembly line. From the origins of the idea lean Toyota Corporation, these principles have moved to other Japanese car manufacturing and then to the US auto companies such as benchmarking and improvement techniques.


**Figure 1.1 Increase in Industrial Growth in Gujarat**


The current literature suggests that the SMEs may differ from the larger companies by a number of the key characteristics. Some of them are putting the greater strains
on the SMEs inducing that the business development may be more challenging in this context (Narayana M. R. 2007, Bala Subrahmanya M.H. 2007, Ghobadian and Gallear 1996):

• The resource limitations associated with the SMEs highlights the importance of the productivity.
• The lack of money may cause the liquidity risk.
• The reliance on a small number of the customers means that the SMEs must ensure the high level of the customer satisfaction and the flexibility to respond quickly to the changes in the market.
• The flatter structure of the SMEs means that the employees have several job roles and more responsibility. The multi-skilled employees are necessity to the enterprises

There are several reasons for this situation, and unfortunately, there are no simple solutions. Considering the above facts, it is an important issue to study the factors that affect the performance of SMEs working in and around Gujarat. This study examines the relationship between critical success factors at the operational level and the operational performance of small and medium-sized enterprises. The exploratory study was conducted to formulate the theory basis for operational level factors important for SMEs and their operational performance (priorities).

First, the definition of small and medium-sized industry is presented in its case in India, according to the law of small, small and medium-sized enterprises (SMEs) 2006 sooner rather limited concept Industries has expanded into businesses. A large number of companies have been divided into two categories, namely, companies engaged in the manufacturing / production of goods belonging to any sector; and companies engaged in the provision / supply of services. Businesses have been defined in terms of investment in plant and machinery / equipment (excluding land and buildings) in the Table 1.1.

Small and Medium Scale Engineering Enterprisers (hereafter referred as SMEs) cover a wide spectrum of industries and play an important role in both developed and developing economies. India is no exception and SMEs play a vital role in planned development of Indian economy.
Table 1.1 Definition of Micro Small and Medium Enterprises

<table>
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<th>Type of Enterprise</th>
<th>Investment in plant and machinery/equipment (excluding land and building)</th>
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<tr>
<td></td>
<td>Manufacturing Enterprises</td>
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<tr>
<td>Micro</td>
<td>Up to Rs. 25 lakh</td>
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<tr>
<td>Small</td>
<td>More than Rs. 25 lakh and up to Rs. 5 Cr</td>
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<tr>
<td>Medium</td>
<td>More than Rs. 5 cr and up to Rs. 10 Cr</td>
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(Sources: Annual Report 2014-15, Ministry of Micro, Small and Medium Enterprises, Government of India)

Most of the SMEs are the suppliers to the large companies, especially in the automotive industry which is very true; therefore, changes in large companies that affect SMEs. But if we look at the sales data in India in general, compared with last year is very low. On the one hand, the automotive industry is increasing and the other side decreasing sales revenue, why is it so? What to the industries will do and one can say that it is due to the global recession, it is one of the biggest contributors to this competition. But what these companies are doing to increase sales in this highly competitive market? So Original equipment Manufacturers (OEMs) are now making it mandatory to use quality tools for quality improvement and techniques of Lean Manufacturing - Lean tools through various ways to manage their suppliers and these tools are very successful in large companies and Indian automotive internationally. However, another issue is the OEM suppliers especially small industries in Gujarat is actually going through Lean Manufacturing Practices or not and are they getting benefits from it or not? If yes, it is only on paper or documented anywhere. What difficulties arise if opt for implementation?
1.2 Methodology/Approach:

The literature review presented in the previous section has demonstrated a number of research gaps which have been identified by the research investigation within SMEs especially small and medium scale manufacturing suppliers. These gaps have facilitated the development of the goal of this study which is to; development of a lean practice model for small-to-medium scale automotive industries in Gujarat using lean practice core tools. Hence, survey based research methodology has deemed necessary for the execution of the identified research tasks.

The detailed research roadmap for the research study is presented in Figure 1.2 to achieve the stated objectivities of research. At the outset, the researcher can claim that the said objective has been accomplished through survey based research as presented in forthcoming chapters. The research can be distributed into mainly literature review, implementation of Lean manufacturing tools and techniques in SMEs, development of Lean Practice model and validation phase. The Performance Measures (PMs) have been defined at the start to have qualitative results on improvements. The PMs have been measured on likert’s scale and observed based on the qualitative outcomes.
Review of Literature

Identification of Research Problem

Identification & Selection of Factors Affecting Lean Manufacturing Practice

Identification and Outline Of Organizational Performance Measures of Lean Manufacturing Practice

Research Design
- Design of Survey Instrument (Pilot Questionnaire & Internal Consistency Analysis)

Development of Final Questionnaire

Data Collection
- Email, personal Contact, post & Couriers, representatives

Analysis of Data
- Factor Analysis, Content, Construct, Validity, Reliability

Hypotheses Testing
- Multiple Regression Analysis and Development of Lean Practice Model

Validation of Lean Implementation (Performance) Model Through Case Studies

Documentation of Observations and Interpretation & Sharing With subjects

Figure 1.2 Research Road Map (Modified From Tushar N Desai and R.L. Srivastava, 2012)
1.3 Thesis Structure:

The structure of this thesis is comprised of seven chapters as total as presented in figure 1.3. Where chapter 1 illustrates the methodology, objectives of the study, whereas chapter 2 provides a critical review of related work in lean manufacturing, critical success factors and small-to-medium sized industries scenario, knowledge bases system and summary of the conceptual framework. In chapter 3, the research methodology adopted for the research study is presented and discussed. This particular chapter also discusses the overall research process followed in chapters 4, 5 respectively. Initial model development by structural equation model SPSS AMOS is presented in Chapter 4. Chapter 5 documents the developed unique model using ANN and results for the Lean Practice Model in SMEs. Chapter 6 demonstrates the validation of the developed model through real-time survey case studies. Finally, Chapter 7 presents discussion and conclusion respectively of the overall research work. It also highlights the limitations and the recommended future work.

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Figure 1.3 Thesis Structure