This research study takes you to the journey of World Class Manufacturing System (WCMS) adopted by the manufacturing companies located in and around Chennai and how they are wrestling with the challenges faced to achieve the world class status across the globe. In the changing business paradigm, competition has become more intense and the market has changed rapidly. To beat out the turbulent, complex and even chaotic market, the manufacturing companies need to adopt world class manufacturing philosophies, principles and techniques to achieve a competitive edge at the pipeline of competitive priorities of quality, cost, price, delivery speed, delivery reliability, innovation, flexibility etc., The mission of this study taps into the minds of Chennai manufacturers to assess their impressions of what world class manufacturing means to them, and how far they think they have come towards achieving that accreditation. This research was designed especially to illustrate how the WCM practices, principles and techniques have been implemented in Chennai manufacturers to achieve the competitive advantage in their business operations.

This study was carried out at 150 different manufacturing companies located in and around Chennai. A pilot survey of 25 respondents was conducted at 15 manufacturing sites to test the validity of the
A structured questionnaire was used for this complex research project. After having validated the questionnaire through expert validation and pilot testing, a sample size of 150 manufacturing firms in different industrial contexts was drawn based on purposive (or) judgmental sampling technique. At the end, the researcher was able to obtain 125 productive and fruitful responses from senior production executives and plant supervisors to assess their myopic impressions of what WCM means to them and how far they come towards achieving that accreditation. Thus, the response rate of this research study was 83.33 percent. Hence, the sample size of the study is confined to 125. Each manufacturing organization represents one sample unit of the study. The research analysis was performed using both SPSS 17.0 and AMOS 18 statistical applications. The Confirmatory Factor Analysis (CFA) was applied to establish construct validity and reliability. An internal consistency analysis of the measurement scales was performed using the Cronbach’s alpha for the each concept variable as well as for the complete construct. The reliability coefficients for all the concept variables as well as the constructs were found to be higher than the recommended minimum Cronbach’s alpha coefficient reliability of 0.70 (Nunnally 1978), which was used to test the reliabilities of each factor.

More interestingly, all respondents were able to give a good explanation of what they felt WCM was, with majority (more than 7 out of 10 manufacturing companies) linking it to ‘Product quality is of paramount
importance (mean=4.44)’, ‘Having a culture of continuous improvement throughout the whole company (mean=4.14)’, ‘Improving efficiency and productivity of the organization (mean=3.97)’, ‘Responding quickly to the changing needs of the customers (mean=3.91)’, ‘Empowering employees to be involved & take responsibility (mean=3.82)’ and ‘following lean manufacturing principles (mean=3.70)’. It indicates that manufactures have a strong view of what constitutes world class. The most important lean initiatives that promote the implementation of WCM principles and techniques by manufacturers in Chennai with a mean score of more than 3.0 were ‘Kaizen (mean score=4.26)’, ‘Removal of wasteful processes (mean score=3.91)’, ‘Kanbans (mean score=3.62)’, ‘5S principles (mean score=3.51)’, ‘Just-in-time delivery from suppliers (mean score=3.37)’, ‘Total Productive Maintenance (mean score=3.34)’, and ‘Six-sigma (mean score=3.14)’.

The TQM principles proved to be rated among top priorities for successful implementation of WCMS by Chennai manufacturers with the mean score of more than 3.0 were found to be ‘customer focus (mean=3.82)’, ‘management commitment (mean=3.72)’, ‘continuous process improvement (mean=3.54)’, ‘training & education (mean=3.52)’, ‘empowerment & teamwork (mean=3.40)’, ‘performance management (mean=3.33)’, and ‘employee involvement (mean=3.14)’. The most significant IT Systems/Applications with a mean of greater than 3.0 found to have
implemented by the manufacturing firms in Chennai for achieving world class performance were ‘Design systems (e.g., CAD, CAE) (mean value=3.98)’, ‘Materials Requirements Planning (MRP) (mean value=3.90)’, ‘Enterprise Resource Planning (ERP) (mean value=3.63)’, ‘Financial Management System (FMS) (mean value=3.62)’ and ‘Electronic Data Interchange (EDI) (mean value=3.14)’.

This research study uses seven competitive performance indicators to evaluate the competitiveness of each Chennai manufacturing plant as: quality improvement, costs reduction, reduced time to market (or delivery speed), constant innovation, improvement of efficiency and productivity, flexibility in operations, and offering quality products/services at affordable price. The findings of this empirical study are encouraging that all the competitive performance indicators were found to have a mean response of greater than 3.0 and were recognized as the core of manufacturing capabilities that leads to their competitiveness in the global market.

Structural Equation Modeling (SEM) was conducted by using AMOS 18.0 to assess fitness of the path model based on the proposed hypotheses. The results of the SEM clearly revealed that the WCM Practices, Lean Initiatives, IT Systems/Applications, and TQM Principles implemented by Chennai manufacturers have a strong significant positive influence on the achievement of competitive edge in the operational performance of their
business. One of the purposes of this study is to identify the critical driving and resisting forces toward implementation of WCM principles and techniques in Chennai manufacturing firms. The survey results confirm that all the WCM drivers are in the positive side and WCM barriers are in the negative side with regard to implementation of the WCM principles and techniques.

Independent samples t-test was performed in this study to explore the sector-wise responses to the indicators of major research variables and revealed that there were significant differences in most of the indicators of the research variables considered to be the key by small, medium and large scale manufacturing firms for the effective implementation of WCMS. Given the very positive findings relating to the application of WCM practices, principles and techniques elsewhere in this report, it is perhaps surprising at first sight to see a significant quarter of respondents (25.6%) have allowed themselves the accolade of having achieved WCM status already. The findings of this study highlight the stability and consistency of the implementation of WCMS by Chennai manufacturers, which can be used as one of the strategic weapons for achieving and maintaining competitive edge at their business operations to meet global business standards consistently.