SUPPLY CHAIN OPTIMIZATION AT ANRITSU CORPORATION

A Project Report

Presented to

The Faculty of the Department of

General Engineering

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Engineering

By

Chitthaarth Maurya

Vinay Rajapuram

December 2009
APPROVED FOR THE DEPARTMENT OF GENERAL ENGINEERING

Prof. WenBin Wei
Technical Advisor,
Assistant Professor, Dept. of Aviation & Technology
San Jose State University

Mr. Gurbrinder Singh Grewal
Industrial Sponsor, Anritsu Corporation

Dr. Leonard Wesley
Assistant Professor, Department of Computer Engineering
MSE Director, Graduate & Extended Studies, General Engineering Dept.
San Jose State University
This project deals with the reduction of the supply chain cost of Vector Network Analyzer (VNA) manufactured by Anritsu Corporation. The supply chain cost of the Vector Network Analyzer is reduced by reducing its logistics and inventory cost. Logistics cost is reduced by changing the way the company orders. Inventory cost is reduced by identifying and eliminating the non value adding process. By reducing the supply chain cost we were able to reduce the total cost of the Vector Network Analyzer.
ACKNOWLEDGEMENT

We would like to express our respect and appreciation to Professor. WenBin Wei, Assistant Professor, Dept of Aviation and Technology, San Jose State University for his continuous support, encouragement and direction.

We would like to thank Mr. Gurbrinder Singh Grewal, Design Engineer, Anritsu Corporation for his support in achieving our goal.

We would like to thank Dr. Leonard Wesley, Associate Professor, Dept. of Computer Engineering, San Jose State University for his suggestions and guidance thought the ENGR 298/295B course in FALL 2009 Semester.

We would like to thank to our family members who continuously gave us an encouragement and support.

Chithraarth Maurya
Vinay Rajapuram
# Table of Contents

1. Project Overview ........................................................................................................... 1  
   1.1 Company Profile .................................................................................................... 1  
   1.2 Problem Statement .............................................................................................. 1  
   1.3 Objective ............................................................................................................. 2  

2. Literature Review .......................................................................................................... 3  
   2.1 Supply chain design with Inventory ........................................................................ 3  
   2.2 Quality Function Deployment .................................................................................. 4  
   2.3 Market Research .................................................................................................... 5  
   2.4 Logistics Cost Reduction ........................................................................................ 6  
   2.5 Use of Linear Programming ................................................................................... 7  

3. Implementation Methods ............................................................................................... 8  
   3.1 Logistics Cost Reduction ....................................................................................... 8  
   3.2 Inventory Cost reduction ...................................................................................... 12  
      3.2.1 Estimated savings from the proposed solution ............................................. 16  
   3.3 Value Stream Mapping ......................................................................................... 17  
      3.3.1 Value Stream Mapping of the current process ............................................. 18  

4. Economic Justification ................................................................................................. 19  
   4.1 Executive Summary .............................................................................................. 19  
   4.2 Product Service & Value Proposition ..................................................................... 21  
   4.3 Target Market for the service ............................................................................... 22  
   4.4 Competition and Product Prices .......................................................................... 22  
   4.5 Targeted Customer .............................................................................................. 23  
   4.6 Product Cost Summary ......................................................................................... 25  
      4.6.1 Cash Flow Analysis ....................................................................................... 25  
         4.6.1.1 Calculation of Fixed Cost ........................................................................ 32  
         4.6.1.2 Calculation of Variable Cost .................................................................... 32  
   4.7 SWOT Analysis ..................................................................................................... 33  
   4.8 Personnel Required .............................................................................................. 34  
      4.8.1 Supply Chain Staff ....................................................................................... 34  
      4.8.2 Marketing & Sales Staff ............................................................................... 34  
      4.8.3 Software & Quality Assurance Staff .......................................................... 35  
   4.9 Product Summary & Business Model .................................................................... 36  
   4.10 Break Even Analysis .......................................................................................... 37  
   4.11 Norden Rayleigh Curve ...................................................................................... 40  
   4.12 Return on Investment ......................................................................................... 43  
   4.13 Exit Strategy ..................................................................................................... 45  
      4.13.1 Exit Strategy for current process at Anritsu Corp .................................... 45  
      4.13.2 Selling to bigger established company who are not direct competitor ....... 46  
      4.13.3 Selling to bigger company who are direct competitor .............................. 46
5. Project Schedule .......................................................................................................................... 47
6. Results ......................................................................................................................................... 48
7. Further Studies ............................................................................................................................. 49
8. References ..................................................................................................................................... 50
List of Figures

1. Quality Function Deployment Matrix...............................................................5
2. Value Stream Mapping....................................................................................18
3. Market share of Anritsu Corporation............................................................25
4. Expected Income in 2012..............................................................................30
5. Annual Cash Flow Analysis..........................................................................31
6. Globalized function and projected increase by 2010...................................37
7. Formulae for Break Even Analysis...............................................................38
8. Break Even Analysis Graph..........................................................................39
9. Profit & Loss Chart.......................................................................................40
10. Norden Rayleigh Curve................................................................................42
11. Norden Rayleigh Curve (funding profile over time)....................................43
12. ROI Analysis...............................................................................................44
13. Gantt Charts...............................................................................................48
List of Tables

1. State wise distribution of VNA Component Suppliers........................................8
2. Demand for one of the three raw materials shipped within CA..........................12
3. Weekly orders before forecasting......................................................................13
4. Weekly orders after forecasting........................................................................14
5. Resulting Inventory............................................................................................15
6. Final weekly orders after recommendation........................................................16
7. List of companies in Bay Area providing SC Solutions.........................................22
8. Market Share & Cost of VNA............................................................................24
9. Zen Inc. SC Solution Customers with locations...................................................26
10. Annual Customer Sales.....................................................................................27
11. Annual Income from Customers........................................................................29
12. Cash Flow Analysis............................................................................................31
13. List of Fixed Cost Drivers..................................................................................32
14. List of Variable Cost Drivers..............................................................................32
15. SWOT Analysis..................................................................................................33
16. Data for Break Even Analysis............................................................................39
17. Norden Rayleigh Data.........................................................................................41
18. Calculation of Return on Investment.................................................................44