Chapter 5 Statement of Problem, Objectives of Study and Hypothesis

5.1 Statement of Problem: This research aims to explore and choose the right technology options to implement supply chain automation for monitoring the export logistics processes of bulk cargo industry and then implement the same to collect real-life data for analyzing its impact on supply chain effectiveness and efficiency.

Hence objectives of the study were defined as follows:

- To study and automate the transactions in ore export logistics’ processes through infusion of right technology with an aim to reduce the transaction time.

- To suggest newer ways of monitoring the logistics processes by analyzing the data so collected with a view to control the efficiency of logistics processes and fleet thereof.

- To arrest transit or handling losses in each logistics segment by introducing accurate auto-weighment and self-reconciling mechanism of trips to enable speedy identification and corrective action of deviations.

- To improve visibility and coordination amongst various stakeholders through enabling seamless exchange of relevant critical information related to above.

5.2 The Introduction to Problem

As we have shared perspectives of bulk industry and the organization (the case company) in earlier sections, it would be worth recollecting some of the key challenges in the logistics supply chain of the company, which is already crumbling under the pressure of daily volumes, leave alone its efficiency and effectiveness for the business objectives. There is growing mistrust among its transporters whilst the company is also not able to arrest its leakages in the form of missing trips and short delivery of the cargo in the road segment. This phenomenon got further compounded as no. of trips performed by same truck on same route had been falling as there was high waiting time at source as well as destination, besides increasing journey time. As a result, higher number of trucks were now necessary to carry same volume of cargo (almost 35 %
higher) resulting from the load and timing restriction from local authorities. This led to frequent demands of increase in freight and other consequent complex issues, not so logical at all. While these effects / symptoms were witnessed or diagnosed in road segment, it was also clearly observed that almost all important business controls were absent. Due to high volume pressure and being manual environment, it led to raising questions about the capability and competence of the people involved despite doing their best efforts.

Similar was the case in river transport, wherein ship weight of cargo as declared in the shipping bill or in Bill of Lading was not tallying with total weight of barges loaded at the jetty. This was also further compounded as jetty teams were struggling to get enough cargo supply from falling road segment trips and consequently no. of barge trips were falling as compared to similar months of last year as the waiting / idle time of barges increased substantially high, with hardly any ground stocks of export ore left after December. This also had adverse effect on daily loading throughput from trans-sippers as they were not getting cargo through barges regularly, thus losing a lot of productive time. All these problems had a cascading effect on the health of trans-shippers’ equipment, as seen by increasing trend of their equipment break-downs since there was no time was left for attending maintenance activities, especially those requiring longer service time, being prone to corrosion from sea winds. Thus it was easily gathered that the company’s internal environment had reached a stage where the problems of individual segment were casting their compounded negative effect on the next segment and thus a kind of bull-whip effect as seen in inventory systems, was clearly visible across the operations of whole supply chain, magnifying the ill-effect of previous chain link.

The factors responsible for such performance degradation would have to be studied in detail, duly supported by appropriate data collection, compilation and analysis to enable us to reach to the root causes of these inefficiencies. Then the design and development of automation-solution would be focused to provide solution for these causes, to either eliminate the root cause or at least reduce its effect to almost negligible level. Further the new solution so deployed should be able to bring objective evidence of
improvements in efficiency and effectiveness of operations in all segments of supply chain. It would be worth keeping in mind that sometimes a new solution might require a trade-off between the overall benefit at company level versus a small negative impact in one of the supply chain segment, but due weightage would be given to maintain the simplicity of new solution, so that the company does not face scarcity of skills in order to sustain the improvements.

5.3 Hypothesis

The study would be subjected to test the following hypothesis for each segment of transport i.e. road (Hr) and river (Hw) segments separately:

- **Hypothesis 1**
  
  H0: Automation of logistics process does not result in reduction of transaction time.

  Ha: Automation of logistics process results in reduction of transaction time.

- **Hypothesis 2**

  H0: Automation of logistics process does not lead to reduction in transit losses during cargo journey between source and destination.

  Ha: Automation of logistics process leads to reduction in transit losses during cargo journey between source and destination.

- **Hypothesis 3**

  H0: Automation of supply chain processes does not improve visibility and coordination amongst chain partners.

  Ha: Automation of supply chain processes improves visibility and coordination amongst chain partners.

The last hypothesis can be treated an outcome of overall automation effort across full logistics supply chain. Therefore it need not be tested for each segment separately and can be applied to both segments in a common manner.
Having seen the problems industry / company was facing, it was now time to go back to library to get some ideas of technology which could be deployed to find solution to these problems, so that performance improvement can be demonstrated through objective data evidence besides empirical data, if any.

While testing the hypothesis, available right tools would be used to prove that null hypothesis does not hold good and wherever the data is otherwise clear and straight, it would be obvious to support the hypothesis so framed.