Summary of the Thesis

This thesis presents some new models on inventory systems with postponed demands and provides extensive study on the behaviour of the system in the study state.

Though the inventory system with postponed demand is of recent origin and many real life models have not been studied by researchers in the past. The models proposed in this thesis include one or many of the following

1. Population size is finite or infinite.

2. Arrivals are Poisson/Bernoulli/D-MAP/quasi random output.

3. Perishable inventory systems. The lifetime of each item has exponential/geometric distribution.

4. Continuous-time and discrete-time (s,S) policy inventory systems.

5. Lead time distribution is exponential/geometric.

6. Postponed demands; the pool size is finite.

7. The demanding customer accepts the offer of postponement according to an independent Bernoulli trial.
8. The inter-selection time of customers from the pool have independent
discrete phase type distribution/exponential distribution.

9. Multiple server vacations. The duration of the server vacation is expo-
nential distribution.

In all the proposed models, we carried out the following:

1. We formulated various stochastic models on the inventory level, queue
size etc., by using appropriate stochastic process.

2. We have derived the necessary quantities, in particular, the joint prob-
ability distributions in the steady state and the system performance
measures.

3. In some models, we provided extensive numerical examples to demon-
strate the computability of our results and to bring out the convexity
nature of total expected cost rate per unit time.

**Future Work**

It is proposed to formulate models with more realistic assumptions which
may lead us to consider advanced stochastic processes for the various be-
haviours of the system, such as demand, lead time etc. It is also proposed to
carry out vacation models studied in the thesis and those to be proposed in
the future, to get more insight in to the performance of the systems.
List of Publications of Mr R. Jayaraman


3. A Perishable Inventory System with Postponed demands and Multiple Server Vacations (with B. Sivakumar and G. Arivarignan), Performance Evaluation - Communicated.


List of Papers Presented at Conference

1. A study on finite capacity $M/G/1$ Queueing system with server vacation under a gated vacation scheme, International Conference on Mathematics and Computer Science, held during March 01-03, 2007, Loyola College, Chennai.


3. An Inventory Systems with Postponed demands and Multiple Server Vacations, International Conference on Recent Trends in Stochastic Modelling, held during 16-18 December, 2008, Department of Applied Mathematics and Statistics, School of Mathematics, Madurai Kamaraj University, Madurai, Tamilnadu, INDIA.

4. A Perishable Inventory System with Postponed Demands and Finite Population, International Conference on Stochastic Modelling, held during 12-14 February, 2009, Department of Mathematics, Alagappa University, Karaikudi, Tamilnadu, INDIA.

5. A Perishable Inventory System with Postponed demands and Multiple Server Vacation, Third National conference on Applied Stochastic Methods, held during 26-27 February, 2010, Department of Applied Mathematics and Statistics, School of Mathematics, Madurai Kamaraj University, Madurai, Tamilnadu, INDIA.