VMI-BASED SUPPLY CHAIN SETUP PROCEDURE

This software helps the instructor or administrator to set a four stage serial supply chain under different settings or parameters and evaluates the same by using various performance measures. The screenshot of VMI-Based Supply Chain Role Play Game is given in Fig.2.
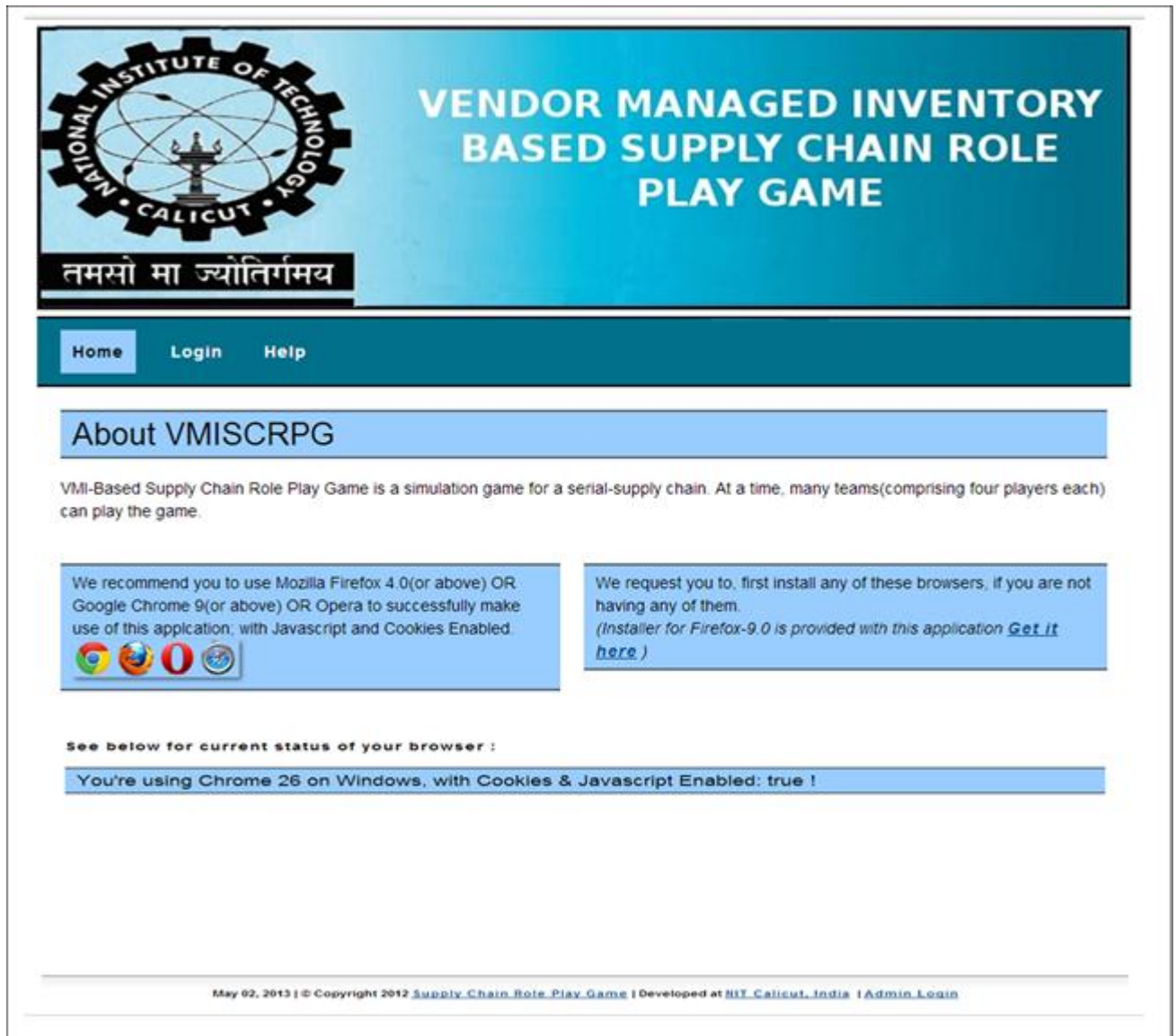

Fig.2. Screenshot of VMI-Based Supply Chain Role Play Game

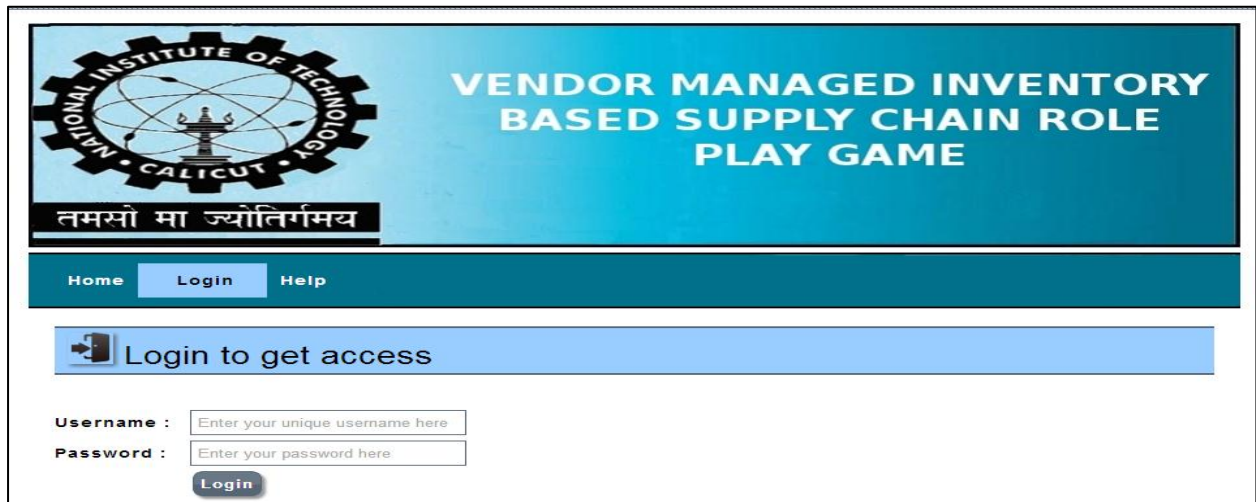Click on admin login the following window will appear as a result.

Fig.3. Screen shot of administrator Login page

Enter the user name, password and click on login button. It will open the instructor page as shown below.

Fig.4. Screen shot of Admin Functions

Click on the setup a new game and follow the steps to set the game. The screen shot is shown in Fig.5.

Fig.5. Screen shot of Game Setup

Supply Chain Settings:

The following parameters can be set at in each setting by the administrator. The screen shots are shown below.

Game Settings

Number of Teams :	'1'

| Business Environment : | Lost Sales ○ |
| | Backorder ◉ |

Type of Information Sharing :	----VMI---- ▾
Input Customer Demand Distribution :	Normal distribution ▾
Maximum Number of Weeks to Play :	Enter count of weeks

Lead Times

Retailer Order Time	must be 0	Retailer Receiving Time	In fulfilling order
Wholesaler Order Time	In placing order	Wholesaler Replenishment Time	In fulfilling order
Distributor Order Time	In placing order	Distributor Replenishment Time	In fulfilling order
Factory Order Time	In placing order	Factory Production Time	In fulfilling order

Initial Inventory Details

Retailer	retailer	Wholesaler	wholesaler
Distributor	distributor	Factory	factory

Initial Shelf Space Allowed

Retailer	shelf space

RESET NEXT

May 03, 2013 | © Copyright 2012 Supply Chain Role Play Game | Developed at NIT Calicut, India

Fig.6. Screen shot of setting the initial details for the game and some parameters of supply chain

Fig .7. Screen shot of demand and cost settings window

➤ Business Environment:

In which settings the game is played

- Backorder:
   ✓ Demand (immediate or past due) against an item whose current stock level is insufficient to satisfy demand. Customer order that cannot be filled when presented, and for which the customer is prepared to wait for some time
   ✓ For example, the customer demand is 100 units and the current inventory is 90 units, then the back order is 10 units which will be satisfied in the following weeks.

- Lost Sales:
   ✓ Demand occurs and the item is out of stock - the customer will not wait for the stock to be replenished, thereby the demand is a lost sale.
   ✓ For example, the customer demand is 100 units and the current inventory is 90 units, then the lost sales are 10 units because of out of stock.

➤ Type of Information Sharing:

The following are the possible categories of Information sharing and this can be set under *backorder* or *lost sales* cases.

VMI with four players:

In this the four players acts in a supply chain, and each week the retailer allows the shelf space to wholesaler to get the quantity from the wholesaler.

VMI with three players:

In this the three players acts in a supply chain, and shelf space is fixed by the administrator to get the quantity from the wholesaler to retailer. In this retailer role is absent, but his function will visible to the wholesaler.

➢ Input Customer Demand Distribution

   ✓ This software helps to generate the customer demand as a random variable which follows normal or uniform distribution.

   ✓ It also provides the facility to enter the demand data manually which follows any distribution. which helps to compare the performance at same customer demand

➢ Maximum number of weeks of the play:

It is the duration of the play.

➢ Lead time

Lead time of a stage is the sum of the order lead time and replenishment or delivery lead time. These two can be set for the each stage separately.

Order lead time: This is the time required by the order to reach next upstream stage from a downstream stage. For example, *retailer order lead time* is the time required by the retailer order to reach the next upstream stage, wholesaler.

Replenishment or Delivery lead time: This is the time required by the shipment quantity to reach downstream stage from its immediate upstream stage. For example, *retailer replenishment lead time* is the time required by the shipment quantity to reach the retailer from wholesaler.

➢ Initial inventory at each stage:

It is calculated based on the lead time and review period. For example if mean of customer demand is 20,order lead time is one, replenishment lead time is one and review period is one. The initial inventory is 60 (20*3), calculated as mean of customer demand multiplied by sum of lead time and review period.

- Initial shelf space allowed:
    - ✓ In case of four players initial shelf is allocated to wholesaler for the week 1
    - ✓ In case of three players the shelf space is fixed and it is for entire duration of game play.
- Performance analysis period:

    It is the time duration under which the performance of the supply chain is evaluated. It is better to eliminate some initial periods to reduce the initial bias. Similarly it is better to remove some end periods to eliminate the end game effect.

- Holding cost per unit per period at each stage
- Backorder or lost sales cost per unit per period at each stage

Performance Measures:

The performance of the supply chain under each setting can be evaluated for the performance evaluation period. Various performance measures possible at each stage of the supply chain are:

- Fill rate
- Variance of orders
- Total end period inventory
- Inventory variance
- Variance of allocated space
- Variance of allocated quantity
- Holding cost
- Total cost of the supply chain: This is the sum of the inventory cost of all stages in the supply chain
- Backorder or lost sales cost
- Total inventory cost: This is the sum of the holding and backorder or lost sales cost of a stage

The screen shot of performance measures provided by software are given below.

S.No.	Performace Measure	Checkbox
1.	Fill rate	☐
2.	Variance of Orders	☐
3.	Total End Period Inventory	☐
4.	Inventory Variance	☐
5.	Variance of Allocated Space	☐
6.	Variance of Allocated Quantity	☐
7.	Total Cost of Supply Chain	☐
	Some other Useful Data	
1.	Demand Arose	☐
2.	Demand Met	☐
3.	Total Inventory Cost	☐
4.	Lost/Backorder Sales Quantity	☐
5.	Lost/Backorder sales Quantity Cost	☐
6.	Total End Period Inventory Cost	☐

Fig.8.Screen shot of performance measures

Timer Settings:

This setting includes notification time and blocking time. By setting this it shows the timer in each window of the supply chain. If the players do not take the decision within the specified time it will block the team. The screenshot of timer settings window is shown below. After setting the time click on start game, the game will start to play.

Fig.9.Screenshot of timer settings window

The minimum value of notification time is 3 minutes and blocking time is 2 minutes.