

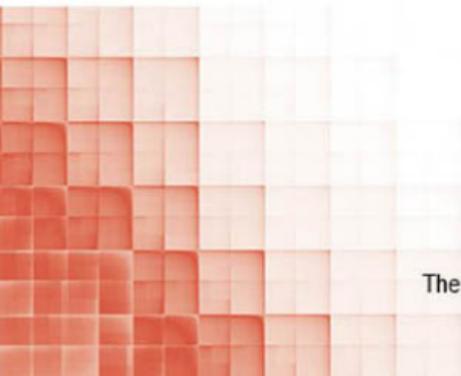
# **Tussle between Maintaining Customer Satisfaction and Supply Chain Constraints: IGNYs Automotive**

---

**Satish Kumar, Indian Institute of Management;  
Dileep More, Indian Institute of Management**

---

**PEARSON CASES IN SUPPLY CHAIN MANAGEMENT AND ANALYTICS**



The case is reprinted from *The Supply Chain Management Casebook* by Chuck Munson

# Tussle between Maintaining Customer Satisfaction and Supply Chain Constraints

IGNYS Automotive

Chuck Munson  
with Satish Kumar and Dileep More

Vice President, Publisher: Tim Moore  
Associate Publisher and Director of Marketing: Amy Neidlinger  
Executive Editor: Jeanne Glasser Levine  
Operations Specialist: Jodi Kemper  
Managing Editor: Kristy Hart  
Senior Project Editor: Betsy Gratner  
Compositor: Nonie Ratcliff  
Manufacturing Buyer: Dan Uhrig

© 2014 by Chuck Munson  
Published by Pearson Education, Inc.  
Publishing as FT Press  
Upper Saddle River, New Jersey 07458

FT Press offers excellent discounts on this book when ordered in quantity for bulk purchases or special sales. For more information, please contact U.S. Corporate and Government Sales, 1-800-382-3419, [corpsales@pearsontechgroup.com](mailto:corpsales@pearsontechgroup.com). For sales outside the U.S., please contact International Sales at [international@pearsoned.com](mailto:international@pearsoned.com).

Company and product names mentioned herein are the trademarks or registered trademarks of their respective owners.

All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.

ISBN-10: 0-13-358549-2  
ISBN-13: 978-0-13-358549-0

Pearson Education LTD.  
Pearson Education Australia PTY, Limited.  
Pearson Education Singapore, Pte. Ltd.  
Pearson Education Asia, Ltd.  
Pearson Education Canada, Ltd.  
Pearson Educación de México, S.A. de C.V.  
Pearson Education—Japan  
Pearson Education Malaysia, Pte. Ltd.

Reprinted from *The Supply Chain Management Casebook* (ISBN: 9780133367232) by Chuck Munson.

# Tussle between Maintaining Customer Satisfaction and Supply Chain Constraints: IGNYS Automotive<sup>1</sup>

**Satish Kumar<sup>†</sup> and Dileep More<sup>‡</sup>**

Mr. Neil Parr, head of Automotive Division of IGNYS, is facing a tough time. He needs to prepare a presentation to the board of directors of the IGNYS Company regarding the dip in customer satisfaction that was highlighted in yesterday's JD Power and Associates market research report. Ms. Arunima Pandey, the marketing and customer care director, and Mr. Rajesh Kumar, operations head of IGNYS, are helping Mr. Parr to prepare for the presentation. Ms. Pandey is worried about the way supply chain efficiency of the spare parts operation is deteriorating day by day. She is also concerned about the measures taken by Mr. Kumar to improve the existing situation.

The marketing and customer care unit mainly interacts with the dealers in the downstream supply chain. As an improvement initiative, the unit has identified dealers who are placing maximum orders and given special consideration to apply inventory management at their end. The unit has also implemented a dealers' engagement program through which they are making dealers more energetic and engaged

<sup>1</sup> As this is a pedagogical case, certain data have been disguised to ensure data confidentiality. None should be interpreted as being the actual data from this company.

<sup>†</sup> Indian Institute of Management, Calcutta, India; satishk2013@iimcal.ac.in

<sup>‡</sup> Indian Institute of Management, Calcutta, India; dileep\_more@iimcal.ac.in

with IGNYS automotive. However, for the unit managing 36,143 automotive parts of vehicles and looking after 4,325 active parts, dealing with 2,316 vendors and 190 dealers is indeed a difficult task.

After discussing with the senior management, Mr. Kumar has appointed JP & Company, a top consulting firm, to help IGNYS identify the constraints in, and optimize the performance of, the supply chain for the spare parts business. After interviewing various stakeholders and via data crunching, JP & Company has given its suggestions. Ms. Arunima Pandey is still worried about the implementation component of the suggestions. Meanwhile, Mr. Kumar has tried to implement a few of the consulting firm's suggestions; however, the supply chain gap is widening daily, and management is worried about it.

## Company Background

In 1986, the IGNYS Group was set up in Gujrat, India, in the manufacturing automotive segment of light and medium commercial vehicles. Today, IGNYS is in the top 20 in the utility vehicle segment in India with its flagship brands in the automotive businesses. Over the past few years, IGNYS has expanded into new industries and geographies entering into the two-wheeler segment and opening plants outside of India in order to increase its global footprint.

Today, IGNYS is public company with headquarters in Bangalore, India, and having a turnover of \$10.13 billion. In total, 12,568 employees are serving the organization in its Indian and global operations. There are 10 stock keeping units (SKUs) in the company product portfolio, including SKUs present in small-segment cars, medium-segment multipurpose vehicles, midsize pickup trucks, and heavy-duty trucks. The company has 190 dealerships across 28 states, and the supply chain is being served by 2,316 vendors primarily concentrated in the four industrial hubs of Chennai, Pune, Gurgaon, and Hyderabad. The company is doing well as far as sales are concerned in India, and its branding and advertising is excellent with low after-sales service cost for consumers. However, there is also intense competition in this market from domestic and foreign players, and spare parts management is becoming tougher due to presence of non-genuine spare parts in the market.

There are many non-original equipment manufacturers that supply spare parts in the spare parts market, and they are competing with IGNYS brands on price. However, Standard Motors and India Wheels are the strongest competitors of the IGNYS. Standard Motors offers high margins to vendors and distributors on spare parts, but it also imposes stiff penalties in the case of untimely deliveries from vendors and a high number of urgent orders from distributors. On the other hand, India Wheels has bargaining power strength since it has the largest market share in the industry. This firm forces its vendors to deliver parts on time and levies heavy penalties on distributors in case of highly urgent orders from them. Compared to Standard Motors and India Wheels, IGNYS offers relatively higher margins to the vendors and dealers; however, it has low bargaining power with its vendors due to its low market share in the industry.

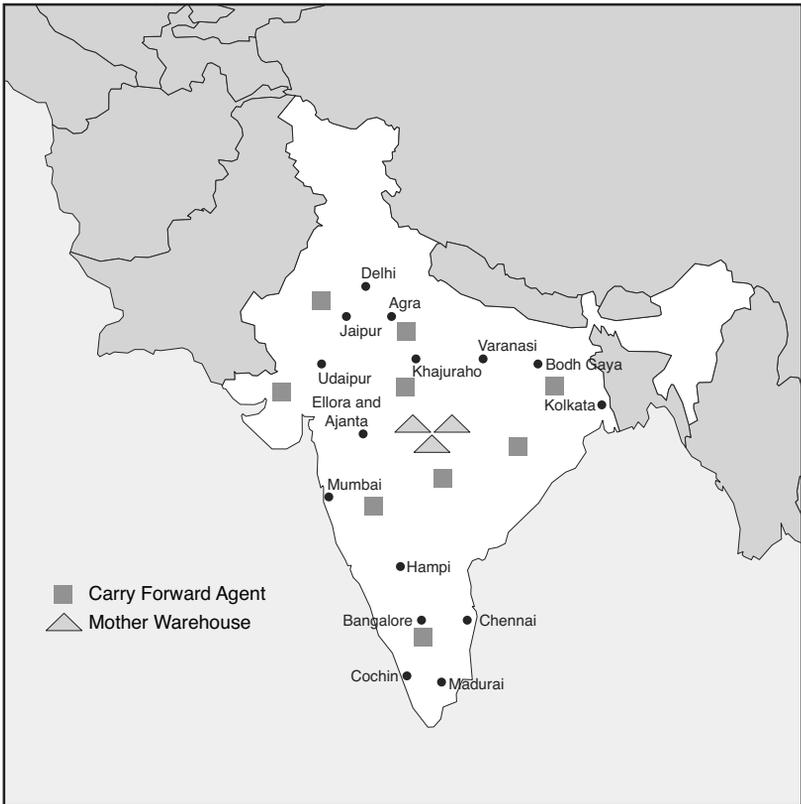
## **Spare Parts Supply Chain Management at IGNYS Automotive**

Whenever the customer experiences any fault in the vehicle, an order is placed by the customer through the dealer. Depending on the urgency of the order, the dealer places the order either in *urgent* order category or the *relax* order category. The serving time for the urgent orders is two working days and for relax orders is 10 working days as promised by IGNYS. As expected, the margin for dealers is much higher in relax orders. Serving time includes order confirmation and order dispatch.

The dealer places the orders through SAP data base management software, and the orders are routed to the mother warehouse. IGNYS currently has three warehouses located at one place in the country. In the urgent order category, every day an SAP run takes place, and, if the material is present in the warehouse, it will automatically be assigned to this order. If the material is not present, a notice is sent to the respective sourcing manager of the spare parts division, who places the order with the vendor. The vendor delivers the material to mother warehouse, and then it is shipped to the respective dealer by third-party logistics. For relax orders, the SAP scanning is done every day for one region (the country is divided into the 6 regions). If the

material is present in the warehouse, it is allocated to the orders; otherwise, the same procedure (as for urgent orders) applies.

In spare parts management, the Carry Forward Agents (CFAs) play a crucial role in the supply chain as they act as small company warehouses close to the customer end. They are responsible for the highly frequent relax orders so that those orders can be directly served from them. There are currently 10 CFAs of IGNYS in all of India's big states as shown in Exhibit 1. However, due to small size, CFAs are not able to serve their core purpose effectively. The other major problem the CFA faces is idle inventory, which is consuming a substantial part of the total space of the CFA, as shown in Table 1. The table shows that a large amount of inventory for different SKUs is idle for long time, which ties cash in the inventory and occupies storage space of CFAs.



**Exhibit 1** CFA and Mother Warehouse locations of IGNYS in India.

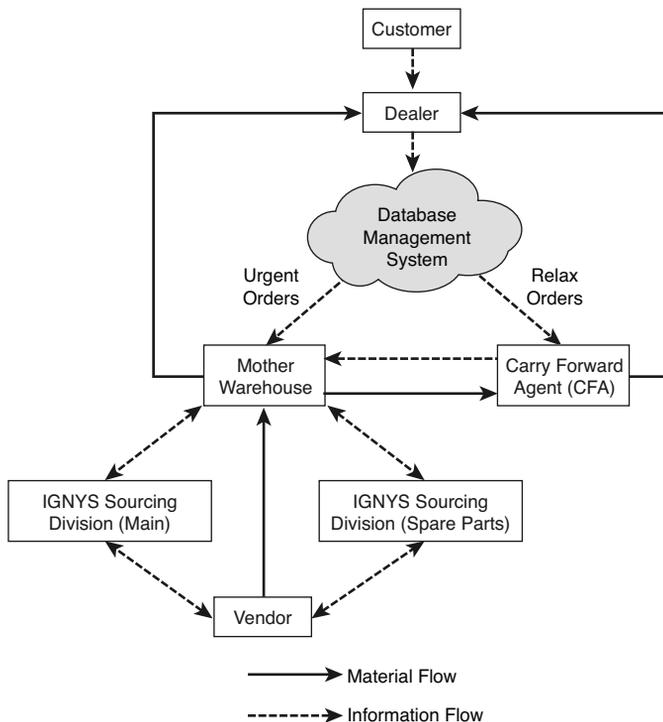
**Table 1** CFA's Idle Inventory Data

<b>No. of Days (Idle)</b>	<b>Value of Stock (Rs)</b>	<b>No. of Days (Idle)</b>	<b>Value of Stock (Rs)</b>	<b>No of Days (Idle)</b>	<b>Value of Stock (Rs)</b>
786(SKU <sub>1</sub> )	300	493(SKU <sub>15</sub> )	50,000	308(SKU <sub>27</sub> )	4,000
644(SKU <sub>28</sub> )	52,000	491(SKU <sub>11</sub> )	100	307(SKU <sub>35</sub> )	4,000
617(SKU <sub>18</sub> )	3,000	459(SKU <sub>19</sub> )	3,000	276(SKU <sub>4</sub> )	18,465
615(SKU <sub>6</sub> )	1,000	430(SKU <sub>10</sub> )	11,000	256(SKU <sub>20</sub> )	45,768
610(SKU <sub>12</sub> )	40,000	398(SKU <sub>26</sub> )	4,000	253(SKU <sub>22</sub> )	2,389
583(SKU <sub>24</sub> )	500	386(SKU <sub>31</sub> )	50,000	245(SKU <sub>14</sub> )	13,456
557(SKU <sub>33</sub> )	5,000	378(SKU <sub>7</sub> )	3,560	227(SKU <sub>3</sub> )	1,000
549(SKU <sub>13</sub> )	30,000	367(SKU <sub>21</sub> )	600	214(SKU <sub>23</sub> )	3,000
521(SKU <sub>29</sub> )	900	353(SKU <sub>16</sub> )	17,839	199(SKU <sub>30</sub> )	3,876
520(SKU <sub>8</sub> )	50	346(SKU <sub>9</sub> )	2,367	189(SKU <sub>36</sub> )	500
518(SKU <sub>17</sub> )	20,000	337(SKU <sub>32</sub> )	3,000	184(SKU <sub>5</sub> )	5,000
511(SKU <sub>34</sub> )	4,000	322(SKU <sub>38</sub> )	26,000	171(SKU <sub>2</sub> )	6,000
499(SKU <sub>37</sub> )	8,000	317(SKU <sub>25</sub> )	45,664	168(SKU <sub>39</sub> )	12,367

There are a number of players such as vendors, CFAs, dealers, customers, and the IGNYS main and spare parts sourcing divisions themselves that are involved in the spare parts management system. Exhibit 2 shows the complete picture of spare parts management, including material and information flows.

**Dealers**

Dealers are the front face of IGNYS's supply chain. The dealer places spare part orders through database management software. Many times, the dealer uses its own discretion whether it should place a relax order or an urgent order. Table 2 shows typical order type classification of urgent orders for an SKU by dealers, and the trend is similar for the other SKUs as well. The high-frequency O1, medium-frequency O2, and low-frequency O3 order types have orders covering 8–12 months (presence of at least a single order continuously for 8-12 months in a year), 4–7 months, and 1–3 months, respectively, in a year.



**Exhibit 2** Process map of the IGNYS spare parts supply chain.

**Table 2** Order Type Classification for Urgent Orders

Month	Order Type			Total Urgent Orders
	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	
Jan, 2012	43%	7%	50%	5,263
Feb, 2012	42%	7%	51%	5,678
Mar, 2012	43%	4%	53%	5,643
Apr, 2012	39%	3%	58%	4,567
May, 2012	42%	5%	53%	7,865
Jun, 2012	38%	4%	58%	5,656
Jul, 2012	45%	6%	49%	6,754
Aug, 2012	46%	8%	46%	8,765
Sep, 2012	48%	9%	43%	5,875
Oct, 2012	43%	6%	51%	4,567
Nov, 2012	37%	5%	58%	5,444
Dec, 2012	42%	7%	51%	5,555

The dealers should maintain sufficient inventory levels of the spare parts with high purchase frequency. However, many dealers who do not want to tie up their money in inventory usually place a high number of urgent orders. This is creating difficulty for IGNYS to fill those orders. After visiting dealers, the consultant has identified the major constraint of the situation as non-adherence of on-time delivery of spare parts to the dealers. The dealers are not getting the urgent orders in two days, and the relax orders usually take more than a month. Hence, even if the dealer wants to place a relax order he is forced to put that order in the urgent order cycle so that he would more likely receive the order in 5–10 days. Sometimes the dealers have a bad payment history and poor performance; hence, IGNYS's warehouse may not serve these dealers if they order through the relax order route. However, if they order through urgent order route, the warehouse has to send the spare parts to these dealers.

The high number of urgent orders is creating pressure on the warehousing operations. Table 3 shows the urgent order fulfillment rates in 2012, where, in January, for example, 23% of all orders were filled within two days, 40% of all orders were filled within three days, and so on.

Another concern is that genuine spare part prices are high relative to market prices of non-genuine spare parts. Due to this trend, IGNYS is losing market share. Yet another concern is tracking of the spare parts orders. It is difficult because the third party is often not able to trace its trucks due to the unavailability of mobile signals at various parts in India. Finally, many dealers have not implemented proper inventory management practices and hence ask for too many regular orders of which otherwise they could have had sufficient stock.

**Table 3** Cumulative Urgent Order Fulfillment Rates in 2012

Month	No. of days								
	0-2	3	4	5	6	7	8	9	>9
Jan, 2012	23%	40%	50%	55%	60%	65%	65%	65%	100%
Feb, 2012	34%	42%	44%	53%	55%	60%	65%	70%	100%
Mar, 2012	20%	25%	35%	45%	50%	57%	63%	68%	100%
Apr, 2012	22%	32%	37%	55%	60%	66%	69%	73%	100%
May, 2012	12%	24%	36%	48%	60%	72%	73%	74%	100%
Jun, 2012	33%	33%	50%	57%	65%	67%	67%	69%	100%
Jul, 2012	23%	41%	52%	61%	67%	70%	70%	72%	100%
Aug, 2012	23%	33%	44%	55%	66%	77%	77%	80%	100%
Sep, 2012	12%	21%	31%	43%	54%	57%	60%	78%	100%
Oct, 2012	23%	32%	43%	57%	61%	64%	64%	65%	100%
Nov, 2012	25%	35%	45%	56%	60%	67%	69%	77%	100%
Dec, 2012	33%	44%	44%	55%	65%	69%	69%	73%	100%

IGNYS's warehouse confirms the incoming orders received from the dealers based on the availability of the material in the warehouse. However state government permit availability is a major issue here because every spare part order requires an official permit of the state without which the material cannot be transported to that state. The permit has to be sent by the dealer, and sometimes the dealer places a lot of orders but does not send the required number of permits to IGNYS's warehouse. In this case, the warehouse cannot make invoices for the orders that do not have permits, and the orders would be delayed for dispatch until the permits are received. Some dealers do not require permits if the orders are placed within the state where IGNYS's warehouse is located. For instance, the orders coming from the dealers in Maharashtra state do not need permits.

### **Vendors**

Vendors are the backbone of the supply chain. They supply parts to Original Equipment Manufacturers (OEMs). In IGNYS's supply chain, vendors supply the main sourcing division and the spare parts division separately, interacting with the individual sourcing managers. For the spare parts division, the vendors take the orders from its sourcing manager and supply them to the mother warehouse. However, the orders given by the sourcing manager fluctuate highly due to demand uncertainty. After discussing with the senior management of the vendors about their problems, the consultant has identified *high back order* as a major problem. It is also a major concern for the senior management of IGNYS. The consultant has also realized that the spare parts sourcing manager does not share dealers' actual ordering data with vendors; hence, the vendors are not able to plan their inventory much ahead of time. The vendors claim that forecasting of spare parts done by the sourcing manager is wrong and erroneous. The vendors also encounter space constraints at the mother warehouse of IGNYS, because unloading the spare parts there usually takes 3–4 days.

On the other hand, IGNYS usually has smooth demand for final goods. Hence, the vendors get almost constant, regular, and confirmed business orders from the main sourcing division, so they give more preference to those orders over the orders from the spare parts division. The logic behind this, according to the vendors, is that the

orders from the spare parts division are irregular; hence, the vendors cannot achieve proper economies of scale. A select few vendors are contributing most of the backorder problems. It has been seen that 70–80% of the backorders (by value) come from only 20% of the top SKUs. Finally, each sourcing manager of the spare parts division looks after 30–40 vendors, and sometimes the vendors complain that the individual attention of the sourcing manager is very poor.

### ***Warehousing***

IGNYS has three central mother warehouses at one location for the spare parts division. The operations are managed by a third party. All orders come to the mother warehouse from the dealers, and after the software runs, the spare parts present in the warehouse are automatically assigned to the respective orders. The next day, an operator collects the parts from the bins in specified locations in the mother warehouse and gives the parts to prepackaging department. After prepackaging, the order is given to the dispatch office. The part details in the order are inspected, and the permit and invoice are attached to the order before dispatching.

After discussing with managers of the warehouses and analyzing the process flow diagrams at the three warehouses, the consultant has identified the first major constraint in the warehouse as the *space*. Also, the warehousing operations are handled by third party; hence, sometimes there is a conflict of interest with respect to doing work that is more beneficial to the third party as compared to IGNYS. Sometimes the spare parts sourcing manager tries to persuade warehousing operators to work on their orders, leaving the operator's job to arrange and execute the orders on first-come, first-served basis. Warehouse operators still rely on manual work as the level of automation in the warehouse is low. There is idle inventory, which in some cases has been lying for many years in the warehouses. Because of presence of these constraints, too much time is lost in finding the required parts and filling the orders.

Presently, IGNYS maintains a safety stock of all the spare parts. The trucks of vendors usually take 3–4 days for unloading the materials at the warehouse, and the vendors are upset because of this time delay. The spare parts are checked at the main gate, and then a location is assigned to the parts. Next, the logistics person stores the spare

parts at the required destination inside the warehouse. When searching for material, the SAP system provides the location of the spare parts. After the parts are retrieved, they are sent to the prepackaging and post-packaging process areas. These processes include individual material packing, final clubbing according to the orders, attaching permits and printing the invoices. Finally, the orders are dispatched based on minimum ordering quantity.

### ***The Sourcing Division***

The main responsibility of the spare parts sourcing division is to take orders from the dealers and place the orders to either the mother warehouse, if material is present at the warehouse, or place the orders with the vendors. The concerns for this division include the high bargaining power of the vendors and late order deliveries. Few vendors have capacity or monetary constraints; hence, they give more preference to the orders received from the main sourcing division over the spare parts sourcing division. The vendors also frequently ask for price increments. The spare parts sourcing division is also concerned about the demand variation and is not able to predict the future demand for spare parts well. Thus, it has become difficult to meet the timelines without having high inventory levels for all the spare parts. Each spare parts sourcing manager handles up to 40 vendors, making the job very difficult. The consultant believes that is the cause of the high attrition rate in the division. The average age in the division is 35, which means that there are many junior people working in the division, and many times they are not able to handle the vendors' concerns. The order forecasting accuracy is very poor, even though the sourcing manager accounts for trend and seasonality. There is also concern about data and knowledge sharing between the vendors and the sourcing manager. Experienced personnel are also reluctant to share data and knowledge with junior members.

### **Summary**

The number of urgent orders has been continually increasing, which is leading to the low service levels in warehousing. The point strongly raised by Ms. Arunima Pandey is that the warehousing operations have gone bad. On the other side, the dealers are unhappy since

they are losing their margins on the relax orders and are forced to place urgent orders so that the material arrives on time. The vendors are not happy as they are not getting confirmed and stable orders from the spare parts division. There is a high attrition rate in the sourcing division. The operations at the warehouse are being managed by a low level of automation. The team is now ready for the senior management presentation.

## Discussion Questions

1. Identify the undesired effects (UDEs) in the spare parts supply chain of IGNYS. (*Hint*: UDEs are the indicators of problems, have negative influence on a system or a subsystem performance and are not desired on the way of achieving the goal.)
2. Identify the core undesired effect(s) in the IGNYS's spare parts supply chain. (*Hint*: Core undesired effect(s) cause most of the UDEs. Here, to identify the core cause, develop a current reality tree.)
3. Identify the conflicts that can be observed in the supply chain of IGNYS. (*Hint*: Conflicts could be alternative or opposite actions or issues having a common goal.)
4. Suggest the solution(s)/action(s) to solve the conflict(s) that you have observed in the IGNYS's supply chain. (*Hint*: Develop a conflict resolution diagram.)
5. What would be the negative consequences of the proposed solution(s) or action(s) if implemented? (*Hint*: The negative consequences are again UDEs that arise if the solution is implemented.)
6. If the players in the supply chain do not agree that proposed solution will solve the problem, how will you convince them to implement the solution? (*Hint*: Develop a future reality tree (FRT) and apply negative branch resolution (NBR).)
7. Identify the obstacles while implementing the proposed solution(s). (*Hint*: Use the first part of developing the Prerequisite Tree-PRT.)

**15** TUSSELE BETWEEN MAINTAINING CUSTOMER SATISFACTION  
AND SUPPLY CHAIN CONSTRAINTS

8. Explain the intermediate objectives and actions to overcome the obstacles that are identified in Question 7. (*Hint: Use the second part of the Prerequisite Tree-PRT.*)
9. Develop a concrete map considering the intermediate objectives, actions, and the need for the actions. (*Hint: Develop the Transition Tree –TRT.*)
10. How could you achieve ongoing improvement in IGNYS's supply chain? (*Hint: Apply the five steps of the Theory of Constraints.*)