Summary Report: Lessons Learned

Abstract:

This report intends to survey the experience we had as a team when we played the supply chain collaboration simulation game by Inchainge, focusing on critical thinking, teamwork, collaborating, analysis, risks, and strategies to achieve an optimal return on investment. The report highlights the implementation of the theoretical concepts that were used in practice for the game, the lessons learned from mistakes, how we bounced back from the mistakes, and how proper collaboration with team members of respective departments plays a vital role in the success of the company. It also highlights the need to not only focus on oneself but to play the game as a team, to make collective and responsible decisions, to stand up for the mistakes, and to learn from the mistakes. Overall, having played the game and invested a lot of time in discussions proved to be good, as we emerged as toppers in the class for maintaining the highest positive return on investment, balancing out most of the parameters in the respective departments, leveling up, and getting an insight into the real world of the supply chain while also focusing on the importance of proper research and collaboration with the team members to achieve the common objective.

Introduction:

The fresh connection business simulation game developed by the Dutch company Inchainge aimed at helping students play in a fun, competitive, risk-free, yet realistic environment where a direct relationship between cause and consequence can be experienced. The company is a producer of fresh fruit juices based in the Netherlands and is currently undergoing losses and needs to return to profitability by making strategic decisions, logical reasoning, and collaborative teamwork between members by playing a game comprising six rounds, where each round represents six months in the life of the company. The decision-making is split into four respective departments, namely Sales, Operations, Supply Chain, and Purchasing, who ultimately have to collectively make decisions in the common interest of the company's objectives.

The company primarily produces fruit juices in three flavors: orange, orange C-Power, and orange/mango. These juices are packed in PET bottles and cartons, have a shell life within which they are to be sold and are stored on pallets in the outbound warehouses. There are different storage units in the inbound warehouses based on the type of raw material. Each member is assigned to a specific department and has a role and responsibility to fulfill. As the VP of the Purchasing department, I was assigned the task of choosing suitable and optimal suppliers who present favorable terms with our company, provide low prices and a high level of reliability, keep total purchasing under control, and maintain the agreed delivery reliability of components so that production goes on smoothly. I had to make purchase deals for five components, namely PET, pack, orange, mango, and vitamin C, from various suppliers to produce the final product.

Methodology and Analysis:

Round 1:

After we were given a brief introduction to the basics of the game and a few technical parameters, we were instructed not to collaborate with our teammates for the first round. The initial conditions were set to be the same for all the team members within a given time frame. The user interface of the game was really good, and within no time we could get an idea about the options available for gameplay. Since there was no collaboration with the teammates, the changes in round 1 were very minimal, and the results were also similar. We as a team felt that it was better to make minimalistic changes and look at which parameters would be affected rather than mass-changing all the parameters. My focus was to keep the contract index low so I could purchase the components at a lower price. Changes were made in the trade units from tank and drum to IBC for oranges and vitamins, respectively. At the end of the first six months, we observed that the delivery reliability of Trio PET PLC and Seitan Vitamins (84.5% and 81.5%) was significantly less than what was agreed upon, and the rejection percentage for components supplied by the supplier for PET was high (5.9%). No action was taken as there was no communication between the team members, so I felt it was a better option to wait and carry on with minimalistic changes in the very first round. We also found out that the raw material warehouse was relatively full, so an increase in pallet locations in the raw material warehouse increased cube utilization, and the finished goods warehouse was empty, so pallet locations in the finished goods warehouse decreased, resulting in an increase in cube utilization and a slight increase in overflow. The availability of vitamin C for production was low, so safety stock was increased, resulting in high availability. The service level was increased as low service was being provided; this increased revenue, but penalties remained the same. The overall rejection rate and delivery reliability were 2.9% and 92.2%, respectively. Based on the half-year financial report, a return on investment (ROI) of -2.3% was achieved.

Round 2:

Having got an idea now about the gameplay, my team decided to do a proper study on the available parameters in the respective departments allocated to everyone and know the proper meaning of new terms associated with the gameplay. We wanted to make sure if there were any changes to be made, a proper reason should be put forth before changing it in the gameplay. Looking into the dashboards, our next aim was clear. We proposed raw material inspection by the operation department because Trio PET PLC faced major product rejections. This implementation resulted in a decrease in rejection by 0.8%. The delivery reliability of PET and Orange was still less than what was agreed upon, so we proposed to change the delivery reliability to 90%, change the delivery window to four hours for Pack 1 Litre and PET, and change the payment term to three weeks for PET, but we did not get the expected change; instead, the delivery reliability decreased from 84% to 73.6%.

The payment term was changed, hoping that earlier payments to the supplier would increase or strengthen goodwill. Breakdown time was high, so training was provided to employees to solve it, and the impact was that breakdown time decreased from 10.9 hours to 1 hour. Production plan adherence on the Swiss Fill 2 was low, so bottling line speed was increased, resulting in an increase in production plan adherence from 81.5% to 92.5%. PET had higher stock levels, so we reduced the safety stock from 2 to 1.5 weeks, resulting in a reduction of average stock components from 4.3 to 4.1. A high percentage of obsolete products was found in the outbound, so the safety stock of Fressie Orange/C Power 1 Litre and Orange/C Power 1 Litre was reduced from 3 to 1.5 weeks, causing a decrease in obsolete products at the outbound from 8.3% to 1.7%. Increasing the service level impacted a better contract index, and penalties were decreased. High obsoletes of 8.3% were observed, so the shelf life was decreased to 73% for Food & Groceries, Land Market, and 70% for Dominick's, causing a decrease in the obsoletes percentage to 1.7. To enhance cash flow The payment term was set at three weeks for all customers. We felt it was better to give cash in case of any uncertainties. By the end of round 2, we concluded that the service level had improved and led to a decrease in penalties, and we were able to achieve a positive return on investment (ROI) of 4.7% at the end of round 2.

During the team meeting, we set up further actions at the end of round 2 for the next round. Based on that, we set up one main objective for each of the departments and collectively worked towards it to improve our ROI. For the purchasing department, the aim was to increase the delivery reliability of Trio PET PLC and Miami Orange; the operations department had to focus on improving cube utilization and run time; the supply chain had to reduce the stocks of Moo Packaging Materials; and the sales department had to improve service levels and increase sales revenue. Our team created supply chain mapping to better understand what changes can be made in the next round and see where the focus should be. We took an innovative approach to designing it and made sure all the parameters were matched properly and made sense when referred to.

Round 3:

For the third round, we found out that the delivery reliability of Seitan Vitamin C was low (81.5%), so we decided to change the supplier to YoBoMa. After carefully selecting the parameters and the services they offer and comparing them with other suppliers, YoBoMa came out as the correct supplier, and the delivery reliability was increased to 94%. The rejection percentage for components supplied by the supplier for Trio PET PLC was high (5%), so again looking upon the available suppliers and choosing the optimal supplier for our needs, we went ahead with a new supplier, Philyp Jones Plastics, as they had mentioned that they were known for their reliability and that they had certification, but the results were not as we expected; rather, we saw that the rejection percentage for components supplied by the new supplier for Trio PET decreased to 3.8% and the agreed delivery reliability was not delivered (79%).

The operations department had observed that the raw material warehouse was relatively empty with pallet locations open, so we increased pallet locations from 1050 to 1000, resulting in an increase in cube utilization from 78.4% to 87.1% and overflow from 4.8% to 6.9%. The raw material inspection was introduced to the new supplier of Vitamin C, finding that the rejection rate for YoBoMa was 6.3%. From the supply chain department, we observed that Pack 1 Litre had a higher level of stock, so we reduced the safety stock of Pack 1 Litre from 2 to 1.5 weeks, causing a reduction in stock components. There was also a high percentage of obsolete products in outbound, so we decreased the production interval of fressie orange 1 liter and fressie orange/mango 1 liter to seven and eight days, respectively, causing a decrease in obsolete products of fressie orange 1 liter from 2.6% to 2.1% and fressie orange/mango 1 liter from 2.1% to 1.4%. The sales department saw that a lower service level was being provided than what was agreed upon with Food and Groceries, so we kept the service level constant at 95% by other parameters. This caused a slight increase in service level by 0.5%. It was seen that the production interval for Fressie Orange and Fressie Mango was decreased, so shelf life was increased to 1% only for food and groceries, causing a shelf life of 87% to be attained. An observation was made that customer priority could be set in case of a shortage of products, so customer priority was set based on the highest demands. Based on the financial report, our company's return on investment (ROI) of 6.2% was achieved.

Round 4:

With the same approach, we moved on to round 4 and observed that the rejection percentage for components supplied by the supplier for Seitan Vitamin C was 6.3%, so we changed the quality of the product of the supplier from poor to high, which decreased the rejection to 3.1%. After changing the supplier of Trio PET PLC to Plantin PET, we were able to increase the delivery reliability from 79% to 94.2%. There was an option of dual sourcing for a particular product, but the reason we did not opt for it was because that was too costly to implement it for a product with low demand. The operations head observed that the lot size of mango was reduced from 4 to 3 weeks and PET from 4 to 3.5 weeks, so we increased pallet locations in the raw material warehouse from 1000 to 950, causing a decrease in cube utilization from 87.1% to 81%. It was also observed that the production interval of Fressie Ornage/C Power 1 Litre, Fressie Orange PET, Fressie Orange/Mango PET, and Fressie Orange/C Power 1 Litre was reduced from 10 to 7 days, so we increased the pallet locations in the raw material warehouse from 1100 to 1030, causing a decrease in cube utilization from 87.1% to 86.7% and an increase in overflow from 1.3% to 2.1%.

The supply chain observed that there was a high level of availability of components for production, so the lot sizes of mango and PET were reduced from 4 to 3 weeks and 4 to 3.5 weeks, respectively, causing a slight reduction in the availability of components. A high percentage of obsolete products in outbound was seen, so we reduced the production interval of all the components to seven days, resulting in a reduction in the obsolete percentage of the respective products.

A rigid production interval was observed, so the frozen period was reduced from 3 to 2 weeks, resulting in an increase in service level due to the flexibility of the production interval. The sales department had observed that the production interval for all the products was decreased and the frozen period was decreased, so the shelf life was increased for Dominck's by 2%, causing a better contract index and service level of 96.1% for Dominck's. Fressie Orange/C power PET had a bias of -0.2%, so we increased the forecast for the weekly demand for the respective product by 5%, cascading an increase in obsoletes from 0.8% to 1.5%. At the end of six months, we achieved a return on investment (ROI) of 5.70%.

Round 5:

At the end of round 4, we had come up with a few conclusions and strategies to play in round 5. The service level of all the customers increased significantly, but the average gross margin decreased as production costs increased. So, for each department, the strategic plan was: the purchasing head to maintain the suppliers and look to reduce rejection rates; the operations head to collaborate with the supply chain to optimize production and inventory; the supply chain head to reduce the availability of components to reduce inbound pallet locations; and the sales head to focus on improving gross margin per week and increasing sales revenue. We tried discussing and looking for various alternatives to see where improvement could be made, and we went on with the following changes: For the purchasing department, we had the option of vendor management inventory, which could have been employed for each supplier. This may or may not have increased our ROI by +5%. After proper study and discussions with our members, we decided to opt out of this scheme as it was not worth investing 5,000 euros per year for a result that is not sure. The supply chain head increased the safety stock of vitamin C as it has low availability for production, and the sales head increased the service level, causing an increase in ROI and a weekly gross margin increase. We, as a team, were able to achieve the goals that we had set for the respective rounds. The dashboards also mentioned that our company is generating good profits. A good return on investment of 6.4% was achieved at the end of this round.

Round 6:

In this particular round, we had little scope to improve as we had minimized the rejection rate of components to 2.2%, raw material costs to 31.8%, and increased the delivery reliability of customers to 95.9%. The operations department also increased the production plan adherence to 92.4% and increased the cube utilization of the raw materials warehouse and finished goods warehouse to 80.5% and 84.3%, respectively. The sales team minimized the obsolete products to 0.7%, the service level of outbound order lines was achieved at 95.9%, and a gross margin of 344464 was achieved. The supply chain head maintained the availability of components at 99%. We also observed that the team that had invested in VMI had no impact, indicating that we made a safe move.

Having achieved most of the parameters and not being able to find where we could look for improvement, we went ahead with retaining the same parameters we had from round 5 and keeping the same Kpi's intact. The result was that we secured the top position in the class for maintaining the highest positive return on investment of 6.5%.

Conclusion:

Having the opportunity to run a company with a simulation game during the duration of the course changed the way I look at the field of logistics. There were so many new terminologies and parameters involved, which took a lot of research, investment of time and resources, meetings, arguments with members, and disagreements. Collaborating with the team members, working towards the company, and not being selfish proved to be worthy. In the end, I was able to gain valuable lessons from this course and know the reality of the field of logistics and how little changes often lead to major impacts. The user interface of the game is so good that in no time we get an idea about the game, and one valuable lesson that I learned is to not make decisions in a hurry without proper backing and proof.

Reference:

Mastering the Supply Chain. (n.d.). Retrieved February 2, 2024, from https://elearning.ovgu.de/pluginfile.php/884824/mod_resource/content/0/7%29%20MSC%20selected%20pages.pdf