

# Decision analysis and work flow management tool business plan sample

[Business](#), [Customers](#)



A. Develop a distribution pattern that meets availability and demand constraints and minimizes total shipping costs for Shuzworld, utilizing the appropriate decision analysis tool.

1. Submit a copy of the output from your decision analysis tool of choice.
  - a. Explain why you chose the decision analysis tool you used.

Shuzworld, a manufacturing company has a total of 3 production plants. In addition, they also have 3 centrally located warehouses, which also contain the most successful line of women's shoes. The manufacturing plants were identified to be Shanghai, Shuzworld Hangzhou, and Shuzworld Fuzhou. As per the analysis which had been carried out later, it has been found that the capacity at which they currently produce is enough to meet the demands of the customers.

As per the statistics the current production of Shanghai is 1, 300 units. The goal here is to increase the production of this plant to 2, 800 units, which means an increase of 1, 500 units from the current capacity. In order to fulfill this target the people in-charge or the “ managers” need to implement a distribution policy which will not only increase the product but also lower the overall costs of the company. The first table shows the current rate of output of all the three production facilities, whereas the second table shows the price comparison between the manufacturing facilities and the warehouse. After reviewing the statistical data we can find that the most cost-effective and viable economical distribution for a time span of 1 month is \$13, 400. In order to fulfill this aim the Shanghai plant needs to transport 1500 units to the second warehouse, which is listed. Next would the manufacturing plant named Shuzworld H and they need to distribute 300 units of their products

to the 1st warehouse and then a further 1800 units to the third warehouse. The next step should be to have the 3rd manufacturing plant or Shuzworld F to send their entire production to of 2, 200 units to the first warehouse and a lot of units must also be send to the warehouse which has been termed “ dummy”.

The next step should be to have the Shanghai plant send 1, 300 plants and to send 200 further units from Shuzworld H to the Dummy Warehouse. By solely increasing the demand without the supply, 2, 800 units need to be placed for the future demand levels. The company Shuzworld is increasing the product by increasing production/supply in the manufacturing facility called Shanghai to a total of 2, 800 manufactured products in order to meet a possible future demand level. The current consumer demand is not at this level at this point in time so by using the Dummy Warehouse.

This opportunity will give the corporation the advantage to decide the next direction the company is headed in order to meet the demand of the future and increase the consumer supply. The decision might possibly include adding another warehouse for the additional 1, 500 production of women’s shoes but that will depend on how fast the consumer demand rises versus the supply.

The POM for windows was used for the calculations. The chosen method for this was the Intuitive Lowest-Cost Method due to the factor of the method chooses allocations based on the low-cost ratio being the best alternative.

The accuracy is rated better based on optimal lowest cost findings compared to possible other options on the POM Program such as Vogel’s Approximation Method or even the NW Corner Method.

B. Analyze the reliability of the computer-driven shoe machines process in the Shuzworld Shanghai plant.

1. Recommend ways to increase the reliability of the system, utilizing the appropriate decision analysis tool.
2. Submit a copy of the output from your decision analysis tool of choice.
  - a. Explain why you chose the decision analysis tool you used

In analyzing the reliability of Shuzworld and the production of the product called casual deck shoes these are currently manufactured by the utilization of three manufacturing machines. One of the voiced concerns is the unpredictability of one machine malfunctioning, the entire line of production comes to a stand-still and no more production until that one machine is repaired or replaced. Shuzworld should focus on its main priority of realizing their analyses on efficiencies and improved operations in order to improve the reliability of the company for its consumers. The current total of the machines reliabilities are listed below in the graph with machine number three being the most reliable of all three at . 99 reliability rate.

In order to be completely accurate all information must be dependent on the individual production machines. In these numbers the data is currently incomplete given that the machines all rely on each other in order to complete the production line and keep it running smoothly. The next piece would be to measure the liability by using the statistical data in combined form on all three in order to show the reliability metric. The program used to calculate this would be the POM for Windows which is exhibited in the table below.

As exhibited in the graph above the overall statics of all three machines

together show the overall reliability of 75.68% for the specific type of casual deck shows that are produced by these particular manufacturing machines. When comparing the result it is adequate that the overall score in reliability contribute to being lower than one specific machine by itself.

The specific program used in order to calculate the specific statistical information was the POM for Windows specifically the Reliability Module which is found under the “serial components only” option. The serial components in question are explained as if one manufacturing machine fails, then all manufacturing machines fail at the same time and production is impossible until repair or replacement which is why it is the most accurate decision tool for the statistical information listed and examples given.

Shuzworlds overall reliability statistic of 75.68% shows that for continued operations there needs to be a way to increase the reliability number overall in order to meet a better demand of manufacturing. So in reviewing the data it is important to focus primarily on achieving a reliability that is much higher and in order to accomplish this the solution would be to add redundancy or additional machines to the manufacturing process. As quoted in the reading, “The extra machine will have the same reliability as the one it is backing up, but will greatly increase overall reliability (Heizer & Render, 2010)”. By focusing on increasing the machines in the production process it has the capability to create a backup system for the lowest reliable manufacturing machine which in-turn will increase the overall reliability of the machines combined. The best machine that should be chosen to link the new manufacturing machine to is Machine 1 which has the lowest statistical data of 84% which is listed below in the graph for review:

C. Provide the optimum number of shoelaces to order for the Shuzworld Factory, considering appropriate cost balancing, utilizing the appropriate decision analysis tool.

1. Explain how an economic order quantity amount relates to the problem.
2. Submit a copy of the output from your decision analysis tool of choice.
  - a. Explain why you chose the decision analysis tool you used.

The Economic Order Quantity amount relates to the problem when using this model in order to make assumptions. The demand is relatively known and consistent. Shuzworld uses 300, 000 pairs per year. The lead time is also known and consistent; in regards to the receipt of inventory levels which is all done at once and completed, including quantity discounts which are not available.

The model of the EOQ shows calculation data of 27, 387 for the optimum quantity of shoelaces to order with an overall average inventory level of 13, 693 pairs, which is considered one-half of the optimal order quantity. The model used also shows a calculated amount of 11 as the maximum number of orders placed which shows the overall total being \$1369. 31 in the ordering costs including holding costs of \$1369. 31. Shuzworld can now match inventory levels based upon this statistical information.

This model calculates the minimized total of the overall costs to Shuzworld.

The analyzing shows that Shuzworld is better managing the order times, and the amount of shoelaces to order in assuring a reasonable inventory level. By following the EOQ analysis Shuzworld will in-turn minimize the total overall costs concerning its inventory on shoelaces.

The Shuzworld inventory order department seems to be ordering excess shoelaces each year given what the demand levels are currently. The yearly amount of shoelaces entails 300, 000 and each time an order is placed the amount equals \$125. 00. There is a standard holding cost for shoelaces which is \$. 10 each pair of laces. The company would like to have a more accurate account of the optimal number of units that is needed for orders. In order to find this statistical data information you would need to calculate the information using Basic Economic Order Quantity (EOQ) Model for accuracy. By taking the information and entering the data into POM for Windows this would give the necessary information needed to define the solution see the graph below for specifics.

The information above in the graph shows that instead of ordering the 300, 000 pairs of shoelaces that the order should be 27, 386. 13, and ordering rate of 10. 95 times each year of ordering. It is an impossible feet to order . 13 shoelaces and even to order the 10. 95 each year, so the next step would be to take the data and round up the numbers to a result of 27, 387 shoelace units an order them at a rate of 11 times ordering per year which is far more feasible.

The decision tool that needed to be used for this statistical data information was the Economic Order Quantity. There a many reasons why using this tool was chosen: it is the most common and easiest to use for an inventory control type model. The model itself is basing the information that all of Shuzworld's assumptions regarding statistical data are complete. Economic Order Quantity (EOQ) gives the opportunity for inventory levels to reduce to

zero supply before placing a new order which is an important factor of information given that Shuzworld needs to focus on due to the current overstocking that is occurring

In reviewing the cause and effect on the overage at Shuzworld it is caused by the fact that the men's shows are in demand as previous periods. For a cost balance to occur Shuzworld would need to decide on the ABC analysis and implement it into their system. The definition of an ABC analysis is simply a system of inventory ranking that can help Shuzworld develop certain procedures and policies that link their controls for the inventory. This can be accomplished simply by grouping the inventory into different categories of three and basing this on the yearly dollar volume (annual demand of each item multiplied by the cost per unit). For example take a Class A type item it would be the highest yearly dollar volume, and Class C would be listed as the least yearly dollar volume. By using this type of system it could give the opportunity for Shuzworld to gain tighter controls on the highest priority of the Class A items and allocate more resources to support them. By focusing on allocating more resources on the Class C item would not help the company in the least given Class C is the least yearly dollar amount for the company and there wouldn't be a cost advantage. It can be more effective on cost to focus the main priority on the high dollar inventory that is making more of a profit.

D. Compare the characteristics (e. g., number of customers waiting, waiting time, total checkout time) of one-cashier and two-cashier waiting-line systems.



1. Recommend a one-cashier or two-cashier waiting line system, utilizing the appropriate decision analysis tool.
2. Submit a copy of the output from your decision analysis tool of choice.
  - a. Explain why you chose the decision analysis tool you used.

In comparing the one-cashier and two-cashier waiting line systems there are several factors to consider by Shuzworld in order to make the appropriate decisions. The one-cashier system will have waiting times that are longer, and that means more unhappy customers will be waiting, and there will be service times that are unpredictable and un-measurable typically. By using the one-cashier operating system it is based on the First In, First Out Method (FIFO). This is defined as customers or consumers will end up waiting in line by order of arrival and wait to be checked out at the cashier before leaving. All in all the arrival rate will be slower than the service rate which will be faster when measured. The next piece to focus is the two-cashier system which is like the one-cashier system and operates on the standard First In, First Out Method (FIFO). The difference from one to the other is the customer of the two-cashier model will go to the next available cashier. There can be advantages like decreased waiting times, reduction in the amount of consumers having to wait in the standard lines for checking out. All in all this would equate to a checkout time that is far more predictable and can be more consistent between the different cashiers.

The true question for Shuzworld to decide would be which system the one-cashier or two-cashier system would be a better model for their retail outlet stores. Every company including Shuzworld would want their customers to

have a special feeling when shopping in the stores and they also would want the customers pleased with the fact of being able to purchase the merchandize and leave the store in an appropriate amount of time without long lines of waiting. Statistically, Shuzworld knows that a register transaction can take five minutes to process and that every sale occurs approximately every ten minutes or so which is exhibited in the graph below of the one-cashier system.

**Analyzing the second piece below is a graph that shows the two-cashier system for comparison to the one-cashier system.**

The two show that in looking at the average amount of people that are in line for the one-cashier system equates to . 5 where the two-cashier system equates to . 03. These statistics show that there are far less people in line while using the two-cashier system. The one-cashier has an average number of customers which equates to 1 however, using the two-cashier system the number equates to . 53. This means that there are less customer's in the system using a two-cashier system method.

In reviewing the time spent average standing in line the one-cashier system shows five minutes for each customer whereas the two-cashier system showed only 20 seconds which is far faster than the one-cashier system. The complete amount of time that a customer would spend within the checkout system would equate to 10 minutes for the one-cashier system versus the two-cashier system would equates to 5. 33 minutes which is almost half the time. The graph below shows the factor of probabilities if there were any

consumers in line or even being helped which could be a good concern to focus on for Shuzworld.

### **The One-Cashier System Module is graphed below:**

The Two-Cashier System Module is graphed below:

The graph shows a 50% probability that there won't be customers in the system with the one-cashier system, and it increases to 60% probability by using a two-cashier system. Given this type of data if the decision was to be made the recommendation would be for Shuzworld to not implement a two-cashier system given the 60% probability factor. By only using the one-cashier system it would be in the best interest of Shuzworld given the amount of probability involved with the two-cashier system. The 60% probability factor shows that there wouldn't be the amount of customers needed to even justify the extra costs of the extra cashier. In order for Shuzworld to help their customers feel special and assist them in their purchase of shoes during their valuable time it is important to make the customer feel valued and give that one on one attention wow factor.

The statistical information used in this section was calculated by using the POM for Windows program. The module for the waiting lines was used as it was specific to this portion of the requested task. Using the single-channel option was the preferred method for the one-cashier calculation statistics due to the fact the information supports using the one-cashier meets the necessary criteria for the single-channel. Using the multi-channel option was used in the two-cashier system model, due to the fact it also met the criteria of having a one line system with two cashiers. The wait-line tool for analysis

has been chosen because of its flexibility for a single server as well as for the multiple server applications.

## **References:**

- Taylor, B. W & Russell, R. S. (2007). Operations Management (6th Edition). United States: John Wiley and Sons, Inc.
- Heizer, J., & Render, B. (2010). Operations management (10th ed.). New Jersey: Pearson
- Brown, S. (2001). Operations Management. (6th Edition). United States: Routledge.