REVIEWER 1

This paper discusses an inventory ordering policy when considering dependency factor, a variable that indicates the level of dependency between one product and its substitutions. The basic EOQ model with lead time is modified to optimize the inventory outcomes. I suggest a major revision as explained below.

1. One major issue with this paper is that the authors need to justify why EOQ model still apply to the scenario described in the paper. The goal of EOQ is to minimize the sum of ordering cost and holding cost. However, as illustrated in Section 4, the authors seem to maximize revenue using their inventory ordering policy. Also, when considering the penalty cost for shortage, why EOQ model is the best option? EOQ model is a good theoretical concept to demonstrate optimization of inventory consumption while taking into account the trade-off between order cost and holding cost. Our model could also be applied on other inventory model, like newsboy for example. The core development of the model is the advanced part of "smart" engine that calculates probabilities of future consumption given specific product's stockout. This calculation is continuance so that with time the accuracy level is getting better as there are more cases or observations.

2. Another major issue with the algorithm is that the authors did not specify how to choose the substitutable products when one item is out of stock. The numerical study in Section 4 assumed only two products in the group, which obviously avoided the discussion of substitutable product selection. If item A is out of stock and customers can switch to products B or C, then which products between B and C should have higher ROP? The answer was merely discussed in this paper although the authors claimed that the proposed solution is for “multiple substitutable items within an inventory system”. This is a good question, we must clarify that only for simplicity purposes 2 product were introduced, the model is designed to have the capacity to deal and calculate mutli-products data set. If product goes out of stock and has let's say 4 substitute items so the consumption probabilities of these 4 will have to be all equal to 1 [1 = P(T) = P(1) +P(2) +P(3)+P(4)]. Based on the dependency factor (correlation strength) we know how to allocate different weights to different items. These differences reflect the consume taste given OOS of specific product.

3. Last but not least, I believe the paper needs to compare its ordering policy with some other existing policy in order to demonstrate that the proposed policy achieves a much better result. Can this policy generate lower cost (or higher revenue) that the cited paper? Comparing the proposed policy with the basic EOQ provided very limited insights. The comparison of the ordering policy will be the future research which will be undertaken in due course of time.

Besides the three major issues listed above, there are some minor comments.

1. The algorithm needs to specify when the ROP will be adjusted: when one product is out of stock or when its supply from the upstream is delayed.

2. Is eta_{i,j}=eta_{j,i}? If not, then the definition of eta_{i,j} (defined as Strength of the correlation between product i and product j} is unclear. Also, I am confused with the definition of consumption gap.

3. Figure 1 lacked some important information. Does i start from 1? If so, does j start from i+1? DF in Figure 1 is not predefined.

4. Why eta is the same in Section 3.3?

Please correct the following typos or errors:

a. On page 7, in figure 1, “i+1” should be “product i+1” and “product I to product j” should be “product i to product j”.

b. On page 8, “P_i belongs to G_i” should be “P_i belongs to G”? yes.

c. On page 9, “By finding CGij, we can now compute the correlation strength ηii as follows:” should be deleted.