1. Barilla’s own sales and marketing organization considered JITD as infeasible and/or dangerous. Consider the following remarks by Barilla’s personnel: **[2 points]**
2. “*Our sales would flatten if we put this program in place.”*

What is the motivation for this argument? Do you agree with this statement? Motivate your answer.

1. *“If space is freed up in our distributors’ warehouses when inventories of our own product decrease, we run the risk of giving our competitors more distributor shelf space. The distributors would then push our competitors’ product more than our own, since once something is bought it must be sold.”*

Comment on this statement.

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| 1. Barilla Sales and Marketing organization is assuming that JITD will flatten the sales curve because they have not witnessed the benefit of this method yet. Therefore, I disagree with the statement. JITD will increase efficiency, decrease cost and increase sales in the long term. The main and wrong belief is that Barilla will lose opportunities created by demand variability. JITD will create a stable demand, but not a lower one. This better system will help Barilla in anticipating demand in an accurate way and base their decisions on these predictions. 2. Internally, a part of the company thinks that Barilla could end up losing inventory space to a competitor. I disagree with this belief. Moving to JITD would mean having a high inventory turnover, which is caused by an effective selling of the Barilla products. Nonetheless, the company will always be following demand closely and act accordingly, increasing the service level for distributors. Therefore, this shift’s effects can be considered a success by the company and these decisions will likely not lead to a loss of space in the distributors’ warehouses. |

1. Promotions are a very relevant aspects in the case. There are 2 kind of promotions: retail promotions done by the retailers to the customers and trade promotions done by Barilla towards the distributors. **[4 points]**
2. A major complaint by sales personnel is: “*We wouldn’t be able to run trade promotions with JITD. How can we get the trade to push Barilla product to retailers if we don’t offer some sort of incentive?”* Comment on this statement. Do you agree with the statement? Motivate your answer.
3. If you want to eliminate forward buying through trade promotions, but still allow for retail promotions, think about an approach to incentivize distributors to encourage retailers to make retail promotions.

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| 1. Even though forward buying would be eliminated, since JITD is based on predicting the level of sales as precisely as possible, it does not mean the company would not be able to run promotions after switching to the new method. Thus, I disagree with the statement. Barilla will still be able to enable promotions that will not affect demand variability or any other parameter. Moreover, the switch to JITD will not affect in any way the ability to run promotions at the retail level. 2. Barilla should probably create a system of target incentives for their distributors, which corresponds to some benefits that the two parts agreed upon that can be used by the distributors in case some performance goals are met. Switching to a JITD model means having an integrated data supply chain, thus Barilla would already have the access to the data needed to create this target incentives system, making it a fast solution to adapt. |

**Calculation part**

You now take the part of Cortese. In the Excel-file you find the demand data for 3 types of Pasta (Pasta A-C) and order data for Pasta A for Cortese, the large DO. The data relates to figures 5-3 and figures 5-4 of the case (but contains data for individual pastas only).

**Note**: in the Excel sheet, please use for the initial period -20 a starting inventory of 0 and assume that there are 0 orders prior to period -20.

1. Cortese use a moving average with p=6 to forecast demand. You are now looking at Pasta A in 2019. The lead time is 2 weeks. To determine the optimal inventory, Cortese uses a base-stock policy, with a review cycle of 1 week. Target service level is a CSL of 95%.
2. For Pasta A in 2019, calculate the lower bound of the BWE caused by Cortese and compare this with the actual BWE caused by Cortese for the data provided in the Excel-file. **[2 points]**

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| Since the company uses two central distribution centers that aren’t communicating, we will use the decentralized method.  Data:  Base stock policy  p = 6  Lead Time= 2 weeks  r = 1  Target service level CSL = 95%  BWE(lower bound and decentralized) = = 1.89  VarQ and VarD are calculated with the VAR.S method in the Excel table.  VarQ = (VAR.S(H27:H78)) = 8716.09  VarD = (VAR.S(C27:C78)) = 3239.3  BWE actual = VarQ/VarD = 2.69 |

1. If you reduce the lead time for Pasta A to 1 week, how does this affect the lower bound of the BWE and the actual BWE? To calculate the effect on the actual BWE, you need to simulate this by using of the excel file (you might need to adjust the equations). Beside the results on the BWE, please also provide a graph showing the demand and the order quantities for period 1-52 and provide a table with the orders of periods 1-10. Also state how you calculated the Up-to-level exemplarily for periods 7 and 10. **[4 points]**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Order | 185 | 314 | 273 | 342 | 372 | 206 | 276 | 324 | 250 | 223 |

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| If the lead time is reduced, the lower bound of the BWE and the actual BWE will decrease. As the lead time is shorter, less safety stock is needed.  BWE(lower bound and decentralized) = = 1.39  VarQ and VarD are calculated with the VAR.S method in the Excel table.  VarQ = (VAR.S(H27:H78)) = 6623.49  VarD = (VAR.S(C27:C78)) = 3239.3  BWE actual = VarQ/VarD = 2.04  Computing the Up-to-level exemplarily for periods 7 and 10:  Formula used:  (Forecast of period)\*(lead time+1)+z\*  In excel:  Periods:  N 7 = 623.61  N 10 =D36\*($E$3+1)+$E$2\*SQRT(($E$3+1)\*STDEV.S($C$6:$C$78)) = 586.28 |

1. Cortese now wants to increase the review period for Pasta A to 2 weeks. How would this affect the lower bound of the BWE? How does this affect the actual BWE? To calculate this, please use the Excel file and adjust the calculations to match this new policy. Beside the results on the BWE, please also provide a graph showing the demand and the order quantities for period 1-52 and provide a table with the orders of periods 1-10. Also state how you calculated the order quantity exemplarily for periods 7 and 10. **[4 points]**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Order | 190 | 313 | 273 | 339 | 373 | 204 | 266 | 324 | 254 | 224 |

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| The lower bound of the BWE is not affected, as it is not influenced by the review time.  VarQ = VAR.S(H27:H78) = 11160.66  VarD = VAR.S(C27:C78) = 3239.29  BWE actual = VarQ/VarD = 3.45  Computing the Up-to-level exemplarily for periods 7 and 10:  Formula used:  (Forecast of period)\*(lead time+2)+z\*  In excel:  Periods:  N 7 = 930.38  N 10 = 874.38 |