Supply Chain & Operations Management

Written exam June 5, 2018

**Exercise no. 1**

The companies Future Century Fashion (FCT) and Future Engine Technology (FET) have recently approved their Strategic Plan and a series of Operational plans aimed at implementing the main strategic orientations.

First,select one of the two companies. Second, write at least two of the following documents:

* Strategic plan
* Marketing plan
* Master production scheduling
* Guidelines for supplier management and supply chain operations
* Quality plan
* Financial ratio analysis

As far as possible, try to use different numbers than the ones in the classroom exercise. After drafting the two documents answer the following questions:

1. Can you anticipate which might be the **sources of conflict** between each of the two documents (and their issuing authority) and other authorities/ business functions within the company?
2. Identify the variable(s) that have the largest impact on one or more **objective variables** (i.e. variables for which the company has made explicit a goal in one of the documents drafted, for example a target of sales, the level of customer service, quality, delivery etc.). Please define the range of the objective variable as a function of other variables and show which are the most important determinants.
3. Now suppose that one of the variables that are important for the achievement of the objectives (discussed at point b above) is subject to a sudden, external, impredictable and uncontrollable **shock** (for example it changes by +/- 50% of its original value). What would be the impact on your objective variables? Please quantify the change and calculate the expected impact. What would you do to to cope with the change? And what would you have done before to anticipate and mitigate the shock?

**Exercise no. 2**

Please answer the following questions:

1. What are the relations between marginal and average costs in the short run? Discuss this issue analytically and graphically
2. Define production returns in the short run and in the long run. Are they the same (i.e.decreasing, increasing, or constant)? Why is this the case?
3. Make at least one example of increasing returns in the long run.

**Exercise no. 3**

A company selling numerically controlled equipment is considering a decision related to the organization of the salesforce.

It considers two options:

1. Independent agents (sales fee 5%, frontup fee for new customer acquisition 12%, all costs absorbed by agents, no aftersales service)
2. Salesforce (fixed salary + variable salary), all costs of transport and accomodation covered, customer retention and customer relationship activities included in the job description.

Please answer the following questions

1. Define a quantitative model according to which it will be possible to make a decision on the options (1) and (2), leaving the variables unknown. Add relevant variables to the ones sketched in the description of the problem.
2. Fill the unknown variables with numbers (or range of numbers if adequate) and calculate the preferred option.
3. Change some of the variables and show whether the option identified at point (b) is robust to variability.