

# **MBA350 – INTEGRATIVE CAPSTONE COURSE**

## **Individual Assignment**

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Team # 6

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## Introduction and general drivelines

The mentality with which such game should be faced is the one of the dynamic and aggressive entrepreneur. Being a hard-line market participant is key to win the competition.

Establish your “battle plan” at the beginning; see what the bulletin says, what are the hints given from the professor, and the environmental variables set for the game. You should also play at least 20 hours with the solo version in order to get familiar with the dynamics and the variables which do not change with the in-class version. Once all this information is collected, use single linear regression to determine the independent variables coefficients. With the excel file that my team and I created<sup>1</sup>, is important to run several simulations on the possible scenarios which are likely to happen. Based on the major assumptions of the total quantity you are expected to sell by the end of the game, where, how, and at what price produce / sell them, you are ready to run these scenarios. You should always pick the one which gives you the highest net income after taxes because five of the performance measurements on which your team will be graded are based on this value and the higher it is, the better you will be positioned in the industry ranking.

There is no one strategy that is wrong in this game, what does not make sense to you in reality, in this game might lead you to be number one, so go for it, don't be afraid even to sell all your assets at the beginning of the game, because it might be the way to pursue.

Constantly check the bulletin, all the cost windows, the exchange rate, and the performance report. All these variables can change any time and they may make your strategy from a winner, to a loosing one. Loosing efficiency for a couple of quarters might be unrecoverable when you are playing with very efficient competitors.

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<sup>1</sup> The excel spreadsheet is actually developed up to quarter 13, but extending it farther in time is not difficult once the player has understood the logic of the game.

Meet constantly with your team, all the decision should be discussed on a regular basis among the other team members and only one should be entering and saving the decisions in the website, to avoid overlapping, they should all be discussed and formally approved ahead.

## **S&A Report**

In this screen, you have to enter the “Salespersons commission”, in case you want to link any extra compensation of the salesman salary with his sales. I tried several times with solo to enter several values in this field, but I did not notice any remarkable implement in sales.

The other decision you have to make is whether you would like to hire an extra salesman or replace a lost one. By my personal experience, a reasonable number of salesmen you should have are one salesman every 1,600 units sold in each region. My experience demonstrated that when you go beyond the 2,000 units per salesman, it becomes hard to bust sales further without adding extra help in that particular region.

## ***Marketing Research***

Obviously, it would be nice to spend as much as you like in order to keep yourself up to date with what is going on in the market. However, you have to understand that this information comes at a considerable price and if your goal is also to maximize the net income, you have to let go some information you can predict by yourself. In addition to this, using some statistics, it is possible to improve the forecasts which are provided from Micromatic. For the sales forecast, the rule of thumb is that the sales, limited to one quarter, change in a pretty linear way. It is therefore suggested that you use linear regression to calculate the actual sales against the quarter's forecast<sup>2</sup>. After some quarters, it is possible to skip one quarter's forecast, to save money, without taking too much risk

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<sup>2</sup> This regression could be implemented to a multiple linear regression, considering as additional variable the dollar sales of the other teams of the previous quarter.

for stock-outs. There is no need to purchase the sales forecast for four quarters, you may be as accurate as the game using your regression.

The other useful information is:

- Existing Plant Capacity – this information is mostly needed when you have a drop in efficiency, compared to the other teams, and you need to figure out the way the others are producing their goods in an efficient manner.
- Pages of Trade Publications, Pages of Local Newspaper Advertising, Product Quality, WWW Promotion, Total Product Features, and Unit Price by Company<sup>3</sup> – all this information has to be considered together as part of your marketing mix strategy. For an MBA student there is no need for me to explain how to set your variables compared to the competitors in order to win the battle, but I would just suggest going for quality. The higher the quality, the higher the price of your goods, and the higher profit margin → higher net income. As a rule of thumb, Total Selling/Admin Expense / Net Sales, should be around 15-17%. The other suggestion is that if you observe a dynamic marketing strategy, and say you are the leader, even though the others will try to imitate you, quarter after quarter your marketing mix will be changed and the other team will be followers most of the time.<sup>4</sup>

## Cost of Goods Sold

It is important that you control your Total Manufacturing Cost of Goods Sold. Obviously, if buying the good from the sub-supplier costs less than producing them on your own, maybe you should subcontract your goods. See whether it pays more to be a leader in capacity without using overtime

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<sup>3</sup> Unless you are interested in the units sold by region, there is no need to buy the units sold report when you are buying the unit price report since you can approximate the number of units by dividing the sales by the average price per unit.

<sup>4</sup> Let them buy the reports and you do the market.

pay, or be a ledger in capacity and extensively use it all beyond regular working hours. Always make a comparison of the costs of producing the goods among the three regions.<sup>5</sup>

## **Warehouse Operations**

In the excel file I developed, warehouse operations, is the worksheet where the decisions are being entered. This is because I wanted to re-arrange this section in order to control under the same window, the units assembled, transported, subcontracted, and the sales forecast.<sup>6</sup> It is important to run the company assembling units at full capacity. Even though there is a trade off in assembling too many units because of the inventory carrying cost of the finished goods, it is costly to produce under capacity and it should not happen to have more than 2-300 units beyond the actual demand (in a growing sales scenario) because the efficiency will suffer, bringing the net income down.

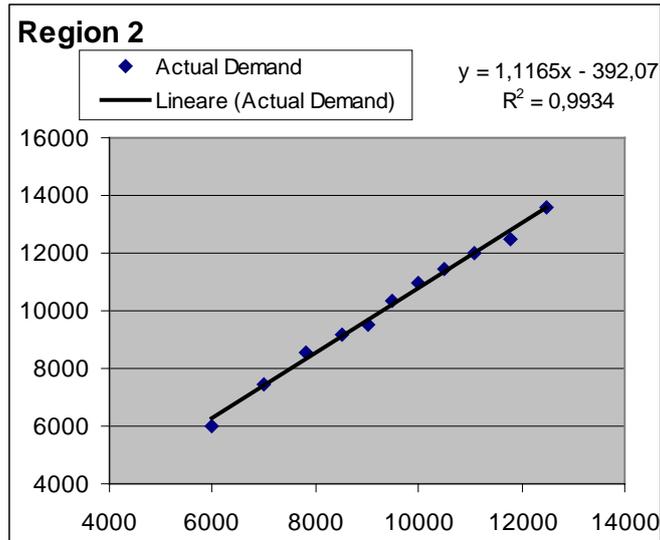
## ***Sales Forecast Regression Models***

The two models developed to predict are one based on the sales forecast and the other on the quarter number. The first one is much more accurate, as it can be seen from the R squared (0.9934), and the second one, it is not as accurate (0.9776), but it is good enough to determine the plant capacity that you will need by the end of the game. As mentioned before, these models could be improved using also the sales data of the other teams (using excel multiple linear regression features).

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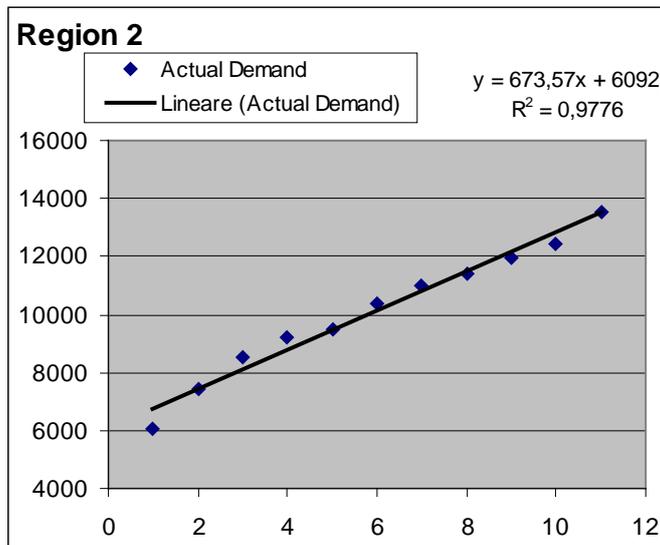
<sup>5</sup> If you have, for example, the exchange rate \$/€0.8, and the transportation cost impacts for 16%, it might be convenient to open operations in region 3, saving the transportation cost for that region saving on production.

<sup>6</sup> In Micromatic, most of these decisions are entered in the Operating Decisions screen, while the Warehouse Operations it is a visualization screen where you see the units assembled, subcontracted, transported, and the warehouse's costs.



**Figure 1: Regression Model based on the sales forecast**

Usually the game forecast model has a certain deviation from the actual sales which is quite constant throughout the quarters. Some quarter's sales forecast may be skip in order to save money, but combined with an extra cushion of units in stock.



**Figure 2: Regression Model based on the quarter number**

Normally the decisions taken within the quarter that have to be run, as greater is their impact on the sales, like the price, the quality, and the adverting / salesmen available, the wider the deviation of the actual sales from the model.

## **Workforce & Plant Report**

Also in this case, in Micromatic, the decisions are entered in the Operating Decisions screen. As for the Warehouse Operations, I combined the visual screen of the game with the decision enter screen in order to see on the same excel worksheet what are the results of the entered decisions.

### ***Productivity***

It is recommended to maintain at nominal capacity (1,000 units per crew) the crew productivity. Going beyond it is useless unless you have extra capacity, but this does not make sense too. To do this, you should play with the solo version and see what is the amount of money you need to put in maintenance and training for each region to achieve such goal. Per my experience the in-class game was giving the same results, therefore it is suggested to do the test with solo and implement the solution in the competition game once these values have been determined.

### ***Plant Capacity***

Unless the lease of the plant has a prohibitive cost, it is usually better to lease than buy the plant. Also because in the game the control over the leased units is identical to the units you own. There is less flexibility in the leased plant because you'll have to honour the lease until expiration meanwhile the plant you own can be sold anytime. However purchasing the plant has a big impact on the net income in the moment you buy it, since it is considered a short term liability.<sup>7</sup> In addition to that, your fixed assets will increase and the return on assets will decrease. Therefore, unless in owning the plant the difference in profit margin is such to justify such decision, lease it.

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<sup>7</sup> Purchasing the plant you usually pay 20% upfront and 80% at delivery. These amounts will be deducted from your income before tax.

## **Raw Material**

The basic rule to observe for every region is to augment the needed quantity (= assembled units) by the percentage that might not be delivered (usually 20%) and subtract the units you have in stock. It is then suggested to round this quantity to the most convenient “volume discount” to optimize the raw material flow.

## **Balance Sheet**

Other than all the valuable information you find in this document, you may want to keep track of the P/E ration of yours and other companies. This way, you might be able to predict to a certain extent your market stock price in case of stocks buybacks and / or drop in earning per share.

When you buy back shares, always take a look of the Accumulated Retain Earning & Currency Adjustment. If buying back the stocks pushes it into the negative field, you will not be able to buy back stock until it turns positive again. Sometimes, toward the end of the game, it is a good strategy to pay attention to it at the second to last quarter. If you need to buy back some other shares, and you approach the final quarter with positive accumulated retained earnings, then you can buy back up to 10,000 shares in order to boost your earning per shares. The limit of buying back shares will be applied in the successive quarter which will not be played.

## **Cash Flow**

A good handling of the cash flow will save you some money in interest, brokers, and bank fees. In order to avoid incurring an emergency loan, you should make sure that your Net Cash Balance is proportioned to the uncertainty of your cash flow. You can try to enter a sales forecast number in each region decreased by 20% and see what your cash balance is at that point. If it is still positive, it should be sufficient in case you undersell your goods. Anything in excess of that should be deposited in the bank account rather than retire the bond unless you are certain that you will not

need cash for the foreseeable future. If you are taking a short term loan, do not be too tight with the money you are taking and allow your company to have a safety margin, otherwise to save little money in the interest, you might incur an emergency loan and pay usually as much as twice the interests. When you need cash at the second to last quarter, you should borrow through the bond, in case you have a slot available. This is because the principal you pay back in the bond is more diluted (20 quarters instead of 2), and you may need until the last penny to win the game.

Usually demand for the goods is there and it is therefore suggested to use the cash to grow rather than pay out dividends (we do not know about what we are selling except that it is a durable good, but certainly it does not seem that this good is approaching maturity).

In the need for cash, unless the debt / equity ratio is already above 50-60%, it is suggested to use debt rather than selling stocks, because selling stocks usually brings down the stock price upon which you are evaluated (stock price and earning per share).

## **Income Statement**

With the excel file it is possible to set up a plan to buy back the shares and see what will be the final yearly earning per share according to your plan.

You can also see if your sales are growing, if are growing / decreasing at a declining / increasing rate in order to take proper actions to bust them.

## **Ratios**

You should take the information of the average of the other competitors from the performance report in order to see how you are performing compared to the industry average. You should also immediately identify who are your competitors and in what are they beating you. From some of the ratios, it is possible to understand if they have more or less assets, if they took debt, if they incurred in an emergency loan. You should use these as hints to eventually buy the marketing reports and determine the best way to fight against them.

In the excel worksheet it has been calculated also the weighted average cost of capital, the profit margin, and the cost of debt, in order for you to know what you are doing and if you are actually destroying or generating capital. This should not discourage you from using your cash even though you have a cost of debt equal to 2% and  $ROE = 30\%$ . At the end of the story, the winner of this game is the one with the highest net income, and you should seek to maximize it.

## **Game Reports**

Other than the use of these reports already described in this paper, it is important to understand how you are graded in these reports. Losing few points for having not arrived first in net income is not as bad as generating a negative net income (you will get negative score). That negative score will also impact in the following quarters on the “game to date” table; if you accumulated a big loss it will be difficult to recover from it if the game is only 8-10 quarters.