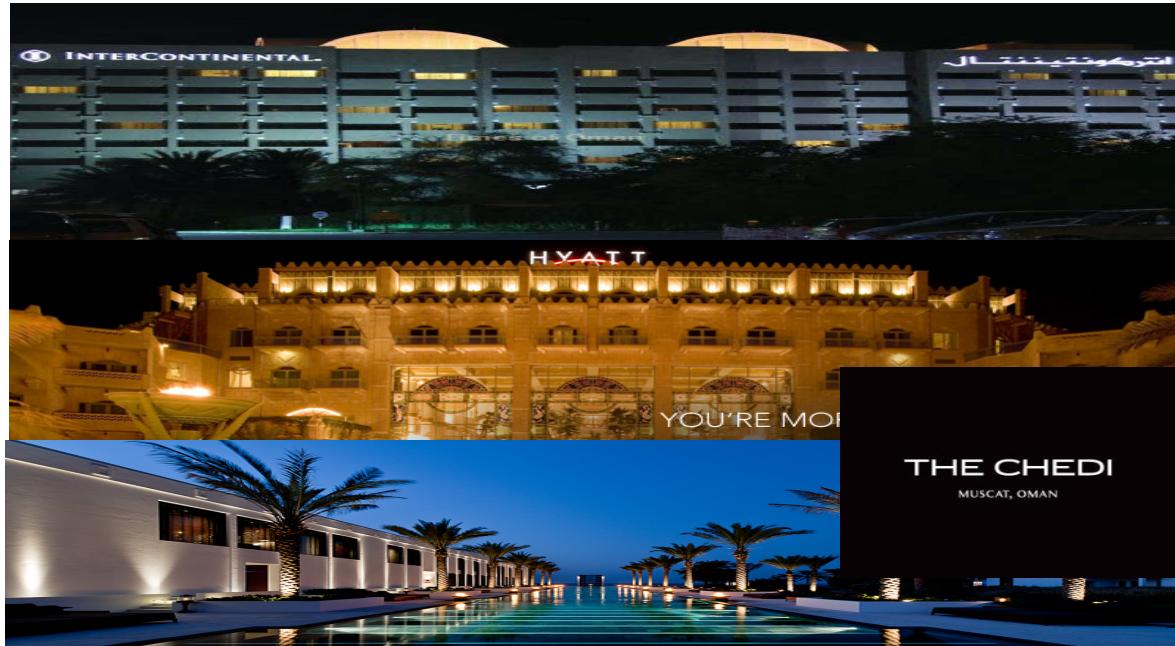




**ANALYTICAL MATHEMATICS COURSE WORK ASSESSMENT**

**GROUP PROJECT REPORT**

**comparison of three 5 – star hotels in Muscat, Oman**



**SUBMITTED BY**

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**Date: 07/06/2015**

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SAMPLE

## Abstarct

The following report is on the topic “**comparison of three 5 – star hotels in Muscat, Oman**”. To collect the necessary information, we visited the three hotels distribution as Abstarct wrote from by first of our team member, itroduction will write second member, caculation will be completed by third member and conculsion completed by forth member. We researched the prices of their standard rooms, the labour and their annual target. We made an appointment with one of the staff members. We were showed around the hotel and saw the different facilities and the different rooms, in the different prices ranges. We asked a lot of questions, to know how everything works. We visited the following hotels:

- The Chedi Muscat
- The Grand Hyatt
- The Intercontinental Hotel

Each hotel offers different luxury, to the different different customers. The Chedi Hotel has 158 rooms, ranging in different prices and benefits. The Grand Hyatt has 280 rooms and the Intercontinental has 260 rooms. However, all the hotels offer breakfast, free wifi and late check out in the summer. Their pool, beach acess, health club and restaurants all varies. With the collected information, we calculated the profit, total cost, break even point and we estimated how much money they would make if the standard room would be occupied all year around. We discovered that all labour is done by a company outside the hotel, not by the hotel's own staff

With the collected information we made calculations, which lead us to the conclusion.

We wanted to know the main differences between each of the hotel and meet the people who are working there, their nationalities and their reasons for working there. Our interest in the hotel industry started earlier, when one of us used to work in a hotel and two of us have friends have who works there. Our reason for choosing the hotel business is as well, that hotels are very different depending on the star or location. But because the variety is so big, there is something for everyone.

In this assignment, we will calculate the different prices, to let you know which hotel makes the highest profit and which room is the cheapest. As well, we will calculate how many days, each hotel needs, to be equal – without loss or profit.

## Introduction

Throughout history, mathematics have played an essential role in people's lives. It has contributed to make people's lives easier. Mathematics is constantly developing with time. What we admire, is that mathematics is the same language on all parts of the planet and therefore, we can communicate, regardless of our mother tongue.

Nowadays mathematics is very important in business. It helps us calculate financials, in order to make good decisions. To start a hotel, a financial plan must be made. The plan must include a budget, annual target and all expenses used. Basically, the annual target to cover all expenses, rent of the building and the prices for all services included. To make a profit, the annual income must be higher than all expenses. To be successful, the hotel has to give the customers what they want and constantly improve their services. Using mathematics as a tool for planning and organizing our financials, makes business more accessible.

A simple way to start up a hotel should include three basic financials.

1. Annual Target – To cover all expenses.
2. Room Rates – To make profit.
3. Labour cost + Materials.

To know your profit and annual expenses, the labour cost should be subtracted from the room rate and the annual room rate should be higher than all the expenses. In that way, profit should be made.

We want to know more about the hotel industry here in Oman. Especially the huge 5 – star hotels, as they are a part of tourism. The tourism industry is a future economy for Oman, as a non-oil industry, which is a future goal. We want to know more about the running of a hotel, because it has so many different aspects to it. We all have different interests, and we each found something in the hotel business that caught our attention. Usually we would not visit these hotels, but with this assignment it gave us an opportunity to go inside and see the hotels, the rooms, the pool area, the health club, the restaurants and ask questions to the staff. We wanted to know how the rooms looked like, and which facilities were available when you book a room. As well we wanted to see the different rooms, in order to understand the difference of prices. Especially we wanted to know how these three hotels differ from one another.

The hotel business is running all year. Many people use it for business, when they are sent by their company for work. As well it is known for honeymoons, for newlyweds. Hotels are used by families, because it gives them a chance to spend time together and relax and enjoy each other's company. As well, hotels are used for big businesses, who have their meetings there, for important events. Hotels are also used by the local people, to eat a good meal, or spend a day at the pool or simply use the health club on a weekly basis. Hotels offer great services so people can relax and enjoy their time.

## Calculations

The following calculations are based on the rates from the Chedi Hotel, the Grand Hyatt and the Intercontinental Hotel.

We want to know the profit of Grand Hyatt and breakeven point, when there is no profit and no loss. First of all, we find the total cost and revenue to calculate the profit, and then, we estimate the annual sale, the number of rooms \* 360 days to know profit earned in a year.

### The Grand Hyatt

1. Fixed cost: 300.000 OMR.
2. Standard room rate: 120 OMR.
3. Variable cost: ( Labor/Materials) = 50 OMR + 30 OMR = 80 OMR (80x)
4. Annual sale: 280 rooms \* 360 days in a year.

- Profit
- $R(x) = \text{price per room} * \text{number of sold rooms}$   
So the price per room is  $120 * x$  and we don't know the total rooms sold so will be  $(x)$   
 $R(x) = 120x$
- Total cost( $x$ ) = to get total cost we have to add the (Fixed cost) with (Variable cost)  
 $C(x) = 80x + 300,000$
- Profit= to find out the profit we have to subtract the total revenue from total cost  
 $P(x) = 120x - 80x + 300,000$   
 $P(x) = 40x - 300,000$
- Estimating 280 rooms\*360 days in a year.  
 $P(280 * 360) = 40(280 * 360) - 300,000$   
 $P(280 * 360) = 40(100,800) - 300,000$   
 $P(x) = 3732,000 \text{ OMR}$
- Breakeven point= Total Revenue = Total Cost  
 $= 120x = 80x + 300,000$   
 $= 120x - 80x = 300,000$   
 $= \frac{40x}{40} = \frac{300,000}{40} = 7500 \text{ days.}$

## The Chedi Hotel Muscat

1. Fixed cost: 200.000 OMR
2. Standard room: 162 OMR
3. Variable cost: ( Labor/Materials) = 65 OMR =  $65x$
4. Annual sale: 158 rooms \*360 days in a year

- Profit
- $R(x) = \text{price per room} * \text{number of sold rooms}$   
So the price per room is 162\* and we don't know the total rooms sold so will be (x)  
 $R(x)=162x$
- Total cost(x) = to get total cost we have to add the (Fixed cost) with (Variable cost)  
 $C(x)=65x+200,000$
- Profit= to find out the profit we have to subtract the total revenue from total cost  
 $P(x) = 162x - 65x - 200,000$   
 $P(x) = 97x - 200,000$
- Estimating selling 158 rooms \* 360 days per year.  
 $P(x) = 97(158 * 360) - 200,000$   
 $P(x) = 97 (56,880) - 200,000$   
 $P(x) = 5,517,360 - 200,000$   
 $P(x) = 5,317,360 \text{ OMR}$
- Breakeven point= Total Revenue = Total Cost

$$\text{Breakeven} = 162x = 65x + 200,000$$

$$\begin{aligned} &= 162x - 65x = 200,000 \\ &= \frac{97x}{97} = \frac{200,000}{97} = 2062 \text{ days} \end{aligned}$$

## The Intercontinental Hotel

1. Fixed cost: 300,000 OMR.
2. Standard room rate: 77 OMR.
3. Variable cost: (Labor/Materials) = 40 OMR =  $40x$
4. Annual sale: 260 rooms \*360 days in a year.

- Profit
- $R(x)$  = price per room\* number of sold rooms  
So the price per room is 77 and we don't know the total rooms sold, so it will be  $(x)$   
 $R(x) = 77x$
- Total cost( $x$ ) = to get total cost we have to add the (Fixed cost) with (Variable cost)  
 $C(x) = 40x + 300,000$
- Profit = to find out the profit we have to subtract the total revenue from total cost  
 $P(x) = 77x - 40x + 300,000$   
 $P(x) = 37x - 300,000$
- Estimating 260 rooms  
 $P(260 * 360) = 37(260 * 360) - 300,000$   
 $P(260 * 360) = 37(93600) - 300,000$   
 $= 3,163200$  OMR
- Breakeven point = Total Revenue = Total Cost

$$77x = 40x + 300,000$$

$$77x - 40x = 300,000$$

$$\frac{37x = 300,000}{37} = 8108 \text{ days}$$

## Conclusion

Calculating the room rates, labor cost and annual target and we used the below function:

- Total Cost
- Revenue
- Break Even
- Profit function

We found that depending on their standard room rate, the higher the rate is, the fewer days they need to break even, being equal, no profit and no lose.

For the Intercontinental Hotel, a standard room is 77 OMR. It is the cheapest hotel. However, they need 8,108 days to break even. Comparing to the Grand Hyatt where a standard room is 120 OMR, they only need 7,500 days to break even. The most expensive hotel is the Chedi Hotel Muscat, which has a standard room for 162 OMR, as well they only need 2,063 days to break even.

The three hotels have different prices, however, they are all 5 – star. What makes them differ from each other, are the facilities, location and services. The Chedi Hotel have a large beach area, which is a private beach. Comparing to the Grand Hyatt, they have many different restaurants, a huge outdoor pool area, but their beach is not private. The Intercontinental Hotel have a smaller pool area, no private beach, but inside they have a larger garden area and they are located next many shops and restaurants.

Each hotel offers something different for each customer, to be open to different kinds of people.

## References

Mr. Nasser Al Balushi – Team Leader – Chedi Muscat Hotel

Mr. Khalid Al Jawabri – Team Leader, Gust Serves - Grand Hyatt

Mr. Husam Al Harthy - Intercontinental Hotel

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