

Business Decision Making

D/601/0578(QCF5)-Assignment 2

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Lecturer:

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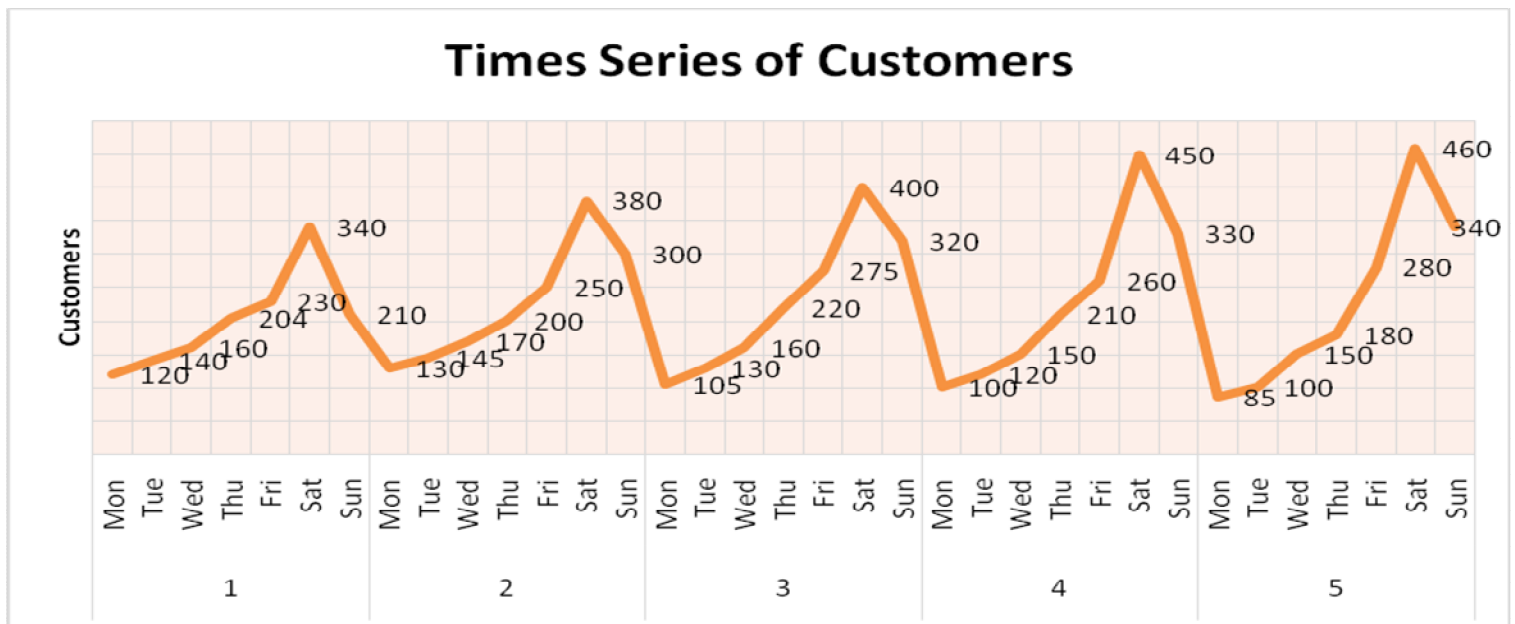
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Task 1:**1. Introduction:**

The general objective of this report is to conduct a statistical analysis, to study the variable i.e. the number of customers entertained or received by Gianluca's restaurant in the past few weeks, so that future forecast for week 6 can be made.

In this report we used the multiplicative model to calculate the moving averages of the trend and the average seasonal components.

The trend is identified to be improving with time while the seasonal component was taken as an average of the previous periods for studying the impact on the numbers of customers.

2. Time Series Analysis:

For analyzing the trend and seasonal effect we have used the Gianluca's restaurant

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data for number of customers entertained over the past 5 weeks, which was used to identify the trend so that we would be able to forecast the next week i.e. Week 6.

Further we have observed that the number of customers were increasing over time while there were seasonal trend as Saturdays is the most busiest day and the number of customers are the highest, while on Monday the numbers of customers are less as compared to other days of the week.

Hence we can identify that the number the resources required for Saturdays are the highest as well as we need to plan for more resources like waiters, materials etc. for future increase.

The fluctuation in the number of customers is due to the reason that as in the start of the week, individuals tend to be busy in work while in the end of the week i.e. Saturdays and Sundays, people go for outing and spend time with families and also have dinner in restaurants.

Week	Days	Forecasted Cus.	Trend	Seasonal
5	Sun	340	229	1.97
6	Mon	336.42	231	1.46
	Tue	88.18	233	0.38
	Wed	104.90	235	0.45
	Thu	157.09	236	0.66
	Fri	188.78	238	0.79
	Sat	270.96	240	1.13
	Sun	477.77	242	1.97

Table 1.1 : Predicted Values

Hence from analyzing the moving average as well as the seasonal trend, the number of customers were forecasted as in Table 1.1. The trends and seasonal variations were

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calculated using the moving average as discussed above, so that the forecasts can be as accurate as possible and we multiplied the Trend with seasonal variation to arrive at the forecasted customers.

Moreover it was analyzed that the increase in the numbers of customers will continue in Week 6 as can be observed from Table 1.1.

While there are certain limitations of the method we have used as averages hide certain aspects of the variation, as well as there will be other variables which are not taken under consideration for this study, which may effect the forecasted figures.

These other factors may include the disposable income, customer service, reputation, weather etc.

3. Conclusion:

The calculations to forecast the number of Customers for week 6 are accurate, as it can also be observed from the time series graphs, that the sales are on the increasing trend.

While it should also be noted that variations can be observed in the forecasted results because of other variables like disposable income, customer service, reputation, weather etc., which may distort our forecast due to which it may be beneficial to revise and keep on updating the forecast on regular basis for more relevant and accurate results.

It is also observed that the company is performing well in the first weeks but after Week 2 and 3 but have experienced a decline in the growth, which may suggest that the

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company is now in the state of maturity rather than growth. But the forecasted results suggest that the company will be on track and will be able to increase or maintain the customers in Week 6.

<u>Week</u>	<u>% Change</u>
1	
2	12.18%
3	2.22%
4	0.62%
5	-1.54%
6	1.83%

Table 1.2 : Performance

4. Recommendation:

It is the recommendation of this report that the management of Gianluca's restaurant should focus their attention on the days which are the busiest as well as profitable.

Hence the management should arrange all the necessary resources for Saturdays and Sundays.

Further the management should also plan for the future forecasted sales, and also can invest in the inventory if they can have discounts etc.

The company have experienced decrease in growth, which needs to taken seriously and the reason may be that the company may not have the resources to sustain the growth, hence a proper strategy is required to manage the growth properly.

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Task 2:**1. Cash Flow Projection:****Excellence s.r.o.**

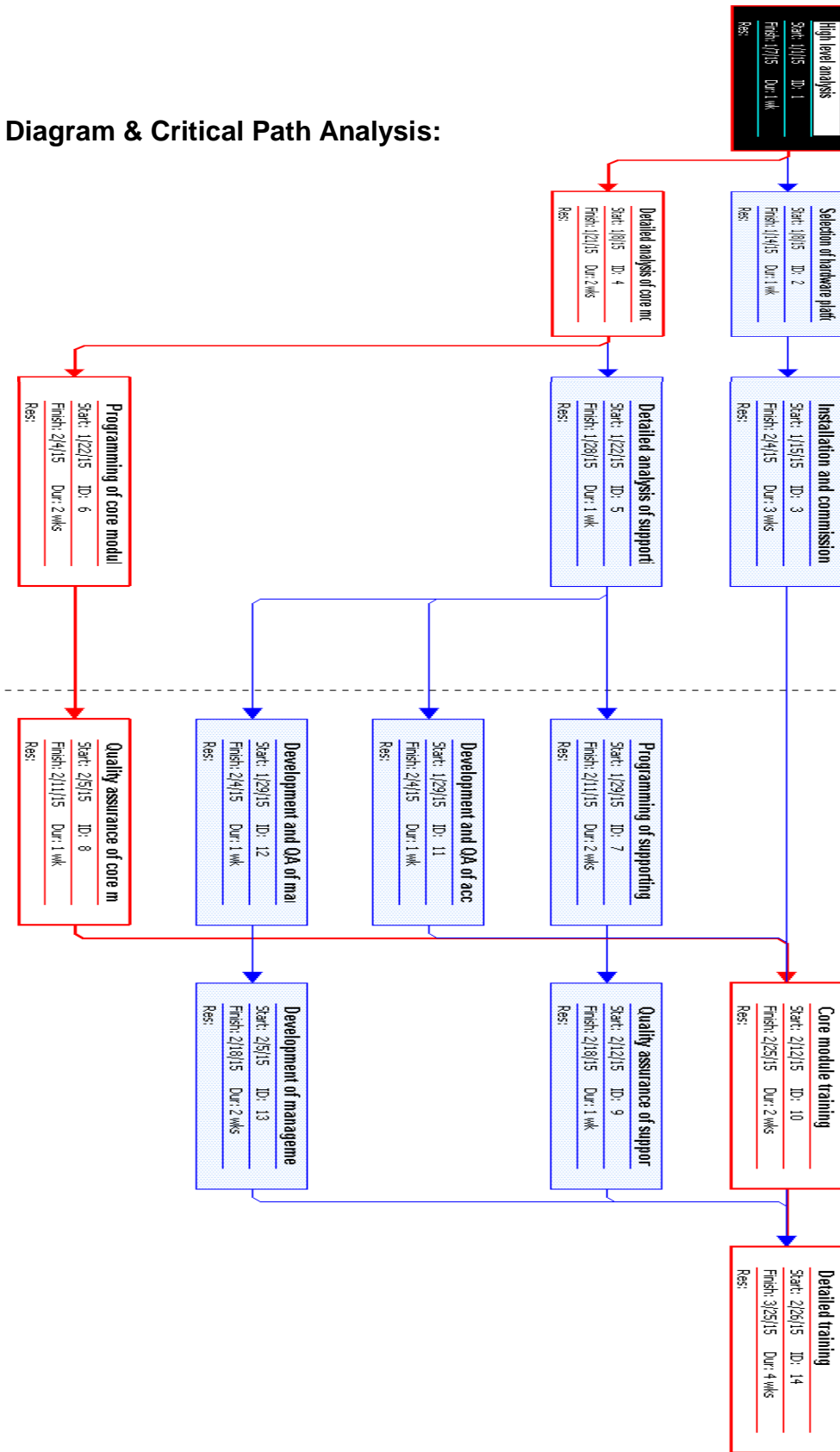
Cash flow projection - Six months until June

	Jan-14 Kc	Feb-14 Kc	Mar-14 Kc	Apr-14 Kc	May-14 Kc	Jun-14
Sales	145,000.00	150,800.00	156,832.00	163,105.28	169,629.49	176,414.67
Cash Receipts						
1 month in arrears 70%	105,000.00	101,500.00	105,560.00	109,782.40	114,173.70	118,740.64
2 months in arrears	30,000.00	30,000.00	29,000.00	30,160.00	31,366.40	32,621.06
3 months in arrears	10,500.00	10,500.00	10,500.00	10,150.00	10,556.00	10,978.24
Cash Inflow	145,500.00	142,000.00	145,060.00	150,092.40	156,096.10	162,339.94
Cash payments						
Purchases	87,000.00	90,480.00	94,099.20	97,863.17	101,777.69	105,848.80
Overheards	29,000.00	29,000.00	29,000.00	29,000.00	29,000.00	29,000.00
Total operating payments	116,000.00	119,480.00	123,099.20	126,863.17	130,777.69	134,848.80
Dividends	-	-	-	15,000	-	-
Capital purchases	40,000.00	24000	-	16,000.00	-	-
Total other payments	40,000.00	24,000.00	-	31,000.00	-	-
Net cash flow	(10,500.00)	(1,480.00)	21,960.80	(7,770.77)	25,318.40	27,491.14
Cash balance b/f	33,000.00	22,500.00	21,020.00	42,980.80	35,210.03	60,528.43
Cash balance c/f	22,500.00	21,020.00	42,980.80	35,210.03	60,528.43	88,019.57

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Task 3:

1) Network Diagram & Critical Path Analysis:



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According to Triant and Dennis (2009), the Work Breakdown structure of the project helps us to identify the areas of critical importance so that the tasks can be managed more appropriately.

The ABC Company is planning for a custom written computer project.

Above is a network diagram which shows the Critical Path as A,D,F,H,J,N as in Table 2.1, hence if any of these task are delayed the whole project will be effected.

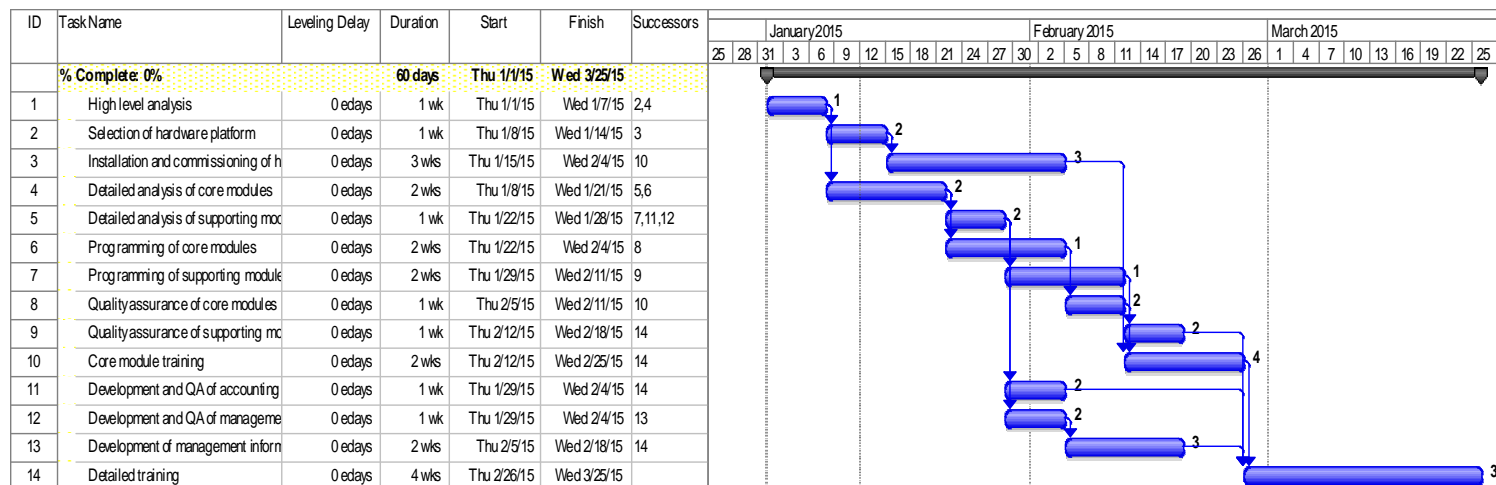
ID	Task Name	Duration	Start	Finish	Predecessors
1	High level analysis	1 wk	Thu 1/1/15	Wed 1/7/15	
4	Detailed analysis of core modules	2 wks	Thu 1/8/15	Wed 1/21/15	1
6	Programming of core modules	2 wks	Thu 1/22/15	Wed 2/4/15	4
8	Quality assurance of core modules	1 wk	Thu 2/5/15	Wed 2/11/15	6
10	Core module training	2 wks	Thu 2/12/15	Wed 2/25/15	3,8
14	Detailed training	4 wks	Thu 2/26/15	Wed 3/25/15	9,10,11,13

Table 2.1: Critical Path

This shows that if these critical tasks are not delayed the project will not take more than 11 weeks and if it is started on 1st Jan 2015, it will end on 25th Mar 2015.

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1)Gantt Chart:



From the analysis of Gantt chart, we can identify what will happen if the tasks are delayed, and we can also identify the critical path which if delayed will effect the whole project.

As discussed above that the critical path as identified is A,D,F,H,J,N and if these critical tasks are not delayed the project will not take more than 11 weeks and if it is started on 1st Jan 2015, it will end on 25th Mar 2015.

Further we can also analyze that there is float available in few of the tasks, for example task 3 can be delayed 8 days etc., which will not effect the project if these are delayed equal to or lesser than available slack or float.

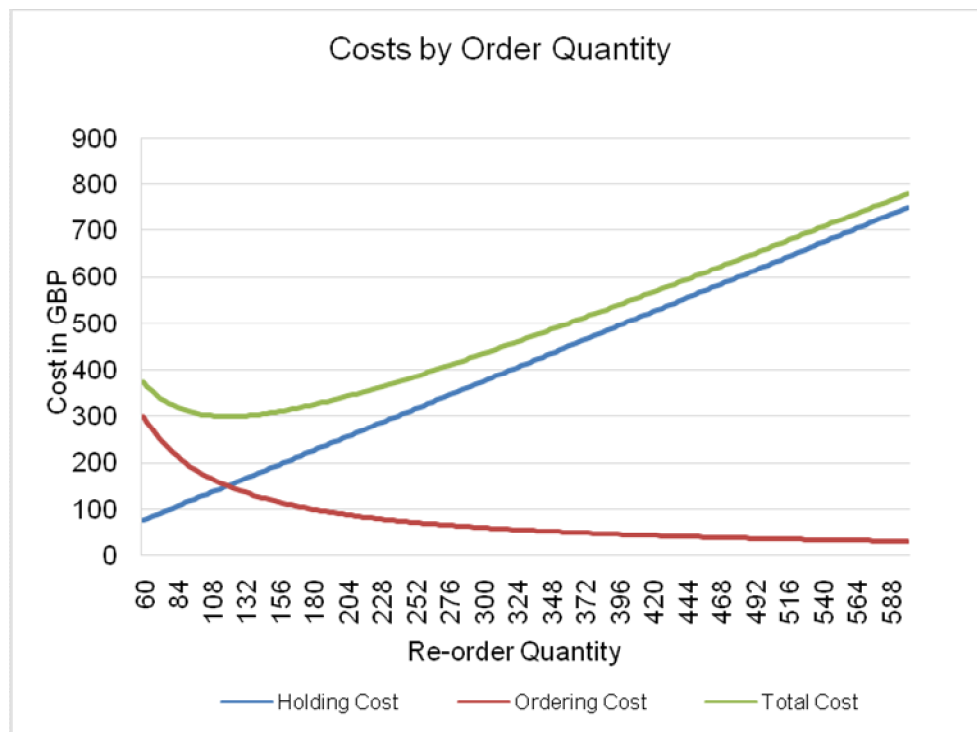
Hence we can reduce the resources on task 3, to reduce our cost, as allocating 3 staff and doing it faster would not improve the allover efficiency of the project management.

Hence Gantt chart and the resources identified in the Gantt Chart should be studied so manage the resources effectively.

Task 4:**a) 1**

According to Nahmias and Steven (2005), the Economic Order Quantity (EOQ) facilitates the management to reduce and minimize the inefficiency losses, due to in effective management of inventory.

Thus from using EOQ, the management can reduce the level of inventory so that the cost of holding i.e. warehousing etc. can be reduced, as well as to manage the inventory in such a way to reduce the ordering cost.



Graph 4.1: Cost by Order Quantity

Hence from our analysis and graph 4.1, it can be observed that the Economic Order Quantity is 120 boxes which will contain 1200 units in total.

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Right now the company is re-ordering at 600 units which increases the ordering cost, thus impacting on the total cost.

While as discussed above, the EOQ is 1200 units which can have positive on the efficiency of the inventory management process.

The calculation of Economic Order Quantity is as follows:

$$Q^* = \sqrt{\frac{2DK}{h}}$$

Where,

Q = Quantity of Units

D = Unit Demand

H = Holding Cost

K = Ordering Cost

Hence from the formula,

$$\text{EOQ} = \sqrt{\frac{2 \times 3 \times 600}{0.25}}$$

$$= \sqrt{3600}$$

$$\text{EOQ} = 120 \text{ Box or } 1200 \text{ Units}$$

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$$\begin{aligned} \text{Total Annual Orders} &= \frac{D}{\text{EOQ}} \\ &= \frac{600}{120} \end{aligned}$$

$$\text{Total Annual Orders} = 5 \text{ Orders}$$

$$\begin{aligned} \text{Order number of days} &= \frac{365}{\text{Annual Orders}} \\ &= \frac{365}{6} \end{aligned}$$

$$\text{Order number of days} = 60.83 \text{ Days}$$

<u>EOQ</u>	<u>Holding Cost</u>	<u>Ordering Cost</u>	<u>Total Cost</u>
60.00	£75.00	£300.00	£375.00
63.00	£78.75	£285.71	£364.46
66.00	£82.50	£272.73	£355.23
69.00	£86.25	£260.87	£347.12
72.00	£90.00	£250.00	£340.00
75.00	£93.75	£240.00	£333.75
78.00	£97.50	£230.77	£328.27
81.00	£101.25	£222.22	£323.47
84.00	£105.00	£214.29	£319.29
87.00	£108.75	£206.90	£315.65
90.00	£112.50	£200.00	£312.50
93.00	£116.25	£193.55	£309.80
96.00	£120.00	£187.50	£307.50
99.00	£123.75	£181.82	£305.57
102.00	£127.50	£176.47	£303.97
105.00	£131.25	£171.43	£302.68
108.00	£135.00	£166.67	£301.67
111.00	£138.75	£162.16	£300.91

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114.00	£142.50	£157.89	£300.39
117.00	£146.25	£153.85	£300.10
120.00	£150.00	£150.00	£300.00

Table 4.2:EOQ/Total Cost

Further the table above we can observe that if the economic order quantity is used the cost saving would be of GBP 75/box and on 10 boxes it would be GBP750.

Hence on 1200 units i.e. on a single order, the company would be saving GBP750.

Thus the total saving would be GBP 3,750 annually as in total 5 orders will be made, if EOQ is used.

Further every 60.83 days i.e. 61 days, the management needs to re-order so that any shortages are not experienced as well as the cost of holding is minimized as much as possible.

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3)

Sales	600	600	600	600
<i>Quantity of Orders</i>	60	120	400	800
<i>Number of Orders</i>	10	5	2	1
<i>Re-ordering Cost</i>	£300.00	£150.00	£45.00	£22.50
<i>Holding Cost</i>	£75.00	£150.00	£500.00	£1,000.00
<i>Total Annual Cost/box</i>	£375.00	£300.00	£545.00	£1,022.50
<i>Discount Benefit</i>	(SalesxGBP25x1%or2%)		£150.00	£300.00
<i>Net Benefit</i>			-£395.00	-£722.50

Table 4.2.1: Discount Benefit

From analyzing the Table 4.2.1, we can conclude that the discount benefits are not having positive impact on the company as the cost of holding is greatly increased because of purchasing bigger quantities, thus eliminating any inherent benefit.

Therefore it is recommended that the company should use EOQ to purchase and do not take the discounts under this scheme.

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b) Morgan Investment Co.

Year	Project A	Project B	Investment	Discounting factor @12%	Project A	Project B
	Profits (£)				PV (£)	
0			(200,000)	1	(200,000)	(200,000)
1	36,000	37,300		0.893	32,148	33,309
2	42,000	40,000		0.797	33,474	31,880
3	56,000	56,000		0.712	39,872	39,872
4	44,000	51,000		0.636	27,984	32,436
5	35,000	39,650		0.567	19,845	22,482
6	32,500	42,500		0.507	16,478	21,548
7	66,000	20,000		0.452	29,832	9,040
	311,500	286,450		Net Present Value	(368)	(9,434)

The Net Present Value of the both the projects i.e. A and B are negative when the discounting factor at 12% is used.

Hence from the above NPV analysis we can conclude that we should not proceed with the investment in either of the two, despite of the fact that the undiscounted cumulative cash flows are positive.

Year	Project A	Commutative
	Cash Flow (£)	
0	(200,000)	-200,000
1	36,000	-164,000
2	42,000	-122,000
3	56,000	-66,000
4	44,000	-22,000
5	35,000	13,000
6	32,500	45,500
7	66,000	111,500

$$\begin{aligned} \text{Payback Period} &= \frac{\text{Initial Investment}}{\text{Cash Inflow per Period}} \\ &= 4 + (|-£22| \div £35) \end{aligned}$$

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$$\begin{aligned}
 &= 4 + (\text{£}22 \div \text{£}35) \\
 &\approx 4 + 0.63 \\
 &\approx 4.63 \text{ years}
 \end{aligned}$$

The Payback period of Project A is 4.63years.

Year	Project B	Commutative
	Cash Flow(£)	
0	(200,000)	-200000
1	37,300	-162,700
2	40,000	-122,700
3	56,000	-66,700
4	51,000	-15,700
5	39,650	23,950
6	42,500	66,450
7	20,000	86,450

$$\begin{aligned}
 \text{Payback Period} &= \frac{\text{Initial Investment}}{\text{Cash Inflow per Period}} \\
 &= 4 + (|\text{£}15.7| \div \text{£}39.65) \\
 &= 4 + (\text{£}15.7 \div \text{£}39.65) \\
 &\approx 4 + 0.40 \\
 &\approx 4.40 \text{ years}
 \end{aligned}$$

While the Payback period of Project B is 4.40 years.

Although the payback period of project B is lesser few months but the negative NPV suggest that both the projects are un-feasible during the life of the investment.

Further please note that the NPV is a more relevant measure to analyze the feasibility of the projects under consideration because it takes into account the present value of the inflows as due to the time value of money, the investments which are spread over long periods, the management should take the concept of

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time value of money under consideration. While the payback period have a strong draw back as it does not considers time value of money as well as doesn't considers the cash inflow after the payback period.

Hence it is recommended that the management should use NPV is a measure to analyze the investment, and does not investment in either of the project because of negative NPV.

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