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Cost classification and decision-making: Practical approach

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Abstract

The application of concepts in a real-life situation is the fundamental requirement for experiential learning. The case provokes simple learning through a real-world learning activity and allow students to apply their knowledge of various cost concepts while taking decisions. The case is designed in such a way so that high level student engagement can be obtained from the initial stage of the course and can be used at an undergraduate or graduate level without calling for strong accounting background. The case could be used for classroom discussion or for individual or group assignment as well. The case contests students to think outside the business environment and apply cost concepts in a daily life for a small service company. Students' responses indicates that the case was comprehensively designed to cover all the relevant concepts of Cost Classification and Decision Making and helped them to learn their practical daily life usage.

Keywords: Cost classification, case study, decision making, management accounting, cost concepts, relevant cost, differential cost, managerial cost

Introduction

For any course like management accounting, understanding of key concepts and their impact on decision making is the fundamental requirement for its usage in real world. Nuances of decision making on qualitative and quantitative grounds can be understood by extrapolating how real-life situations can be thought upon from perspective of management accounting and best possible decisions can be taken easily and scientifically and not through personal judgement.

Definitions of cost concepts can be referred from managerial and cost accounting textbooks like, Fundamental Accounting Principles (Jensen *et al.*, 2015), Introduction to Managerial Accounting (Brewer *et al.*, 2019) ^[4], Financial & Managerial Accounting (Williams *et al.*, 2005) ^[23], Handbook of cost and management accounting (Hoque, 2005) ^[11], and Managerial Accounting: Tools for Business Decision Making (Weygandt *et al.*, 2018) ^[22] Management and cost accounting (Drury, 2013) ^[8], Managerial accounting. (Jiambalvo, 2019) ^[13]. Effective decision making be subject to the understanding of basic concepts with their cause effect & behavioural impact. Experiential learning techniques can support classroom teaching methods in developing critical thinking skill which enhances the power of problem articulation, Analysis, research and decision-making and helps in production of Result-oriented accounting graduates." (Rajeevan, 2020) ^[18].

Various data sources can be used to in a case to study real life issues in a given context (Baxter & Jack, 2008) ^[3]. Case study method help students in developing the basic competencies to apply theoretical concepts in the practical life problems. The prime objective of the case study is to develop clear understanding of basic management/ cost concepts among students by providing an enlightening learning experience in which they can learn application of theoretical knowledge in the real-life situations confronted by the owner of a small service company. case study method provides a context to students in which they can learn actively, develop opinions and derive conclusions (Knyvienè, 2014) ^[15].

Thus, this case contributes to literature by providing the framework to students to explore and test the applicability of cost concepts in a real-situation. Application of existing knowledge to generate new strategic ideas requires profound learning apart from a theoretical understanding of accounting on the part of students so that they can deal with the

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ever-changing business environment and represent the accounting practices socially applicable in a practical situation (Dellaportas, 2015) ^[7].

Literature review

Management accounting framework facilitates understanding of accounting and its role in the management of organizations. One of the simplest definitions of "management accounting" is that it is the process of controlling an organization's activities and decision-making. While the purpose of business accounting is to assist in-house users in making informed business decisions, financial accounting differs from this. In other words, it facilitates the decision making process by helping the directors of an organization to make decisions. (NetSuite.com, n.d.) ('Management Accounting', 2021) ^[5].

In Case-based pedagogy learners expand their thinking, comprehend their skills and achieve a better understanding of the content. It can cover and comprehends a wide range of skills like, reading, writing, listening, problem solving etc. Case-based learning covers a wide range of educational strategies, from basic to advanced learning and even training. (Weil *et al.*, 2001) ^[21] Investigated the application of case and basic accounting education in the context of corporate data collection and management. In management accounting cases, students need to understand the importance of decision-making processes, such as data management, management planning and data analysis, decision-making criteria (Aman *et al.*, 2012) ^[2]. (Schultz, 2018) ^[20].

In this article we document an approach to bridging the gap between students who learn accounting and work as accountants. Case-based teaching helps learners expand their thinking horizon and develop higher order critical thinking skills to achieve a core learning from the given context. (Sawyer *et al.*, 2000) ^[19] (Case Research in Management Accounting, n. d.) (Accounting for Taste: Learning by Doing in the College Classroom • College Quarterly, n. d.).

This sort of learning challenge understudies to create critical thinking, dynamics, basic reasoning and relational abilities (Sawyer *et al.*, 2000) ^[19]. The test for accounting instructors is to forsake the conventional classroom teaching approach and embrace more intuitive learning strategies. Specifically, contextual analyses help decrease the hole between hypothetical study ideas and practices. Case based learning

is appropriate for encouraging accountants to apply critical skills to profession as the act of accounting is loaded with circumstances that require basic reasoning (Healy & McCutcheon, 2010) ^[10] (Hassall & Milne, 2004) ^[9]. This encouraging technique improves the learning' capacity of students to recollect data in situational settings (Johnstone & Biggs, 1998) ^[14]. Cases depicting genuine circumstances have been utilized in a wide assortment of orders to assist students with creating abilities that are needed for progress outside of the classroom. Learners ought to be tested to accomplish something other than remember veracities and definitions; they ought to be needed to exhibit more significant levels of reasoning capabilities. The AICPA's Core Competency Framework states to an extent that, students should be able to utilize and apply knowledge in different setups (Daigle *et al.*, 2007) ^[6]. Along these lines, this case adds to the writing by inspecting cost ideas past the customary business climate with an end goal to provoke students to show their capacity to apply information in genuine circumstances.

Methodology

The case was given to under-graduate management student's part of management accounting class at University of Delhi in India. The course is of six credits and offered to Bachelor's students of general management class. As per course requirement, two weeks' time frame was given to students to independently study the case and submit their responses towards the closing of semester so that they can learn to apply the knowledge they acquired during the semester in practical situations.

Case material

Mr. John is a self- employed person and runs a small business from his residence in Jaipur city. For a business network meeting he has planned to go to Delhi for two days, for which a registration amount of Rs.2500 has already been paid one month ago. The first day he is planning to reach hotel at around 11.00 a.m. and going to attend meeting from 2:00 p.m. to 8.00 p.m. and will do the night stay at the hotel. Due to budget constraint, he is focusing on two options 1) drive by Car or 2) go by train to reach Delhi therefore less costly option will be chosen by him. By car the distance between his place of residence to Delhi Hotel is around 270 KM. The following information has been identified and gathered by John to use in this decision situation:

Table 1:

Item	Annual cost (in Rs)	Cost per km
Expected annual km covered by car	16000 km per year)	
Car price	520000	
Registration and other charges paid at the time of purchase	40,000	
Resale value end of the life year	40,000	
Estimated life of car	10 years	
1) Depreciation Charges		3.25
2) Annual cost of auto insurance	Rs. 16000	1
3) Maintenance and Repairs	Rs. 20,000	1.25
4) Parking charges Semi -annual cost Rs.4800	Rs. 9600	0.60
5) Cost of Fuel (CNG)	Rs. 45 per Kg-20 km per kg	2.25
6) Total cost per km {(1)+(2)+(3)+(4)+(5)}		8.35
7) Decrease in resale value (solely due to wear and tear)	Rs. 1.15 per km	
8) Cost of train ticket, Jaipur to Delhi (include both ways)	Rs. 1800	
9) Hotel booking Amount per day (Check-in 12:00 Noon and Check out at 10:00 a.m.	Rs. 2500	

Advice John which options he should opt from the following alternatives and why?

(Note: Make and notify appropriate assumption wherever required for solving the case.)

- Which cost and benefit are relevant in this decision? And which option should be preferred by John on the basis of quantitative factors? Which costing technique is appropriate to use in this decision situation?
- What should be the choice if John has to travel within Delhi also (round trip from hotel to meeting place) for which details are as follows and he also need to be accompanied by his financial advisor from Delhi for the meeting?

Meeting place distance from Hotel in Delhi	10 km
Taxi charges in Delhi	Minimum fare for initial 1 km Rs. 25 and Rs. 16 per additional km

- What should be the choice in part a) and part b) if one more option is available for travelling by VOLVO Bus. Ticket Price for round trip from Jaipur to Delhi in VOLVO Bus is Rs. 1200 and the distance between the bus stand and hotel where John has the booking is 3 km.
- If John will stay back in Jaipur and will not go for the meet in Delhi, he might can generate a business revenue as follows in those two days when he is supposed to travel for the meeting.

Revenue (in Rs.)	Probability of occurrence
10000	0.35
8000	0.5
2000	0.15

And if he plans to go to Delhi, he can generate Immediate Expected business revenue from the meet is as follows

Revenue (in Rs.)	Probability of occurrence
20000	0.25
10000	0.3
6000	0.25
3000	0.2

- How does the above information will affect John's decision in part a)?
- How does the above information will affect John's decision in part b)?

Hint: The expected business income/revenue can be calculated by simply adding all values generated after multiplying possible revenue with corresponding probability provided for each alternative. Expected Revenue minus additional cost can be used for evaluating the respective alternative available

- In your opinion what are the qualitative factors (if any) will have an impact on John's decision.

Case learning objectives

The case describes a practical application of cost concepts in a day-to-day life situation away from all kind of complex manufacturing or business environment. The objectives of this case are as follows:

- Students will recognize basic cost accounting terms and concepts.

- Students will learn application of management accounting concepts in real life.
- Students will evaluate alternatives on cost basis and make decisions.
- Students will assess the effect of a decision on business profitability
- Students will validate strategic decision making

Implementation guidance

The case focused on developing an understanding about basic cost concepts and visualizing their effect on business decisions. The case can be used for students without a strong accounting background at an undergraduate or graduate level. High student engagement can be obtained from the initial stage of the course with the help of this kind of case discussion. The case could be used for classroom discussion or for individual or group assignment as well. Appendix 1 comprises the Teaching notes.

Classroom testing

To check the attainment of learning objectives, 107 undergraduate students sample responses have been collected through a "Case validation survey". In the survey Likert scale of five points were used to get the perception of students in which scaling has been done as Strongly Disagree=1 and Strongly Agree=5 the results clearly indicate the accomplishment of objectives the detailed results of survey are given in the Appendix 2 Table 1.

From the Appendix 2 Table 1, clear inference can be drawn from mean rating of student responses as they strongly perceived that the case increased their understanding of basic management cost concepts, they found it interesting, thought provoking and giving a boost to their critical thinking. Students' responses/ comments evidently indicates that the case was well balanced and comprehensively designed to keep it challenging vis a vis moderate on difficulty level i.e., not too difficult or too easy.

Appendix 2 Table 2 represents the students unedited comments/answers to specifically designed subjective questions placed in the form to assess quality and perception about the case

The subjective responses in Appendix 2 Table 2 reveals that majority students gain enjoyable learning experience through participation in case activity, and find it interesting, relatable, engaging, and beneficial. The prime objective of the case design was to develop logical reasoning, observation, skills, and out of the box thinking among students. The Case study encourage students to exerts their knowledge in a wide spectrum and identify factors that have influence on the decisions and as some students show desire for more details like; about number of office days, number of times visit taken place between hotel and meeting place, distance between railway station and hotel etc., their responses indicate that our goal was achieved to apprehend critical thinking.

Appendix 1

Teaching notes

- Identification of relevant and irrelevant cost

Item (1)

Both original cost and depreciation are not relevant for Johns stated decision as these are non-differential sunk cost.

Item (2)

The annual premium of auto/car insurance and license is a fixed non-differential cost so it is not relevant for the decision under consideration.

Note: Due to any accident faced by John on the trip, there is likely hike in premium at the time of renewal of policy, the cost of increased premium will be a relevant cost for decision, however, annual general premium is not relevant.

Item (3)

Rs.1.25 average maintenance and repairs cost is relevant as it is affected by the usage of car and generally it is proportionate to km drive.

Item (4)

Rs.4, 800, the Semi-annual charges for parking space is a non-differential fixed cost and irrelevant for the decision.

Item (5)

Fuel cost is an incremental cost among alternatives and relevant for the decision as it would not occur if John would opt for the other alternative i.e., go by train.

Item (6)

Total average cost Rs. 8.35per km is irrelevant for this decision as it includes irrelevant cost too in its calculation like sunk cost, fixed cost or many other which are not relevant for this decision as explained in the above points as well. The incremental cost would be useful for this type of decision instead of an average cost which is a unitized cost (i.e.; cost per km, per l/h, per m/h etc.) and habitually gives deceptive results.

Item (7)

The economic or real value of the car at the end of its life is affected by its economic depreciation/real cost of usage (i.e.; decrease in the asset value through usage over time). So, the decrease in the resale value due to its usage (driving more km) is relevant for this decision.

Item (8)

Two-way train ticket cost of Rs. 1,800 is a relevant for this decision as it would not occur if John will decide to drive

Item (9)

The cost of Hotel Booking is relevant in this decision only for part d) because otherwise Whether he takes the train or drives to Delhi, he will still need to book the hotel room. Following cost estimates would be useful for John in this decision:

Relevant driving cost (Financial)

Fuel (540 KM x Rs.2.25 per km)	Rs. 1215
Maintenance and repairs (540 KM x Rs. 1.25 per km)	Rs. 675
Decrease resale value (solely due to wear and tear) (540 miles x Rs.1.15 per km)	Rs. 621
Total	Rs. 2511

Relevant cost of taking the train

Train ticket cost = Rs. 1800

Decision criteria

Quantitatively/financially John can save Rupees 711 (Rs. 2511-Rs. 1800) if he will go by train but some other qualitative factors like inconvenience of parking the car or benefit of having a car in Delhi city or getting benefit of relaxation and enjoyment during a train journey or inconvenience caused due to non-availability of own vehicle should be considered before taking final decision.

Note: All costs are calculated for round-trip between Jaipur and Delhi

Differential costing method would be more appropriate for John's decision making

b) From the information calculated from part (a) cost of drive is Rs. 2,511 and cost of train journey is Rs.1,800 but if John has to travel within Delhi (from hotel to meeting place and vice-a-versa) and also accompanied by his financial advisor than the relevant cost to the decision will be:

Particulars	Cost (In Rs.)	Cost of travel within Delhi (In Rs.)	Total cost (In Rs.)
By Drive	2511	$93\{=20*(2.25+1.25+1.15)\}$	2604
By Train	3600 (=2*1800)	$338\{=2*(25*1+16*9)\}$	3938

So, with the new information, it would be cheaper by Rupees 1334 (Rs. 3938-Rs. 2604) to drive than to travel by train.

c) Cost of travel by bus will be as follows:

d) Revised part a)

Particulars	Amount (In Rs.)
Bus Fare	1200
Cost of travel within Delhi	
bus stand to hotel and vice-a-versa	$114\{=2*(25*1+16*2)\}$
Total	1314

So, with the new information, it would be cheaper by Rupees 486 (Rs. 1800-Rs. 1314) to travel by bus than to travel by train.

Revised part b)

Particulars	Amount (In Rs.)
Bus FARE	2400 (=2*1200)
Cost of travel within Delhi	
bus stand to hotel and vice-a-versa	$114\{=2*(25*1+16*2)\}$
Hotel to meeting place and vice-a-versa	$338\{=2*(25*1+16*9)\}$
Total	2852

So, with the new information, it would still be cheaper by Rupees 248 (Rs. 2852-Rs. 2604) to drive even than to travel by bus. As we can see, the major factor of cost difference is high taxi service charges in Delhi which need to be hired in case John will travel by Bus or train.

e) If John will stay back in Jaipur and will not go for the meet in Delhi, he might can generate a business of Rs. 7,800 In those two days without incurring any additional cost of travel. Expected business revenue calculation is as follow:

Business revenue (In Rs.)	Probability of occurrence	Expected revenue (In Rs.)
10000	0.35	3,500
8000	0.5	4,000
2000	0.15	300
Total	1	7,800

- i) Immediate expected business Income from the meet in Delhi is Rs.3300 (i.e., Rs. 10,100-(Rs. 1,800+2500) Expected business revenue less cost of travel. Expected Business revenue calculation is as follow:

Business revenue (In Rs.)	Probability of occurrence	Expected revenue (In Rs.)
20,000	0.25	5,000
10,000	0.3	3,000
6,000	0.25	1,500
3,000	0.2	600
Total	1	10,100

However, from the financial point of view John can generate higher income by Rs. 4500 (Rs. 7,800-Rs. 3,300) in case he stays back to Jaipur but before taking final decision he should also take the effect of expected future benefit and growth opportunities provided by the networking meet.

- ii) Immediate Expected business Income from the meet in Delhi is Rs.2,496 (i.e., Rs. 10,100-Rs. 2,604+2500). Expected business Revenue less cost of travel.

Howsoever From the financial point of view John can generate higher income by Rs. 5304 (Rs.7,800-Rs.2,496) in case he stays back to Jaipur but before taking final decision he should also take the effect of expected future benefit and growth opportunities provided by the networking meet into consideration.

- f) Before taking final decision, John can consider the

following qualitative factors which can affect the final choice.

1. Relevance of non-monetary benefits of relaxation and enjoyment during the train ride.
2. Benefits of having a car in Delhi City (during travel) is relevant while taking the decision. In some parts of the case, the benefits have also been calculated in monetary terms like travel within the Delhi city, however, it is difficult to calculate the exact benefits in rupee terms.
3. Hassel of parking car in the city is also a relevant factor for the decision. Although, it is difficult to measure this in Rupee terms.
4. Similarly, long drive is another a relevant factor which has a subjectivity in the evaluation of alternatives. People assign different values to the comforts they achieve while travelling through train and long route driving i.e., some people like comfort of train journey while others like long route driving.
5. Opportunity costs and benefits are important in taking decisions. All opportunity costs and benefits should be considered while taking decision by John. Opportunity cost related to the choice John will make i.e., choice to go for network meet in Delhi. Opportunity cost/loss is the amount of business he has to forgo in Jaipur if he will go to Delhi for business network meet.
6. Implicit costs & benefits of a comfortable ride can be achieved while going by car. John in particular can listen to music, can take breaks and enjoy moments during the journey etc. Implicit and qualitative factors should be considered by John for selection of an alternative.

Appendix 2

Table 1: Case validation survey results

	Strongly disagree	Disagree	Moderate	Agree	Strongly agree	Total no. of responses	Mean rating (1=Strongly disagree and 5=Strongly agree)
This case helped me understand Managerial Cost concepts			8	62	37	107	4.271
This case was Interesting.			10	46	51	107	4.383
This case was easy to understand.		6	53	37	11	107	3.495
This case was challenging.		6	37	56	8	107	3.617
This case was too easy.	9	50	46	2		107	2.383
This case was too difficult.	4	32	66	5		107	2.673
This case made me think critically about the factors that should be included when taking decisions related to cost.		1	8	47	51	107	4.383

Table 2: Unedited comment

What additional information, if any, should have been provided in the case?
All the information provided was sufficient
All the necessary information was already available in the case study. It was quite detailed.
I think pretty much all the necessary information was there in the case.
In my opinion the case could have more information which could make the case less open ended as currently few things were taken as assumption.
Information regarding how many times he need to travel to and from hotel to place of work in Delhi, would have made case clearer and interesting.
Information regarding number of days Mr. John had gone to the office could have been mentioned to make the inferences for calculations easier.
n/a, information provided was adequate to reach a conclusion.
Not much, the questions were good and helped me think critically.
Nothing.

Nothing, all fine to me.
The case was comprehensive already.
The information provided in the case seemed sufficient as it also left scope to use logic and reason and wasn't totally straightforward.
There are many factors that if provided would have helped to understand the case scenario easily but without them even we made some slight assumptions to ease our understanding.
Whether to include distance between railway station and the hotel.
What additional comment, if any, would you like to provide about the case?
Case was extremely interesting as it depended on multitude of factors and assumptions. The only information which could have been added would have been the number of times he goes to the meeting place from his hotel (i.e., how many times he takes a taxi from his hotel to the meeting place).
Excellent case which makes us think about cost effects of things in our everyday life.
I think it was very interesting and logical in nature. Also, this type of analysis can be used by us in our daily life also which makes the case much more useful.
It was a good case that helps in evaluation of alternatives we face every day on the basis of cost calculations.
It was a good case, helped us to understand the concepts and was interesting. it was a very interesting case.
It was an interesting case that requires taking certain assumptions. I felt availability of certain data could have totally changed the answers. I tried to give my own spin to the income questions which may end up being wrong but the fact that case is not being marked solely based on correctness of the answers gives rise to out of the box thinking. It was a genuinely nice class activity and, in my opinion, fosters better learning than test where the expectation of answering each question correctly to score hampers learning and creates only a pressure-based situation.
It was very useful for clarifying concepts of management accounting.
It's really helpful as we have very limited study over this, so this would probably help us.
More of such cases should be provided for giving a boost to critical thinking.
Mr. John's current business outlook should have been given to better assess the last question about the Opportunity cost.
No comments, the case has cleared all the aspects.
Overall, the case was quite interesting and informative.
The alternatives given were extremely interesting.
The case very well showcased how real-life situations can be thought upon from perspective of management accounting and best possible decisions can be taken easily and scientifically and not through personal judgement
The case was challenging and provided an overall good learning experience.
The case was great, it helped me in revising the main concepts again.
The case was interesting.
The case was quite engaging and interesting, it helped me gain insights into the concept.
The case was very interesting and helped in clarifying some aspects of Management Accounting.
The case was very well structured and provided practical insights into cost accounting concepts.
There should be additional clarity in the case.
This case study was very tricky, and helped me a lot in understanding concepts
This case was pretty interesting and actually clarified some of my doubts on its own.
This case was very well balanced and wonderfully designed to make it comprehensive enough to cover all the relevant concepts of Cost Classification and Decision Making. It also gave us an opportunity to learn the practical daily life use of the topic and concepts which everyone knowingly or unknowingly uses in his/her daily life. Thank you, for designing this case for all of us.
Very comprehensive case study that helped me understand the nuances of decision making on qualitative and quantitative grounds.
Very Interesting and thought provoking.

Conclusion

The Case study method help students in developing the basic competencies to apply theoretical concepts in the practical life problems. The prime objective of the case study is to develop clear understanding of basic management/cost concepts among students by providing an enlightening learning experience in which they can learn application of theoretical knowledge in the real-life situations confronted by the owner of a small service company. Students' responses and comments evidently indicates that the case was engaging and well balanced to provide the better understanding of concepts, experiential learning and practical exposure which improved their learning capabilities.

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