**Hot Bricks Inc.**

**Abstract:** The purpose of this case is to demonstrate risks associated with using a product cost system that is poorly matched with the products or services and more specifically some risks of using a simple costing system for multiple products that use production resources differently. Within the case, the original costing system causes manufacturing costs to be assigned inaccurately which in turn affects prices and customer behavior. In the midst of having doubts about the product costs, company employees face the task of making a significant decision, which has implications on their personal financial incentives. The opportunities and challenges start when a company expands from one well-positioned product to three moderately similar products but continues to use the same costing system.

**Keywords-** product costing systems, activity-based costing (ABC), cross product subsidization, accept or reject contract decision,incentive influence on decisions

**Teaching notes:**

**Intended course and audience**

This case is directly related to activity-based costing which is a topic that can be covered in any level of management accounting course.

In lower-level courses, instructors may assign the basic concept and calculations while higher level courses can incorporate increasingly more challenging concept and calculation questions.

**Assignment questions:**

1. **Using the data for the month of December, what would be the cost assigned to a single unit of each type of brick produced and sold in December using the existing traditional costing system?** 
   1. **What would be the total product cost assigned to each unit?**
   2. **What price would be given for each unit?**
   3. **What are the advantages of this method?**
2. **Using the data for the month of December, what would be the conversion cost assigned to a single unit of each type of brick produced and sold in December if activity-based costing is used to assign cost pools separately? (“Other cost” should still be assigned on a per unit basis but you must choose the allocation base to use for the other cost pools)** 
   1. **What would be the total product cost assigned to each unit?**
   2. **What price would be given for each unit?**
   3. **Justify your selection of allocation bases?**
   4. **What are the advantages of this method for assigning conversion costs?**
3. **When traditional costing is used for products that use resources differently, some products are assigned more cost than they should and other are assigned less cost. The over-costed products are subsidizing (taking on some of the costs) of the lower cost products. Compare your answers from questions 1 & 2. Which products are subsidizing at least one other product and which products are being subsidized?**
4. **What aspects of customer behavior can be explained by this cross-product subsidization?**
5. **Which method would you choose for Hot Bricks? Why?**
6. **If HBI and the new customer agree to a contract using prices based on December unit costs under the traditional costing system and the contract included monthly orders of 1000 HB27s and 1000 HB29s, what would be the gross profit percentage of the contract? How does it compare to desired gross profit percentage?**
7. **Is the material cost a direct cost or indirect cost?**
8. **Should Hot Bricks combine direct material cost and conversion costs together? Why or why not?**
9. **Mixing costs are included in the “other cost.” Should the mixing costs be separated into its own cost pool?**
10. **Hot Bricks Inc. is considering a traditional costing system that assigns conversion costs based on the material cost. Using this approach $72,000 of conversion cost is divided by $60,000 of material cost for an average of $1.20 of conversion per $1.00 of material costs. The following costs and prices would result**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **HB22** | **HB27** | **HB29** |
| **Conversion cost** | **4.00\*1.20 =$4.80** | **5.00\*1.20 =$6.00** | **6.00\*1.20 =$7.20** |
| **Product cost** | **$4.80+$4.00 = $8.80** | **$6.00+$5.00 = $11.00** | **$7.20+$6.00 = $13.20** |
| **Prices** | **8.80x1.50= 13.20** | **11.00+1.5=16.50** | **13.20x1.50=19.80** |

* 1. **What are the pros and cons of this approach?**
  2. **What price would be given for each unit?**

1. **Please discuss the general appropriateness of the incentive plan described in the case and the impact the incentive plan can have on the decision? Are there any ethical implications?**
2. **When is ABC appropriate and when is it not?**
3. **How can hierarchy classification be helpful when activity-based costing is used?**
4. **What type of companies would benefit from ABC?**

**Teaching plan**

What I like about the way this case has evolved is that it can be used very surface level to highlight how cost will differ when different methods are used but can also be used to demonstrate the more nuanced characteristics associated with needing an activity-based costing system.

**Overall focus -** Highlight the value of more accurate costs

* + Especially when prices are based on costs
  + Doing so should stabilize customer behavior
  + The incentive system would not be a problem

Question 1 - Give student practice with the calculations – The traditional method is simple

* + This question requires students to put all the pieces back together into a single amount for more appropriate analysis.
  + The costs and prices should be for HB22, HB27, hand ground HB27 and HB29
  + The cost of hand ground and normal HB27 should be the same
  + Solution included in attached spreadsheet.

Question 2 - Give student practice with the calculations – This method provides more accurate cost

* Forces students to consider the potential cost drivers
  + Students typically assign “other costs” correctly
  + Students typically use BTUs to assign “Firing costs”
  + Students typically determine a cost per unit for the hand-ground brick
  + Students typically assign grinding cost either using volume or BTUs
    - I explained that an advantage of either of these methods is that this cost pools can be combined.
    - I point out the size of the cost pool as a potential consideration
    - I mention that setting up dedicated grinding areas for each type of brick (direct cost tracing) is one approach the company could use. They would know labor is used for product type and how many grinding wheels are used.
  + This question requires students to put all the pieces back together into a single amount for more appropriate analysis.
* The costs and prices should be for HB22, HB27, hand ground HB27 and HB29
* The cost of hand ground and normal HB27 should be different
  + Solution included in attached spreadsheet.

Question 3 – I highlight the expectation that ABC costs are the more accurate cost

* When ABC costs are lower than traditional cost, that product is over costed and it is subsidizing the other products - HB22
* When ABC costs are higher than traditional cost, that product is under costed and is being subsidized the other products - HB27 & HB29
* Hand-ground brick are being subsidized by standard product offering
* The calculations are designed so that HB22 has a similar cost as it did before the introduction of the new products

Question 4 – I highlight the fact that prices are determined by costs

* When a product is over costed and overpriced, there is less demand
* When a product is under costed and underpriced, there is greater demand
* Students may see this as a simple change in demand with similar profitability, so it is important to point out the following
  + There is a decrease in demand products that have greater gross margin than planned
  + There is an increase in demand of products that have less gross margin than planned
  + Together this cause the total gross margins ( and profitability to decrease)

* The question is designed to help student better understand the resulting impact of mis-allocating indirect costs.

Question 5- The right answer is ABC because it is more accurate and there is a significant difference in how costs are assigned and resulting prices.

Question 6 – This is another calculation problem to aid in the decision to accept or reject the contract.

* It gives student the opportunity to practice a focused calculation
* It allows students the opportunity to see that revenue accepted in the contract does not include the 50% markup that the company needs to meet profit goals.
* Solution is included in attached spreadsheet.

Question 7 – I want to highlight the fact that material costs are not traced to each unit but are allocated, making material cost an indirect cost like the conversion cost pool

Question 8 - I want students to question the tradeoff of using two cost pools

* I ultimately highlight the ability to measure material cost per unit more accurately.
* The cost pools should not be mixed, except for the setting where material cost is used to assign conversion costs.

Question 9 – I want to introduce the hierarchy here and highlight the fact that volume-based costs are still significant

* Some students argue because the bricks are made in “batches,” the cost should be separate, but I point out that each batch makes exactly the name number of units.
* I find that discussing this topic from these perspectives help them better understand what a “batch activity” is.

Question 10 - This question serves as example of a traditional costing method approach.

* It is designed to give costs that are like the ABC costs using a single cost driver
* I look for student to point out that this method is simpler, but that hand-ground bricks are still clearly subsidized
* The cause-and-effect principle is intentionally vague here. The cost of the material mix used seemingly has a relationship with the indirect costs.
* I ultimately look for students to point out that changes in the prices of the raw materials, for whatever reason, would have impact on the conversion cost assigned and prices although there no change in resources used by the products.

Question 11 – This question shows how other institutional factors can influence decisions

* I argue that the incentives in place are standard and generally appropriate
* We discuss how the incentive system impacts the decision focus of each employee
* We usually discuss an alternative profit-sharing approach
* In my opinion there are no clearly ethical issues presented.

Question 12 –

* Can be used by most types of organizations when products or services use resources differently
  + Service vs manufacturing
  + For-profit vs NFP
* Not needed when a single product is produces

Question 13 – This has been the most difficult to incorporate

* I try to highlight the idea that classifying the activity can help establish an appropriate allocation base.

Question 14 – This is an opportunity to point out the following:

* ABC is not limited to manufacturing
* ABC is not always appropriate – When offering a single product
* Identify tradeoffs to consider
* Tradition costing will always cause hand-ground bricks to be subsidized.
* Using material cost as simple

Question 15 Other factors to consider

* Customer size
* Transaction cost reductions
* Dropping existing customers’
* The overworked accountant

**Evidence of Efficacy**

This case has evolved over several years and has benefited from feedback at a previous IMA case conference. I have used the case at least once a year and each time, I have conducted a survey related to the case and how it helps them better understand activity-based costing. Student consistently say the case and discussion improves their conceptual understanding activity-based costing.

**Epilogue**

This case is based on activity-based costing material as presented in Horngren, Datar and Rajan’s 15th edition of Cost Accounting: A Managerial Emphasis. It is also based loosely on my personal experience at a brick manufacturing plant. To avoid unnecessary emphasis on actual manufacturing processes where I worked, I asked my graduate student to review information online and present a basic explanation of the manufacturing process.