Cooking and the Books: *A Guide to Restaurant Accounting*

The Honors Program
Senior Capstone Project
Lena Lambrou
Faculty Sponsor: Charles Cullinan
Editorial Reviewer: MaryElla Gainor
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ABSTRACT

The restaurant industry is known for particularly low profit margins; this project aims to understand where restaurants spend money and how expenses can be allocated for in this fast-paced environment. Through research of various cost accounting methods and the adaptability of those methods to restaurant culture, activity based costing (ABC) provided the most useful data for the restaurant. This project focuses on small business restaurants, specifically those that serve pizza. The backbone of experimentation for applying these accounting processes is a local pizza restaurant, in which the managers are unaware of how food cost and operating expenses could be combined to provide meaningful cost information. This study analyzes the process of implementing ABC in this restaurant to ultimately contribute to the formation of a deliverable. The product of this process is a guide which will walk restaurant owners through the application of ABC. This research and application process is intended to demonstrate to restaurant owners the purpose and ease of understanding the expenses of the business.

INTRODUCTION

The purpose of this project is to understand the expenses a restaurant incurs and to communicate to the small business restaurant industry how to account for those expenses. To accomplish this requires a three part explanation: (1) the purpose of cost accounting, (2) the implementation process of a cost accounting method, and (3) the impact this system has on future decisions of the restaurant. The deliverable of this project stems from these three points. First, research was completed on several cost accounting methods specifically in the context of the restaurant industry. From this analysis, Activity Based Costing (ABC) was deemed to be the method that would provide the most useful information to a restaurant. Further explanation of this choice is described in the literature review section of this paper.

The heart of this project focuses on the implementation process of the ABC method in the restaurant industry. In order to study this, a local pizza restaurant allowed access to its information and kitchen as the test subject of an implementation process. This was a mutually beneficial relationship in which the restaurant management wants to better identify their costs and this study aims to understand how to account for restaurant expenses. Thus, this relationship allowed for trial and error in the data collection process and made it possible to develop a system tailored to restaurants, specifically those that serve pizza.

The data collected at this restaurant allow for the creation of a guide which will inform restaurant owners first of the importance and purpose of the ABC method and then describe the application. The goal is to allow restaurant owners to understand why they are making this change and how to fit it into their busy schedules.

LITERATURE REVIEW

There are numerous scholarly articles that delve into different methods used by restaurants to price menu items as well as the importance of effective pricing. However, many restaurant

owners do not have a way to access this information or they simply do not know that this information is available to them. The bottom line is that restaurant owners are not exposed to this material and if by chance they do see it, they may not understand it. This project produces a guide to serve restaurant owners, allowing them to better understand and manage the costs of their business. This could improve business for restaurant owners and could improve their earnings even if the restaurant is already profitable.

I. Introduction

Today there are more than 230,000 restaurants in the United States that offer full service in a casual experience and these establishments account for around $225 billion in revenue ("First Research Industry Profile - Casual Restaurants"). Each day as the number of restaurants grow, creating potential for a new chance for the restaurant to be losing money to competition. Restaurant revenue is expected to grow at an annual rate of 4% through 2019 ("First Research Industry Profile-Casual Restaurants"). Finding a way to support these businesses is important for economic development for the United States. Work done in this area will impact the economic environment in the country and small business restaurants in particular. If these restaurants can more accurately record costs, then prices will be more likely to cover costs. Accurate costing will lead to more informed decisions about pricing which should bring even more revenue into the business. Meals could be a mixture of overpriced and underpriced: after this project is complete, more restaurants will be able to get to the accurate cost in order to set the right price for its customers.

According to Don Hansen and Maryanne Mowen, authors of the *Cornerstones of Cost Management* book, "improving the cost assignment process has been one of the major developments in the cost management field in the past 30 or so years" (Hansen and Mowen 32). This process is relatively new for accounting and has not yet reached all of the applicable areas restaurant cost accounting may be one of those areas.

II. Background

Before understanding the different costing methods that will be described in this review it is important to gain a background in basic cost accounting vocabulary and principles. Cost accounting can be part of a larger system called the Cost Management Information System. This system is of use for internal users and encompasses the costing of goods and services, planning and control, and decision making (Hansen and Mowen 28). Deciding how to do the costing of the products, or in other words meals that the restaurant produces will be the main focus of this project.

There are two kinds of costs: product costs and non-product costs. The three main categories of product costs are: direct materials, direct labor, and overhead. Non-product costs consist of categories such as marketing and administrative expenses. For a restaurant, the direct materials would include any food cost associated with menu items. The direct labor is the labor cost of the employees who are cooking the food. The non-product costs also called overhead are advertising costs or the costs for sustaining the facility such as rent, utilities, and taxes.

Traceability is an important factor in evaluating the accuracy of cost assignments. A cost can be classified as a direct cost or as an indirect cost. The direct costs are costs that can be linked to the product and are therefore more accurate at predicting cost, this is also called direct tracing. When looking at other costs the term used is driver tracing. Driver tracing means utilizing drivers to assign costs, drivers are "factors that cause changes in resource usage, activity usage, costs, and revenues" (Hansen and Mowen 34). Any nonproduction costs would be considered period costs and would include the selling and administrative expenses. Additionally, as a point of reference throughout this work, a prime cost consists of direct materials and direct labor, while a conversion costs entails the direct labor and overhead costs.

An important note to keep in mind is that the need for this project springs from the fact that restaurant owners need to be involved in the process of costing and pricing their menu items. However, research of the data sources that are available through Bryant University, provides only limited scholarly advice pertaining to the restaurant industry and its costs. The information is not simplified for restaurant owners and does not provide a solution to the problem that restaurant owners do not have time to figure out a costing system on their own. Additionally restaurant owners are unaware of how an effective costing system can be beneficial to the business. They need a guide to explain implementation and purpose in simplified terms. Not every restaurant owner understands accounting. The sheer lack of information suggests that there is a gap in the information and that this project has the potential to fill that hole. The restaurant lifestyle is extremely fast paced and there is a great deal of time and energy that goes into running a business like this. However, knowing how much the restaurant spends is very important to success, and there needs to be time and resources devoted to this issue, which is the reasoning behind the creation of this guide, to educate the present and future restaurant owners.

This quote of analysis from Carola Raab and Karl Mayer explains the restaurant industry and the need for this research in this business:

> "Traditionally, the restaurant industry has very small profit margins and a high failure rate (Bell, 2002). Because of the labor-intensive nature of the restaurant business, labor costs usually make up the largest proportion of total cost. Overall, restaurants' operating expenses often make up close to 60 percent of total revenues, with wages and salaries representing about 30 percent of total revenues. In addition, fixed costs (such as occupancy costs and depreciation expense) comprise about 10 percent of a restaurant's total costs, resulting in a very tight profit margin (Schmidgall, 1997; Bell, 2002)." (Raab and Mayer 88)

Not understanding true profitability should be a major concern for restaurant owners. Since profit margin is so small in the industry, costs should be considered a vital aspect to success in the business.

III. Review

This review of literature will contain three major categories: accounting principles, pricing strategy, and guide-writing principles. Each section pertains to a portion of the project that will result in a final deliverable.

Accounting Principles

This section includes a review of a few major cost accounting methods that were found to be relevant to the restaurant industry and worth exploring for the final project. It is important to note that a cost management system such as the traditional and activity based cost management systems are made up of a cost accounting system as well as an operational control system.

    A. Traditional Cost Management Systems

In a traditional cost accounting system there are a number of assumptions that are made. The first is that costs are either fixed or variable and the second is that unit or volume based drivers are the sole way in which costs from production are assigned to the products that are produced. If the costs are assigned only based on these two kinds of drivers this means that many costs need to be assigned through allocation. In terms of the traditional operational control system, a budget is set for individual organizational units. An organizational unit has a manager and this manager ensures that the costs are controlled. If the unit is over or under budget, that determines the unit's performance. Costs that become higher than budgeted would mean trouble for the manager and the business (Hansen and Mowen).

Traditional costing tends to assume that there will always be a fixed cost and the pricing relies more heavily on the variable cost of the menu items. This concept is typically titled the contribution margin approach (Annaraud, Raab, and Schrock 24). However, "over the last three decades, the costs that have increased the most in many businesses are fixed costs"

(Raab and Mayer 86). This leads to the assumption that there are holes in the costing methods of this approach.

An idea that has been relevant in research is that, "traditional costing is inappropriate when products and service lines are diverse and heterogeneity exists in processes, customer demands, and customers. Furthermore, traditional costing provides false information when overhead expenses are high and profit margins are small" (Raab and Mayer 86).   The restaurant industry could be described as exactly this, meaning that traditional costing would have some major drawbacks for restaurants.

    B. Activity Based Cost Management Systems

Activity based costing (ABC) systems aim to avoid allocation and determine more non-unit based activity drivers, in order to attribute more costing to driver tracing in addition to the unit drivers that are used in a traditional costing system. This system is considered to be more flexible than a traditional costing system and there is a focus on the specific activities of the business. In the control portion of activity based costing there is a focus on the management of the activities of production instead of the costs. When there is a focus on the activities, managers are able to focus on cultivating value for customers while at the same time increasing profits for the business (Hansen and Mowen).

Once a business decides to use an ABC system, "several major decisions have to be made about the system at the outset, such as the formality of the design and the degree of precision and complexity required" (Raab and Mayer 82). Advice for making these decisions is included in the guide.

Activity based costing is exactly what the name describes, it is focused on the activities of the business and the cost of those activities rather than the costs of the individual steps it takes to get to those activities. Many of the authors on this topic (Raab and Mayer 83) and (Annaraud, Raab, and Shrock 24) speak to this and for restaurants this is an alluring point for this costing system. Tracking activities is important because restaurants have so many moving parts that

tracking each individual step going on in the kitchen would be daunting. Instead different activities would include the cooking of different menu items. These activity costs are further broken down into cost drivers and include unit, product, and batch level cost drivers. A fourth driver is mentioned in some of the readings and this is a facility level driver (Raab and Mayer 84).

ABC systems provide many advantages to businesses that use them, the most frequent and applicable advantages that were described by authors include: (a) attention to the capacity of the business and if the full potential is being utilized, (b) use of multiple activity drivers, not all costs are driven by units or volume and the ABC system has appeared to be more accurate over traditional costing systems.

It was found that ABC has been tested in different forms of restaurants such as: buffets, support kitchens, and coffee shops. Articles written about these different applications show that application of ABC was beneficial to the business. These articles include, "The Application of Activity-Based Costing to a Support Kitchen in a Las Vegas Casino" and "Menu Analysis for Coffee Shop Operation: Using Activity Based Costing". These experimental applications occurred around the world: Greece, Hong Kong, Las Vegas, and Puerto Rico to name a few. ABC is also useful in not only for providing cost information for the businesses that adopt it, but it also shows areas in which the company is spending too much money (Terungwa 38). This means that the company could find ways to reduce costs for activities that too much money is being spent on, therefore reducing the costs of the business.

The disadvantages of ABC are that there is a great deal of up keep with the system and it has been seen as a drawback to many businesses that do not know how to keep up with the changes (Terungwa 38). If the business has a schedule to periodically review costs there would less work in the future, since the business would be on top of any changes before they escalated. Also the extra effort needs to be placed into context. If the restaurant is putting in

extra time now to keep track of their costs, then it could avoid problems in the future of running out of cash to cover its expenses.

Additionally it takes a great deal of time and some money to figure out costs and then continue to keep track of those costs. However, if restaurant owners took a look at how much time and money it would save them for other decisions, this initial cost of implementing may appear minimal. There is opportunity in knowing exactly how much money goes into the activities that a business performs on a daily basis, especially in an industry with such a small profit margin. When restaurants become aware of the costs of the activities that they perform, they recognize which activities are not serving them or their customers. This means less time doing extra work and more time serving food and making profit.

C. Additional Methods

There are three other costing methods that were investigated for the purpose of this review. These three methods are job order costing, process costing, and standard costing. It was particularly hard to find information on job order costing and process costing specifically in the restaurant industry.

Job order costing is applicable to many industries and should be "utilized by any organization which produces more than one product or service and has more than one client" (Born 1). The problem with this definition is that on the surface a restaurant has that criteria, but looking further into the set-up of the costing method, a restaurant does not necessarily fit the requirements. This method notes the costs and profits made on each job individually. Individually is an important word here because it means that is necessary to "physically identify the jobs produced" (Born 1). As an example, when the term "jobs" is used here it refers to a vehicle for a mechanic or a client for a lawyer, maybe even a custom boat for a builder. The problem here is that a restaurant is not set up in this way. If it was considered in this manner there would be far too many "jobs" to keep track of. Components of this costing system may be useful and that is why research was still completed for this method. For

instance, labor cost is often included in jobs which is an important cost for restaurants to include in the cost of their meals since the industry is very labor intensive. This method also takes into account overhead in an interesting way. Overhead is assigned to jobs through a predetermined rate that could be applicable to restaurants if it is found that overhead cannot be determined before the menu item is sold. For example, maybe the exact overhead is not known for a new menu item or a special on the menu, but a predetermined rate is substituted in the meantime to track cost.

Research of process costing revealed that it does not fit into the restaurant structure. The definition of process costing is as follows, "an accounting methodology that tracks the production of large quantities of identical units. At the end of the period, units in production and completed units must be valued on the balance sheet and income statement" (Dosch and Wilson 38). This costing methodology is more applicable to the manufacturing sector and as of right now there are no direct applications to the restaurant industry. Restaurants produce all menu items in a period and do not need to account for work in process due to the perishability of the products sold. What would need to be accounted for would be waste at the end of the day or week.

The final cost accounting method analyzed in this review is the standard costing method. The first line in an article titled *Benefits from Standard Costing in the Restaurant Industry* states "when reduced to its basic functions, a large-scale restaurant operation is readily comparable to a manufacturing plant, and hence becomes a prime candidate for standard costing techniques" (Mullet 47). The part of this quote that should be emphasized is, 'large-scale restaurant', it is important to understand what Mullet meant by this and if the restaurants in question for this project fit that description. In turn these small business restaurants that are under analysis quite possibly could fit this description. Mullet states that much like a manufacturing plant, a restaurant follows similar steps: "purchasing, processing the raw material, cost and inventory control, and establishing an effective marketing approach" (Mullet 47). In a standard cost system, standard costs are compared to actual costs. A

standard cost would be determined in the restaurant industry for a pizza for example by first defining the cost of each of the ingredients, then the amount of time it takes to make that pizza multiplied by the wage rate of the employee that prepares the menu item, plus any additional costs. This standard cost gets compared to actual average costs. If there is a variance then something is wrong with the control of costs. It is important to remember that ingredients such as steak and seafood shift in price and this method takes into account those issues. It may take time to set up this system of costing, but it is a viable option for restaurants.

Pricing Strategies

Pricing strategy is the next hurdle after costs have been determined. According to a study completed by Carola Raab and Karl Mayer published in the International Journal of Hospitality and Tourism Administration, 56% of restaurants surveyed stated that they priced menu items through mark-up but did not consider their overhead costs in this mark-up (Raab and Mayer 93). In the same study one firm had adopted activity based costing that made up 4% on the restaurants surveyed (Raab and Mayer 91).

Mark Perry had some interesting revelations in his article title *Restaurant Economics: Why don't Popular Ones Raise Prices.* Perry speaks to the phenomenon that popular restaurants cannot just increase their prices without feeling some sort of back lash. When restaurants that are busy with people decide to raise prices it throws off the dynamic and alienates customers. An important point to make is the role of price elasticity and its effect on the customers of the restaurant. By using economic principles, changes in price could be analyzed before a change is actually made.

Pricing can be determined through multiple strategies. Many strategies were found on the Small Business Administration's website in an online video. Cost based pricing is the strategy that will be most important to this project because the costs are being determined in order to set up the best price for better profit margins. An article by Michael Salinger calls

this into question and analyzes cost based prices versus price based costs. There are advantages and disadvantages of choosing price based on current cost. There is always an opportunity for costs to change and that is one of the reasons why a cost management system consistently needs to be updated. Other pricing strategies include competition based pricing and customer based pricing and both will be analyzed once the costs of the menu items have been observed.

Additionally, looking at an industry article from Restaurant Business magazine, restaurant owners tend to be familiar with 'quick and dirty' methods of pricing menu items. It is called a formula that states whatever it costs to make the dish should be multiplied by three to get the price. If actual restaurants employed this strategy they would have prices that would be much higher than their competition ("Menu Pricing Tips and Formulas"). This is what makes pricing difficult, there is no simple rule to menu item pricing. A restaurant needs to take into consideration its entire menu and which items will be loss leaders and which will be higher priced products. There should be a mix in a single menu.

Guide Writing Principles

In order to understand how to structure the guide for small business restaurant cost accounting, looking at sample restaurant guides, business plan how to books, and a guide to self-employment were helpful sources. These books proposed formats from the past and present, using a combination of these formats will prove to make a creative guide that mixes the best practices from each to have the most effective piece of work.

Three guides that were researched that were applicable to this issue and also important source for formatting of a guide. These three books are *The Restaurant Start-Up Guide* by Peter Rainsford and David Bangs Jr., *Opening a Restaurant* by Sharon Fullen, and *Guide to Self-Employment* by David Lord. *The Restaurant Start-Up Guide* contained set chapters but also provided charts for businesses to fill in with their own data to see the information written out.

It also provided a timeline with steps to be taken along the way and checkpoints to reach. This could be important for the guide for cost management because it would help to be able to tell restaurants how much time will understanding and managing their costs take for the business. The restaurant industry does not have a lot of extra time and to have it planned out would be one less thing to worry about for restaurant owners. In the *Opening a Restaurant* guide book, it explained the purpose of the book and also why this was important to restaurant owners. This is something that should be replicated in the guide so that restaurant owners understand the importance of the process that is explained. The final source, *Guide to Self-Employment* was easy to read and the voice was intriguing. The guide also provided questions at the end of each chapter that allowed readers to explore who they are and what they would be looking for in business. There were fun add-ins that could be captured in the guide to make it interesting to the restaurant owners and not just straight text. Also the guide that will be created for this project will not be the length of an entire book, but it will be as long as necessary to get the point across.

IV. Conclusions

Restaurants usually focus on two factors when prices are made, the cost of ingredients and the acceptable mark-up that they plan to charge. Few restaurants take the time to look at their operating expenses and see how that impacts their profits. In the restaurant industry, fixed costs are extremely high and there is a very low profit margin. The restaurant could appear that it is pulling in money when in fact a large amount of the money could be going to labor or rent.

Research has started to point toward specific costing methods that may be more beneficial than others for the restaurant industry. However, it is important to note that once a method is chosen there is still extensive work that will need to be done in order for those costs to be collected and examined. The guide will walk through those steps as well as how a decision of costing method was made for the family restaurant and if it makes sense for other restaurants.

It is not necessary to go strictly one method or another, a hybrid may work best. This will be discovered through data collection and observation. Articles tend to have components of this project within the text, but not all three objectives together. This project will be a comprehensive analysis of costing in restaurants.

Costs of the business are the building blocks to all major decisions made by the business. If management were deciding to change prices, open a new location, or move forward with the business in any way, the costs are a starting point and play a significant role. If this information is inaccurate or not recorded, then management's decisions will be the equivalent of baking a cake without a recipe. It can be done, but how many tries will be necessary to get it just right? A baker with knowledge of how ingredients work together could be able to do this very easily, just as an accountant with knowledge of costing methods could figure out how a restaurant should set up its cost management system. Restaurant owners are not expected to be accountants, but hopefully this guide will provide the 'recipe' to bake the perfect cake.

METHODOLOGY

This project is categorized as a problem-solving endeavor and this has an impact on the methods used to complete it. In contrast to a traditional research thesis, the development of this project has a strong process focus paired with a field based case study. This form was chosen because there is a need for field based case study research in management accounting, according to an article written by Michael Shields on the different research methods used in management accounting (Shields 10). This method of research is seen as creating new opportunities in the management accounting world. If the researcher has access to a proper site and the time to accomplish adequate research the process can be beneficial at determining the best accounting process to be implemented. This project has the luxury of obtaining both an observation site and the time to observe. Field based research is differentiated from other

research methods because it involves "being in the field with management accounting long enough to be sensitized to the organizational and environmental context in which management accounting is embedded" (Shields 10). This was a central goal of the project, not only to implement an accounting process, but to ensure that the process being put in place fit with the restaurant culture.

In addition to this point, Michael Sheilds also goes on to say, "case/field studies also can use (what I will call) dynamic theory. This would be a Bayesian approach to theory construction in which a theory is revised during the course of the research project as evidence is obtained" (Shields 10). This statement highlights the process focus of the project. Through the work with the case study, information was obtained that contributed to the evolution of how the accounting process was put in place. This process was also able to describe how new conclusions were reached through the documentation of the procedures taken to reach the final product.

The first part of this process is research centered, uncovering information about costing methods such as traditional costing, ABC, job order costing, and process costing. These methods are analyzed for the outputs each provide, the structure of the business that they work best with, and the ease of implementation. After the research, the ABC method shows the strongest ties to the restaurant industry. It is a system that will fit in with the restaurant culture and the volume of activities that are conducted. However, there are two pain points that cause trepidation among restaurant owners: this method is viewed as confusing and is viewed as unnecessary.

This point leads to the creation of the guide to walk restaurant owners through the process of implementing the ABC method. In order for this deliverable to come to fruition, trial and error with the sample restaurant plays a key role. The premise behind this portion of the project was to create formatted sheets that would help with data collection at the restaurant. After a data sheet was created, it was tested at the restaurant to see how the information could be compiled. Quickly it became noticeable that certain formats were not helpful in taking in

the variable data. Looking at the direct materials first, ingredients are purchased from multiple vendors and all vendors do not provide the same information. The format needed to be flexible to fit a range of information available. This process continued with each visit made to the restaurant, walking in with a plan and then adapting it to the restaurant's activities and the information that could be made available. Each time a visit took place, corresponding notes were transcribed in order to contribute to the guide. These notes also provided a storyline of the process that was taking place.

Frequent visits to the restaurant, allowed for conversations with the owner and employees about how the operations flowed. Knowing this information helped both in understanding how to apply ABC and in writing the guide in the most effective manner. Each visit contributed to the pool of context knowledge by providing observational research that could not be obtained through reading an article. Observation and brainstorming are key factors in this process because the goal is to teach restaurant owners the most efficient way to complete this implementation process.

After the data collection, reflection becomes the focus. Reflecting on the experience and the information that has accumulated in order to turn it into something useful for the intended user.

RESULTS

The results of the process are identified in three categories. The research portion of the project, the field based case study, and the guide.

Research

The research displayed in the literature review analyzed traditional, activity based, job order, process, and standard costing. Of the methods reviewed, activity based costing was determined to have the best fit for the restaurant industry, based on the following criteria:

Attribute	Traditional	ABC	Job Order	Process	Standard
Applies to heterogeneous products	X	X	X		X
Traces OH based on non-unit drivers		X	X		
Accurate for small profit margins		X			X
Applies to high volume of production	X	X		X	X

ABC provided the most attributes that applied to the restaurant cost structure. However, the complexity of the accounting system needed to be considered in combination with the restaurant culture. Through interviews with restaurant owners and employees, the guide sets up realistic timeframes and milestones, making it possible for a restaurant to adapt a complex accounting method to the business operations.

Field Based Case Study

The observations and hands-on learning of the field based case study provided for experiential and experimental learning. The tests of various spreadsheet formats and recording techniques made it possible to continually develop the final deliverable of this research project. This form of research also helps to explore how accounting knowledge can be connected to the restaurant industry in a simplified manner.

The Guide

The guide is a written piece describing the steps taken to implement ABC in a restaurant. In addition to this write-up, a spreadsheet is pre-set to follow the steps written in the guide. This spreadsheet allows restaurant management to easily fill out the costs of the business, while also being able to add in additional line items, to correspond to a particular menu. The reasoning behind the form is that many effective restaurant guides or even entrepreneurial

guides in general, have an interactive component. This could be anything from a questionnaire to an interactive drawing, the point is these guides utilize the lesson being taught in a manner that can be directly applicable to the reader's business and that is what is being accomplished here. The guide explains three subject areas: what to do, when to do it, and the purpose of the each step that is taken.

DISCUSSION:

This project illustrates the process of using a field based case study to create an implementation guide for activity based costing in the restaurant industry, specifically in terms of pizza. The guide is in a form that allows for the system to be scaled to other menu items once implementation is complete for this section of the menu.

The process for this project began with research, this research revolved around various cost accounting methods and the adaptability each had to the restaurant industry. This means that the context of the restaurant industry and its cost structure were taken into account when analyzing the various cost accounting methods. For instance a restaurant is known for small profit margins, high labor and overhead costs, and a pricing structure that focuses on food cost. Therefore, when looking for a match for an accounting system, something that was accurate to combat the small margin and effective at connecting the labor and overhead costs to the individual menu items was key. It was also crucial to pick a system that restaurant owners could see the benefit in. The point is that this process is going to cost time and money, but if the benefit outweighs the cost in the eyes of the restaurant owner then, the process will be implemented. Ultimately, ABC was considered the best choice for a cost accounting system for a restaurant.

After this decision, I began to create spreadsheet formats that would be able to track the costs that would be recorded from the sample restaurant. These formats were then used on site

when compiling the direct materials, labor, overhead costs. Through visiting the restaurant and filling out these spreadsheets it was found that certain formats worked better than others and that a set plan was necessary in order to spend time efficiently. The visits became an important part of the process because this is when observations could be made of the environment that employees work in and observations of the employees and the work that they do. This also provided opportunities to interview management and employees about the cost of the business and their understanding of how it affected the business and how a new process could be implemented.

After each visit a reflection on what had happened was written in order to contribute to the writing of the guide and also to write about the process of creating that guide. The comments and attitudes of the employees and management greatly shifted throughout the time of visiting the restaurant. Multiple trips were made to the restaurant. At first, comments were made by employees and managers that insinuated this project was going to be daunting and that there was a lot of work to be done. However, during visits many employees were found peering at the results of the data that was being collected and stating that this information could be important for the future. As visits passed, it became apparent that employees and management wanted to understand what was happening and once they did, they wanted to help. That is why the beginning of the guide places a focus on explaining how, when and what is being implemented in order to gain the most compliance with the process.

Data collection from the restaurant was a turning point in the understanding of the purpose this guide would fulfill. This guide would not only explain ABC to restaurant owners, but it would explain how to find the numbers needed, how to fit the process into the pace of the restaurant, and the purpose for each part of the process. One trip of data collection was not enough, many visits to the restaurant took place because after each visit more numbers were needed. The guide intends for someone who is already employed in the restaurant to record the costs. The process for recording has been simplified and summarized so that the process is not as scattered as the initial one undergone, through the case study. The in person visits

also allowed for the brainstorming of different techniques at finding the numbers needed to be recorded. For instance, when toppings needed to be weighed and costs accounted for, as the weighing process occurred an adaptation formed in which multiple empty pans were used to create mock pizzas on top of wax paper to allow for easier weighing. Work arounds such these are recorded in the guide.

After the information was collected, it truly became about using the ABC process and applying it to the formatted information that was collected. This in turn became a part of the guide and additionally a learning experience. The process of explaining how the numbers impacted each other and how to state this information in a clear way to people who may not be familiar with accounting is a skill that will be required when working with clients.

This process of implementation and creation exemplifies the benefits of the field based case study approach and its impact on the research process.

Telling the story of the process that has occurred is important because it is a part of the research method. The field based case study is not only about the end result, it is about the process for getting to that point and the development, creation, and re-creation it took to get there. This guide is important because it does something that many other accounting articles do not, it connects with the reader and brings the information into the reader's world because of the benefits the field based case study method has of immersing in the environment of the field being analyzed. This guide also does what current technology cannot. Current point of sale systems can track sales, but most businesses must input their own costs in order to get information about profit margins. If the cost information is inaccurate, the profit margin information will be inaccurate and useless. Therefore, this guide still finds a purpose among the growing technological influence in the restaurant industry.

This guide was created with the intention that first it would be used to cost the various pizzas served on the menu. If the restaurant found success with using the implementation process

and also with the ABC method then the guide was intended to have the ability to scale to the other menu items in the restaurant. Therefore, allowing the restaurant to know the total costs of all of the menu items that it serves.

Further research that can be completed to supplement this project would be to look into how this total cost information and profit margin analysis could be utilized to make pricing decisions for the restaurant. Additionally, research could be completed on how knowing the cost information could help a restaurant decrease their spending.

APPENDICES

Appendix A: The Guide

COOKING AND THE BOOKS: A GUIDE TO RESTAURANT ACCOUNTING

PURPOSE

Restaurants are known for small profit margins, in order to combat this issue, this guide educates restaurant owners about how to account for the expenses of the business. The business is about more than food cost and in order to make this point clear, read the story below about a conversation with a restaurant owner.

Thomas owns a pizza restaurant and is speaking with Leah, an accounting student about the costs of making a single pizza.

Thomas: "Leah, if I decide to make a small cheese pizza and I pay $4.00 for ingredients and sell the pizza for $10.00, I would make a 60% profit or $6.00."

Leah: "Would you?"

Thomas: "Yes, I spent $4.00"

Leah: "Who made that pizza, did you pay them? Where are you making that pizza, did you pay rent for that space? What machinery did you need to make that pizza and who took the

order for that pizza in the first place? You paid for all of these components of the business. A restaurant is not just about food cost, and its prices should not only reflect that."

Thomas: "So what do I do? How do I record all of those expenses additional expenses and make them attributable to that one pizza?"

This guide focuses on the concept that many restaurants focus on food cost when setting prices. The assumption is that adding a markup to food cost is sufficient to cover the business' operating expenses, taxes, and the profit that it hopes to assume. This idea comes from the writings of Katerina Annaraud, Carola Raab, and Jay R. Schrock in the article from the Journal of Foodservice Business Research "The Application of Activity-Based Costing in a Quick Service Restaurant". This is not a satisfactory method for achieving profit, this guide seeks to walk restaurant owners and employees through the implementation process of a costing method, specifically activity based costing.

READ BEFORE STARTING

This guide is a result of a field based case study. A family pizzeria opened up its doors to walking through the implementation of this process. Throughout this guide there will be reference to what worked best for this sample restaurant. This also provides a connection to the restaurant industry, outside of an accounting perspective. It is important to note that through this process it is necessary to observe and work with other employees. Before jumping into work, explain what is happening to the employees either as a group or one on one when necessary to work with him or her. Through the experience of working with the

sample restaurant, it was found that people were more willing to help and were less

intimidated by observation if they knew what was trying to be accomplished.

A sample explanation that could be utilized is provided below:

A restaurant spends money on food to prepare menu items, but it also spends money

on labor, utilities, rent, taxes, etc. The goal here is to measure the food cost per menu item

and to connect the additional costs of labor and operating expenses to each menu item. At the

end of this implementation process the result will be a record of total cost per menu item that

can then be utilized to determine prices that will generate a known amount of profit for the

business. A situation in which only food cost is considered in determining the price of a

menu item should be avoided, because then it is uncertain if a profit is being made.

PART 1: RECORD THE FOOD COSTS FOR THE RESTAURANT

This may be a daunting task, there are so many different menu items and there is a great deal

of possible combinations for possible pizza toppings.

First look at the spreadsheet attached to this guide, this will provide a general form for where

information can be inserted about ingredients for pizza. The idea here is to first implement

the system for the pizza portion of the menu and if that is successful, scale it to the rest of the

menu items. The spreadsheet is designed to provide a general list of the components that

make up a pizza. There is additional space to incorporate additional toppings, ingredients, or

special pizzas.

When thinking about finding the food cost for pizza, consider the costs in two groups: (1) the base (dough, sauce, cheese) and (2) the toppings.

Any reference to recording information means to fill in the spreadsheet connected with this guide.

DAY 1: FOCUS- DOUGH, SAUCE, CHEESE

Step 1.1: Record a list of all of the ingredients in the dough and the measurements needed for each ingredient to make a batch of dough on the tab titled DM-1. Do the same for the sauce and the cheese. Sauce may come in cans but consider if additional spices are added, there is a place on DM-1 to record and total batch ingredients. After batch ingredients are totaled for dough and sauce divide by corresponding pounds the batch produces. Divide this number by 16 (ounces) and multiply by ounces of sauce or dough used per pizza. An additional note about the cheese; since it is typically made up of one component, this item is recorded on DM-2 with the toppings.

Step 1.2: Now that you have a list of all of the ingredients look for the price per pound on invoices received by the restaurant, it may be helpful to sit down with the person responsible for making the purchases of the food inventory. He or she could help locate where certain ingredients can be found and from which supplier, for this part to be done in a more efficient manner.

TIMING TIP:

Try to complete these steps during a time that an employee is making dough or sauce. Then, that person can answer questions about amounts of ingredients that are put into the mix if there aren't specific measurements for the recipe, the same goes for the sauce and cheese.

Step 1.3: Record how many ounces of dough, sauce, and cheese are used for the various sizes of pizzas produced. Then, work through the chart to calculate sauce, dough, and cheese cost per pizza. Make sure to record these totals in the summary sheet titled Total Cost.

PURPOSE OF DAY 1:

To record the cost of base components of pizza, also known as direct materials for accounting purposes. These three components: dough, sauce, and cheese are the base for most pizzas any additional food cost will be added to this base and included within direct materials.

DAY 2: FOCUS- TOPPINGS

Step 2.1: The spreadsheet connected to this guide provides a list of possible pizza toppings on tab DM-2, edit this list so that it matches the toppings offered by the restaurant implementing this process.

Step 2.2: The goal of this step is to find the amount of each topping that is put on a pizza and find the weight of that amount of topping for all sizes of pizza offered. Weigh toppings and record weights in ounces for the various size pizzas. An efficient way to accomplish this is to use an empty pizza pan for each size of pizza available at the restaurant and place of piece of wax paper in each pan. Two people are needed for this step, one should put toppings on top of the wax paper in the pan, as if he or she was making a pizza, the second

person will take that "finished" pizza, pick up the wax paper keeping all of the toppings on the paper and weigh on a scale. Record the weight in ounces on the spreadsheet with the corresponding size pizza. While person two is determining the weight, person one is putting the same topping on a different size pizza. This process goes back and forth through the different toppings, the idea is to constantly have a new topping ready to be weighed and a new pan to add toppings to, so that no time is wasted. If the restaurant only has one size of pizza, then, take out two empty pans of the same size and rotate through the toppings in the same manner.

Step 2.3: In the spreadsheet to calculate topping cost per each size of pizza, take the cost per pound divided by sixteen ounces and then multiplied by the number of ounces used for that topping (cost of topping = (cost per pound/16)* ounces of topping). On the Total Cost tab there is space to record all the numbers from day 1 and day 2 in a summarized form, total them to arrive at Total DM (direct materials).

TIMING TIP:

It may be easiest to weigh toppings when employees are prepping toppings for the day or when they are putting toppings away at night.

PURPOSE OF DAY 2:

To record the final costs that will be included in direct materials. The toppings are the final component of the pizza, after today, the total food cost per pizza should be calculated. This total food cost will be added to labor cost and overhead costs (overhead consists of expenses such as utilities, rent, and taxes) to arrive at total cost.

PART 2: RECORD LABOR COSTS.

Labor is a major cost for restaurants and it can be connected to individual menu items through activity rates.

DAY 3: FOCUS- LABOR

Step 3.1: Record the number of people that work in the pizza restaurant on average, in the DL tab of the spreadsheet. This includes employees that do prep work and cleaning of the pans. Record the labor cost on a monthly basis including management and not including management. If management is a part of the labor force use this amount when calculating labor rate, if not then use the latter.

Step 3.2: Determine how many hours the restaurant is open and any additional hours that the restaurant has employees working after hours for prep in a month.

Step 3.3: Divide the labor cost per month by the labor hours per month determined in step 3.2. This number is the labor rate per hour, divide this cost by 60 to arrive at the labor rate per minute and divide by 60 again to arrive at labor rate per second. Then, divide the labor rate per second by the average number of employees determined in step 3.1 to arrive at Pizza Labor Rate.

Step 3.4: Time employees doing key activities in the cooking process of the menu item. In the case of the sample pizzeria, time for putting the pizza together, cutting the pizza, and cleaning the pan were included and recorded in seconds. If the business has multiple size pizzas average the times together. Total these recorded average times in seconds to arrive at

Average Total Pizza Time. This time multiplied by the Pizza Labor Rate equals Labor Cost

per Pizza. The spreadsheet follows these account titles and formulas. Additionally, add this

labor cost into the Total Cost tab.

TIMING TIP:

This work for today can be done before opening, after closing, or during a slow time at the

restaurant. When speaking with the sample pizzeria it was disclosed that the middle of the

afternoon was a typically slow time of day for pizzas, therefore there is a potential

opportunity to record the information at that time of day.

PURPOSE OF DAY 3:

Labor is a major cost in the restaurant industry and in order to determine total cost per menu

item the labor cost must be included. Today, finding the labor cost per hour, minute, and

second creates a rate that can be multiplied by an amount of time, in order to arrive at the cost

of labor per pizza.

PART 3: RECORD OVERHEAD EXPENSES OF THE BUSINESS.

Overhead expenses of the business are the operating expenses required to keep the business
going.

DAY 4: FOCUS- OPERATING EXPENSES

Step 4.1: Record a list of any overhead expenses that the restaurant incurs and the

monthly amount spent on those expenses in the OH tab. The OH tab has a list of potential

expenses that the business could incur. As always, feel free to modify the sheet to include

additional expenses that the particular restaurant being analyzed incurs. Indirect labor is a

part of OH on the spreadsheet and the formulas displayed show how to arrive at that number.

Step 4.2: Total the overhead expenses per month and multiply by the percent of sales

pizza accounts for, as a sample the spreadsheet uses 60%. Divide that amount by average

number of pizzas sold a month multiplied by the number of seconds it takes to make a pizza

(calculated in the previous day). This number is the overhead cost per second.

Tip: If the restaurant has a point of sale system finding the average number of pizzas

sold a month should be determinable from the data that the system collects. If the restaurant

does not have this software, it should have knowledge of a typical number sold in a week,

which can then be multiplied by the number of weeks in a month.

Step 4.3: Overhead cost per second multiplied by the Average Total Pizza Time equals

Overhead cost per pizza.

Step 4.4: Add this Overhead cost per pizza to the Total Cost tab. Once total costs are

found, compare them to current prices, refer to the prices tab to input current prices and the

total costs just calculated. Subtract total cost from price to find the margin on each size of

pizza.

TIMING TIP:

The steps for this day can be completed during a slow time of business hours. This could also

be accomplished on a day that the restaurant is closed, if the restaurant is open every day,

there may be a day in which the hours are shorter than other days. Use the early closing time

to get this information recorded. The thought process here is to work within the normal hours

of the business even though it may have closed early.

PURPOSE OF DAY 4:

To trace the labor and overhead expenses to individual pizzas. This information allows for

the total cost to be calculated and compared to current prices.

PART 4: PRICING DECISIONS AND UPKEEP

Now that the current margin is known, pricing decisions can be made in a more informed

manner. Also, now management should be aware of which activities are costing the

restaurant the most money. From this realization the restaurant could plan how to reduce

costs, based on knowing where the heavy cost activities are in the process.

Additionally, these calculations should be checked for accuracy periodically. Determine an

appropriate timeframe with the restaurant management and schedule days and times in which

the system will be updated, quarterly, semiannually, or annually may be appropriate.

Appendix B: Spreadsheet of the Guide

	A	B	C	D	E	F	G	H
1	Price Tab							
2	Item	Ingredient		Current Price	Current Cost Total	Margin	Current Cost Total	Margin
3			Small	Large				
4	Pizza	Cheese	6.95	10.95	='Total Cost'!I5	=C4-E4	='Total Cost'!I38	=D4-G4
5	Pizza	Pepperoni	7.45	11.95	='Total Cost'!I6	=C5-E5	='Total Cost'!I39	=D5-G5
6	Pizza	onion	7.45	11.95	='Total Cost'!I7	=C6-E6	='Total Cost'!I40	=D6-G6
7	Pizza	pepper	7.45	11.95	='Total Cost'!I8	=C7-E7	='Total Cost'!I41	=D7-G7
8	Pizza	salami	7.45	11.95	='Total Cost'!I9	=C8-E8	='Total Cost'!I42	=D8-G8
9	Pizza	mushroom	7.45	11.95	='Total Cost'!I10	=C9-E9	='Total Cost'!I43	=D9-G9
10	Pizza	sausage	7.45	11.95	='Total Cost'!I11	=C10-E10	='Total Cost'!I44	=D10-G10
11	Pizza	hamburg	7.45	11.95	='Total Cost'!I12	=C11-E11	='Total Cost'!I45	=D11-G11
12	Pizza	meatball	7.45	11.95	='Total Cost'!I13	=C12-E12	='Total Cost'!I46	=D12-G12
13	Pizza	anchovies	7.45	11.95	='Total Cost'!I14	=C13-E13	='Total Cost'!I47	=D13-G13
14	Pizza	pastrami	7.45	11.95	='Total Cost'!I15	=C14-E14	='Total Cost'!I48	=D14-G14
15	Pizza	ham	7.45	11.95	='Total Cost'!I16	=C15-E15	='Total Cost'!I49	=D15-G15
16	Pizza	artichoke	7.45	11.95	='Total Cost'!I17	=C16-E16	='Total Cost'!I50	=D16-G16
17	Pizza	bacon	7.45	11.95	='Total Cost'!I18	=C17-E17	='Total Cost'!I51	=D17-G17
18	Pizza	broccoli	7.45	11.95	='Total Cost'!I19	=C18-E18	='Total Cost'!I52	=D18-G18
19	Pizza	black olive	7.45	11.95	='Total Cost'!I20	=C19-E19	='Total Cost'!I53	=D19-G19
20	Pizza	pineapple	7.45	11.95	='Total Cost'!I21	=C20-E20	='Total Cost'!I54	=D20-G20
21	Pizza	spinach	7.45	11.95	='Total Cost'!I22	=C21-E21	='Total Cost'!I55	=D21-G21
22	Pizza	kielbasa	7.45	11.95	='Total Cost'!I23	=C22-E22	='Total Cost'!I56	=D22-G22
23	Pizza	eggplant	7.45	11.95	='Total Cost'!I24	=C23-E23	='Total Cost'!I57	=D23-G23
24	Pizza	linguica	7.45	11.95	='Total Cost'!I25	=C24-E24	='Total Cost'!I58	=D24-G24
25	Pizza	garlic	7.45	11.95	='Total Cost'!I26	=C25-E25	='Total Cost'!I59	=D25-G25
26	Pizza	fresh sliced tomato	7.45	11.95	='Total Cost'!I27	=C26-E26	='Total Cost'!I60	=D26-G26
27	Pizza	roasted green	7.45	11.95	='Total Cost'!I28	=C27-E27	='Total Cost'!I61	=D27-G27
28	Pizza	canadian bacon	7.45	11.95	='Total Cost'!I29	=C28-E28	='Total Cost'!I62	=D28-G28
29	Pizza	hot peppers	7.45	11.95	='Total Cost'!I30	=C29-E29	='Total Cost'!I63	=D29-G29

30	Pizza	feta cheese		7.45	11.95	='Total Cost'!I31	=C30-E30	='Total Cost'!I64	=D30-G30

	A	B	C	D	E	F	G	H	I
1	Total Cost Tab								
2		Dough	Sauce	Cheese	Toppings	Total DM	Labor	OH	Total Cost
3	**Cost: per small:**	Traditional Dough	Traditional sauce	Traditional Cheese					
4	Type of topping:								
5	Cheese	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3		=SUM(B5,C5,D5,E5)	=DL!$B$13	='OH '!$D$25	=SUM(F5:H5)
6	Pepperoni	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E5	=SUM(B6,C6,D6,E6)	=DL!$B$13	='OH '!$D$25	=SUM(F6:H6)
7	onion	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E6	=SUM(B7,C7,D7,E7)	=DL!$B$13	='OH '!$D$25	=SUM(F7:H7)
8	pepper	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E7	=SUM(B8,C8,D8,E8)	=DL!$B$13	='OH '!$D$25	=SUM(F8:H8)
9	salami	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E8	=SUM(B9,C9,D9,E9)	=DL!$B$13	='OH '!$D$25	=SUM(F9:H9)
10	mushroom	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E9	=SUM(B10,C10,D10,E10)	=DL!$B$13	='OH '!$D$25	=SUM(F10:H10)
11	sausage	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E10	=SUM(B11,C11,D11,E11)	=DL!$B$13	='OH '!$D$25	=SUM(F11:H11)
12	hamburg	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E11	=SUM(B12,C12,D12,E12)	=DL!$B$13	='OH '!$D$25	=SUM(F12:H12)
13	meatball	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E12	=SUM(B13,C13,D13,E13)	=DL!$B$13	='OH '!$D$25	=SUM(F13:H13)
14	anchovies	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E13	=SUM(B14,C14,D14,E14)	=DL!$B$13	='OH '!$D$25	=SUM(F14:H14)
15	pastrami	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E14	=SUM(B15,C15,D15,E15)	=DL!$B$13	='OH '!$D$25	=SUM(F15:H15)
16	ham	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E15	=SUM(B16,C16,D16,E16)	=DL!$B$13	='OH '!$D$25	=SUM(F16:H16)
17	artichoke	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E16	=SUM(B17,C17,D17,E17)	=DL!$B$13	='OH '!$D$25	=SUM(F17:H17)
18	bacon	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E17	=SUM(B18,C18,D18,E18)	=DL!$B$13	='OH '!$D$25	=SUM(F18:H18)
19	broccoli	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E18	=SUM(B19,C19,D19,E19)	=DL!$B$13	='OH '!$D$25	=SUM(F19:H19)
20	black olive	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E19	=SUM(B20,C20,D20,E20)	=DL!$B$13	='OH '!$D$25	=SUM(F20:H20)
21	pineapple	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E20	=SUM(B21,C21,D21,E21)	=DL!$B$13	='OH '!$D$25	=SUM(F21:H21)
22	spinach	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E21	=SUM(B22,C22,D22,E22)	=DL!$B$13	='OH '!$D$25	=SUM(F22:H22)
23	kielbasa	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E22	=SUM(B23,C23,D23,E23)	=DL!$B$13	='OH '!$D$25	=SUM(F23:H23)
24	eggplant	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E23	=SUM(B24,C24,D24,E24)	=DL!$B$13	='OH '!$D$25	=SUM(F24:H24)
25	linguica	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E24	=SUM(B25,C25,D25,E25)	=DL!$B$13	='OH '!$D$25	=SUM(F25:H25)
26	garlic	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E25	=SUM(B26,C26,D26,E26)	=DL!$B$13	='OH '!$D$25	=SUM(F26:H26)
27	fresh sliced tomato	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E26	=SUM(B27,C27,D27,E27)	=DL!$B$13	='OH '!$D$25	=SUM(F27:H27)
28	roasted green peppers	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E27	=SUM(B28,C28,D28,E28)	=DL!$B$13	='OH '!$D$25	=SUM(F28:H28)
29	canadian bacon	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E28	=SUM(B29,C29,D29,E29)	=DL!$B$13	='OH '!$D$25	=SUM(F29:H29)
30	hot peppers	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E29	=SUM(B30,C30,D30,E30)	=DL!$B$13	='OH '!$D$25	=SUM(F30:H30)
31	feta cheese	='DM-1'!$G$20	='DM-1'!$G$12	='DM-2'!$E$3	='DM-2'!E30	=SUM(B31,C31,D31,E31)	=DL!$B$13	='OH '!$D$25	=SUM(F31:H31)
32									
33									
34									
35	**Cost: per large**								
36									
37	Type of topping:								
38	Cheese	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	0	=SUM(B38,C38,D38,E38)	=DL!$B$13	='OH '!$D$25	=SUM(F38:H38)
39	Pepperoni	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F5	=SUM(B39,C39,D39,E39)	=DL!$B$13	='OH '!$D$25	=SUM(F39:H39)
40	onion	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F6	=SUM(B40,C40,D40,E40)	=DL!$B$13	='OH '!$D$25	=SUM(F40:H40)
41	pepper	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F7	=SUM(B41,C41,D41,E41)	=DL!$B$13	='OH '!$D$25	=SUM(F41:H41)
42	salami	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F8	=SUM(B42,C42,D42,E42)	=DL!$B$13	='OH '!$D$25	=SUM(F42:H42)

43	mushroom	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F9	=SUM(B43,C43,D43,E43)	=DL!$B$13	='OH '!$D$25	=SUM(F43:H43)
44	sausage	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F10	=SUM(B44,C44,D44,E44)	=DL!$B$13	='OH '!$D$25	=SUM(F44:H44)
45	hamburg	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F11	=SUM(B45,C45,D45,E45)	=DL!$B$13	='OH '!$D$25	=SUM(F45:H45)
46	meatball	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F12	=SUM(B46,C46,D46,E46)	=DL!$B$13	='OH '!$D$25	=SUM(F46:H46)
47	anchovies	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F13	=SUM(B47,C47,D47,E47)	=DL!$B$13	='OH '!$D$25	=SUM(F47:H47)
48	pastrami	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F14	=SUM(B48,C48,D48,E48)	=DL!$B$13	='OH '!$D$25	=SUM(F48:H48)
49	ham	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F15	=SUM(B49,C49,D49,E49)	=DL!$B$13	='OH '!$D$25	=SUM(F49:H49)
50	artichoke	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F16	=SUM(B50,C50,D50,E50)	=DL!$B$13	='OH '!$D$25	=SUM(F50:H50)
51	bacon	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F17	=SUM(B51,C51,D51,E51)	=DL!$B$13	='OH '!$D$25	=SUM(F51:H51)
52	broccoli	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F18	=SUM(B52,C52,D52,E52)	=DL!$B$13	='OH '!$D$25	=SUM(F52:H52)
53	black olive	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F19	=SUM(B53,C53,D53,E53)	=DL!$B$13	='OH '!$D$25	=SUM(F53:H53)
54	pineapple	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F20	=SUM(B54,C54,D54,E54)	=DL!$B$13	='OH '!$D$25	=SUM(F54:H54)
55	spinach	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F21	=SUM(B55,C55,D55,E55)	=DL!$B$13	='OH '!$D$25	=SUM(F55:H55)
56	kielbasa	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F22	=SUM(B56,C56,D56,E56)	=DL!$B$13	='OH '!$D$25	=SUM(F56:H56)
57	eggplant	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F23	=SUM(B57,C57,D57,E57)	=DL!$B$13	='OH '!$D$25	=SUM(F57:H57)
58	linguica	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F24	=SUM(B58,C58,D58,E58)	=DL!$B$13	='OH '!$D$25	=SUM(F58:H58)
59	garlic	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F25	=SUM(B59,C59,D59,E59)	=DL!$B$13	='OH '!$D$25	=SUM(F59:H59)
60	fresh sliced tomato	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F26	=SUM(B60,C60,D60,E60)	=DL!$B$13	='OH '!$D$25	=SUM(F60:H60)
61	roasted green peppers	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F27	=SUM(B61,C61,D61,E61)	=DL!$B$13	='OH '!$D$25	=SUM(F61:H61)
62	canadian bacon	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F28	=SUM(B62,C62,D62,E62)	=DL!$B$13	='OH '!$D$25	=SUM(F62:H62)
63	hot peppers	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F29	=SUM(B63,C63,D63,E63)	=DL!$B$13	='OH '!$D$25	=SUM(F63:H63)
64	feta cheese	='DM-1'!$H$20	='DM-1'!$H$12	='DM-2'!$F$3	='DM-2'!F30	=SUM(B64,C64,D64,E64)	=DL!$B$13	='OH '!$D$25	=SUM(F64:H64)

	A	B	C	D	E	F	G	H
1	DM-1 Tab							
2	Toppings	small (oz)	Large (oz)		batch cost	cost/unit (lb)	cost per small	cost per large
3	Sauce:							
4	sauce	0	0			0	=(F4/16)*B4	=(F4/16)*C4
5	tomato puree						=(F5/16)*B5	=(F5/16)*C5
6	oregano (per batch)							
7	salt (per batch)							
8	pepper (per batch)							
9	basil (per batch)							
10	parsely (per batch)							
11	sugar (per batch)							
12	Total Sauce:			spices per batch	=SUM(E6:E11)		=SUM(G4:G11)	=SUM(H4:H11)
13								
14	dough:							
15	Flour	0	0			0	=(F15/16)*B15	=(F15/16)*C15
16	Salt							
17	sugar							
18	Oil							
19	yeast							
20	Total Dough:			ingred. per batch	=SUM(E16:E19)		=SUM(G15:G19)	=SUM(H15:H19)

	A	B	C	D	E	F
1	DM-2 Tab					
2	Toppings	small (oz)	Large (oz)	cost/unit (lb)	cost per small	cost per large
3	Cheese	4	10	1.85	=(D3/16)*B3	=(D3/16)*C3
4	Cheese	4	10	1.85	(1.85/16)*4	(1.85/16)*10
5	Pepperoni				=(D5/16)*B5	=(D5/16)*C5
6	Onion				=(D6/16)*B6	=(D6/16)*C6
7	pepper				=(D7/16)*B7	=(D7/16)*C7
8	Salami				=(D8/16)*B8	=(D8/16)*C8
9	mushroom				=(D9/16)*B9	=(D9/16)*C9
10	sausage				=(D10/16)*B10	=(D10/16)*C10
11	hamburg				=(D11/16)*B11	=(D11/16)*C11
12	meatball				=(D12/16)*B12	=(D12/16)*C12
13	anchovies				=(D13/16)*B13	=(D13/16)*C13
14	pastrami				=(D14/16)*B14	=(D14/16)*C14
15	Ham				=(D15/16)*B15	=(D15/16)*C15
16	artichoke				=(D16/16)*B16	=(D16/16)*C16
17	Bacon				=(D17/16)*B17	=(D17/16)*C17
18	Broccoli				=(D18/16)*B18	=(D18/16)*C18
19	black olive				=(D19/16)*B19	=(D19/16)*C19
20	pineapple				=(D20/16)*B20	=(D20/16)*C20
21	Spinach				=(D21/16)*B21	=(D21/16)*C21
22	Kielbasa				=(D22/16)*B22	=(D22/16)*C22
23	eggplant				=(D23/16)*B23	=(D23/16)*C23
24	Linguica				=(D24/16)*B24	=(D24/16)*C24
25	Garlic				=(D25/16)*B25	=(D25/16)*C25
26	fresh sliced tomato				=(D26/16)*B26	=(D26/16)*C26
27	roasted green peppers				=(D27/16)*B27	=(D27/16)*C27
28	canadian bacon				=(D28/16)*B28	=(D28/16)*C28
29	hot peppers				=(D29/16)*B29	=(D29/16)*C29
30	feta cheese				=(D30/16)*B30	=(D30/16)*C30

	A	B	C	D	E	F	G	H	I	J	K
1	DL Tab										
2						Driver	Rate	cost			
3	Salaries and Wages:						Hours	Shop Labor rate per hour	Shop Labor rate per minute	Shop Labor rate per sec	Pizza Labor rate
4	Labor cost with owners		per week	=B4*4.4	month	labor hours	361	=D4/G4	=H4/60	=I4/60	=J4/K7
5	Labor cost without owners		per week	=B5*4.4	month	labor hours	361	=D5/G5	=H5/60	=I5/60	=J5/K7
6											
7	Time to make Pizza:	Time (sec)								Avg # of Employees:	10
8	Toppings	55.98									
9	Cut	7									
10	Clean Pan	7.2									
11	Average Total Pizza Time (sec):	=SUM(B8:B10)									
12											
13	Labor Cost per Pizza:	=B11*K4									

	A	B	C	D	E
1	OH Tab				
2	Direct Operating Expenses:				
3	Utilities		year	=B3/12	month
4	Credit & Collection Costs		year	=B4/12	month
5	Security		year	=B5/12	month
6	Rubbish Removal		year	=B6/12	month
7	Supplies		year	=B7/12	month
8	Telephone		year	=B8/12	month
9	Insurance		year	=B9/12	month
10	Music and Entertainment:				
11	Cable		year	=B11/12	month
12	Repair and Maintenance Exp:				
13	Repair and Maintenance		year	=B13/12	month
14	Depreciation:				
15	Building Depr.		year	=B15/12	month
16	Dep of Property		year	=B16/12	month
17	Property Taxes:				
18	Taxes and Licenses		year	=B18/12	month
19	Rent		year	=B19/12	month
20	Other:				
21	Indirect Labor			=DL!J4*B35	month
22			total	=SUM(D3:D21)	
23				=D22*0.6	Product Mix: 60% Pizza
24			moh	=D23/B30	cost per second
25				=D24*B29	OH cost per pizza
26					
27					
28	Pizzas per month	100			

29	Average Total Pizza Time (sec)	=DL!B11			
30	Total Pizza Time per month (sec)	=B28*B29			
31	Total Direct Labor (sec)	=B30/0.6			
32	Direct Labor (not incld. Pizza) (sec)	=B31-B30			
33					
34	Total Labor (sec)	=361*60*60			
35	Indirect Labor (sec)	=B34-B31			

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