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Geneva Electronics

Part A

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During the afternoon of August 30th, a meeting was convened of the senior finance managers and the industrial engineering manager of Geneva Electronics Company. The meeting had been called by Alice Johnson, controller, following her disturbing conversation with the president, Bill Simms. Johnson had approached Simms to discuss the idea of committing the resources necessary to update Geneva's activity based costing (ABC) model. This idea seemed reasonable, given that the previously designed ABC model relied upon information that was more than one year old. Much to Alice's surprise, Simms responded to her inquiry by questioning the value of ABC altogether. Simms commented that he was well aware of the time and money spent designing the ABC model; however, he was not comfortable that a game plan existed for starting to actually use the ABC system to help make business decisions. In fact, Simms was concerned that even though the ABC model building process had been completed, the idea of educating the management team on the potential applications of ABC had completely stagnated since the recent departure of the former controller and ABC champion, Mike Foster.

Simms explained to Johnson that simply rearranging the company's general ledger expenses into an activity based format was not beneficial enough to justify the continued support and maintenance of the ABC system. Instead, the ABC system needed to help Geneva's management team make better decisions that would improve overall company profitability. He informed Johnson that the ABC system was on the agenda for the next management team meeting to be held in three weeks. Her task for this meeting would be to substantiate the potential value of ABC to Geneva's management team. Simms knew that if Johnson could not demonstrate the potential applications of ABC to his company, he would halt the finance department's intentions of committing additional resources to updating an offline ABC system that had yet to be used within his organization to support decision making.

Johnson concluded that for ABC to survive the upcoming management team meeting, she would have to demonstrate its value in terms of cost reduction rather than just cost reporting. In particular, she thought it would make sense to narrow the scope of her presentation to focus on a recent cost cutting proposal that called for a reduction in the number of different types of parts contained in the A12 junction box. This product line had recently been threatened by a major competitor's announcement to reduce its price by $0.40 per unit. Geneva's management team felt that it must find a way to meet the price cut without causing a decline in the company's profits. Johnson believed that the ABC system would survive Simms's scrutiny if she could use ABC data to help Geneva effectively respond to the A12 price reduction.

Company Background

Geneva Electronics, located in Lake Geneva, Wisconsin, builds components, such as ducts, connectors, and junction boxes, which are used in the installation of power cable and data communication cable management systems. These systems are typically installed within concrete floors in office buildings and shopping malls. Geneva employs 300 people who are responsible for engineering, fabricating, and assembling these products for resale through its two primary regional customer channels— large contractors and wholesale electrical supply houses. The firm's strategy is to "offer superior quality products and customer service at competitive prices." Geneva's 1999 revenues were $60 million. The company's sales growth has been steady over the past several years; however, profit margins have shrunk as the company has experienced an increase in expenses that cannot be passed on to its customers in the form of higher prices. In 1999, Geneva's average cost structure across all product lines was as follows: 59¢ of each sales dollar was material cost, 14.7¢ was conversion cost, 13¢ was fixed selling and administrative expenses, and 6¢ was sales commissions. This provided financial results in 1999 of a 7.3 percent before tax profit margin and (given a 40 percent tax rate) an after-tax return on sales of 4.4 percent, which compared unfavorably with industry norms of 10 percent and 6 percent, respectively. (See Exhibit 1 for summary financial information, by major product line.)

Geneva sells more than 100 different product types and models across four major product lines. It is currently operating at or near its practical capacity. Most of Geneva's products are

commodity type products that have standard designs and applications. The technology of these products does not change rapidly; therefore, each competitor offers similar functionality and design. However, a growing source of revenue for Geneva during the past five years has been customized production of orders with unique size and feature requirements for customers outside of Geneva's normal distribution channels. In 1999, Geneva secured record highs in its growing custom business in terms of number of orders received (740) and total number of units produced (68,500). Even though the volume is lower, Geneva's management team considers the custom business to be attractive because it utilizes previously idle plant capacity, earns reportedly high profit margins, and offers some pricing flexibility. Furthermore, Geneva has been able to adapt its existing manufacturing equipment to handle most of the custom business with minimal additional capital investment.

The Cost Accounting System

In 1998, Geneva, with the support of Mike Foster, the controller at that time, decided to develop an ABC model that would encompass the materials acquisition and manufacturing departments. After this model gained acceptance within the company, Foster's long-term goal was to expand the ABC model's scope to include all of Geneva's departments. The model building process included: (1) gathering activity definition, resource driver, and activity driver data; (2) creating an ABC cost model that had the ability to model the effect of changes in product design on activity frequencies; and (3) inputting data into the model. The ambitious goal of creating "what-if" activity cost modeling capability was understood by Foster to be more time-consuming because of the need to create activity time standards, but he also viewed this capability as essential to managing the business from an activity oriented perspective.

At the outset of the ABC project, Foster expressed the desire that the ABC model rely on activity charge rates that represented the cost of creating activity capacity. For example, a rate such as $100 per material move should reflect the investment in resources necessary to provide the capacity to make material moves. Therefore, unlike many ABC systems that use annual estimates of activity driver counts needed to satisfy demand, Geneva developed measures of activity driver capacities that were used as the denominators in its ABC rate calculations. Foster decided that Geneva would state its activity driver capacities in terms of employee capacity. Accordingly, he worked with Geneva's Industrial Engineering group to develop activity time standards that could be used to determine activity capacity estimates. (See both Exhibit 2 for a summary of the estimates of employee capacity in each department and Exhibit 3 for a summary of the activity time standards and activity driver capacities established for each activity in the ABC model.) For example, the first activity, "analyze purchase decision reports," has a time standard of 50 minutes per batch. Purchase orders are prepared for specific customer orders produced in batches. The average time to review the order requirements and make the purchase decision represents a general range of time from 35 minutes to 70 minutes. Over many orders, the average time of 50 minutes was fairly representative and deemed adequate for the ABC project. Foster's ABC philosophy was that periodic drops in activity frequency should be viewed as evidence that temporary levels of idle activity capacity existed, rather than as evidence that ABC rates should be raised. The ABC model was designed to isolate idle capacity as a cost to the company, rather than treating it as an expense to be borne by customers. This approach was intended to put pressure on management either to fully utilize existing activity capacity or to adjust that capacity downward when lower levels of activity frequency became permanent.

The Transition

After completing the ABC model (see Exhibit 4 for a summary of the model), Foster spent a month experimenting with activity-based report formatting. The primary type of report format that he designed for analyzing annual product line profitability was called a "bill of activities," which Foster referred to as the activity-based alternative to a conventional "bill of materials." Foster was beginning the process of organizing a presentation for Geneva's management team that explained the full range of the ABC model's potential applications when he received an outstanding job opportunity to be the chief financial officer of a ecommerce firm near his hometown of Naperville, Illinois. While Foster opted to take the job in Illinois, he agreed to remain at Geneva for six weeks to oversee the hiring and transition of his successor. Unfortunately, during his last six weeks, Foster was unable to complete his ABC presentation.

Once the new controller, Alice Johnson, was hired and briefly oriented to Geneva's operations, Foster departed for Illinois. His departure struck a blow to the momentum of Geneva's ABC system. Although a bright young prospect with ample financial accounting experience, Johnson did not have any prior ABC experience. Furthermore, none of Geneva's functional managers had familiarity with how to use output from the ABC model, given that they were merely asked to provide some data inputs during the model building process. In short, the core of Geneva's ABC knowledge base walked out the door with Foster's departure. Not surprisingly, after Foster's exit, the ABC model ended up sitting on the shelf for the next year as efforts to apply the data to real decisions took a back seat to the day-to-day tasks that demanded everyone's attention. During this time, the direct labor hour based standard cost system continued to support all financial reporting and decision making at Geneva, while the ABC system and its offline computer terminal sat untouched in the finance department.

Aware that the ABC project had stagnated, and intrigued by thoughts of the system's potential, Alice Johnson contemplated the idea of dedicating resources within her department to update the ABC model. Since the original ABC project was started almost two years ago and finalized over one year ago, Johnson felt that refreshing the data in the ABC model made sense. In all likelihood, some changes within the organization and its manufacturing methods had likely occurred, thus calling into question certain assumptions built into the initial ABC model. Updating the model would require performing interviews again within each department and reassigning organizational expenses to activities. Of course, Johnson's unexpected conversation with Simms shifted her focus from refreshing the ABC model to defending its continued existence.

The A12 Junction Box and its Cost-reduction Proposal

The A12 junction box product line accounted for approximately 18.5 percent of Geneva's sales in 1999. It has generated approximately 300 customer orders per year and an annual volume of 100,000 units that is expected to continue for the next several years. Geneva maintains a 20 percent market share in this product line, while its five major competitors each possess market shares ranging from 8 percent to 25 percent. Geneva offers little product differentiation on the junction box line; therefore, it must be price-competitive in this commodity business or risk loss of substantial market share.

Junction boxes are installed at intersections of tubes or ducts containing cables, allowing for turns and connections to other ducts. When installed in concrete floors, they provide limited access to the cable management system for additions or changes in the type and quantity of cable used. The outer shell of the junction box is assembled from steel housing comprising a separately fabricated top and bottom. Assembly workers assemble and mount electronic components inside the junction box. The current model A12 junction box contains ten different types of parts and 26 total parts.

The A12 cost reduction proposal was predicated on the belief that the number of different types of parts used in each model is an important cost driver, along with the total volume of parts used annually in production. Therefore, the product-engineering group wanted to redesign the A12 model of the junction box so that it would require only 21 total parts (in stead of 26) and eight different types of parts (instead of ten different types) with virtually no loss in quality or functionality. The group's expectation was that the primary savings would come through improving operational efficiencies.

Exhibit 5 provides an overview of the material cost impact of the redesign. Three old parts, labeled part numbers #3, #5, and #7, would be replaced by a single new part. The cost for the new part is $12.85. Since two of these new parts would be required per unit, the added product cost would be $25.70 per junction box. The three deleted parts have a cumulative cost per junction box of $24.70; therefore, the total increase in material costs based on 100,000 units of production would be $100,000 or $1.00 per unit.

As part of the cost reduction proposal, the product-engineering group solicited numerous bids from potential suppliers of the new part. Applied Technologies was identified as the preferred supplier of the new part because of its competitive price ($12.85), reputation for high quality, and commitment to customer service. Geneva's engineers believe that, since Applied Technologies is ISO 9000 certified, incoming inspection of the parts would not be necessary. If this turns out not to be the case, three other potential suppliers (all ISO 9000 certified) could be called upon to source the new part at price and quality levels comparable to Applied Technologies, with slightly inferior customer service.

The estimates of the project's upfront costs include $10,000 for product engineering work and $9,500 for process engineering work. In the event the proposal resulted in any layoffs, Geneva would have to cover severance pay of approximately $5,000 per employee. Any future cash flows associated with the proposal would be evaluated using a 14 percent discount rate. The product engineering group believes that the extra upfront costs and material costs associated with the A12 redesign would be more than offset by future savings created by activity reductions in procurement, material handling, and manufacturing.

The product engineering group's problem has been trying to use existing information databases, such as the standard cost system, to estimate the potential savings associated with the A12 redesign. Data provided by the standard cost system, with its labor based factory burden rate, makes it difficult for the group to predict credible changes in operating costs for the A12 product line.

The August 30th Meeting

Alice Johnson (Controller), Ed Branson (Head of the Industrial Engineering group), Phil Markley (Assistant Controller), and Sally Jones (Cost Accounting Manager) were all in attendance at the August 30th meeting. Alice began the meeting by saying:

> As you know, Mr. Simms has put the ABC system on the agenda for the management team meeting in two weeks. My task at the meeting is to substantiate the potential value of our ABC system to this company. If my presentation bombs out, Simms may permanently revoke any additional support for maintaining the offline ABC system. I believe that to save the ABC system we need to shift our focus from cost reporting to cost reduction. More specifically, I believe that we have to prove ABC's worth by demonstrating how it can help management quantify the costs and benefits associated with the cost reduction and profit improvement proposals that have become more prevalent in recent months. Right now, the standard cost data that our managers look at to help make business decisions is misleading. I have reviewed the design of the ABC system and believe that the cost pools created and activity drivers chosen are reasonably accurate; therefore, I feel confident that the ABC system can do a much better job of supporting decision making than the standard cost system.
>
> The A12 junction box proposal is our opportunity to show how ABC can make a difference. It can provide the "proof of concept" that we need to sustain the system. With the impending price reduction on the A12 product line, our target cost reduction is $0.40 per unit. The initial report on the redesign is not very encouraging. The reengineering plan, while achieving a reduction in the number of different types of parts per unit from 10 to 8, projects that material costs will increase by $1.00 per unit. (See Exhibit 5.)

Ed Branson interrupted, saying:

> So, the key to our analysis is determining if the potential cost savings associated with the reduction in number of different types of parts exceeds the $1.00 per unit increase in material costs by more than the $0.40 per unit market driven price reduction. Given the annual product volume of 100,000 units, this means a total parts reduction of 500,000 parts per year, which should generate significant savings in employee time from the standpoint of buying, storing, moving, and assembling these parts into products. We know the savings are there; it is just a matter of properly quantifying them. Clearly, the standard cost system cannot do it, so this presents a good opportunity to show the value of the ABC system.

Alice interjected:

> To that end, I asked Sally [cost accounting manager] and Ed [industrial engineering head] to use the "what if" capability of the ABC model to estimate the impact of the parts reduction on the workload of the departments directly affected—Purchasing, Stores, Material Handling, and Assembly. I have further asked Sally to quantify the cost savings using our existing activity driver charge rates.

Sally Jones offered:

> Ed and I began by reviewing the available ABC data on the A12 junction box as shown in the bill of activities (Exhibit 6). The current unit cost is $82.72, composed of $64.00 in direct materials, $13.51 in ABC costs, and $5.21 in overhead charges from departments that were not included in the ABC project. Of course, these costs are based upon the ten parts version of A12.
>
> We then used the ABC model to adjust the activity driver counts affected by the change in parts. The model assumes the same size and contents of parts containers. It also assumes that the distance traveled and carrying capacity of the forklift trucks would be unchanged. The projection of activity driver count changes is shown in the report that I prepared on "Estimated Cost Savings Using ABC" (Exhibit 7). For example, activity #5b (unload materials and put in stores—assembly) uses the activity driver "# parts containers." Notice the proposal calls for reducing the total number of parts used by 19 percent, from 26 to 21. However, adjusting for parts volume changes as well as parts size changes, the ABC model estimates that the number of parts containers will be reduced by 16 percent. This works out to be a reduction of 3,200 containers, from 20,000 to 16,800.

My report (Exhibit 7) shows how the ABC model estimated the related cost savings by taking the activity driver count reductions and multiplying them by their corresponding ABC rates. For example, activity #5b (unload materials and put in stores—assembly) has a potential cost savings of $6,016, determined by multiplying the ABC rate of $1.88 per parts container times the projected reduction of 3,200 parts containers. As you can see, whenever we reduce activity counts, we achieve cost savings. Looking at the eight activities that are affected by the A12 redesign (#3, #4, #5b, #6b, #8, #13, #15, and #16), we can see that the total annual cost savings due to activity reductions will be $147,206, as shown in the Exhibit. This translates to a $0.47 per unit savings net of the increase in material costs.

The redesign proposal prepared by the product-engineering group relies upon the standard cost system to estimate the savings associated with the A12 redesign. The standard cost system is based on the assumption that direct labor is the only relevant cost driver and, therefore, reductions in direct labor will result in proportional reductions in overhead. Obviously, that assumption is flawed! We could never have identified all of these cost savings using the traditional labor based overhead allocation method, because the plant wide overhead rate effectively hides any specific changes in resource costs that might result from mix and volume changes. Thanks to the ABC model and its "what if" capability, we can estimate with much greater certainty what our cost savings will be in each one of these support departments.

Ed Branson interrupted at this point:

Sally, that brings up an interesting point. You just used the term "cost savings." What does cost savings really mean to us? What does it mean to the line managers and to our company's top management? What does it mean to our stockholders?

I think that the estimates generated by the ABC model are flawed because they do not account for the fact that this type of proposal essentially boils down to quantifying cash savings—"cash" being the key word. Tangible reductions in cash outflows most often will be found by making specific reductions in employee headcount and payroll. Estimating these potential reductions in spending, particularly with respect to payroll, depends upon two factors: the aggregate change in activity demand within each department and the amount of idle capacity that may now be available within each department. For example, if eliminating 800 forklift moves freed up 333 hours of labor time, this would not necessarily save us any money. In other words, since each forklift operator provides 1,571 hours of productive capacity (see Exhibit 2), a reduction in demand of 333 hours does not allow us to let one forklift driver go without becoming shorthanded. On the other hand, if we knew that we had idle capacity in this activity area, say 1,250 hours of unused forklift driver time, we could now be confident that letting one driver go would still leave us with sufficient capacity among the remaining drivers to handle all workload needs. So, it is not a matter of how much we reduce activity levels and release employee time, but whether we can reduce our capacity by one or more workers. So, it seems to me the value of ABC for evaluating this type of proposal rests upon whether it can help us assess short run changes in spending.

I propose that we consider the impact of the activity reductions identified by the ABC model on departmental workloads and savings in employee hours. As we know, no employee performs just one activity. Rather, within a departmental structure, employees are trained to perform a set of activities. Whether enough time can be saved to release an employee is dependent on what is happening to all the activities within a department. For example, within Purchasing we want to determine how much time is saved by the impact of the A12 proposal on two activities—#3, issuing purchase orders for parts, and #4, expediting open parts orders—and whether that time savings is sufficient to allow us to reduce the number of people we employ in that department. The cost savings materialize only if we can reduce our payroll expense.

Based on discussions with department heads, I have developed an estimate of idle employee time within each department. Believe me, they were not very happy about providing these estimates because our department heads are very protective of their staffing levels. Nonetheless, almost every manager did admit to having some idle capacity within his or her respective departments, as shown below:

Department	Estimate of Total Idle Capacity
Purchasing	0.75 full time equivalents
Stores	0.25 full time equivalents
Crane Operators	0.25 full time equivalents
Forklift Operators	0.50 full time equivalents
Fabrication	0.50 full time equivalents
Assembly	0.00 full time equivalents

For example, the Purchasing manager admitted to having three fourths of a person idle or 0.75 fulltime equivalents (FTEs). By using the practical capacity estimate of one purchasing agent (1,537 hours), we can determine that the parts reduction proposal needs only to produce a time savings of approximately 385 hours (0.25 × 1,537 hours) to generate the opportunity for real cost savings. Assembly was the only department that would not concede any idle time. Of course, that probably makes sense, given how backed up they have been lately, coupled with Mr. Simms' reservations about increasing payroll expense by hiring more people.

Alice Johnson interrupted with several questions:

Why are you bringing up the issue of existing idle

> time in the departments? Don't these crude estimates change from week to week? It seems that the inclusion, or exclusion, of existing idle time can have a significant impact on cost savings according to your point of view. Yet, the parts reduction proposal on the table is not in any way responsible for the current level of idle capacity within each department. How can you justify linking these idle capacity estimates to the analysis of this proposal? If I were seeking approval of a cost reduction proposal, using your mode of thinking, I would wait for a down period in our business when capacity utilization drops and then make my pitch to the management team.

Phil Markley spoke up at this point:

> I think an important point that we have yet to mention is the notion of time frame. What time horizon should we consider when trying to estimate the economic benefits of these types of cost reduction proposals? Sally's approach to estimating cost savings seems to be more long-term oriented, while Ed's point of view is more short-term in nature. There is no doubt that Mr. Simms is pretty focused on getting short run results to appease our creditors and investors. Yet, the rhetoric suggests that we are supposed to be managing for long run success. Should our perspective of cost savings be focused on a 6-12 month time horizon, or something more long-term?

As the meeting progressed, little consensus emerged regarding how to measure the cost savings associated with the A12 proposal. Alice was becoming somewhat concerned. The management meeting was less than two weeks away and she was not confident about what to say regarding the A12 proposal.

Questions

1. Describe the position taken by Sally Jones. Prepare a new bill of activities for the revised version of the A12 junction box, based on the old bill of activities provided in Exhibit 6. How much cost savings per unit will be realized? How does the capacity based approach to designing an ABC system enable the measurement of changes in resource usage?

2. Describe the position taken by Ed Branson on what is meant by cost savings. Prepare a schedule of employee timesavings and a schedule of cost savings according to this viewpoint. How much cost savings will be realized in the next year— in total and per unit for the A12 junction box—according to this viewpoint? Decide if you should recognize available idle time estimates in your analysis.

3. With which point of view (Question 1 or 2) do you agree? Why? What net dollar amount of savings, per unit and in total, would you use to analyze this proposal?

4. Does this proposal meet the strategic needs of the company, with respect to competition on the A12 junction box product line? What other advice would you give Alice Johnson to help her prepare for the management team meeting? What do you think the response of President Simms will be to Alice Johnson's presentation? Assuming Simms takes Alice Johnson's recommendation and commits the resources necessary to update Geneva's ABC model, do you think this overall ABC initiative will be successful?

Geneva Electronics

Part B

As the date of the management team meeting approached, Alice Johnson was gaining confidence that her presentation concerning the A12 junction box would have a positive effect on her colleagues. The $0.47 per unit resource-usage-based savings associated with the A12 redesign provided her with the means to illustrate ABC's value to the company. However, a few days before the management team meeting, another one of Wilson's major competitors announced a $2.50 per unit price reduction on its version of the A12 junction box. Johnson is now convinced that her demonstration of a meager $0.47 per unit savings for the A12 junction box will have little influence on the management team; therefore, the credibility of her presentation is doomed. At a loss as to how to respond to this recent development, Alice decided to contact Mike Foster, the former corporate controller of Wilson Electronics. When Foster departed to pursue another job opportunity, he encouraged Alice to use him as a "sounding board" if any questions or concerns arose. Alice decided to take him up on his offer with a phone call.

Alice Johnson (AJ): Hello, Mike. This is Alice Johnson. How are you doing?

Mike Foster (MF): Good to hear from you. I'm doing fine, thanks. Things are a little hectic down here, but I'm hanging in. How are you doing at Wilson? Are you becoming comfortable with their systems and procedures?

AJ: Well, I'm fine, but I'm not so sure about our ABC system.

MF: What do you mean?

AJ: After you left, ABC ground to a screeching halt. In an effort to jump-start things again, I suggested to Mr. Simms that we update the model. He not only put that thought on hold, but he questioned the value of the ABC system altogether. To make a long story short, I have to make a presentation to the management team in a couple of days that explains how ABC can add value to the decision making process within our company. If I fail to deliver a convincing argument, it's possible that Mr. Simms will essentially "pull the plug" on the ABC system entirely.

MF: Dumping ABC would be a mistake. It doesn't surprise me that, subsequent to my departure, the ABC system is on the chopping block. It was tough enough getting support for the initiative while I was there. Well anyway, what do you have up your sleeve for this presentation?

AJ: I decided that it probably makes sense to focus on a cost-reduction proposal as a way to demonstrate that ABC is capable of aiding the decision making process. Therefore, I selected a cost-cutting proposal that relates to the redesign of the A12 junction box.

MF: Tell me a little bit about that particular proposal.

AJ: The proposal is designed to reduce the total number of parts in the A12 junction box from 26 to 21. Also, the number of different types of parts used in each junction box is being reduced from ten to eight. What is interesting about the proposal is that the revised bill of materials projects that raw material costs will increase $100,000 as a result of the product redesign. Since the standard cost system is unable to link the reduction in the number of parts to activity reductions and cost savings, this proposal provides a good opportunity to demonstrate the value of ABC.

MF: Sounds like an interesting proposal. So, how is your presentation to the management team shaping up?

AJ: Well, this is where the problem starts. A few months ago one of our major competitors announced a $0.40 per unit price reduction on its version of the A12 junction box. I concluded that if we could use ABC to document a net savings in excess of $0.40 per unit, then my presentation to the management team would be a success. I met with Sally and Phil from Accounting and Ed from Industrial Engineering to see if we could use the data from the ABC system to estimate the cost savings potential of the A12 redesign proposal.

MF: So, what did your cost savings estimates turn out to be?

AJ: We didn't exactly reach a consensus on this point. Sally applied what I now understand to be the resource-usage viewpoint to calculate an estimated cost savings of $0.47 per unit, net of the material cost increase. However, Ed took a more short-run-oriented perspective that focused on spending reduction. According to Ed's viewpoint, the A12 redesign doesn't generate enough savings to offset the increase in material cost.

MF: What was your reaction to these two sets of cost savings estimates?

AJ: I tend to agree with the long-run oriented resource-usage-based perspective that Sally used to calculate her numbers. Therefore, I was going to build my presentation around the $0.47 per unit savings figure that she derived. I was intending to make the argument that ABC could enable us to make a data-driven decision to match the $0.40 per unit price reduction while maintaining profitability.

MF: You just said that you "were intending" to make this point, but it sounds like you've changed your mind.

AJ: Actually, I was forced to change my mind because yesterday another one of our primary competitors announced a $2.50 per unit price reduction on this product. So, if I go into the management team meeting bragging about a $0.47 savings on a product in need of a $2.50 per unit price cut, I'm going to look foolish! It's the proverbial "eleventh hour" and I'm feeling a little stressed out! So, I decided to call you to see if you could offer any advice as to where I should go from here.

MF: First of all, the work that you have done regarding the A12 redesign was not wasted time. The information that you've conveyed to me regarding your analysis is interesting and it should comprise a portion of your presentation. However, you're correct in assuming that the A12 proposal can't be the basis for your entire presentation.

AJ: But, should I use Sally's numbers or Ed's? I'm inclined to use Sally's, but what do you think?

MF: Personally, I prefer the usage model because I believe that it puts the focus on redeploying freed-up capacity as opposed to the spending model that tends to focus on headcount reduction. Nonetheless, I would present both modes of analysis as potentially useful sources of

information depending upon the decision context. Furthermore, I think that both modes of analysis are an improvement over the existing standard cost system.

AJ: Okay, what else can I build into the presentation beyond the usage-vs. -spending analysis of the A12 proposal?

MF: My suggestion is that you use the ABC cross model as a way to broaden the scope of your presentation to include some "big picture" issues that you're currently overlooking if your focus is exclusively on the cost-reduction potential of the A12 proposal. I'll have my assistant send you a copy of an article describing the ABC cross model, but for now, here is a thumbnail sketch. The ABC cross model will not only give you a platform for talking about applications of ABC from a "what-if" cost-modeling perspective, which you're already touching upon with the A12 proposal, but it will also enable you to discuss ABC applications from both a product-mix-strategy perspective and a process cost-management perspective. Right now, your presentation game plan is overlooking these two potential applications of ABC that I've always felt are critical to Wilson. I think it's important for you to consider why the product-engineering group picked the A12 product line over other product lines as the focal point of its product redesign cost reduction efforts.

AJ: Probably it was a "knee-jerk" reaction to our competitor's announced price reduction of $0.40 per unit coupled with the already low 2.2 percent profit margin on this product reported by the standard cost system. Of course, you and I know that the 2.2 percent margin is probably distorted, but….

MF: So, in other words, management's perception was that the A12 junction box was marginally profitable before any price reduction, and a further reduction in price without taking any type of management action would drop this product into the "red." So, a response was necessary and cost reduction seemed to be the most likely option. A "big picture" question that you should ask is: Should Wilson be focusing its attention on products such as A12? Is A12 really a loser even before the price cut? Products such as A12 are the perceived reason that overall company profits have been shrinking, but what about all those low-volume, custom products that look so great according to the standard cost system? Right now, nobody outside your finance department has a clue about the true relationship between the revenue being generated by the growing custom business and the costs being driven by that segment of Wilson's business.

AJ: Wow, I guess in the back of my mind I was aware of this issue, but I allowed myself to get caught up in the detail of A12 proposal, while turning a blind eye to the product-mix-strategy issue.

MF: Keep in mind that there's nothing wrong with the details of the A12 proposal that you've been wrestling with. After all, if Wilson reduces its price on the A12 junction box by $2.50 without any true accompanying cost reduction, your company will see its profits decline regardless of what the ABC system indicates about A12's profit margin. So the usage-vs. -spending issue is worth thinking over and incorporating into your presentation, but it's not the whole ABC story. While we're talking, here's another issue to think about. Let's assume for a minute that your focus is the A12 junction box. You just told me moments ago that Sally's projected cost savings were well short of the market driven $2.50 price cut. Look at the activity costs that are being charged to the A12 line and are being passed on to Wilson's customers. How many of those activities in the ABC model are value-added from the customer's perspective?

AJ: You're right—moving, storing, setting-up equipment, expediting—none of those activities adds any value. We could be spending time analyzing these nonvalue-added costs to find ways to reduce support costs without sacrificing product quality or customer service.

MF: Given the volume of sales associated with A12, it may make more sense to talk about cost reduction from a process-redesign perspective instead of a product-redesign perspective. There is probably a big savings opportunity associated with creating a manufacturing cell for A12. I think the big dollars are there instead of the proposed product redesign. Obviously, Wilson cannot snap its fingers and have a manufacturing cell up and running, but the purpose of your presentation should be simply to create an awareness of this application of ABC data. In other words, how on earth would you quantify the resources being consumed in nonvalue-added work using the standard cost system? Furthermore, how would you use the standard cost system to estimate the cost savings associated with a process redesign initiative?

AJ: Good point. These process-cost management issues definitely need to be included in my

presentation.

MF: Listen, I have an appointment coming up, but I want to mention one last thing for you to think about for your presentation. Spend some time contemplating the tone of your message. If your sole focus is on cutting—cutting product lines and cutting nonvalue added workers—your fellow managers may begin to get resentful and see you only in the role of the proverbial "bean counter." I know the people out on the manufacturing floor are going to want to talk about revenue growth, not just cost reduction. You probably should be prepared to offer some comments regarding ABC from a resource redeployment and revenue growth perspective. Make the point that once ABC has helped identify freed up resources in support as well as production departments, those valuable resources do not necessarily need to be eliminated; rather, they can be channeled to growing revenue and contributions from other product lines. In that way, total profitability can be increased without sacrificing people. That will appease the manufacturing managers.

AJ: Good advice. I'll need to consider that point. Perhaps the theory of constraints [TOC] could come into play here since we are talking about revenue growth, and we have recently been operating at practical capacity. I know the Assembly Department has been particularly backed up in recent months.

MF: You're right. I never really thought about that, but perhaps TOC could somehow work in a complementary fashion with ABC. AJ: All right, I've taken up enough of your time. I know that you're busy and must go. You've given me a ton of great ideas to think about. Thanks a million!

MF: It was my pleasure to help. Give me a call after the meeting to let me know how it worked out.

AJ: Will do. Talk to you later and thanks again.

As Alice hung up the phone, she continued to fill her note pad with a summary of the insights provided by Mike Foster. Alice had become well aware that her original game plan for the management team presentation would probably have failed. Thanks to Mike's advice, Alice was beginning to crystallize in her mind a presentation that she felt was sure to impress Simms, thereby saving the ABC system from discontinuation.

Questions

Assuming that you hold the position of corporate controller (that of Alice Johnson), organize a written presentation to the Wilson management team attempting to sell the virtues of ABC. To help organize your thoughts and presentation, consider the following questions:

A. What is the ABC cross model? Define what is meant by the product costing, process costing, and the "what if" cost modeling perspectives of ABC.

B. Estimate an income statement for the current version of the A12 junction box using the direct-labor based standard cost system. Compare the profitability of the current version of the A12 junction box as reported by the direct-labor-based system to the ABC system and relate these cost numbers to the competitor's announced price reduction of $2.50 per unit. What conclusions may be inferred from this information?

C. Estimate the average overhead charge per unit for the custom product lines using the direct-labor-based standard cost system. How do these charges compare to the per unit charges assessed against the A12 junction box using the standard cost system? What conclusions may be inferred from this information?

D. Estimate an income statement for the A12 junction box, assuming that Wilson implemented a manufacturing cell for the A12 line and was able to eliminate all nonvalue-added resource costs associated with producing A12. What other information could you present that would highlight the dollar value of resources that Wilson is channeling to nonvalue-added activities?

E. What role would the data from the resource usage vs. resource spending analysis play in your presentation? How could net present value analysis be incorporated into the usage-vs. -spending analysis?

F. How would you use data from Geneva's activity model to estimate the throughput growth potential associated with the A12 redesign?

EXHIBIT 1

In thousands $

In thousands $ 10821

		Ducts	Connectors	Junction Boxes	Custom	Total	[%]	Industry Average
1997	Sales	17,515	13,560	20,905	4,520	56,500	100.0%	100.0%
Direct materials		10,118	8,040	12,125	2,600	32,883	58.2%	58.0%
Direct Labor		650	450	750	150	2,000	3.5%	4.0%
Overhead		2,145	1,485	2,475	495	6,600	11.7%	10.5%
Gross margin		4,602	3,585	5,555	1,275	15,017	26.6%	27.5%
S, G & A		2,978	2,305	15.3%	768	9,605	17.0%	17.0%
Profit before tax		1,624	1,280	5,555	507	5,412	9.6%	10.5%
Tax expense		650	512	800	203	2,165	3.8%	4.2%
Profit after tax		974	768	4,755	304	3,247	5.7%	
Profit margin		5.6%	5.7%	22.7%	6.7%	5.7%		6.3%
1998	Sales	16,820	13,920	20,880	6,380	58,000	100.0%	100.0%
Direct materials		10,183	8,213	12,110	3,365	33,871	58.4%	58.0%
Direct Labor		442	394	734	230	1,800	3.1%	4.0%
Overhead		1,729	1,541	2,871	900	7,040	12.1%	10.0%
Gross margin		4,466	3,772	5,165	1,885	15,289	26.4%	28.0%
S, G & A		2,994	2,478	3,717	1,136	10,324	17.8%	17.5%
Profit before tax		1,472	1,294	1,448	749	4,965	8.6%	10.5%
Tax expense		589	518	579	300	1,986	3.4%	4.0%
Profit after tax		883	776	869	449	2,979	5.3%	
Profit margin		5.2%	5.6%	4.2%	7.0%	5.1%		6.0%
1999	Sales	16,800	14,200	21,000	8,000	60,000	100.0%	100.0%
Direct materials		10,550	8,430	12,320	4,100	35,400	59.0%	58.0%
Direct Labor		392	368	680	260	1,700	2.8%	4.0%
Overhead		1,646	1,546	2,856	1,092	7,140	11.9%	10.0%
Gross margin		4,212	3,856	5,144	2,548	15,760	26.3%	28.0%
S, G & A		3,192	2,698	3,990	1,520	11,400	19.0%	18.0%
Profit before tax		1,020	1,158	1,154	1,028	4,360	7.3%	10.0%
Tax expense		408	463	462	411	1,744	2.9%	4.0%
Profit after tax		612	695	692	617	2,616	4.4%	
Profit margin		3.6%	4.9%	3.3%	7.7%	4.4%		6.0%

4.2

EXHIBIT 2 **Employee annual capacity in labor hours**

(excludes supervisory labor)

Employee Classification	Employee Headcount	a Theoretical Capacity	b Practical Capacity	c Average Employee Practical Capacity	d Average Wage per employee	e Average Wage + Fringe per employee	d / 2,000 Average Average Hourly direct wage per employee	e / c Average Hourly wage + Fringe cost per employee
Purchasing Agents	15	30,000	23,050	1,537	$ 25,311	$ 30,373	$ 12.66	$ 19.76
Stores Employees	12	24,000	17,880	1,490	$ 24,223	29,067	$ 12.11	$ 19.51
Crane Operators	2	4,000	3,230	1,615	$ 25,917	31,100	$ 12.96	$ 19.26
Forklift Operators	13	26,000	20,420	1,571	$ 24,592	29,510	$ 12.30	$ 18.78
Fabrication Workers	32	64,000	50,880	1,590	$ 25,426	30,511	$ 12.71	$ 19.19
Assemblers	103	206,000	157,220	1,526	$ 24,833	29,800	$ 12.42	$ 19.53

a Theoretical capacity is defined as 50 weeks/ year multiplied by 40 hours/ week, or 2,000 hours/ employee/ year.

b Practical capacity equals theoretical capacity less nonproductive times, such as vacation and sick time, planned idle time, scheduling, and other downtime. Idle capacity estimates were obtained from departmental managers in the form of FTEs.

c Fringe benefits are 20 percent of employee wages.

EXHIBIT 3 Activity Capacity Estimates in Hours

	Hours of employee capacity	Activity Driver	Activity standards minutes per activity	Activity capacity
Purchasing Department				
1. Analyze purchase decision reports	2,060	production batches	50	2,472
2. Issue purchase orders for sheets	1,834	production batches	45	2,445
3. Issue purchase orders for parts	7,614	unique parts/batch	20	22,842
4. Expedite open parts orders	11,576	unique parts/batch	30	23,152
	23,084			
Stores				
5. Unload materials and put in stores				
a. Fabrication— steel sheets	2,346	sheet bundles	16	8,798
b. Assembly— parts	10,260	part containers	5	123,120
6. Process material requisitions				
a. Fabrication— steel sheets	894	sheet bundles	5	10,728
b. Assembly— parts	4,452	part containers	2	133,560
	17,952			
Material Handling				
7. Move sheets to Fabrication by crane	3,203	crane moves	60	3,203
8. Move parts to Assembly	11,619	forklift moves	25	27,886
9. Move steel housing to Assembly	5,116	forklift moves	45	6,821
10. Move finished goods to warehouse	3,669	forklift moves	30	7,338
Fabrication				
11. Setup equipment	5,083	setups	150	2,033
12. Fabricate steel housing units	40,728	housing units	6	407,280
13. Rework defective units	5,129	of rework hours	10	30,774
Assembly				
14. Unload steel housing units	12,704	housing units	1.5	508,160
15. Unload parts and hold	18,768	parts '000	0.1	11,260,800
16. Assemble finished products	94,264	parts '000	note below	11,260,800
17. Inspect finished goods	17,435	finished units	2.0	523,050
18. Package finished goods	14,138	finished units	1.5	565,520
	157,309			

Total assembly times (in minutes and hours) for the original A12 and the revised A12 are provided in Exhibit 5.

EXHIBIT 4 Activity Cost Pools

	Wages and Fringes	Super-vision	Supplies and Utilities	Equipment	ABC Cost Pools	
Purchasing Department						
1. Analyze purchase decision reports	$ 41,004	$ 5,000	$ 3,000	$ 2,181	$ 51,185	
2. Issue purchase orders for sheets	36,448	6,000	4,000	1,938	48,386	
3. Issue purchase orders for parts	150,348	10,000	8,000	6,481	174,829	
4. Expedite open parts orders	227,800	31,000	6,380	5,380	270,560	
	455,600	52,000	21,380	15,980	544,960	30,373
Stores						
5. Unload materials and put in stores						
a. Fabrication— steel sheets	$ 45,344	$ 8,160	$ 5,200	$ 4,440	$ 63,144	
b. Assembly— parts	198,816	18,000	6,800	6,290	229,906	
6. Process material requisitions						
a. Fabrication— steel sheets	17,440	5,780	8,500	3,145	34,865	
b. Assembly— parts	87,200	16,860	7,000	4,625	115,685	
	348,800	48,800	27,500	18,500	443,600	
Material Handling						
7. Move sheets to Fabrication by crane	$ 62,200	$ 11,200	$ 9,600	$ 42,800	$ 125,800	
8. Move parts to Assembly	218,666	24,350	17,200	38,600	298,816	
9. Move steel housing to Assembly	95,906	7,525	10,600	32,250	146,281	
10. Move finished goods to warehouse	69,052	6,063	8,500	26,930	110,545	
	383,624	37,938	36,300	97,780	555,642	
Fabrication						
11. Setup equipment	$ 97,635	$ 22,000	$ 14,400	$ 38,450	$ 172,485	
12. Fabricate steel housing units	781,080	78,800	15,000	126,500	1,001,380	
13. Rework defective units	97,635	11,200	10,000	100,000	218,835	
	976,350	112,000	39,400	264,950	1,392,700	
Assembly						
14. Unload steel housing units	$ 245,552	$ 52,600	$ 3,000	$ 17,200	$ 318,352	
15. Unload parts and hold	368,328	72,000	3,900	33,700	477,928	
16. Assemble finished products	1,841,640	86,000	18,100	66,500	2,012,240	
17. Inspect finished goods	337,634	94,200	11,300	23,000	466,134	
18. Package finished goods	276,246	66,000	6,500	33,000	381,746	
	3,069,400	370,800	42,800	173,400	3,656,400	
Total Activity Costs					$6,629,742.00	

EXHIBIT 5 Junction Box—Model A12

Summary of Direct Material Cost and Assembly Time per Unit

			Direct Material Cost			Assembly Time per Unit (minutes)		
Unique Part Number	Original Number of Parts per unit	Revised Parts List	Vendor Cost per part	Original Materials cost	Revised Materials cost	Assembly Time minutes	Original Assembly Time per unit	Revised Assembly Time per unit
1	4	4	0.50	$ 2.00	$ 2.00	0.25	1.00	1.00
2	3	3	2.80	$ 8.40	$ 8.40	0.50	1.50	1.50
3	2	0	4.00	$ 8.00	—	0.75	1.50	0.00
4	1	1	2.50	$ 2.50	$ 2.50	1.00	1.00	1.00
5	3	0	3.50	$ 10.50	—	0.50	1.50	0.00
6	2	2	2.75	$ 5.50	$ 5.50	0.75	1.50	1.50
7	2	0	3.10	$ 6.20	—	1.00	2.00	0.00
8	4	4	2.40	$ 9.60	$ 9.60	0.25	1.00	1.00
9	3	3	2.00	$ 6.00	$ 6.00	0.50	1.50	1.50
10	2	2	2.65	$ 5.30	$ 5.30	0.75	1.50	1.50
New part	0	2	12.85		$ 25.70	1.71	0.00	3.42
	26	21		$ 64.00	$ 65.00		14.00	12.42
						Hours:	0.23	0.21

In thousands	1997	Original	Revised		Original	Revised
Production Volume (units)		100,000	100,000		100,000	100,000
Direct Materials Estimate		6,400,000	6,500,000			
Total assembly hours					23,333	20,700

EXHIBIT 6 Bill of Activities for Current Version of A12 Junction Box

Volume of production 100,000 units

Activity#	Activity Driver		Activity rate Cost	Total Activity Charge	Activity Charge/unit
1	300	production batches	$ 20.71	6,213	$ 0.06
2	300	production batches	$ 19.79	5,937	$ 0.06
3	3,000	unique parts/batch	$ 7.65	22,950	$ 0.23
4	3,000	unique parts/batch	$ 11.69	35,070	$ 0.35
5a	1,500	sheet bundles	$ 7.18	10,770	$ 0.11
5b	20,000	part containers	$ 1.87	37,400	$ 0.37
6a	1,500	sheet bundles	$ 3.25	4,875	$ 0.05
6b	20,000	part containers	$ 0.87	17,400	$ 0.17
7	600	crane moves	$ 39.28	23,568	$ 0.24
8	3,333	forklift moves	$ 10.72	35,730	$ 0.36
9	1,500	forklift moves	$ 21.44	32,160	$ 0.32
10	1,500	forklift moves	$ 15.06	22,590	$ 0.23
11	300	setups	$ 84.83	25,449	$ 0.25
12	100,000	housing units	$ 2.46	246,000	$ 2.46
13	4,550	of rework hours	$ 7.11	32,351	$ 0.32
14	100,000	housing units	$ 0.63	63,000	$ 0.63
15	2,600,000	parts used	$ 0.04	104,000	$ 1.04
16	2,600,000	parts used	$ 0.18	464,605	$ 4.65
17	100,000	finished units	$ 0.89	89,000	$ 0.89
18	100,000	finished units	$ 0.68	68,000	$ 0.68
Total activity charges				1,350,669	$ 13.47
Overhead from departments not included in ABC study				520,661	$ 5.21
Conversion costs				1,871,330	$ 18.68
Total Material Costs				6,400,000	$ 64.000
Total Product Cost				8,271,330	$ 82.68

The overhead charged from the departments not included in the ABC study continues to be the same amount as would be charged from these departments using the direct-labor-based standard cost system.

EXHIBIT 7 **Estimated Cost Savings Using ABC**

Assumed annual volume 100,000 units

		Activity Driver	Original Activity Frequency	Revised Activity Frequency	Change		ABC Rates	Cost Savings
Purchasing Department								
1. Analyze purchase decision reports		production batches	300	300	0	$	20.71	0
2. Issue purchase orders for sheets		production batches	300	300	0	$	19.79	0
3. Issue purchase orders for parts		unique parts/batch	3,000	2,400	(600)	$	7.65	(4,592)
4. Expedite open parts orders		unique parts/batch	3,000	2,400	(600)	$	11.69	(7,012)
Stores								
5. Unload materials and put in stores								
a. Fabrication— steel sheets		sheet bundles	1,500	1,500	0	$	7.18	0
b. Assembly— parts	a	part containers	20,000	16,800	(3,200)	$	1.87	(5,975)
6. Process material requisitions								
a. Fabrication— steel sheets		sheet bundles	1,500	1,500	0	$	3.25	0
b. Assembly— parts	a	part containers	20,000	16,800	(3,200)	$	0.87	(2,772)
Material Handling								
7. Move sheets to Fabrication by crane		crane moves	600	600	0	$	39.28	0
8. Move parts to Assembly	b	forklift moves	3,333	2,800	(533)	$	10.72	(5,712)
9. Move steel housing to Assembly		forklift moves	1,500	1,500	0	$	21.44	0
10. Move finished goods to warehouse		forklift moves	1,500	1,500	0	$	15.06	0
Fabrication								
11. Setup equipment		setups	300	300	0	$	84.83	0
12. Fabricate steel housing units		housing units	100,000	100,000	0	$	2.46	0
13. Rework defective units	c	of rework hours	4,550	3,000	(1,550)	$	7.11	(11,022)
Assembly		In thousands						
14. Unload steel housing units		housing units	100,000	100,000	0	$	0.63	0
15. Unload parts and hold		parts used	2,600,000	2,100,000	(500,000)	$	0.04	(21,221)
16. Assemble finished products		parts used	2,600,000	2,100,000	(500,000)	$	0.18	(89,347)
17. Inspect finished goods		finished units	100,000	100,000	0	$	0.89	0
18. Package finished goods		finished units	100,000	100,000	0	$	0.68	0
Total Savings								(147,653)

a The original activity frequency for activities #5b and #6b assumed an average of 130 units per container. The revised frequency is based on fewer although larger parts, which average 125 parts per container.
b For activity #8, each forklift move is assumed to carry 6 parts containers. Thus, 3,333 moves would be required to move 20,000 containers
c For activity #13, the revised number is an estimate based on the presumption that the change in unique parts will reduce rework by approximately 1/ 3.