

## Can Parametric Estimating Complement ABC?

### **Abstract:**

Activity Based Costing (ABC) is a fairly recent movement to help businesses identify the real costs of products and customers. Businesses like Deluxe Check Printing, Warner-Lambert Pharmaceutical, and the USAF Arnold Research Center have implemented ABC to help achieve greater return on resource expenditures. After almost 20 years of recognition as a business model, ABC thinking is now expanding into Activity Based Budgeting (ABB) and Activity Based Management (ABM), though these practices are less mature.

Despite its name, ABC involves more estimating than it does accounting. At the heart of the estimating function of ABC is the activity cost driver, or what estimators would call the cost estimating relationship (CER) that produces a cost object (i.e. product, service, or customer). An activity cost driver serves as the link of activity costs to cost objects. The complexity of the three types of activity cost drivers become more complex as one moves from the simple transaction driver to the time sensitive duration driver, and finally to the time and complexity sensitive intensity driver. In fact, a case can be made that many implementations of ABC have avoided use of the intensity driver due to its complexity. This talk will address:

1. Why an alternative (ABC) to the traditional financial based Cost System is needed.
2. Why ABC emerged when it did.
3. Activity-Based Management (ABM), Activity-Based Budgeting (ABB), and competing initiatives.
4. The components of ABC Systems and the steps involved in building them.
5. A notional example of an ABC system.
6. The CAM-I cross model of operational ABC/ABM.
7. The parametric estimating link to ABC.

### ***Why ABC?***

There are three fundamental reasons for a company needing a cost system: 1. To value inventory and measure cost of goods sold; 2. To estimate the costs of activities, products, services, and customers; and 3. To provide economic feedback about process efficiency. The first of these needs is driven by external reporting requirements imposed by tax authorities and investors. Systems that meet this need, serve as meters of the present health of a business. But, it is through systems that address the second and third needs that the internal management of a company is able to meter the effect that strategic decisions about operational changes (improvements) will have on the future health of the company. In short, systems addressing the first need look back, while those that address the second and third needs look forward.

Table 1 summarizes the differences among systems designed for each of the needs, using the names Financial, Operational, and Strategic to define systems addressing a specific need. Most business have a Financial System, but not all use Operational and Strategic cost systems. A small and predictable business is not as likely to see the value in anything more than a financial system for costing. Why? Because what that business encounters today is virtually the same as what was encountered yesterday and what will be encountered tomorrow. For any business trying to redefine itself, the operational and strategic views of cost will be most important in determining how well that redefinition translates to profitability.

Profitability is not a bad word in ABC. It is a very important component that requires an accurate picture of overhead costs. Most financial systems use aggregate methods for overhead cost allocation. These methods pass audits, but they provide very little information about the true

costs of specific products or customers (cost objects in ABC language). Since it is difficult to accurately assign costs like marketing, distribution, sales, and other overhead elements to inventoried items, financial systems usually show them as aggregates. In fact, assigning these types of costs to “users” is almost always disallowed for financial reporting purposes.

**Table 1 - Three Views of Cost**

<b>Time Frame</b>	<b>Financial: Yesterday</b>	<b>Operational: Today</b>	<b>Strategic: Tomorrow</b>
<b>Users of Information</b>	Financial controllers Tax managers Treasury Tax authorities	Front-line managers Process improvement teams Quality teams	Business/strategic planners Sourcing groups Capital budgeting Cost engineers
<b>Uses</b>	Shareholder reporting Inventory valuation Preparation of taxes Lenders monitoring	Key performance information Value/non-value added identification Manage daily activity	Activity-based product costing Make/buy analysis Justify investment Life cycle costing
<b>Level of Aggregation</b>	High Company wide data Often on legal entity basis	Very detailed Work unit level	By product line Level of detail is decision type dependent
<b>Reporting Frequency</b>	Regular & periodic, usually monthly, quarterly, and/or annually	Immediate, daily or hourly	Ad hoc, as needed, often a special study
<b>Types of Measures</b>	Mostly financial	Mostly physical	Combination of physical and financial

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Due in large part to the failure of financial systems to meet the operational and strategic needs of cost decision making, ABC began to emerge as a practice in the 1980s. The fundamental need addressed by ABC is to provide accurate information about the cost of resource demands by individual products, services, customers, and channels. An activity-based approach enables indirect and supporting costs to be driven first to activities and processes and then to products, services, and customers, where they converge with the direct materials and direct labor costs. This concept of cost is a dramatic shift away from the view of the financial function as a passive reporter. The activity-based view is that the financial function can and should be a proactive influencer of the future. That view hinges on two premises: 1. Activity costs can be accurately measured; and 2. Costs are reduced by continuous and discontinuous process improvements.

***The Business Case for ABC***

Traditional financial cost systems stress control, stability, and efficiency of isolated machines, workers, and departments. Today’s business execution model has come about as a response to competitive demands and is characterized by continuous and discontinuous improvement, cross-functional integration, quick response, and high-quality processes. Many of the reasons for companies implementing ABC are directly linked to process improvement (see below).

The ideal is a single Enterprise-Wide System (EWS) that can meet all three costing needs, rather than different systems for individual needs. At the moment, few, if any have been able to achieve

the ideal, though information management technology advances are helping to make the ideal more realistic.

### Reasons for Implementing ABC

- Profitability analysis/Pricing decisions and rationale
- Business, Quality, and Operations Process Improvement
- Cost Estimating, Modeling, & Analysis
- Budgeting and Capital Justification
- Attribute Value Analysis
- Strategic Planning/Decision Analysis
- Benchmarking /Performance Measurement
- Operations Analysis

Kaplan and Cooper (reference 1) suggest a 4-stage evolution to the ideal EWS. Stage I Systems are those that are inadequate for financial reporting. Hopefully, most companies can skip this stage, though some never progress beyond it. Stage II Systems are the financial reporting-driven systems of Table 1. This is the system that many businesses have employed and have stopped trying to improve. Stage III Systems are customized, managerially relevant, stand-alone, separate, and largely non-integrated. A Stage III system will often employ a Stage II financial system and a separate ABC system. Stage IV Systems integrate Cost Management and Financial Reporting into the ideal EWS. Table 2 summarizes the characteristics of the 4 stage systems.

**Table 2 – Four-Stage Model of Cost System Design**

<b>Systems Aspects</b>	<b>Stage I Systems</b> <i>Broken</i>	<b>Stage II Systems</b> <i>Financial Reporting-Driven</i>	<b>Stage III Systems</b> <i>Specialized</i>	<b>Stage IV Systems</b> <i>Integrated</i>
<b>Data Quality</b>	<ul style="list-style-type: none"> <li>•Many errors</li> <li>•Large variances</li> </ul>	<ul style="list-style-type: none"> <li>•No surprises</li> <li>•Meets audit standards</li> </ul>	<ul style="list-style-type: none"> <li>•Shared databases</li> <li>•Standalone systems</li> <li>•Informal linkages</li> </ul>	<ul style="list-style-type: none"> <li>•Fully linked databases and systems</li> </ul>
<b>External Financial Reporting</b>	<ul style="list-style-type: none"> <li>•Inadequate</li> </ul>	<ul style="list-style-type: none"> <li>•Tailored to financial reporting needs</li> </ul>	<ul style="list-style-type: none"> <li>•Stage II system maintained</li> </ul>	<ul style="list-style-type: none"> <li>•Financial reporting systems</li> </ul>
<b>Product/ Customer Costs</b>	<ul style="list-style-type: none"> <li>•Inadequate</li> </ul>	<ul style="list-style-type: none"> <li>•Inaccurate</li> <li>•Hidden costs and profits</li> </ul>	<ul style="list-style-type: none"> <li>•Several standalone ABC systems</li> </ul>	<ul style="list-style-type: none"> <li>•Integrated ABM systems</li> </ul>
<b>Operational &amp; Strategic Control</b>	<ul style="list-style-type: none"> <li>•Inadequate</li> </ul>	<ul style="list-style-type: none"> <li>•Limited feedback</li> <li>•Delayed feedback</li> </ul>	<ul style="list-style-type: none"> <li>•Several standalone performance measurement systems</li> </ul>	<ul style="list-style-type: none"> <li>•Operational and strategic performance measurement systems</li> </ul>

The single leap from traditional financial Stage II costing system to the integrated EWS is large, and challenging if undertaken. The systems capability and theory for such integration are simply not yet mature enough to make this an advisable venture for most. Stage III systems employ ABC as a stand-alone or networked system for specific managerial uses. In this mode, ABC is installed as an additional costing system to the conventional system. It is interesting to note the parallels between the four stage ABC model and the Software Engineering Institute Capability

Maturity Model (SEI CMM). Both deal with sequential progress from barely functional to a fully integrated and mature state. In fact, a legitimate case can be made that ABC, SEI CMM, TQM, Employee Empowerment, Continuous Process Improvement, 6-Sigma, and many other improvement oriented initiatives of late all fall under the category of Business Process Re-engineering.

Surprise! – ABC is not really about costing as much as it is about new approaches to dealing with the cost of doing business. ABC emerged not because financial systems couldn't adequately measure costs, but because of the clash in what businesses need from a costing system in order to survive and thrive and what they need to remain legitimate. The ideal EWS is a single integrated system that serves all functions: financial reporting, strategic costing, operational improvement and performance measurement, inventory and production planning, engineering, sales order fulfillment, and customer administration. To realize the full benefits of ABC and activity based management, organizations are likely to need information contained in many disparate sources – only an Enterprise Wide System can deliver this. Some influential businesses are working toward an EWS where common data resides and is shared by applications that produce both the traditional financial cost reports and the managerial decision information – the right information at the right time for essential managerial learning, decisions, and control. No more vivid evidence of this occurred in September 1998, when ERP leader SAP announced an equity investment in ABC Technologies, one of, if not the market leader in ABC tools and training.

### ***ABM and ABB***

Since ABC deals with new philosophies about how business is measured, it should have a set of rules for business conduct. Activity Based Management (ABM) can be considered to be the new rules. ABM is the entire set of actions that can be taken with ABC information. It is the business actions taken from a practice of tracing the resource consumption of products, services, and customers. ABC enables an organization to identify resource demands, while ABM is the actions taken with this information to control or reduce demands on resources. Generally, these actions are directed to improving profitability by lowering costs, investing in efficiency increasing tools and practices, becoming more competitive, and so on.

Just as ABC has an operational and a strategic view, ABM objectives are usually accomplished through 2 complementary applications: Operational ABM and Strategic ABM. Operational ABM is often referred to as, "Doing things right." An example of operational ABM is engaging in processing re-engineering in order to use resources most efficiently and/or effectively. Operational ABM treats demand for resources as fixed and attempts to increase the capacity of those resources or to lower the spending so that fewer resources are needed to produce revenue (sales). The benefits of Operational ABM are normally measured by reduced costs, higher revenue, and cost avoidance.

Strategic ABM, or, "Doing the right things," strives to alter demand for activities in order to increase profitability. This can be achieved by reducing the cost demands of unprofitable or low profit products so that freed up resources can be directed to more profitable products. Strategic ABM also encompasses product design decisions; for example, trade-offs in use of common versus custom components. When a Stage II cost system distorts the direct labor required for a product, it can encourage over-investment in reducing the product's consumption of that labor. A strategic decision to invest or not invest in a resource consumption saving measure needs accurate information about the amount of resource an activity really consumes – this is Strategic ABM.

Activity Based Budgeting (ABB) is ABC in reverse. ABB concentrates on the organization resources; specifically, the amount of resources needed to accomplish the level of activities

demanded to achieve prescribed levels of sales. Budgeting has traditionally treated a business's infrastructure as a fixed cost. ABB transforms the view of infrastructure costs to one that is variable. ABC does tend to treat expenses for supplying resources to perform activities as a given in that the expenses are considered to be committed in advance. When there are short-term fluctuations in activity demands, ABC will treat the supply and cost of resources as fixed. But, when an organization budgets on an activity basis, it opens the opportunity for controlling the amount of resources the organization supplies. Ideally, that amount should be just enough to meet the anticipated demands for the activities performed by the resources. Traditional budgeting is a once a year negotiation with results that are very much a function of the power and persuasive ability of individuals. ABB breaks that model – it is a continuous process that addresses almost all of the organization resources and it is based on facts of consumption. The goal of any budgeting process ought to be to balance the resources so that the demand equals the capacity (of the resources) and results in 0 excess capacity. This theory, once known as zero based budgeting, is the basic tenet of ABB.

### ***Competing Initiatives***

In addition to those who prefer Stage II cost systems for all business needs, there are others who argue against ABC for something considered more practical. One competing initiative is the Theory of Constraints (TOC). TOC is a management philosophy based on the assumption that every organization has at least one factor that inhibits its ability to meet its objectives. Applied to business, TOC focuses on limiting the factor(s) that most constrain the ability to generate products, thereby maximizing profit. TOC relies on a measure of Throughput (sales minus costs for materials, commissions and distributions) as the maximizing entity. The objective is to maximize throughput while minimizing operating expenses for labor, sales, administration, and capital expenditures. TOC does not seem to speak to the minimizing function for operating expenses, which is where it differs the most from ABC. TOC proponents believe that ABC is too complex and cumbersome to be widely implemented. ABC proponents take issue with the lack of attention to direct and indirect costs by TOC. In the middle are advocates of a hybrid of TOC and ABC. One such approach proposes a variable cost that is based upon the indirect costs ignored by TOC. The variable cost is derived via ABC and integrated with the TOC Throughput to yield a per unit consumption measure. This approach seems to be an attempt to incorporate as much of the TOC simplicity on ABC as possible without ignoring all indirect costs. Just how well ABC and TOC advocates accept the hybrid approach is a question.

Most people will find some truth in the assertion that ABC is very complicated to implement – maybe too complicated for many. And, the same people would probably feel incomplete with TOC. The question of which theory (if either) is right for an organization comes down to the question of overhead costs and their allocation. We know that the Stage II costing systems allocate overhead arbitrarily, usually according to volume. ABC re-addresses the allocation on an activity basis for more accurate assignment to products. TOC is a direct costing system. Direct costing systems ignore overhead costs entirely, concentrating on material and direct labor only, or as in the case of TOC, just material. It seems reasonable to conclude that a direct system like TOC is suitable only if overhead is small and manageable.

### ***Components of ABC Systems***

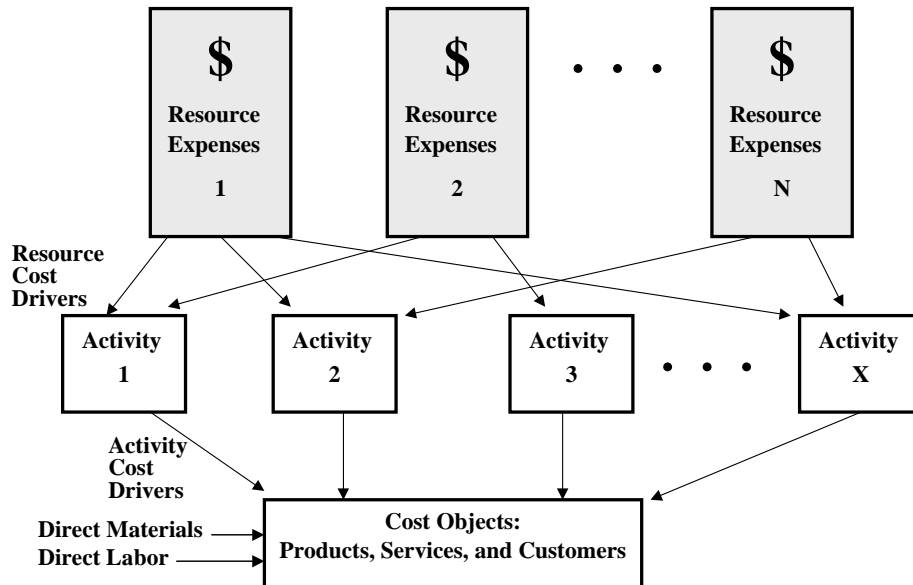
Traditional, Stage II cost systems address the question of how best to allocate costs for financial reporting and for departmental budget cost control. ABC systems address cost on the basis of activities, specifically:

1. What activities are organization resources performing?
2. How much does it cost to perform the activities?
3. What is the cost of other business processes?

4. Why does the organization need to perform activities and perform other business processes?
5. What is the quantity of activity needed for the organization's products, services, and customers?

An ABC model attempts to answer these questions. It can be thought of as an economic map of an organizations expenses and profitability based on the kind of activities it performs. Just as it is possible to navigate without a road map when the ground is familiar, it is possible to be profitable and efficient without an economic road map if the products, services, and customers are very familiar. Unfamiliarity, change, unpredictability, and newness are among the reasons for needing both a road map and an economic map.

There are four major components of an ABC system (Figure 1): Resources, Activities, Cost Objects, and Cost Drivers (Resource and Activity). Resources are the costs the organization bears to operate. We usually think of these in terms of people (or human resources), supplies and materials (which includes services), and equipment (tools, capital, data processing, etc.). In most Stage II systems, each major category of resource will be further categorized and sub-categorized. For example, labor may be divided into job categories (direct, indirect, clerical) and job functions (purchasing, sales, engineering, manufacturing). ABC systems usually map the indirect or support resources to activities, based on demand for the resource. The product direct resources will merge with the indirect and support resources after the latter have been mapped to activities.



**Figure 1 – Components of an ABC System**

Activities are the tasks performed by the resources. Examples include scheduling, purchasing, customer administration, product improvement, marketing and sales, and human resource administration. In an ABC system, activities are described by verbs and associated objects (nouns). Activities are clearly and simply stated, as the following examples illustrate:

- *Measure customer satisfaction*
- *Develop organization goals*
- *Prepare for production*

- *Process customer orders*
- *Deliver products*
- *Bill the customer*
- *Develop and train employees*
- *Manage Information Services*
- *Report Information*
- *Implement TQM*

Cost Objects are the reason for performing activities in the first place. In its most basic form, profitability is revenue minus expense. Therefore, to measure profitability, it is natural to drive all costing to products; the sum of the product costs will be the expense. However, organizations sometimes want to identify the profitability of customers. For example, a pharmaceutical distributor is likely to be interested in the profitability of its Medicare and various health plan customers. In such a case, the customer is the cost object.

ABC Cost Drivers are of two types: Resource Cost drivers and Activity Cost drivers. A Resource cost driver is the measures of the amount a particular resource contributes to performance of an activity. These are often obtained by analysis of time records or by surveys completed by those other than the front line resource enablers themselves. The concept is to allocate all the cost of a resource to a subset of all activities on the basis of demand for the resource by each activity. The demand allocation is the resource cost driver.

An Activity Cost Driver provides the linkage between the activity and cost objects placing demand on it. Activity cost drivers are the quantitative measure of the output of an activity. Simple examples are shown below.

**Table 3 – Sample Activity Cost Drivers**

<b>Activity</b>	<b>Activity Cost Driver</b>
Run Machines	Machine Hours
Set Up Machines	Setups (#)
Receive Materials	Material Receipts (#)
Maintain Equipment	Maintenance Hours
Schedule Production Jobs	Production Runs (#)
Modify Products	Engineering Change Notices (#)

Selecting the activity cost drivers is a major challenge to ABC system designers. One must trade off accuracy and the cost of measurement in selecting drivers. To keep the system manageable, designers will try to economize on drivers, using a single driver for as many activities as possible. There are different types of activity drivers that permit accurate measures when transaction times and level of resource demands are variable within activities.

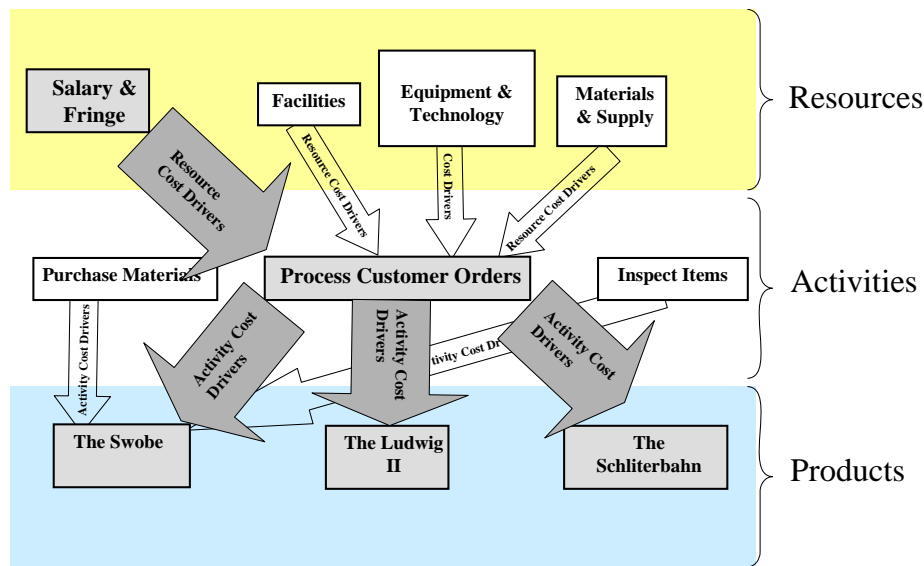
***Fritz Spatzle Press Company ABC System***

Activity-Based Costing shifts analysis away from organization expense categories to the activities performed by organization shifts resources. The simple cost accounting of the Fritz Spatzle Press Company illustrates the concept.



**Figure 2 – Fritz Spatzle Press Company Traditional and Activity-Based Cost Accounting**

In Figure 2, the left hand side boxes show the traditional view of expenses for Salary and Fringe, Facilities, Equipment and Technology, and Materials and Supply. An activity-based system maps each expense category to specific activities based on demand for the resource. Let's use the ABC map to follow one of the resource pools (salary and fringe) through one of the activities (Process Customer Orders), and then out to the three different spatzle presses produced by the Fritz Company. Figure 3 shows the route we will be taking with the map, along with pieces of other routes for other resource/activity/object expeditions. In creating this notional example, we will exercise some liberty with ABC theory and practices by drawing imaginary boundaries around resources, activities, and objects of the Fritz Company ABC system.



**Figure 3 – Salary & Fringe/Process Customer Orders/Objects Map**

The Resources of the Salary and Fringe Pool are the workers of the Fritz Company. The resource cost drivers might be determined from records or a survey of time spent on company activities. The result might be a table like that below, showing not only a finer level of detail about the resource, but also how the resource details align to activities. Only a few activities are illustrated in the table.

**Table 4 – Salary & Fringe Resource Pool Cost Drivers**

	Process Customer Orders	Purchase Materials	Schedule Production Orders	Move Material	Inspect Items	Maintain Product Information
<b>Salary &amp; Fringe Resources</b>						
Engineering		\$2,362				
Quality Assurance	\$1,575				\$23,621	
Sales & Purchasing	\$23,621	\$39,368	\$15,747			
Technical Publications	\$4,724					\$37,793
Manufacturing		\$2,205		\$11,023		
<b>Total</b>	<b>\$29,920</b>	<b>\$43,935</b>	<b>\$15,747</b>	<b>\$11,023</b>	<b>\$23,621</b>	<b>\$37,793</b>

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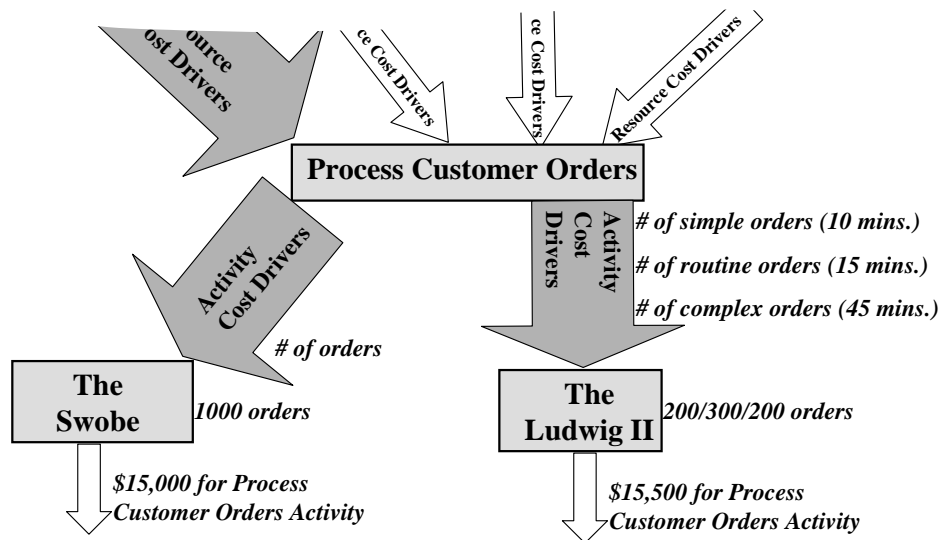
With the resource cost drivers established, we turn attention to the activity cost drivers. Recall that the function of an activity cost driver is to map the resource demands to a product or other cost object. The Fritz Company product line consists of 3 models of Spatzle Press: The Swobe, The Ludwig II, and The Schliterbahn. The activity cost drivers should be reflective of the demands for activities/resources placed by these models. The demands are as stated below.

*The Swobe:* This is the oldest of the Fritz company presses. It has changed very little since its introduction over 100 years ago. Processing orders for this product is very predictable (approximately 15 minutes, or about \$15 per order). The Swobe is a large, heavy-duty press used almost exclusively by restaurants; orders are almost always placed by phone.

*The Ludwig II:* The Ludwig II has three types of customer from an ordering standpoint: restaurants phoning in orders, stores and restaurants ordering by mail, and foreign customers ordering by mail. Each customer type represents a different amount of expected order processing time (10, 15, and 45 minutes respectively).

*The Schliterbahn:* The newest model of press, The Schliterbahn is sold to anyone. Depending upon customer, order-processing time will vary. In addition, Schliterbahn is the first product Fritz Company sells via the Internet. When an order is placed via the Internet, a resource demand is placed on computer resources.

If we traced the activity cost drivers for The Swobe and The Ludwig II products only, the drivers and the demand they put on the resources would be like those shown in Figure 4. Keep in mind that this trace does not encompass the entire cost for the products since we have ignored all activities but Process Customer Orders.



**Figure 4 – Activity Cost Driver Trace for The Swobe and The Ludwig II**

The cost driver for The Swobe is the number of orders placed, 1000 in this example. It drives exactly \$15 per order to each Swobe product ordered since the processing time (15 minutes) is fixed. Number of orders is also the Process Customer Orders activity cost driver for the Ludwig II. However, in this case, a time-sensitive driver must be used since processing time will vary by customer type; 10 minutes for the simple domestic restaurant phone-in order, 15 minutes for the routine domestic mail order, and 45 minutes for the complex foreign order. 700 orders for Ludwig II, distributed into the simple/routine/complex categories according to a volume of 200/300/200, will consume more Process Customer Order activity cost than the ordering of 1000 Swobes.

We won't cover the Schliterbahn activity cost driver construction here. However, by virtue of the consumption of computer resources for all Internet orders, plus the variable time demands of the various phone and mail order customers, we can expect that this driver will be more mathematically complex than those of the Swobe and Ludwig II.

#### ***4 Steps to Building an ABC System***

In their book, Cost & Effect, Using Integrated Cost Systems to Drive Profitability and Performance, Kaplan and Cooper prescribe a 4-step process to building an ABC system.

*Step 1. Develop the Activity Dictionary:* We have seen the simple structure of activities as verbs and noun objects. Every organization that decides to build an ABC system must establish a compendium or dictionary of activities. The activity dictionary is what an organization uses to build the activity map of the things that must be done to create products. Early adapters of ABC have established standard dictionaries that others can choose to use. Some organizations prefer to have workers build their own, recognizing the value it can have in obtaining buy-in to the ABC initiative. The size of the activity dictionary depends upon the purpose of the ABC system. A basic, Stage III ABC system doesn't require a massive dictionary, whereas a Stage IV EWS will

probably require a very large one. A rule of thumb for those building a dictionary for the first time is to only identify activities that consume at least 5% of resource capacity.

*Step 2. Determine the Amount Spent on Activities:* In this step, an organization often learns quite a bit about how much it costs to perform its activities. The methods for capturing cost-performance information are fairly traditional. The Fritz company allocation shown in Table 4 is an example of driving resources (salary and fringe) to activities (Process Customer Orders). This is a very important and revealing step of the ABC system building process. Driving support and overhead costs to activities before driving them to products is a sharp contrast to a Stage II cost system where support and overhead costs are allocated on the basis of volume. This can be a worthwhile process on its own since a volume-based allocation is not really a valid measure of the cost of resources to realize a product.

An ABC system may actually categorize activities so that they can be grouped by attributes. Activity attributes could involve things like hierarchy of the activity (unit, batch, or product sustaining) and business process (procurement, development, etc.). The purpose of using activity attributes is simply to create a more manageable and flexible way of viewing cost information. At the end of this second step, an organization may have learned enough about itself to begin immediate process improvement, even though the ABC system is not fully implemented. Not surprising, some organizations suspend further development of the ABC system at this point to focus on a critical inefficiency or need identified by activity cost analysis.

*Step 3. Identify the Cost Objects:* This is a simple step for most. In order to address whether activities and processes of the business are worthwhile, some linking to what is received for performing the activities is needed. The most natural link is to the revenue-generating component of the ABC system – the products, services, and/or customers of the implementing organization.

*Step 4. Select Activity Cost Drivers:* Activity Cost Drivers provide the linkage between activities and cost objects. Activity Cost Drivers represent the most inventive and challenging part of ABC. Selection of these is a trade-off between accuracy and the cost of measurement. Practicality limits the number of drivers to be less than 50 for most organizations. Supreme accuracy could easily multiply this to 500, which in turn creates such a complicated and sluggish system that it would be useless. ABC proponents like to express the goal as one of being, “approximately correct, rather than precisely wrong.”

There are 3 types of activity cost drivers:

*Transaction drivers* are the simplest to implement. They assume the same demand on activities for every transaction, thus the cost per activity for a product driven by a transaction driver is constant. The driver used for The Swobe press (see Figure 4) is an example of a transaction driver.

*Duration drivers* are variable rate transaction drivers. That is, they produce a cost for an activity that varies with the amount of time or other resource measure required to complete the activity. Very often, the specific amount of the variable resource is tied to a measure of activity complexity. The Ludwig II press is a duration driver example.

*Intensity drivers* are duration drivers where resource costs vary over the duration measure. These are the most complex type of activity cost driver to construct. They are the most accurate and also the most expensive to implement. Intensity drivers are used for special people and/or machines. Even though we did not construct an activity cost driver for the Schliterbahn press,

enough is known about the demand it places on resources to conclude that an intensity driver is needed to capture the computer costs for orders placed via the Internet.

Almost every activity to object mapping offers the chance to use any one of the three activity cost driver types. Though a transaction cost driver was used for The Swobe, a duration or intensity driver could have been selected in its place. After all, no repeated activity is always of exactly the same duration or intensity. The choice of driver type to use comes down to a trade-off in accuracy of measurement for return in accuracy. In few cases is the value of accuracy worth the enormous cost of the measurement system to realize it. Because of this, cost drivers, especially the intensity type, are often constructed with estimating relationships. Estimating relationships provide a rational means of dealing with tasks of varying difficulty. Reliance on estimating relationships spawns the use of complexity indices so that variation in demands for an activity among cost objects can be gauged without an overly complex measurement system.

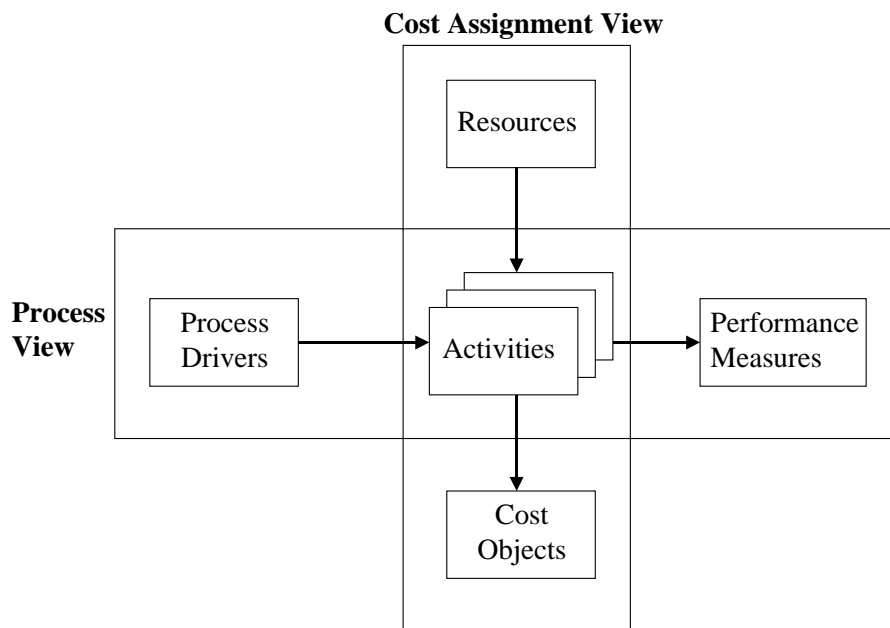
### ***CAM-I Cross***

The Consortium for Advanced Manufacturing – International, or CAM-I, is an international association of companies, consultancies and academics who have elected to work cooperatively in a pre-competitive environment to solve problems that are common to members. CAM-I's Participative Model produces value for members through:

1. Participative Research - by working together, the participants understand the journey - the best practice path.
2. Targeted Intellectual Efforts - each program targets results and produces implementable deliverables by program sponsors.
3. Human Networks - Develop and continue to share, challenge ideas, and learn long beyond the end date of the specific result.

CAM-I added a process view to ABC, which, when coupled with the cost assignment view, produces a model referred to as the CAM-I Cross (see Figure 5). The process view introduces a new type of driver, the process driver. The process driver helps explain the quantity of resources (cost) required to perform an activity. While the activity cost drivers measure the amount of activity needed for a product, the process cost drivers gauge the efficiency in performing an activity. An activity could have several process cost drivers associated with it. As an example, consider the activity: enumerate system requirements. If the source of information specifying high-level requirements is poorly prepared, the activity will consume additional time in correcting the problem. Therefore, the quality of the incoming information is one process driver. Another process driver could be the extensiveness of the organizations' requirements definition tool-kit and the degree to which those performing the activity are trained to use it.

The CAM-I model helps balance the operational aspects of ABM. Remember that operational ABM is doing things right, while strategic ABM is doing the right thing. So, we can look at the CAM-I cross as balancing the continuous and non-continuous process improvements that are central to the view of ABC as a proactive business discipline.



**Figure 5 – CAM-I Basic ABC Model**

***Parametric Estimating Practices in ABC***

The title of this article promises a discussion about parametric estimating and ABC. Yet, with less than 10% of the content undisclosed, this is the first mention of parametrics. From the vantage point of a parametric estimating professional, the answer to the complementing question is anti-climatic once a basic understanding of the goals of ABC is understood. The understanding of this author is that there is no question that parametric estimating can complement ABC because parametric estimating is actually an integral part of ABC. Use of independent variables, such as number of orders placed, and use of complexity indices is parametric analysis applied to the cost driver creation step of ABC.

The assertion that ABC uses parametrics, if not by that name, is not new. Ed Dean (Reference 5) contends that ABC is really a form of parametric cost analysis where cost of activities are driven by variables that quantify the number of times an activity is used to bring forth, sustain, or retire a product. He also introduces the term: meta-activity. A meta-activity is a bundle of activities, each with it's own cost driver or set of drivers. The essence of Dean's assertion that ABC is rooted in parametric analysis is also based on the role of cost drivers used to produce costs rather than relying on the accumulation and apportionment method of Stage II systems. Could it be that the meta activity, common attribute activity, and parametric cost model are really different names for the same concept?

In researching the introduction of ABC, it is apparent that there are striking similarities with the introduction of parametrics. For one, both initiatives surfaced relatively recently – early 1980s. Both are viewed as alternatives to Stage II cost accounting systems for cost and price decision-making. Both view cost on a cause and effect basis rather than as part of the genetic composition of a product. The mathematics of cause and effect is the cost driver that is so vitally important to both ABC and parametrics.

Despite the similarities, there is an important difference between the way ABC and parametrics have been introduced into the business community. The proponents of ABC have concentrated

on the business case for the method. Where it fits, how it fits, and the terminology set for ABC is well defined. A causal survey of those using ABC – Corning, Harley-Davidson, Citgo Petroleum, Boeing, Kimball Electronics, Pacific Gas & Electric, Canandaigua Wine Company, Federal Express, Humana, Phoenix, Nationwide Insurance, Veterans Benefit Administration, PHH Vehicle Management, Minnesota Department of Transportation, UUNET, DaimlerChrysler, Navistar, U.S. Army, ... - indicates broad acceptance of ABC as a legitimate and valuable business process. However, it appears that the area of cost drivers is in need of considerably more development in the ABC community. Most references suggest that only the simplest of drivers are being employed; most for the less complex products/objects of implementing organizations.

On the other hand, we proponents of parametrics have done far more to develop cost engines using complex drivers. We have constructed many impressive cost models and have the know-how to build more. But, we haven't adequately addressed the business case for parametrics or defined how and where parametrics fits into an organization. Aside from a few pockets of excellence, where local management has committed to understanding and implementing parametrics, the value remains too difficult to unlock and too unknown.

It could be concluded that we have a case of a need and a capability unaware of each other's existence. Though they probably don't realize it, ABC implementors are searching for good parametric analysts to extend the breadth of coverage.

#### References:

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