



## **Activity-Based Costing An Emerging Foundation for Performance Management**

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Activity-based costing has been around since the mid-nineteen eighties. Given its longevity, it's worthwhile to answer:

- How has ABC evolved over its life cycle?
- What lessons have been learned from the evolution of ABC?
- What can ABC do today that it could not do 20 years ago?

This article answers these questions by examining the evolution of ABC in the context of a product life cycle. It summarizes the history of ABC according to the phases of its life cycle, highlights its expanding functionality over time, and details the lessons learned from two decades of use. It concludes with a description of the current state of ABC as a key input and value adder to performance management systems.

It took just a short time for ABC to be recognized as an innovative and potentially valuable costing methodology; yet it took another 20 years to reach its full potential. ABC emerged in response to competitive pressures that exposed inaccuracies in cost accounting. Early uses helped companies view the distortions inherent in cost accounting systems leading to changes in strategy, processes, operations and improved competitive position.

Buoyed by early successes, ABC emerged as a powerful profit analysis tool. These successes stemmed from ABC's ability to reveal the hidden sources of profitability and embedded cost, and to serve as a catalyst for decisions to improve profitability. Over time ABC adapted to new areas such as cost-to-serve activities, customer profitability, channel profitability, and the use of ABC outputs to perform capacity planning and drive predictive modeling. By the late nineties ABC was used extensively in diverse industry and government sectors.

Today, ABC is the emerging foundation of performance management. If you lift up the hood of a performance management system, you will find ABC powering performance measures for scorecards, providing rates for customer profitability analytics, helping devise human resource plans, modeling sustainability, and supporting budget development and planning.

Like most technologies, the value of today's ABC is the result of many years of development and learning. In assessing its value for your organization, it is important to understand how it has evolved and how this evolution has created opportunities to create value. Whether you are considering ABC for the first time, or a returning early adopter, it is time to take a fresh look.



## THE ABC HYPE CYCLE

The hype cycle is a graphic representation of the maturity, adoption and business application of a technology. It reflects differences in human attitudes to the technology as knowledge increases and risk decreases over its development and deployment cycle<sup>1</sup>. Early in the cycle there is little practical knowledge about the technology. Thus, an organization's cost/benefit analysis is often dominated by unknown risk factors making an adoption decision difficult. As knowledge accumulates over the cycle risks reduction occurs facilitating more informed judgments regarding adoption.

The hype cycle typically covers the period of time between market introduction and a 30 to 50% adoption by the mainstream business community. The ABC hype cycle has six phases of evolution: (1) technology trigger, (2) peak of inflated expectations, (3) trough of disillusionment, (4) slope of enlightenment, (5) the plateau of productivity, and (6) the post-plateau phase (Figure 1). The first five phases represent the history of ABC, while the sixth phase is the current state.

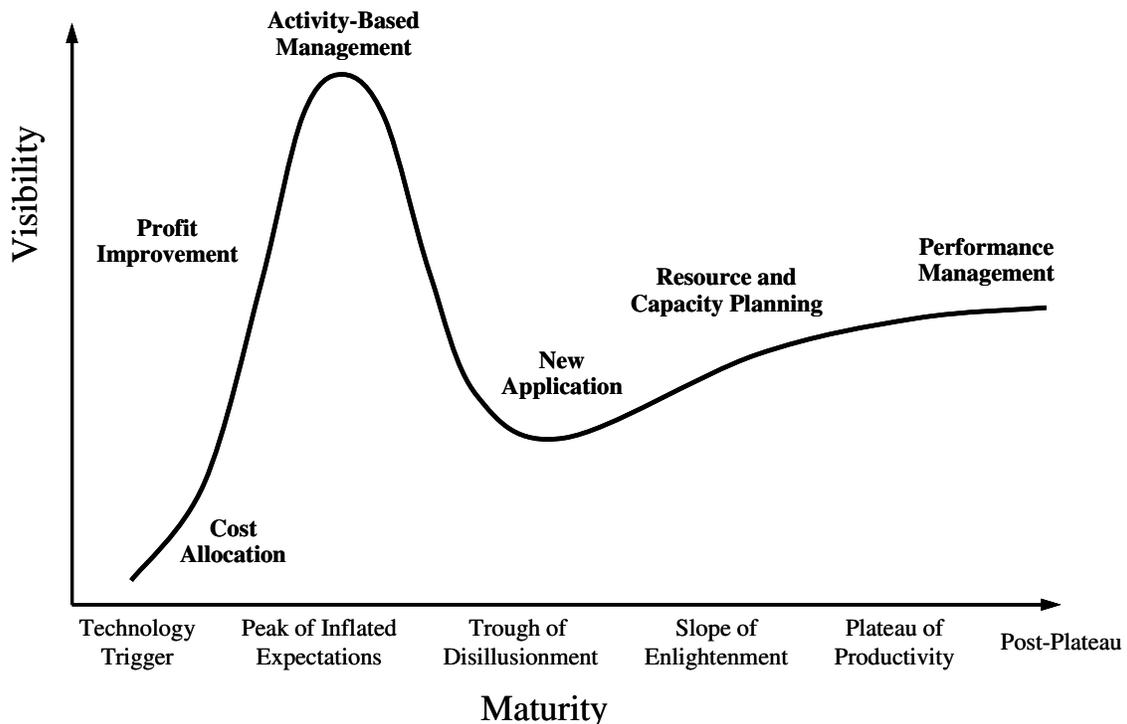


Figure 1: The ABC hype cycle.

What results from this exercise is that the evolution of ABC is not unique. In fact, it is remarkably similar to the life cycle of other technologies, including the achievement of two milestones typically reached by only mature and successful technologies. First, the performance of ABC has increased over time reflecting ongoing research and development, cumulative learning from application of the method, and enhancements in systems technology. Second, the

<sup>1</sup> Understanding Gartner's Hype Cycle, Strategic Analysis Report, Gartner Research, Gartner Inc., 2003.



behavioral response to ABC has progressed from user enthusiasm, through disillusionment, to eventual acceptance of the technology's relevance to business success.

### **Technology Trigger (1984-1987) Innovations in Cost Accounting**

Discontinuous innovation is generally the result of a trigger - an external impetus that stimulates innovation. The trigger for ABC was the increasing Japanese competition experienced by western companies, particularly those in the electronics and automotive verticals. Believed to be the result of low-wage labor and undervalued currencies, they were de facto innovative management practices, such as just-in-time material flow systems, continuous improvement, and statistical process control.

The impact of this change on western companies was dramatic. Some retreated and complained of unfair competition, and others adopted the management practices used at leading Japanese companies such as Toyota. A few western companies developed innovative practices of their own, including innovative costing methods.

New approaches to costing emerged in several manufacturing companies. These companies recognized that the cost accounting systems used at that time had unintended negative strategic and operational consequences. Tektronix, for example, allocated manufacturing overhead to products based on direct labor, which encouraged engineers to design products that required less labor to manufacture. This design directive increased the complexity of products and the number of unique parts in each product. It also increased the cost of purchasing, receiving, and stocking thousands of different parts, thereby reducing profitability and ultimately Tektronix's competitiveness. Only when the cost of procurement was allocated to products based on the number of unique part numbers used in the product was this bias corrected and engineers encouraged to use common parts wherever possible.

Tektronix' new cost accounting method helped engineers see the impact of their decisions. While lacking the accuracy and diagnostic capability of ABC systems, the elimination of the behavioral distortion inherent in the cost accounting system helped Tektronix compete<sup>2</sup>. Tektronix's success, along with that of others, was an important step to developing first generation ABC methods.

### **Peak of Inflated Expectations (1987-1991) First Generation**

The peak of inflated expectations is a bubble of enthusiasm for a new technology. For ABC, the journey to the top of the bubble was accompanied by extensive publicity and the emergence of first generation methods and tools.

Beginning in 1987, a flood of articles on ABC appeared in the Harvard Business Review, Journal of Cost Management and other publications. Invitations to attend conferences by the Institute for International Research and other organizations filled mail boxes. These publications and presentations explained how to implement ABC, what it meant, and what impact it would have on businesses that adopted it.

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<sup>2</sup> Peter B.B. Turney, *Common Cents: The Activity-Based Costing and Activity-Based Management Performance Breakthrough* (New York: McGraw-Hill), 2005, pp. 27-29.



As with most technologies, the combination of interest among potential users and the development of first generation methods encouraged commercial development of the ABC market. Most of the large consulting firms built ABC practices in the late 80s and early 90s, and the first commercially available software for ABC was introduced in 1990.

Underlying this enthusiasm was the recognition that ABC could yield important insights into profitability. This was because ABC:

- eliminated the product cross subsidies inherent in cost accounting;
- revealed the sources of loss that were responsible for the decline in profitability; and
- acted as a catalyst for decisions affecting profitability.

For example, Figure 2 is for a manufacturing company that believed all of its products were profitable. An ABC model revealed that over 25% of its products were unprofitable and another 40% were breakeven. ABC helped the company develop a new focus on profitable markets and customers, prune unprofitable products, redesign products to remove cost, and eliminate non-value added activities. This new focus transformed profitability from “worst in class” to “best in class”<sup>3</sup>.

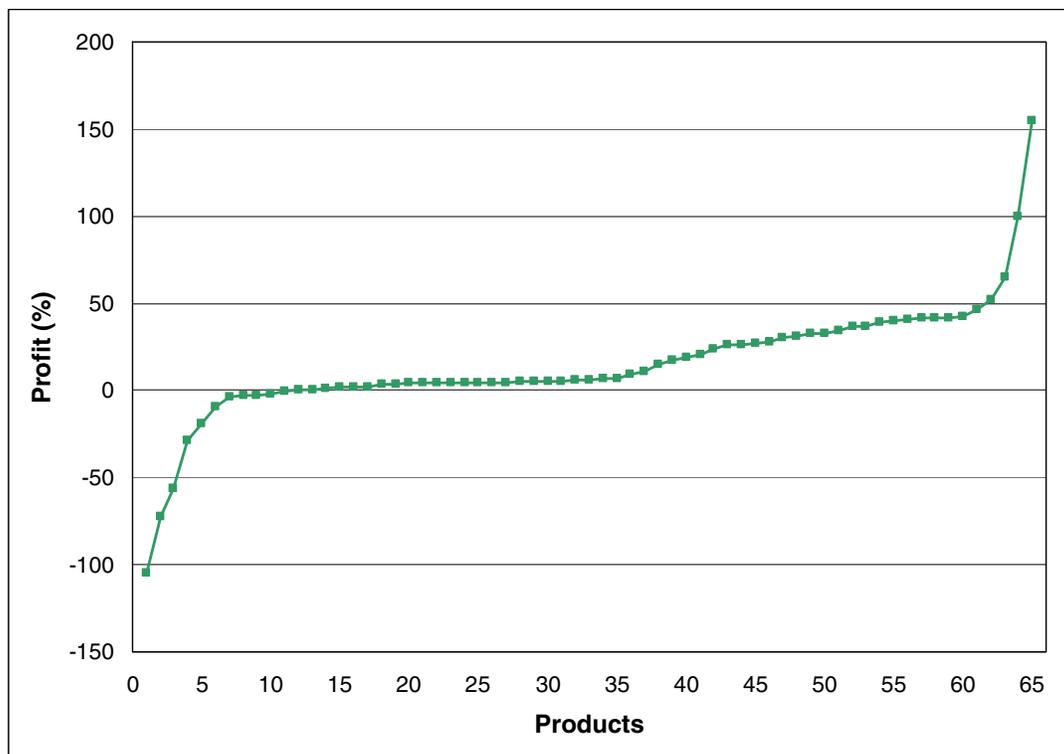


Figure 2: The ABC “S” Curve.

The lesson learned from this period was that the value of ABC was its ability to drive change. Early versions of ABC were designed to improve the accuracy of product cost using high level cost pools and cost drivers. These systems helped management see the profitability of products;

<sup>3</sup> *Common Cents*, Second Edition, pp. 177-195.



however, they had limited diagnostic capabilities. The inclusion of activity and customer costs during this period increased the diagnostic power of ABC leading to activity-based management (ABM).

### **Trough of Disillusionment (1991-1995)**

The excesses involved in scaling the peak of inflated expectations led inevitably to the bursting of the bubble. Media over-enthusiasm, confusion over the method itself, limits to the method and supporting systems, difficulties of sustainability, and some well-publicized failures were precursors to lowered expectations. ABC was also the victim of shifting attention to new management methods.

Critics of ABC generally fell into two camps. Some argued that ABC was inconsistent with the principles of continuous improvement and total quality management. They wrote that ABC lacked customer focus, was not process oriented, did not enhance organizational learning, and was top down in approach (*i.e.*, did not involve employees). Others argued that ABC was inconsistent with the theory of constraints. A common argument was that ABC could not reliably measure the short-term impact of decisions on operating cost, inventory and throughput.

These criticisms reflected a misunderstanding of the purpose and nature of ABC. Early versions of ABC were designed to reveal strategic insights into sources of profitability. The intention of ABC was neither to provide day-to-day guidance on process quality nor to measure short-term variable cost.

A contributing factor to lowered expectations was the relative immaturity of the ABC method combined with lagging systems technology. In hindsight, it was ambitious to build ABC models using non-enterprise software on PCs. It was inevitable, with rare exceptions, that ABC models of this era were difficult to build, cumbersome to use, and lacked regular reporting and integration with data sources.

The inevitable failures also took their toll. In some cases failure was attributable to poor change management. For instance, in the case where ABC revealed that 80% of a company's products were unprofitable, management denial precluded meaningful change. In other cases failure was the result of incorrect implementation. One company's ABC model was so complex it was costly to maintain and difficult to understand. Inevitably the information was not used for decision making.

ABC's gain from media exposure during the climb to the peak turned to loss when management attention turned to other emerging methods. Interest in ABC declined after 1992 when attention turned to business process reengineering, enterprise resource planning (ERP) systems and the balanced scorecard.

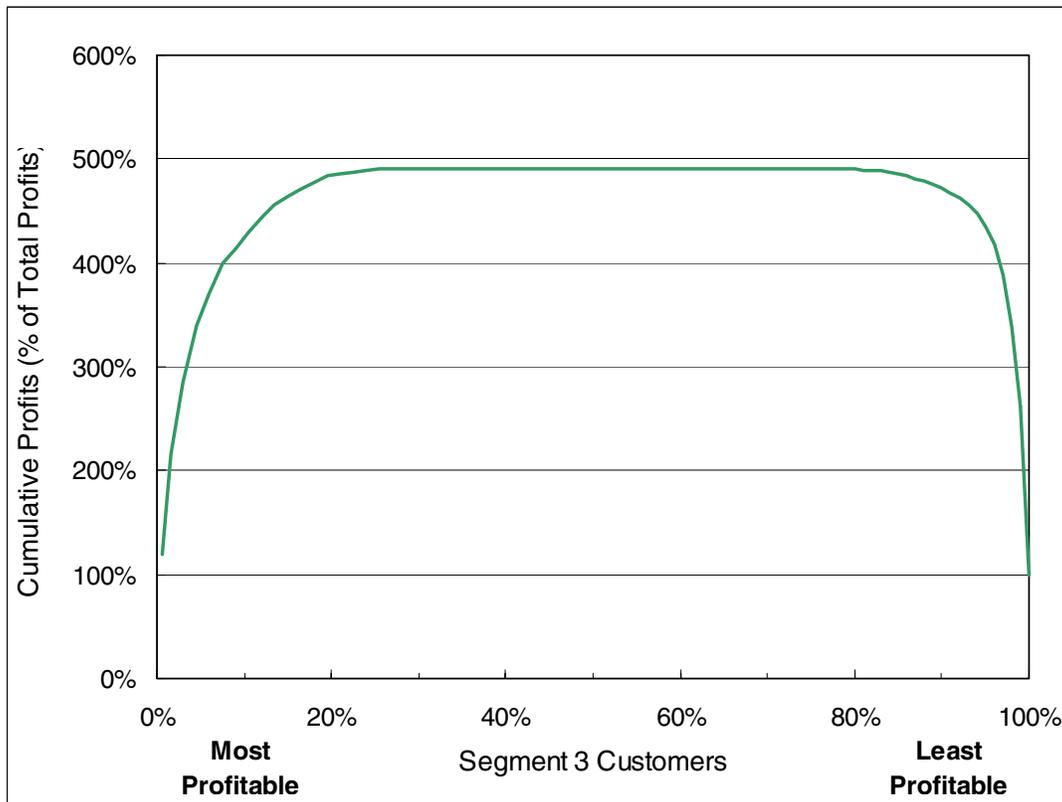
The lesson from this period is that critical commentary, diminished user interest and failure are inevitable byproducts of the development of an immature technology. The good news is that ABC crossed the chasm of failure and continued its learning and development.



### Climbing the Slope of Enlightenment (1995-2000) Second Generation

Climbing the slope of enlightenment was characterized by increased market penetration and continued technology development. This occurred in spite of the proliferation of ERP systems, which were costly and time consuming initiatives, and the need to bring systems into compliance with the new millennium (Y2K).

Early ABC implementations were focused on correcting the errors in overhead allocation to products inherent in cost accounting systems. With continued development, however, it was clear that ABC was applicable to areas outside the scope of cost accounting. These areas included administration, sales, marketing, research and development, supply chain, and logistics. Figure 3 is an example of ABC analysis of cost-to-serve activities supporting customer profitability analysis.



**Figure 3:** ABC Profit Cliff. Note: The first 20% of customers account for 500% of profits, and the last 20% of customers destroy 400% of the profits from this market segment.

In this example, approx. 20% of the customer base takes profits to almost 500% of what gets finally reported. This figure goes flat for the next 60% suggesting they merely breakeven on cost. The final 20% destroy profit by 400% to arrive at the final figure reported in the income statement. The other interesting observation is that a single customer accounts for 120% of profit.

With this kind of insight, managers are better able to segment customers and adapt process and pricing strategies to deliver more equitable returns – even if that means “firing” the final 20% by



increasing price to a point where they churn. A key lesson from this analysis could be that your best customer, based on revenue, could be your worst. Traditional accounting completely hides this kind of information.

ABC implementations expanded into insurance, healthcare, packaged goods, energy, banking and other industries. These industries faced increasing competition during the 90s and benefited from information about the cost of services, customers and activities. Government agencies and the military used ABC to help ameliorate budget pressures.

The addition of predictive modeling to ABC extended its use from historical costing to resource and capacity planning and scenario analysis. Predictive ABC models served as factual bases for budgetary cost estimation and scenario analysis for decision making.

Another development involved creating detailed models of business processes. The process models revealed opportunities for cost reduction, helped prioritize opportunities based on cost, time and quality, and allowed tracking of the impact of improvements on resource capacity. Cost savings of the magnitude of 10-30% of analyzed cost were achieved routinely across industry sectors<sup>4</sup>.

### **Plateau of Productivity (2000-2006) Third Generation**

The plateau of productivity is where the adoption rate approaches mainstream use of the technology – a market penetration exceeding 30%. It is the point at which the benefits of the technology are recognized and believed to exceed the cost and effort required to implement.

Market penetration for ABC varies from industry to industry and country to country. However, there is evidence that penetration rates for ABC have reached the threshold of 30%. The Gartner Group estimated that between 20 and 50% of global 1000 firms have adopted ABC<sup>5</sup>. A survey by Business Finance in 2004 indicated that 37% of companies with annual revenues in excess of \$1 billion had established ABC programs<sup>6</sup>. Earlier surveys in the 90s showed increasing adoption rates over time and are consistent with ABC entering the plateau phase in the 2000-2004 timeframe<sup>7</sup>.

Increasing interest in ABC was fueled by several factors. These included new evidence of financial benefit, emergence of a new generation of enterprise ABC methods and software, and the use of Internet and business intelligence (BI) systems to report current ABC information to decision makers.

Another positive factor was the desire of many organizations to realize a positive return on their systems investments. These systems met important goals but often did not improve financial performance. For example, ERP systems effectively integrated transactions but were unable to

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<sup>4</sup> *Common Cents*, Second Edition, pp. 166-168.

<sup>5</sup> “*Hype Cycle for Corporate Performance Management*,” Research Report G00120927, Gartner, Inc., 2004.

<sup>6</sup> T. Leahy, “*Where are You on the ABC Learning Curve?*” Business Finance, December 2004.

<sup>7</sup> A Bhimani and M. Gosselin, “*A Cross National Investigation of Factors Influencing Activity-Based Cost Management in Seven Countries*,” Working Paper, December 2002.



guide management which products and services to sell, and which customers to serve. ABC corrected these omissions and revealed opportunities to improve financial performance.

New methods emerged that reduced the cost of implementation and reduced the effort required to maintain ABC systems. These methods included web-based surveys, time-based algorithms to measure complexity, and the use of extract, transform, and load (ETL) technology to integrate ABC with data sources. These methods addressed concerns that ABC was useful but overly difficult to implement and maintain.

Improvements in systems technology were important to these developments. ERP systems and BI tools made it easier to build and modify advanced ABC models and report the information to management. Enterprise ABC solutions coupled with enterprise level reporting tools were easier to sustain over an extended time frame.

New uses of ABC emerged to increase the value derived from the tool. These uses included shared services pricing models for IT and other corporate functions to support service level agreements (SLAs) with business units, target costing for product design, optimization of logistics, supply chain and IT investments, minimization of the total cost of ownership of equipment and other assets.

An important lesson from this period is the impact of technology development and cumulative learning on the cost-benefit equation of ABC. Enhanced functionality and reduced cost opened up entirely new applications for ABC, and encouraged early adopters to take another look at this method.

### **Post Plateau (2006-present) Fourth Generation**

The beginning of the post plateau phase coincides with the use of ABC as an integral component of a new generation of business performance management solutions. These new solutions include profitability management, performance measurement, financial management, sustainability and human capital management.

Profitability Management. As an example of change, SAS® Profitability Management simultaneously offers increased analytic power and faster results from ABC. It is capable of processing billions of transactions in minutes. This power allows ABC analysis of complex business models with millions of customers. For example, a large telecom used SAS® Profitability Management to create income statements for each of 21 million customers using rates derived from SAS® Activity-Based Management. Data mining and statistical analysis on this data yielded hidden insights into the drivers of profitability.



**Contribution Summary for Customer KingPalmer  
For Year 2006**

	Credit Products		Deposit Products		Revolving Credit Products
	Secured/Mortgages	Unsecured	Recurring	Term	Credit Cards
Total Interest Income	16,533	6,429	-	-	3,513
Total Interest Expense	-	-	1,831	4,700	-
Net Interest Income	16,533	6,429	(1,831)	(4,700)	3,513
Net Funds	(197)	(82)	(74)	(74)	(68)
Total Non Interest Income	115	-	7,322	-	1,406
Provision for Losses	197	82	74	74	68
Direct Product	-	-	2,267	-	-
Relationship Management	192	185	3,067	81	617
Sales and Marketing Effort	160	152	-	-	64
Servicing Effort	-	-	2,800	-	-
<b>Net Contribution</b>	<b>15,902</b>	<b>5,927</b>	<b>(2,791)</b>	<b>(4,929)</b>	<b>4,102</b>

**Figure 4:** Customer income statement.

Paradoxically, these new technologies offers fast results from ABC without the heavy lifting. This is because cost rates from existing systems or analysts can be incorporated to support an initial view of profitability. This allows quick results while creating a positive ROI that encourages later more in-depth analysis using ABM. In some respects, this is “back to the future” where tools such as SAS® Profitability Management are first used to “see” the profit opportunities. A deeper drill down using ABM may be postponed to a second follow-on phase when an organization desires to better manage and improve how they act based on the compelling figures surfaced during the first phase.

From a change perspective, this two phased approach helps improve commitment and the long-term success of ABM. As changes are made to the business model, these new technologies allow faster more focused reporting of the impact.

Performance Measurement. Performance management plays an important role in strategy execution. It is used to measure goal accomplishment, provide feedback on performance, predict future performance, and trigger analysis and corrective action. These benefits will only occur, however, if relevant and accurate performance measures are available for inclusion in performance management.

In organizations that integrate ABC with performance management, ABC is an important source of performance measures. These measures are typically found in the process dimension of a scorecard where activity costs provide the focal point for target setting and scoring of goals around process performance. In the case of the South Dakota Department of Transportation, for example, as many as 25% of performance measures in SAS® Strategic Performance Management are sourced from their ABC model.



ABC derived measures are also found in the customer dimensions of the scorecard where goals relating to customer profitability are set. It would be difficult, if not impossible, to include these goals in the absence of an ABC model. It helps communicate the insights of the profit cliff and drive action by a wider audience of responsible managers.

Financial Planning. ABC supports the preparation of budgets and long-term plans that are logically derived from strategic goals and consistent with the relationship between goal achievement and resource intensity. ABC models with predictive capability combine with forecasting and other analytic techniques to support fact-based scenario development.

In an insurance company example, ABC cost was used to optimize process performance. Based on new levels of productivity, forecasting derived the volume of transactions for the process for the coming budget period. Once the forecast was complete, the planner used SAS® Activity-Based Management to predict the quantity of each type of resource required to handle the forecast volume of transactions. The predicted resource costs were then automatically input into SAS® Financial Management to create the budget. This type of analytic support in budget preparation is a far cry from the “let’s add 10% to last year’s budget”.

Human Capital Management. ABC today plays an important role in human capital management (HCM). Many organizations, in both the government and commercial sectors, are working to be more efficient by using fewer people but at the same time struggling to keep internal knowledge and acquire the right level of skills. It is difficult to predict the number of people that will be needed with certain skills and capabilities. It is more difficult to justify the need for additional hiring in difficult economic times.

While solutions such as SAS® Human Capital Management can pull all the information together and predict skills, capability and employee churn effects, ABC provides three important insights. First, ABC analysis can be used to analyze high cost processes and improvement action taken to free up resources. The freed capacity may be redeployed, using cross-training, to meet critical needs. Second, ABC can be used to forecast the transaction level of activities, which are then used to forecast the amount of resources used to perform the new level of activities. Finally, ABC input can be used to perform statistical forecasting to accurately determine the number of people required to support targeted products, channels, markets, customers, etc.

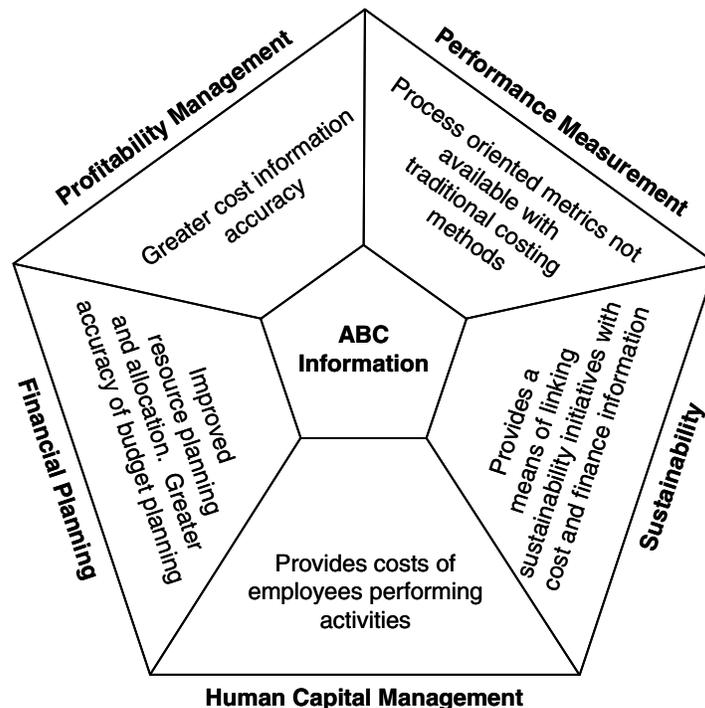
Many firms are beginning to use HCM solutions to bring all employee information into a single platform. Analysis includes retirement planning, capacity planning, dissection of employee base using stratification and forecasting of areas of skills shortage. ABC can be a useful complement to these systems by providing the necessary intelligence at the process level to drive such analysis.

Sustainability. Many organizations today have goals to improve sustainability, reflecting market realities, pressures from stakeholders, and increasing government regulation in this area. Improving sustainability requires measurement of carbon dioxide and other greenhouses gases, optimization of business decisions around profit and sustainability, compliance and transparency of reporting. ABC can help in all of these areas.

For example, SAS® for Sustainability Management uses the power of SAS® Activity-Based Management to measure, model and report the use of carbon dioxide alongside traditional costs



and profitability. An ABM carbon model can track sources of carbon (e.g., air travel) to the resources that consume the carbon. The ABM model can track the amount of carbon used by each activity (similar to the consumption of resource cost in a cost-based ABC model), and flow carbon use from activities to the benefiting products, services and customers. In this way, ABM facilitates the measurement, management and improvement of the use of carbon dioxide. It helps suppliers communicate to their customers how much carbon is embedded in the products and services received, and, more importantly, it provides a quantification of the benefits to the customer of supplier programs to reduce their carbon footprint.



**Figure 5:** ABC - the foundation of performance management.

This latest iteration in the ABC Hype Cycle is where the full potential of ABC is finally realized. Viewed correctly over 20 years ago as a tool of value, it has taken continuous development, learning and improvements in ABM software and enhancements in systems to solidify ABC's place at the center of performance management.

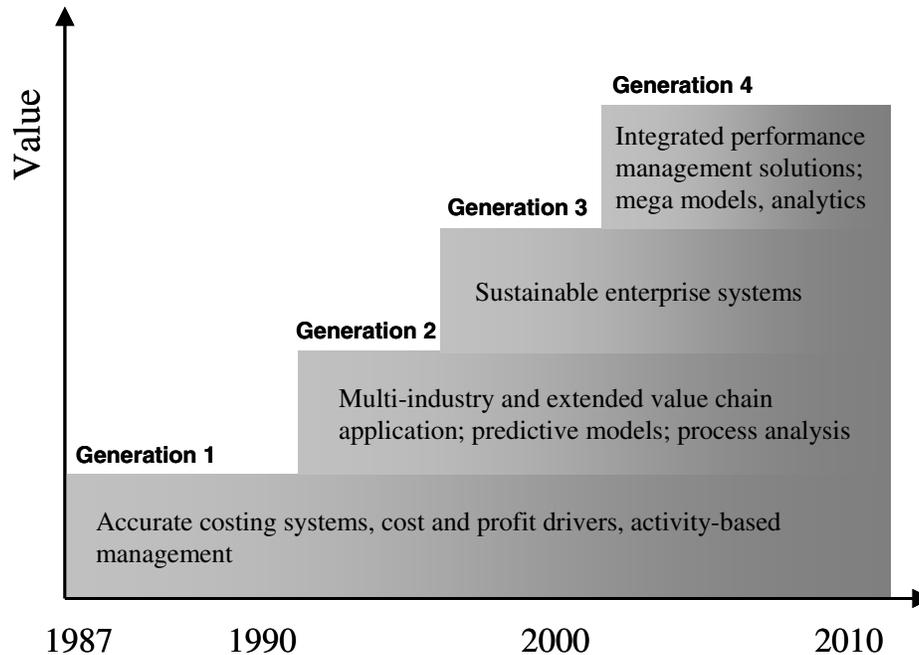
## CONCLUSION

Like most technologies, ABC's life cycle is marked by changing attitudes and increasing diffusion into the marketplace over time. Intense interest at the beginning of its life gave way to criticism and lowered visibility, followed by a longer, unpublicized period of steady growth in adoption rates and functionality. It has now reached maturity and acceptance in the marketplace for management ideas and methods.

ABC evolved greatly over more than two decades. Evolving from early experiments in costing, ABC emerged as a tool for profit improvement and ABM was adapted for use in the extended value chain and multiple industries, and enhanced for resource and capacity planning. In its most



recent iteration, ABC is a multi-faceted algorithm and database of financial and organizational information. It supports performance management systems where business users can access ABC-derived decision relevant information from their desk top. These are the four generations of ABC.



**Figure 6:** The four generations of activity-based costing.

Understanding this journey provides important lessons as organizations continue to adopt and use ABC to create value. One lesson is that ABC is an integrated family of analytic costing methods. A single ABC model can support historical cost measurement, predictive cost measurement, resource planning, capacity planning, performance measurement and other analyses.

Another lesson is that the developments of ABC are sometimes misunderstood, and this may lead to confusion and rejection. For example, assessing the value of ABC in lean accounting will result in one answer if the assessment focuses on the first generation ABC costing method. It will result in a different answer if the focus is on ABC as a process-based resource and capacity planning tool.

As is true with any method or technology, ABC has gained impressive functionality over its life cycle (Figure 5). ABC is at the heart of integrated performance management systems supporting measurement and analytic applications in multiple settings. Concurrently, cumulative experience and new methods have lowered the cost of implementing and maintaining ABC systems.

Understanding the cost-effectiveness of today's ABC is important to assessing its value as a strategic tool in today's hyper competitive and volatile global economy. Assessing yesterday's ABC against today's requirements is akin to assessing the power, comfort, handling, environmental impact, safety and fuel consumption of today's automobile based on a study of the Model T Ford. It is time to take another look at ABC.