



abc case study

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With Ray de Campos Filho, João Carlos Brega, Victor Gilman, Pedro Alha Bayarri of Multibrás, São Paulo, Brazil.

MULTIBRÁS HEATS UP PROFITS USING ABC/M



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Other members of the ABC team inside Multibrás include:

Ray de Campos Filho,
Chief Financial Officer of Multibrás

João Carlos Brega,
General Manager of Control

Victor Gilman is Manager of Cost and Economic Studies

Pedro Alha Bayarri is an ABC Coordinator

Multibrás, a Brazilian company recognized for its management and the excellence of its products, manufactures household appliances including refrigerators, freezers, dishwashers, air conditioners, washing machines, stoves, and microwave ovens. Even with the sales explosion in appliances, Multibrás has never rested in its position of leadership. In fact, the entry of new consumers in the market resulting from earnings generated by the Real Plan, spurred the company to enhance its competitive weapons. The Real Plan, named after the Brazilian currency, which is an economic stabilization program, launched by the Government in 1994, resulted in significant reduction in inflation and improvement of the purchasing power of Brazilian consumers, especially those in the lowest economic levels. As a result, a large portion of the population, who previously did not have access to home appliance goods, started to generate an important market demand for those products.

Amid the sales boom, the company adopted Activity-Based Costing (ABC) as part of its efforts to be more competitive given the entry of international competitors. These groups became interested in the Brazilian market following the vigorous growth in the home appliances sector. With the advent of new competition, profit margins could no longer be repeated. Thus, it became important for Multibrás to prepare itself for

these new times, while making use of a current favorable market position, an advantage not shared by the competition



in the marketplace.

Major foreign investors are attracted to this marketplace due to the industry's growth potential. In view of the modest penetration of appliances in Brazilian homes, major world manufacturers—which in the United States and Europe face a saturated market and stagnant growth—see an emerging economy as a return to better profit margins for those companies with the fastest response.

Multibrás Eletrodomésticos, the regional leader in the electrical and electronics industry, offers consumers a complete range of appliances including Brastemp and Consul brands.

Revenue in 1997 was approximately \$1.7 billion, and profits were in the order of \$129 million.

Controlled by North American Whirlpool Corporation, a traditional home appliance manufacturer with strong penetration in major world markets, Multibrás employs 9,000 people in six industrial units and one

administrative center, which is located in São Paulo. Each of the six industrial units, spread throughout Brazil,

manufactures certain products. For example, facilities in São Paulo and Recife manufacture stoves while the facility in São Bernardo do Campo produces refrigerators as well as distributes spare parts. Some facilities manufacture multiple products, such as Manaus, which produces microwave ovens and air conditioners, and Rio Claro, which manufactures washers and dishwashers. The industrial unit in Joinville amasses the most diverse mix of product lines, including refrigerators, freezers, dryers and air conditioners.

Business Issues

In view of growing

In effect, the existing cost management model no longer met the executives' growing needs because they depended excessively on "pro-rata" allocation approaches based on volume. Raw materials and direct labor were easy to directly allocate to products. However, the use of cost-sharing based on direct costs for general fabrication expenses was more problematic. Such general expenses include: indirect labor, benefits, training, maintenance, trips, services, leases, storage, commissions, advertising and warranties.

From the analysis, it was concluded that 29% of the cost allocations did not directly correlate with the cost and profitability of the product. In view of the complexity of the operation, the previous method (allocation of indirect costs based on volume) did not meet many of the essential needs of the organization. "We need to be certain about the costs and margins of each product in order to make accurate decisions. This was our greatest

Executive Overview — Manufacturing

This Brazilian manufacturer of home appliances, with 1997 revenues of almost \$2 billion, turned to ABC amid a sales boom. In the face of increasing international interest in the region because of the potential for enormous growth, Multibrás sought an important competitive advantage—it adopted ABC. Its results included new insights into costs and profitability of products, markets, channels, customers, and new tools for decision-making.

international interest, Multibrás' reaction had to be immediate. The company decided to strengthen its competitive advantage by means of classic measures, such as reduction of expenses, along with productivity and quality improvements. Additionally, the company added a powerful weapon to its arsenal: the development of an innovative support tool for decision-making—ABC. In this context, the introduction of the new costing methodology had the following objectives:

- To support the strategic administration by generating profitability analyses per product, business, customer, distribution channel and market
- To support the operational administration by assessing and disclosing cost per activity and process
- To support the identification of cost reduction opportunities in the scope of an existing re-engineering initiative
- To redefine product and customer mixes to improve profitability per product and per customer. It was also necessary to identify which customers and products were unprofitable and generated losses
- To rationalize all of these activities

The first two objectives were directly related to the structuring of an information base supporting the administration of business.

motivation when we selected activity-based costing as our costing methodology," stated João Carlos Brega, Multibrás' general manager of control.

One of the most common distortions was that indirect costs were distributed in an indiscriminate way. As a result, products considered highly profitable were actually quite the opposite. For example, the company produced a line of high-end refrigerator and stove models. All of these products were manufactured in small lots and generally considered to be higher value-added. However, despite expectations, these products were not very profitable. The activity mapping detected that costs were very high when machinery was calibrated or set up to produce a small lot. The work of engineering alone to complete product drawings and efforts to maintain the product line, divided by the actual number of units produced, showed that costs were very high. Having these new figures, the company was able to rethink the best strategy for the most sophisticated but less profitable products. Prior to this analysis, the commercial area received inducements to increase sales efforts for products thought to be highly profitable, but that actually produced low returns.

Other surprises came with the revised distribution of the corporate or administrative center cost. With the new ABC model, costs that previously were allocated according to

Continues on page 2, Multibrás



MULTIBRAS

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revenue or variable cost criteria, were now allocated according to services rendered or resources used in producing products. Once this older distortion was corrected, products with lower profitability became more lucrative. According to Ruy de Campos Filho, chief financial officer of Multibrás: "The actual effort of the administrative center bore no relation to the amount of variable costs incurred in a certain plant. ABC was effective in correcting this situation." Potential impacts are illustrated in **Exhibit 1**. In a certain product line, for example, identified here as "Line F", the margin was thought to be 11 percent, according to the existing methodology. But after the implementation of ABC, margin actually could range from -9 percent to 13 percent, suggesting radically different courses of action from the current one.

Traditional methodology hindered appropriate managerial actions because:

1. From the strategic point of view, it did not illustrate the real margins per product and business unit. As such, it did not reflect our market vision and our customers.
2. From an operational aspect, it did not provide enough detail for understanding the origins and reasons for costs.

How ABM Was Used

Multibrás management introduced ABC methodology for cost assessment with multiple visions. This multidimensional approach provided the ability for the company to "slice and dice" the data to analyze results along lines of process, business and market. Process views included sub-processes as well as activities, while the business view allowed the company to drill down into unit and product analysis. A robust and multidimensional view of market findings enabled the company to analyze profitability by region, sales channel and even individual customer.

The first ABC project, which lasted four months, involved several stages:

1. planning the project;
2. mapping activities;
3. generating a database or matrix for process re-engineering;
4. designing the model in the software;
5. feeding the model with actual data;
6. validating the information, and
7. implementing the model.

Once the first model's efficiency was proven in the factory in São Paulo and the administrative center, which is responsible for the conglomerate's main activities, the model was expanded to other factories. The expansion included São Bernardo do Campo, Rio Claro, Joinville and the spare parts distribution center located in São Bernardo do Campo.

The company eventually developed a consolidated model (corporate) to allow for a group vision for all of the factories. At this point, Arthur Andersen became involved with the project, which now included several factories located in different areas, as well as six models working simultaneously. Pedro Alba Bayarri, coordinator of the ABC team at Multibrás, affirms, "Multiple sites running independent models simultaneously to generate a consolidated report of the company's results proved challenging and difficult to complete in a reasonable amount of time. As such, this characteristic made the ABC project unique in Brazil."

Project Roll-Out

The strategy was to set up a model allowing for the multiplicity of visions of costs and profitability. This would satisfy the needs of the major users: marketing, sales, manufacturing, and control. Due to the size of the company, an implementation with a project scope involving all the industrial units would take too long to generate results. Consequently, the adopted strategy was to implement the methodology on a pilot basis in the industrial unit of São Paulo and in the administrative center of Multibrás. Soon after, the units of São Bernardo do Campo, Joinville and Rio Claro and the spare parts distribution center were targeted. The phased approach is illustrated in **Exhibit 2**.

To guarantee uniformity and a means of comparison, a single model of activities was developed, including both production and support for each industrial unit. The activities and efforts for each factory and/or customer were mapped at Multibrás' administrative center. A summary of the Multibrás model is presented in **Exhibit 3**.

The market vision was one of the strong points of the conceptual model of Multibrás. In each sales region, distribution channels were mapped and main customers were selected inside each channel **Exhibit 4**.

Additionally, product profitability for each customer was assessed, starting with the cost of serving a given customer and the cost of producing a certain product. Other visions were then easily generated through the aggregation of this information by distribution channel, regional market, brands, product line, and business unit.

The technical platform was Oros ABC software by ABC Technologies and was the vehicle we used to develop our models. Multibrás used Microsoft Access to generate reports and analyses. Specific models were developed and copies of the programs were installed for each unit. Additionally, local teams in

Continues on page 3 Multibrás

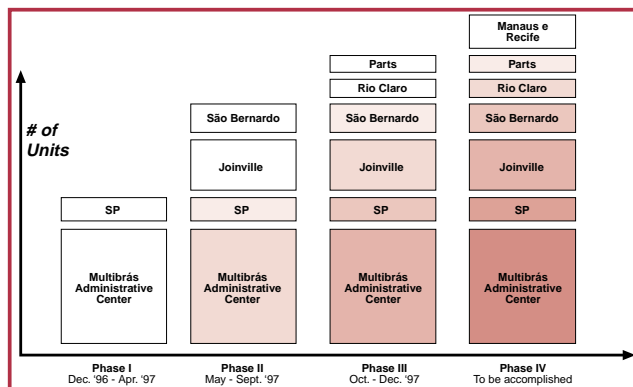
Amounts in percentage

Description	Result			Potential Impacts		
	Income	Cost	Margin	Potential Fluctuation ¹	Minimum Margin	Maximum Margin
Line A	100	83	17	10	7	27
Line B	100	91	9	11	(2)	20
Line C	100	84	16	10	6	26
Line D	100	74	26	9	17	35
Line E	100	136	(36)	16	(55)	(23)
Line F	100	98	2	11	-9	13
Line G	100	88	12	10	2	22
Line H	100	72	28	8	20	36
Line I	100	89	11	10	1	21
Line J	100	91	9	11	(2)	20
Line K	100	72	28	8	20	36

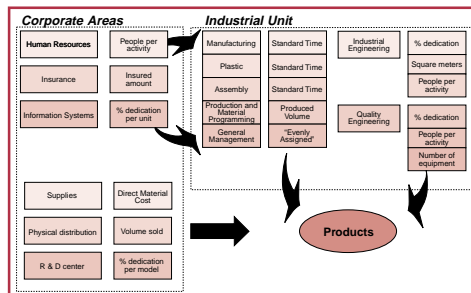
▲ **Exhibit 1 — Potential Impacts on Profitability**

¹ Maximum 40% variation considered on the cost portion subject to imprecise allocations: 29%.

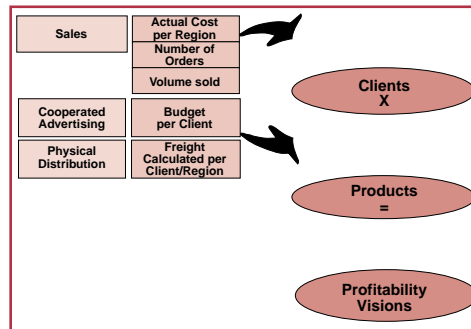
Shaded areas indicate that the impact of imprecise allocations can really distort managerial messages contained therein, suggesting actions or strategies with undesired final effect.



▲ **Exhibit 2 — ABC Implementation Strategy**

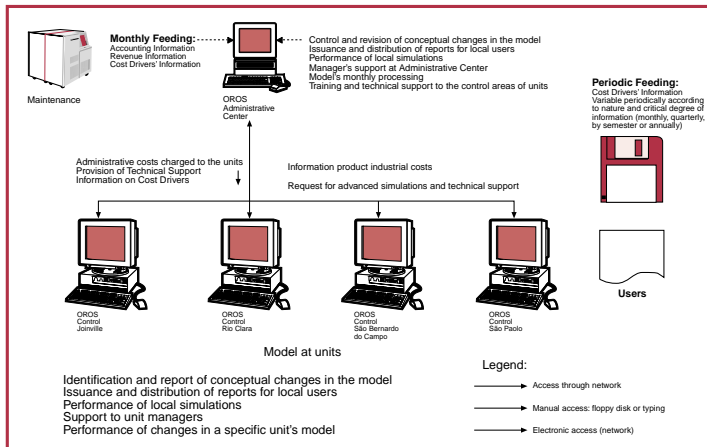


▲ **Exhibit 3A & B — Summary of the Multibrás Model**



Multibrás							
Market							External Market
Internal Market							
Geographical Area	Area A	Area B	Area C	Area D	Area E	Other Areas	Countries
Channels	Channel A	Channel B	Channel C	Channel D	Channel E	Other Channels	Channels
Clients	Client A	Client B	Client C	Client D	Client E	Other Clients	Clients

▲ **Exhibit 4 — Market Vision**



▲ **Exhibit 5 — Processing Model**

Multibrás has achieved strategic and operational excellence with ABC.

each location were trained to manage the system and use its results. On a monthly basis, information from the mainframe updates the Oros model using specially designed interfaces. Decentralizing the processing, as well as the knowledge acquired during the project, provided better support to plant managers. *Exhibit 5* shows the configuration of the processing model.

The main results obtained are highlighted below:

Profitability per Business Unit

The arbitrary criteria for cost allocation of Multibrás' administrative center and each business unit was replaced with real information obtained by measuring the cost drivers of

each mapped activity. In one certain plant where, comparatively, the number of employees was high due to manual operations and the product manufactured required a lower level of variable costs, the costs transferred from the Human Resource Department (administrative center) was adjusted using the driver "number of employees." *Exhibit 6* shows the changes observed in the total cost and margin of each of Multibrás' industrial units after implementing the ABC methodology.

Profitability per Product

The mapping of the true production costs and the effort to support product, as well as of the expenses in connection with warranties and advertising, brought surprises when we looked at product profitability—or lack thereof. Areas of primary concern included:

- Items of high volume were subsidizing items of low volume;
- Products which were lower value-added were subsidized by products of higher value-added;
- Big production runs or lots subsidized the loss provoked by smaller lots, and;
- Unproductive time in factory units was significant in relation to the operation time of the machines.

Exhibit 7 highlights profitability by product under both a traditional method and an ABC method. For example, before implementing ABC, some higher value-added products of "Brand A" received more costs than they should have due to allocation criteria based on variable costs. According to Victor Gilman, manager of costs and economic studies of Multibrás, "The effort of the engineering team to maintain any model in the production line is the same. It does not matter whether the product is a luxury or a popular model and carries more or less variable costs; therefore, all the models must bear the same amount of cost."

Unprofitable products were further analyzed in two ways:

1. From a strategic point of

view: the product's importance in the portfolio was related to obtaining and maintaining market share and to its importance to the comprehensive product mix of price points.

2. From an operational point of view: detailed composition of effort and production costs provided a basis for the value-added analysis of each activity used by the product. Discontinuation of a product involves a complex decision process and efforts were made to recover margins through the examination and revision of the value-added component and the product's manufacturing activities and costs. In this regard, *Exhibit 8* highlights how the cost of a certain product can be detailed and understood using the reports generated by the ABC system. From this example, engineering could drill to the level where the cost of every manufacturing activity of a product can be identified and compared to its value-added component.

Profitability per Market/Channel/Customer

The main costs of service were identified and assigned to major customers and presented together with the result of the mix of products sold. The result represents each customer's individual contribution to the global profitability of the company.

Lessons Learned

- The ABC methodology, if well used, is capable of unmasking inaccuracies and revealing the true costs of products, markets, channels, and customers. Products or factories considered profitable and efficient can be revealed, through ABC, to be exactly the opposite.
- During the initial phases of the project, the ABC work team should concentrate its attention on the quality of the basic data, especially in the production patterns or standards (operations and times). Engineering involvement is fundamental for revising and maintaining the patterns and to carry out the mapping follow-up of production activities. A list of critical information includes:

- control of stock for finished products
- production patterns
- machine efficiency and productivity
- production capacity
- structures of products to be mapped
- accounting cost per cost center
- prices and discounts
- The Information

Technology staff should co-sponsor any ABC project and dedicate a professional for the design and operation of the interfaces. During the tests and in the first months of processing, special attention should be given to the fast execution of file adjustments.

- Control devices on critical information should be put in practice in order to prevent changes of the source database without the knowledge of the ABC team. The following actions are critical and must be authorized by the ABC team: introduction of new cost centers, modification of existing cost centers, introduction of new work centers in the engineering system, and substitution of existing work centers. Additionally, modification of the products' or clients' identification codes, review of products' material structures and production standards and introduction or discontinuation of products should also be approved.

From the ABC analysis, the company identified and analyzed profitability by unit, by product, and by market/channel/customer. In the product profitability area, Multibrás found items of high volume were subsidizing items of low volume, larger production runs subsidized the smaller runs, and a correlation existed between the unproductive time in factory units and the operation time of the machines. Multibrás has achieved strategic and operational excellence with ABC.

Amounts in percentage

Unit	Income	Traditional		ABC	
		Cost	Result	Cost	Result
Unit A	100	92	8	85	15
Unit B	100	93	7	89	11
Unit C	100	93	7	74	26
Unit D	100	108	(8)	111	(11)
Unit E	100	108	(8)	96	4
Unit F	100	109	(9)	100	0

▲ **Exhibit 6 — Comparison of Profitability per Unit**

Amounts in percentage

Product	Income	Traditional		ABC	
		Cost	Result	Cost	Result
Brand A	100	101	(1)	91	9
Product 1	100	106	(6)	101	(1)
Product 2	100	98	2	81	19
Product 3	100	103	(3)	97	3
Product 4	100	99	1	75	25
Others Brand A	100	96	4	111	(11)
Brand B	100	131	(31)	142	(42)
Product 1	100	146	(46)	142	(42)
Product 2	100	125	(25)	123	(23)
Product 3	100	103	(3)	129	(29)
Product 4	100	92	8	124	(24)
Others Brand B	100	108	(8)	163	(63)
Others	100	119	(19)	271	(171)

▲ **Exhibit 7 — Comparison of Profitability per Product**

Traditional	ABC
Price	Price
Material	Material
Direct Labor	Fabrication
General Fabrication Expense	Finishing
	Assembly
	Industrial Support
	Idleness
Total Industrial Cost	Total Industrial Cost
Expenses	Corporate Cost
Guarantee	Warranty
Other Expenses	Marketing
	Sales and Distribution
Expenses	Expenses
Total Cost	Total Cost
Result	Result

▲ **Exhibit 8 — Product Cost Composition**

