# **TARGET COSTING**

### TARGET COSTING AND THE PRODUCT DEVELOPMENT CYCLE



#### THE ESTABLISHMENT PHASE OF TARGET COSTS



### THE ATTAINMENT PHASE OF TARGET COSTING



## 1. Self-Test Questions (p. TC-32)

#### a. What is a target cost? How is it different from a budgeted cost?

A *target cost* is the allowable amount of cost that can be incurred on a product and still earn the required profit from that product. It is a market driven cost that is computed <u>before</u> a product is produced. A budgeted cost is a predetermined cost <u>after</u> a product is in production. A budget is an operational definition of an allowable cost broken by items and by periods.

#### c. Why is it important to manage costs before products have been produced?

Nearly 80% of the costs of many products are committed at the design stage. Therefore, the best opportunity to reduce costs is during design and not after a product is being manufactured.

#### f. At what stage of the product development cycle does target costing play a key role?

Target costing occurs within the product development cycle. This means it starts when a product is in its concept stages and ends when a product has been released for manufacturing.

#### g. What is the difference between an allowable cost and an achievable cost?

An allowable target cost is the maximum amount that can be spent on a product. An achievable cost is the estimate that tells management whether the product and process design is capable of meeting the allowable cost target.

# h. Explain how target costing is different from cost plus pricing.

The table in the module summarizes these differences.

TARGET COSTING	COST-PLUS
Competitive market	Market considerations not part of
considerations drive cost	cost planning.
planning.	
Prices determine costs.	Costs determine price.
Design is key to cost reduction.	Waste and inefficiency is focus of
	cost reduction efforts.
Customer input guides cost	Cost reduction is not customer
reduction.	driven.
Uses cross-functional teams to	Cost accountants are responsible
manage costs.	for cost reduction.
Supplier involved early.	Suppliers involved after product
	designed.
Minimizes cost of ownership to	Minimizes initial price paid by
customer	customer.
Involves the value chain in cost	Little or no involvement of value
planning.	chain in cost planning.

# j. Target costing is the process of translating a customer's view of a product into an engineer's view of a product. Illustrate what this statement means using a product. (Hint: Use a product you are familiar with such as a telephone, a watch, a radio, a cassette player, and so on.)

To a customer a product such as a radio is a set of *features* such as clarity of FM reception, sound quality of speakers, size, portability, alarm-clock, and other features. To an engineer, the radio is a set of *functions* such as chassis, circuit board, resistors, capacitors, cone, antennae, clock timer, a display panel, a frequency analyzer, and so. For a product to be meet customer expectations, we must map how each function to a feature and set a target for that function that an engineer can design to.

#### 6. (p. TC—33) TARGET COSTING GLOWS WITH THE "NEON"

In 1990 Chrysler Corporation found itself in a very unhappy financial situation. Profits were down, cash flow was tight, and the stock was trading at a low price of \$10 per share. The Japanese auto industry posed a serious threat. Despite a strong Yen, they had captured and continued to preserve a healthy share of the U.S. auto market. Chrysler management decided it was time to change their approach to new car design. They adopted a competitive weapon that the Japanese auto industry had used for many years called target costing. Target costing was applied to all product development efforts in the Company including the NEON, a new small car developed for the lower price range. A price and profit target was set for the car and it was then designed to meet that profit without sacrificing major customer requirements. The results of using target costing on the NEON were impressive. The NEON:

- Provided dual airbags and a powerful engine for a small car.
- Was named" Auto of the Year" in 1994.
- Had a relatively short development time going from product concept to market in 31 months.
- Came in below its project development and investment budget.
- Is one of a handful of small cars made in the USA that makes a positive return.
- Is environmentally friendly built using a recyclable facia and non-toxic materials.

Since the introduction of target costing, Chrysler's profits have increased significantly. Its share price went up from \$10 per share in 1990 to \$54 per share in 1995.

Assume that you worked for Chrysler in 1990 and were assigned to the development team for the Neon project. This project was developed under the target costing approach rather than the traditional cost-plus approach. Answer the following questions regarding the development of the Neon car. Be creative, using your knowledge of cars in general, in answering the questions. You should provide car specific examples.

## **Required:**

# 1) Identify the seven steps in the establishment phase of target costing. Provide specific examples of activities undertaken for each of the seven steps.

The seven steps in establishing target costs used by Chrysler are:

- Chrysler conducted extensive research on college and other young professional who buy small cars
- Through competitive analysis Chrysler determined what other car companies were offering. For example, the Ford Fiesta was one of the key products Chrysler viewed as a competitive product.
- The potential and current buyers of cars such as Ford Fiesta were chosen as target customers.
- The initial product concept was developed based on two key customer requirements -- "fun to drive" and "safe" car.
- Detailed product features were developed based on detailed and refined understanding of customer requirements. For example, a "neon key" that shines in the dark was designed to meet a customer requirement about being able to find car keys in a dark parking lot.
- Market price was established using the Ford fiesta as an initial benchmark and adjusted for feature differentials between the two cars.
- A required profit margin was subtracted from this price based on industry norms and Chrysler's desired return to set an allowable cost for the car.

# 2) Discuss how each of the three steps in attaining target costs might have applied to the Neon project. Also discuss how Chrysler could design costs out or reduce costs through design improvements.

The manufacturing cost gap between the initial estimate and the target cost was approximately several thousand dollars. This gap was reduced by value engineering the car in several ways. The chassis was designed of lighter material, the cab design was simplified, suppliers were brought in early in the design and offered cost reduction suggestions for their components.

# 3) List some behavioral problems that may occur when target costing is used. Provide an example of how these problems may have impacted the Neon project.

A number of behavioral changes occurred at Chrysler as a result of target costing. People who were functional specialists worked on cross-functional teams. This caused initial problems for people who were not used to working as generalists. Team work rather individual output was rewarded. This created some motivational problems for people who were used to being rewarded for their work. The culture changed to encourage people to be customer oriented and to meet customer needs. Giving suppliers more power reduced the power of procurement staff who traditionally ran this operation.

#### **CHRYSLER'S RESULTS -- 1994**

- Meets customer requirements for safety and drivability
- Neon named "Auto of the Year" in 1994
- Short development time (concept to market 31 months)
- Below projected development and investment budget
- Neon one of few small cars that earns a positive return

## **CHRYSLER'S RESULTS -- 1995**

- Chrysler's share price \$10 in 1990 to \$54 in 1995
- Since 1990, revenue increase 70%
- Market share increase by 2.1%
- Profits and cash flows increase 400% since 1990
- Profit margin ratio up from 0.33% to 7.1% in 1995
- Chrysler's Truck Line (including Jeeps and Minivans) number one among US carmakers in "Power Survey."
- Industry benchmark study finds Chrysler the low cost producer in North America for second straight year.
- Standard & Poors and Duff & Phelps raised credit ratings first time since 1974 to "A" level.

## **CHRYSLER'S RESULTS – 1996**

- Industry Sales Above Trend
- Stock Levels -- Well Positioned for Launch of 1997 Models
- Relatively Stable Incentives
- Labor Contract
- New Products
- Full Wrangler Production
- All New Dakota -- Very Well Received By Automotive Press
- Jeep Cherokee Update

#### Case 1: SmartCOM, Inc. (pp. TC-35-36)

SmartCOM, Inc. manufactures internal modems for use with personal computers (PC). A modem is a device that allows a personal computer to communicate with other computers or fax machines through ordinary phone lines. The company is working with a PC manufacturer who is thinking of bundling the SmartCOM modem as a standard component with each new PC. SmartCOM's marketing manager has determined that PC buyers would be willing to pay \$110 for a modem. The cost to the PC maker of installing and testing the hardware and the software is \$25. In addition, the PC manufacturer requires a 10 percent return on sales. The net selling price that SmartCOM can charge the PC maker, therefore, is \$74.

Research conducted jointly by the PC maker and SmartCOM's marketing personnel shows that customers want six features. These are: (1) ability to communicate at high speeds, (2) ability to send and receive clear faxes, (3) error-free communication over "noisy" telephone lines, (4) voice mail capability for multiple mailboxes, (5) compatibility with most brands of PCs, and (6) ability to work in the background.

Based on this research, SmartCOM's engineers have come up with a modem design that uses four main modules: (1) a converter module that would convert digital signals into analog signals so they can travel over standard phone lines; (2) a fax module that would provide the capability to communicate with standard fax machines; (3) a voice module that would take messages for multiple voice mail boxes; (4) a processing module that would direct traffic to the right place, that is, to the computer, fax/printer, or voice recording/playback chip. Each module has several major components. A list of the major components in each module, together with preliminary cost estimates for manufacturing or buying each component, appears in Table 1 below.

Table 1: Cost Estimate for SmartCOM Modem							
Module	Component	Cos	t of Each	Quantity	Cost		
Converter	Signal processor	\$	8.00	1	\$ 8.00		
	Phone I/O chip	\$	1.50	1	\$ 1.50		
Fax	Interpreter chip	\$	2.50	1	\$ 2.50		
	Printer I/O switch	\$	1.50	1	\$ 1.50		
	Fax signal chip	\$	4.50	1	\$ 4.50		
Voice	Amplifier	\$	3.00	1	\$ 3.00		
	Voice chip	\$	5.00	1	\$ 5.00		
Processor	Bus controller chip	\$	3.00	1	\$ 3.00		
	CPU	\$	20.00	1	\$ 20.00		
	Memory chips	\$	2.00	8	\$ 16.00		
	I/O controller	\$	7.00	1	\$ 7.00		
	Total cost				\$ 72.00		

In addition to the above, the marketing department estimates that order filling (primarily order processing and delivery) costs would run \$4.00 per unit. General and administrative costs are expected to be \$14.00 a unit. SmartCOM expects to earn a 15 percent return on sales. SmartCOM's engineers have determined the relationship or contribution of each of the various functional components to customer features. This relationship is shown in Table 2 below.

Table 2: Function-Feature Mapping for SmartCOM's Modem						
Feature	Importance to Customer	Component	% Contribution to Feature			
		CPU	40%			
High speed	5	Bus controller	10%			
		Phone I/O chip	50%			
		Fax signal chip	40%			
Send/receive faxes	3	Interpreter chip	40%			
Send/receive faxes	5	Printer I/O switch	20%			
Emer free communication	5	Signal processor	60%			
Enor-nee communication	5	Phone I/O chip	40%			
Voice mail	2	Amplifier	40%			
voice man	3	Voice chip	60%			
Compatibility with PCa	4	CPU	70%			
Company with PCs	4	Signal processor	30%			
Background operation	2	Memory chips	50%			
background operation	۷. ۲	I/O controller	50%			

# Case 1—SMARTCOM, Inc. – a. & b. What is the overall target cost for the modem? The target for the manufacturing cost of the modem? The cost gap between allowable and current cost? The gap for the manufacturing cost?

Final Customer Sell Price	\$110.00
Less: PC maker margin	11.00
Less: Smartcom margin	11.10
	\$ 87.90

10% of Final Customer Sell Price 15% of \$74=Sell price - PC profit - Install & test costs

Cost Element	Sma	artcom's T	arget	PC N	Maker's Ta	arget		Total		
	Target	Current	Gap	Target	Current	Gap	Target	Current	Gap	
Manufacturing Cost	\$ 55.03	\$ 72.00	\$ 16.97				\$ 55.03	\$ 72.00	\$ 16.97	
Ordering Cost	3.06	4.00	0.94				3.06	4.00	0.94	
General Adm. Cost	10.70	14.00	3.30				10.70	14.00	3.30	
Installation Cost			0.00	19.11	25.00	5.89	19.11	25.00	5.89	
Total Cost	\$ 68.79	\$ 90.00	\$ 21.21	\$ 19.11	\$ 25.00	\$ 5.89	\$ 87.90	\$115.00	\$ 27.10	76.4347826%

1-(Gap/Total Cost Ratio)

Component	Target	Current	Gap
Signal Processing Chip	\$ 6.11	\$ 8.00	\$ 1.89
Phone I/O Chip	1.15	1.50	0.35
Interpreter Chip	1.91	2.50	0.59
Printer I/O Switch	1.15	1.50	0.35
Fax Signal Chip	3.44	4.50	1.06
Amplifier	2.29	3.00	0.71
Voice Chip	3.82	5.00	1.18
Bus Controller Chip	2.29	3.00	0.71
CPU	15.29	20.00	4.71
Memory Chips	12.23	16.00	3.77
I/O Controller	5.35	7.00	1.65
TOTAL COST	\$ 55.03	\$ 72.00	\$ 16.97

# c. Calculate a value index for the components of the modem.

	а		b	(a/22)*b
Feature	Importance to Customer	Component	% Contribution to Feature	Customer's Importance Ranking
		CPU	40%	9%
High speed	5	Bus Controller	10%	2%
		Phone I/O chip	50%	11%
		Fax signal chip	40%	5%
Send/receive faxes	3	Interpreter chip	40%	5%
		Printer I/O switch	20%	3%
Error-free	F	Signal processor	60%	14%
communication	5	Phone I/O chip	40%	9%
	2	Amplifier	40%	5%
Voice mail	3	Voice chip	60%	8%
	4	CPU	70%	13%
Compatibility with PCS	4	Signal processor	30%	5%
Destance of the state	0	Memory chips	50%	5%
Background operation	2	I/O controller	50%	5%
	22			100%

a. For each component, marcate what action is implied by the value much	d.	For each co	omponent,	indicate	what	action	is im	plied	by the	value ind	lex.
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Component	Relative Importance (c)	Current Component Cost	Relative Cost of Component (d)	Value Index (c/d)	Action Implied	Revised Cost Reduction Target
Signal Processing Chip	19.09%	8.00	11.11%	1.72	Enhance	
Phone I/O Chip	20.45%	1.50	2.08%	9.82	Enhance	
Interpreter Chip	5.45%	2.50	3.47%	1.57	Enhance	
Printer I/O Switch	2.73%	1.50	2.08%	1.31	Do nothing	
Fax Signal Chip	5.45%	4.50	6.25%	0.87	Reduce cost	1.51
Amplifier	5.45%	3.00	4.17%	1.31	Do nothing	
Voice Chip	8.18%	5.00	6.94%	1.18	Do nothing	
Bus Controller Chip	2.27%	3.00	4.17%	0.55	Reduce cost	1.01
СРИ	21.82%	20.00	27.78%	0.79	Reduce cost	6.72
Memory Chips	4.55%	16.00	22.22%	0.20	Reduce cost	5.38
I/O Controller	4.55%	7.00	9.72%	0.47	Reduce cost	2.35
TOTAL COST	100.00%	72.00	100.00%			16.97

50.50

16.97	Total Mnfc. Gap
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e. Explain how value engineering can help in closing the gap between allowable and achievable target costs for the modem. List some of the major ideas you would consider for cost reduction.

1

. Combine processes and modules to reduce assembly time.

2 Are all parts necessary? If some can be eliminated, quality would increase and cost and time  $\cdot$  would be reduced.

3

. Work with the PC manufacturer to lower installation costs. It may be more beneficial to cut costs at that level instead of the manufacturing level.

4 Work with suppliers of memory chips to see how specifications might be changed to reduce .costs.

5 Examine if certain components are "over-engineered." Do they perform at levels not necessary . for effective functioning of the product.

Marketing costs

<sup>1</sup> Decrease number of orders processed and deliveries made by encouraging larger orders through · discounts.

Installation costs

Work with PC maker to reduce \$25 installation charge by altering product design so that testing and installation will take less time and manpower than originally estimated.

<sup>2</sup>Product design should incorporate the "plug and play" technology to minimize user involvement during installation and engineer the modem so that it can automatically configure itself with the right software.

<sup>3</sup>Design product to include self-checking and diagnostic capabilities into the modem so that the ·modem can automatically test itself during operations.