

Activity Based Costing in Printing Industry — Profitability Enhancement Through Realistic Pricing

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Activity Based Costing is a costing methodology that assign costs to activities and cost objects based on the consumption of resources, rather than the traditional costing approach in which costs are allocated to products based on arbitrary bases such as direct labour/machine hour. It enables organizations to analyse resources/costs in terms of activities and cost objects. An attempt has been made in this paper to identify and analyse activities, cost drivers, both product and customer driven. This analysis may help the printing industry in cost reduction through eliminating unwanted, non-value adding activities and result in overall increase in profitability of the firm. Based on the analysis of activities and cost drivers a pricing model is developed to suit the printing industry which may help the printing industry to quote for any complex job with ease and accuracy.

The development of Activity Based Costing (ABC) as a technique has its origin in the gradual realization of companies not doing well in spite of their concentration into the highly profitable business. Hitherto the traditional method of allocating overheads to specific products based on direct labour hours/cost had its validity when the labour costs in the manufacturing or service industry was of very high proportion as against a very low content of overheads. However, with the advent of highly automated production processes and high level of corporate expenses on sales, general administrative expenses, basing the allocation on direct labour content has utterly distorted the actual costs. ABC theory rests on the foundation that the costs are actually generated by the various activities within an organization and the products consume these activities in varied proportion. The argument in ABC is that the cost allocation to the products should actually reflect the level of these activities consumed by these products rather than allocating the costs on some arbitrary basis.

ABC, at times, also referred to as transaction costing, provides a methodology to dissect the costs in a company and arrive at the root causes of such costs. Unlike in the traditional costing systems, ABC recognizes that a specific activity cuts across the traditional departmental boundaries and hence allocating the departmental expenses directly to the products based on some formula will not help arriving at the actual costs incurred in the manufacturing of the

product. A specific example can be the procurement activity which consumes resources not only from the purchase department but also from the finance, stores, administration etc. Similarly, maintenance activity may consume resources from the production department, finance, administration and so on.

ABC is a costing methodology that assigns costs to activities and cost objects based on the consumption of resources, rather than the traditional costing approach in which costs are allocated to products based on arbitrary bases such as direct labour. It enables organizations to analyse resource costs in terms of activities and cost objects. The CIMA defines ABC as "Cost attribution to cost units on the basis of benefit received from indirect activities e.g., ordering, setting up, assuring quality etc." ABC recognizes that the costs are driven by the activities at different levels within the organization. Cooper (1972) has suggested four levels of production commonly found in an organization, at which costs are incurred which can be attributed to the products. They are (a) unit level activities; (b) batch level activities, (c) product level activities, (d) facility level activities. Michael C.O'Guin (1989) has suggested four levels of customer driven costs in an organization. They are: (a) order level activities; (b) Customer level activities, (c) market level activities, (d) enterprise level activities.

Printing Industry

Printing is, in essence, transfer of image on a mass scale to a recipient medium such as paper, plastic, polythene, etc. There are various methods of printing such as relief printing, offset printing, screen printing, etc Relief printing involves basically transferring the image kept in mirror image form on a photo polymer or metal reliefs. Ink is directly applied on to the reliefs and transferred the same on to a paper or any other medium. In the case of offset printing the image areas are chemically and photographically treated to be water repellent. The non image areas are kept water recipient so that oil based inks are expelled and do not therefore get transferred into the print medium. While these are the two transferred into the print medium. While these are the two mass printing methods, there are several methods such as gravura, flexography, etc to suit specific needs and materials while small jobs are done by sheet fed machines, large volume jobs are done on high speed web-fed machines. The set up time and the machine costs for web-fed machines are very high but the high speed compensates by spreading out the costs into a large volume whereby the unit cost remain very low

Objectives of the Study

The present paper aims at the following :

- a) Analyzing the ABC applicability in printing industry, and
- b) Establishing a full fledged pricing model for printing industry.

Methodology

The methodology of the study involves two specific aspects: A) Literature Survey, B) Field Study.

As a part of field study select personnel from the industry has been interviewed in addition to studying the records, to arrive at the activities and costs. The emphasis has been in grouping activities and identifying their relationships to various products/jobs based on the quantity levels. Effort has been made to structure these information into a logical format enabling a salesman to quote for any complex job with ease and accuracy.

Activity Analysis

The activities in a printing industry can be classified into seven major heads, namely marketing, production, procurement, support management, factory management, financial management and general management. The sub activities of each of these are presented in Chart.

Cost Drivers — Product and Customer Driven

In order to take advantage of the activity analysis and the process re-engineering studies, in terms of cost reduction and better customer services, it is necessary to understand what actually drives or decides the actual cost incidence. It has been mentioned earlier that it is the activities that consume the resources and the products/customers actually consume the activities. It is therefore necessary to know which activity consumes what resources and how much, and how it varies with unit/batch change. Similarly, it is also necessary to know how much of these activities have been used by a specific product/customer. This will help identifying the cost of doing a job which is a vital information in any competitive field.

An indicative list of cost drivers and the activities affected by these cost drivers, for printing industry is given below:

Cost Drivers	Costs affected	Activities
Product Driven		
Type of Product (Pre-printed/Blank/EZR, etc.)	Paper Cost (Wastage)	Art work making, customer visits, machine set-ups customer service
Type & GSM of paper	Paper cost (Base cost & wastage)	Slitting/re-winding, client service, order processing, reel feeding/changing
Size of Job	Paper Cost, Carbon Cost	Machine set-up (Width & Length)
Quantity per run	Paper Cost (Wastage)	Printing speed, plate making & plate fixing, reel changing
Repeat Run	Plate cost	Plate making, artwork making
Machine Proof require- ments	Paper cost, Ink cost, Plate cost	Set-ups, trial run, ink feeding, reel changing/loading.

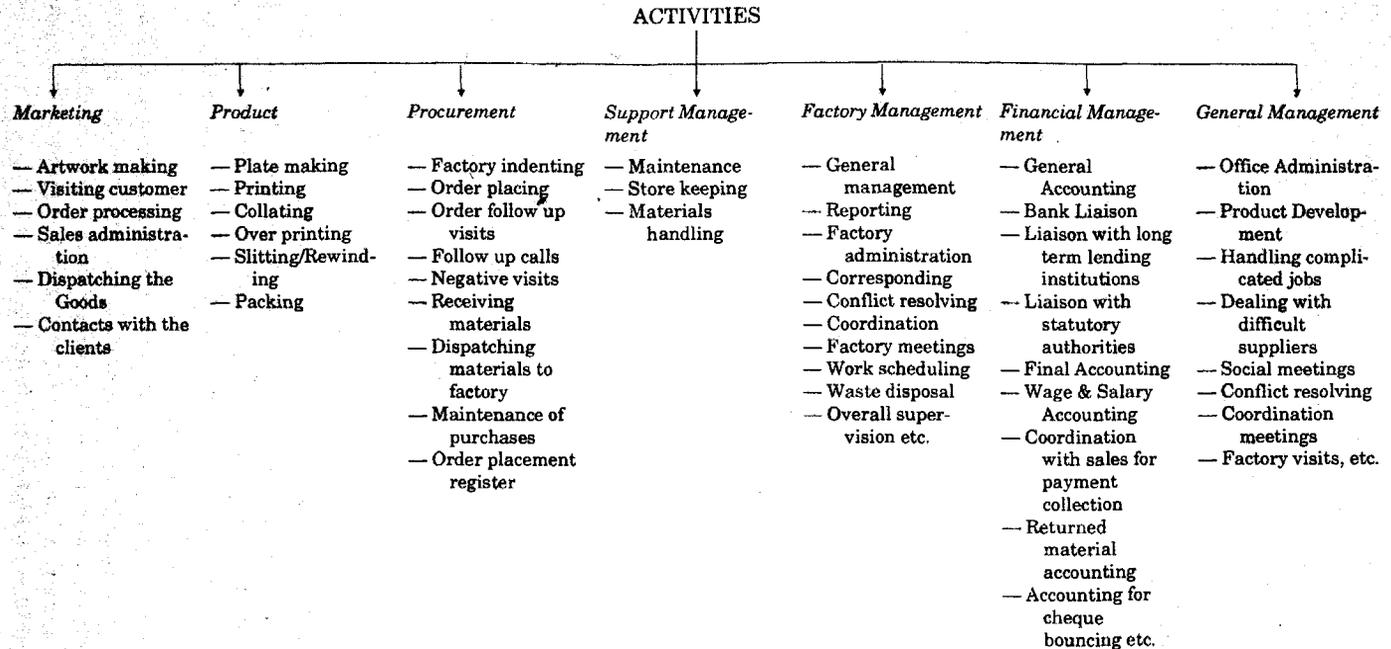
Number of Colours	Ink cost (run wastage)	Ink feeding, tower set-ups, Ink tray cleaning, plate making, artwork/tracing making
Type of Printing (offset/letter press)	Plate cost (offset/letter press), paper cost, Ink cost.	Tower set-up, running speed, art work making, (letterpress needs reduction) Plate making, trial run, plate fixing
Backside Printing	Paper cost (wastage) Plate cost	Artwork making, plate making, tower setting, plate fixing, trial run, etc.
Size of print area for each	Plate cost, Ink cost	Plate making, Ink feeding colour
Artwork size/matter	Artwork bought out cost	Artwork making, plate making, approval visits
Logo Design	Logo bought out cost	Approval visits, touch up
First Job	Art work bought out cost	Art work making, plate making
Repeat Job	Plate cost	Plate making
Type of colour (offset/letter press) Difficulty/complexity of the job	Ink cost, Paper cost, (wastage), Plate cost, Film cost (screen) etc.	Tower setting, Ink tray cleaning, print run, Customer liaison visits, artwork making, plate making, tower set-ups, print run
Gumming	Cost of gum, cost of paper (wastage)	Gumming cylinder set-up, gum feeding, print run
Number of Cross perforations	Paper cost, (Wastage) Blade cost	Perforation blade fixing, print run
Number of ups (repeat prints)	Art work bought out cost, plate cost, paper cost, (Wastage)	Tracing making, artwork making, plate fixing.
Number of parts	Carbon cost	Collator set-up, crimping run
Type of Carbon	Carbon cost	Crimping run
Colour changes in parts	Cost of Ink	Tower cleaning, Ink feeding, trial run
Copy marking	Plate cost, Ink cost	Tower setting, platemaking, Ink feeding
Type of packing	Wrapping paper costs	Packing set-up, label writing label pasting
Type & size of cartons (5 ply/3 ply)	Carton cost	Cartooning, label pasting, strapping
Customer Driven		
Distance	Travelling Cost	Visits, transportation
Location	Travelling Cost	Visits, transportation

Annual Volume	Client development cost, art work cost	Set-up, artwork, platemaking, print run, visits, risks
Per order volume	Artwork bought out cost	Set up, art work, print run
Future Potential	Telephone cost, Developmental costs	Visits, telephoning/faxing
Time required to confirm order	Travelling cost	Visits, telephoning/faxing
Number of Visits required for order closing	Travelling cost, Entertainment cost	Visits, telephoning/faxing
Number of Visits required for artwork approval	Artwork cost, Correction cost	Artwork correction visits, telephoning/faxing
Indecisiveness to confirm the order	Travelling cost, Telephone cost	Artwork correction visits, telephoning/faxing
Difficulties in getting the artwork approved	Travelling cost, Telephone cost, artwork cost, tracing cost	Artwork correction visits, telephoning/faxing
Average changes in the artwork	Artwork Correction cost, tracing cost	Artwork correction visits, Telephoning/faxing
Credit period agreed	Interest, Travelling cost	Documentation, follow-up visits, telephoning
Delay in payment	Interest, Travelling costs	Documentation, follow-up visits, telephoning
Method of payment	Bank charges, Interest	Documentation, follow-up visits, telephoning
Quality standards/tendency for rejection	Product cost, Travelling cost, Transport cost, Insurance	Visits, telephoning, management visits
New Client	Travelling Cost, Developmental Costs, entertainment costs	Visits, telephoning, management visits
Past relationship	Travelling costs, developmental costs	Visits, telephoning, management visits
Bargaining	Travelling costs, telephone costs, interest	Visits, telephoning, management visits
Corporate Relationship	Management travelling cost	Management visits

There are many other aspects such as individual rapport, new supplier (for existing job) status, existing supplier (new job) status, service demands, ego of key persons, corruption, innovation at client level, number of procedures and number of people involved in purchase decision making etc. which will have a direct binding on the product pricing.

The above analysis of activities and cost drivers help the printing industry in cost reduction through eliminating unwanted, non-value adding activities as possible substituting materials and activities with more efficient and low cost alternatives, concentrate on high volume, cost reducing jobs etc. This results in increase in overall profitability of the firm.

Chart 1 Activity Analysis in a Printing Industry



The Pricing Model

Based on the foregoing activity analysis and identification of cost drivers, an attempt has been made to develop a pricing model for the printing industry which may help in pricing the jobs. For this purpose the total costs have been pooled under seventeen different heads. These include:

- Raw materials
- Machine costs
- Labour costs
- Power costs
- Consumable costs
- Art work material costs
- Maintenance costs
- Factory overhead costs
- Material handling costs
- Working capital interest
- Telephone/Fax charges
- Travelling costs
- Outward transportation costs
- Dispatch costs
- Marketing overhead costs
- General office overhead costs
- Management overhead costs

ABC for Job Order Pricing

ABC attains importance from the fact that resources are limited in any economic scenario. Efficient capacity utilization is necessary if one has to achieve best returns possible from these resources. The conventional job order costing seems to be assuming that a cost means mainly direct material, labour and overheads, and all other additional costs are incidental necessities and hence get apportioned based on the direct costs. However, ABC has helped to understand that all other additional costs are not necessarily incidental. While the fixed costs and overheads are incidental to the firm as a whole, there are several elements/activities within the firm that triggers these costs. These elements/activities are not common to all products and/or customers. The realization that any or such cost that is triggered by a specific element/activity which effects the product/service to take shape should get charged to the product and/or service, has helped realistic costing and pricing, for maximum profitability. Unknowingly, cross subsidization between the products and clients has cut down the profits in the traditional methods. The norm of cost based allocation has resulted in low volume jobs/services clients getting lesser allocation of overheads although such low volume jobs/clients in fact cause a more than proportionate share of overheads. ABC has brought in a welcome shift to eliminate this cross subsidization and each product/service thus

reflects its true costs based on actual resource consumption. ABC has therefore been found the most scientific and analytical method for job order costing.

It is therefore necessary to know the actual full cost of any product/job before a job is taken up. Knowledge of such costs help to decide whether a particular job should be taken up or the facility should be put up for alternate, more profitable, use. Printing industry is a specific example of this situation and therefore it is proposed to use ABC for job costing and pricing.

THE NEW PRICING MODEL

Client Name _____ Product Name _____

Client Category _____ Product Type & Size _____

Order quantity _____ Batch quantity _____

Product description _____

Special Instructions: _____

					Values			
	Unit	Qty.	Was- tage	Unit Rate	Print- ing	Over print- ing	Col- lat- ing	Pack- ing

I UNIT LEVEL COSTS

A. Material

a) Paper I

Paper II

Paper III

Carbon

b) Ink I

Ink I

Ink II

Ink III

c) Gum

d) Packing

Wrapping Paper

Cartons

Straps

Clips

Labels

e) Power

Product Driven Costs

					Values					
	Unit	Qty.	Was- tage	Unit Rate	Print- ing	Over print- ing	Col- lat- ing	Pack- ing	Total	
III. PRODUCT LEVEL COSTS										
Product Driven Costs	a) Plate cost (O.S.)									
	Plate cost (L.P.)									
	Consumables (Chemicals)									
	b) Plate making charges:									
	Power									
	Machine hours									
	Labor hours									
	Logo draw/touch up time									
	c) Neg./film making charges									
	d) Artwork Preparation time									
	Artwork material costs									
	Tracing costs									
	IV. FACILITY LEVEL COSTS									
	a) Blanket costs:									
Material										
Labor time										
Machine time										
b) Punches										
Dies										
c) Factory Overheads										
Sub Total										
F.G. holding interest										
Customer Driven	Sales Executive's time									
	No. of telephone units									
	No. of visits									
	Distance traveled									
	Transportation Costs									
	Documentation Costs									
	No. of deliveries									
	Interest (credit period)									
	Rejection (risk)									
	Other charges (Octroi/entry tax)									
	Total:									
Sales Comm. %										
Office Overheads %										
Profit Margin %										
GRAND TOTAL:										

CONCLUSION

The suggested pricing model can be adapted to any commercial printing unit where job works are undertaken. However, it, may be cautioned that this model only describes the approach. The success will depend on the establishing of the activity/resource linkage and consumption pattern, the accurate

costing of the resources and pooling of these costs in relation to the activity. Finally, wholehearted support from the staff and management commitment to introduce activity based costing determines the success of this model.

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