

# CONTRIBUTION-BASED ACTIVITY

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CBA (contribution-based activity) is the flip side of ABC (Activity Based Costing), but whereas ABC is primarily cost and accountant oriented, CBA is primarily contribution and management oriented, addressing the need to present key decision-making information in a time frame that permits preventative action if required and in terms that are relevant to the comprehension of management, whether the latter be a sole proprietor or a corporate team.

CBA is based upon recognition that:

- decision making data, if available, is seldom accessed in time to take preventative action nor is it presented in terms that are relevant to the operational needs of management;
- timely and relevant decision making data includes two key factors in particular - charged activity and unit contribution (see definitions below);
- the most cost effective means of gaining clarity of direction for decision making in marketing, production, quoting or pricing lies in the extraction of these two key factors from ongoing feedback;
- improved performance flows from a growing awareness of the importance of focus on these two factors, weekly and accumulatively;
- management perceives value in a process that speaks the language of management and leads to an improved bottom line.

'Contribution' refers to the difference between the buy-in price (of goods/materials including out-sourced work) and the sale price and is used interchangeably with similarly defined gross profit.

'Activity' refers to the prime identifiable activity that drives the business or a department within a business. Activity broken down into units can refer to man or machine hours in manufacturing or service industries, meals or 'covers' in restaurants, room nights in hotel/motels, sales made in retailing or wholesaling and so forth. Units of activity are referred to as charged (billed or invoiced) or uncharged.

The concepts underlying CBA were developed over several years, during which the initial belief that management advisory services could be delivered by accountants to their clients or employers in the form of monthly financials compared with target plus a cash flow and a few key ratios thrown in for good measure, was shown to be one of the great deceptions. From a management viewpoint, financials, delivered three to four weeks after the event, however nicely bound, were as full of accounting gobbledegook as the annual financials and invariably found their way into the same bottom drawer.<sup>1</sup>

While tertiary institutions and text books faithfully taught management accounting according to traditional cost/volume dissection and pointed to analysis as a basis for identifying problems (the writer was a professor and head of an Accounting Department in two universities for twelve years before commencing the CBA program), it became apparent that the mass of business could afford neither the time or the funds and were in no way motivated to undertake extensive analysis in order to identify key problem areas.

In any event, the historical data available for analysis was invariably fragmented, inadequate, unreliable and unlikely to provide a sound basis for meaningful diagnosis. A solution had to depend on ongoing feedback gradually painting a more complete picture of actual events. This at least was consistent with findings that implementation is 80% of a process

requiring change: implementation lay in the future, not in the past, and the growing awareness of management involved in the process, was itself a fruitful means of educational input.

In order to gain the co-operation of the CEO or Proprietor, it was - and is - necessary to translate the normal language of 'accountese' into terms comprehensible to management and within a short twenty minutes or so, demonstrate one or two facts about the business that arouses interest. One of the most effective means of probing into the heart of business was to compare the actual with the potential results given the resources that were available. A real life example will help:

## Case Study 1

### Charged Activity and Unit Contribution

A printing firm with 10,000 production hours available and a charge rate of \$50 an hour had a potential contribution from the available hours of \$500,000. Compared with an actual contribution of \$250,000 from hours charged, it was possible to identify a 50% level of charged activity or in non-accountese terms, based on an eight-hour working day, four charged hours for eight hours pay.

The next step was to guesstimate a rough budget for the period ahead based on projecting operational expenses plus a desirable net profit to arrive at a target gross profit contribution and relate this to a target level of activity.

For example:

Projected expenses:	\$260,000	A
Desired net profit	<u>\$140,000</u>	B
Target gross profit	\$400,000	C = (A+B)
Available hours	10,000	D
Target Charged Hrs (60%)	6,000	E = (D×60%)
Target Average GP per Hour or		
Target Average Rate Index (TARI)*	\$67	F = (C ÷ E)
Gross Profit Per week (Approx)**	\$8,040	G = (F × (E/50))

\* TARI: *Target Average Rate Index* where 'rate' refers to the contribution per unit of charged (or billed) activity, and 'index' is added to ensure the term is used as a benchmark for the purposes of comparison and not confused with cost or price.

\*\*Based on 6000 hours over a 50-week year excluding seasonal fluctuations.

Management agreed to complete a weekly sales/contribution performance sheet containing details of invoices sent out. Given the nature of the throughput, work in progress flowing one week into the next was ignored as an unnecessary complication. The results of the first week were as shown in Exhibit 1.

The week's summary shows a contribution of \$7,180 from 109 charged hours. Average contribution per hour achieved is \$66 compared with TARI of \$67. Charged activity of 109 hours is 11 hours below the target of 120 hours.

Reviewing the jobs for the week - management saw the hourly contribution rates varied from \$37 to \$118. They wondered about the \$37 job and looked more closely at the jobs providing greater contribution per unit of input. Probably for the first time, they looked at product mix in a conscious and critical way. As the weeks passed, they began to review quotations and those invoiced jobs which compared unfavourably with the TARI of \$67, revisiting the scheduled times and/or the cost of materials. For example, a job that would traditionally have contributed \$600 and involved 10 hours of input, would be rescheduled to take 9 hours, improving the unit contribution from \$60 to \$66.

Exhibit 1

**Sales and Contribution Performance Summary Sheet:**

week one

	A	B	C = (A - B)	D	E = (C/D)
Invoice Number	Invoiced Sales \$	Materials at Cost \$	Gross Profit \$	Standard hours* hr	Average per hr \$
1034	3,500	1,000	2,500	40	62.50
1035	1,750	550	1,200	14	85.71
1036	970	300	670	18	37.22
1037	1,190	600	590	5	118.00
1038	650	230	420	7	60.00
1039	2,700	900	1,800	25	72.00
Total	10,760	3,580	7,180	109	65.87

\* Standard or estimated or quoted hours

Initially, management had difficulty relating the charge-out rate and the 20% mark-up on materials used to cost their jobs with the concept of an inclusive contribution per hour and it took time for them to grasp that, whatever way they looked at it, at the end of the year, they required a total contribution of \$400,000 inclusive of mark-up on material; and at the targeted level of productivity, they needed to track an average hourly contribution of \$67 at an average level of charged activity of 120 hours a week.

Ten weeks down the track, management saw that in comparison with a target contribution of \$80,400 (10 weeks × 120 hours × \$67), the actual contribution amounted to \$104,000, or \$23,600 ahead of target. They realised that this was due to the hourly contribution averaging out at close to \$87 compared with TARI of \$67, whilst the charged activity level had remained on track at 120 hours a week; the conscious effort to improve contribution was taking effect.

At \$23,600 ahead of target they were in a position to underquote any competitor should they wish to target a particular account-which they did, and secured long-run business from two major companies.

Management agreed that the essential difference between their firm and the competitors could be traced to the following:

- an awareness when quoting or invoicing of the contribution per hour compared with TARI;
- an awareness of overall contribution flowing weekly and accumulatively within 24 hours of closing the books at the end of each week;
- an awareness of the overall expenses, accounts receivable (creditors) and payable (debtors) and inventory within four days of a month's end;
- a clear focus on where the "rubber hits the road" i.e., the weekly and accumulative contribution, based on charged hours and unit contribution.

It was this clarity of focus that lifted the perspective of management from its cash driven state and its tree level preoccupation with detail to the exclusion of a wood's view.

Case Study 2

**Product contribution identified and improved**

Some businesses are well aware of their level of charged activity but are nevertheless lost in the trees of computerised feedback. Furnco was such a business. With \$50m sales and 400 employees producing up-market furniture it was an icon of the classic furniture industry, but was losing heavily despite its investment in computerised technology and a 70% level of productivity.\*

\* Productivity refers to units of activity that are chargeable - but due to write ups or more frequently, write downs or other reasons, are not always charged

In such a case, the CBA approach is to identify TARI and compare it with the contribution of each product; dividing Furnco's target gross

profit contribution by the target charged hours gave a TARI of \$100.

Comparison of the \$100 TARI with the achieved gross profit contribution per hour across a sampled range of top selling products, revealed the following situation shown in Exhibit 2. As such an exercise had never previously been attempted, the range of gross profit contribution per manhour unit of activity came as a complete surprise to a management under the impression that the 50% mark-up on factory cost applied to all products, would have resulted in a more even contribution.

Alarmed by the lower unit contributions of what were proving to be the top selling products, E and F, annual sale numbers and gross profit contribution projected for each and every product were extrapolated, only to find that the overall average gross profit contribution rate per hour worked out at \$80, which when multiplied by the target charged hours gave a total contribution well below budget.

Comparison with the preceding year, revealed a subtle change of product mix had taken place with a downward trend in average gross profit rate per hour. Products achieving higher rates per production hour were declining in favour of products achieving lower than average rates, but which were more responsive to market demand.

**Options:** The management team considered it's options:

- Increased throughput be increased without increasing costs. On the face of it, an unlikely option, given they were already achieving 70% productivity with overtime;
- employ more production staff to increase throughput. A quick calculation ended this option: 20 additional production staff would add at least \$750,000 to wages and overheads requiring a substantial increase in sales, an unlikely scenario;
- target sales of products with higher contributions per hour. Given the experience of the slowing demand for these, it seemed unlikely;
- reduce expenses even further. Unlikely in view of the heavy pruning of non value added work in production, marketing/distribution and administration, already undertaken as part of the planned budget;
- review each product performing at less than the target average rate of \$100 and brainstorm a way to improve the production time as well as reduce material costs where possible without losing quality, so that the gross profit contribution moved closer and even surpassed the target average rate of \$100.

Exhibit 2

**Analysis of Six Top Selling Products (out of a total of 120 products)**

	A	B	C = (A - B)	D	E = (C/D)
Product Code	Invoiced Sales \$	Materials at Cost \$	Gross profit \$	Standard hours hr	Average per hour \$
A 42	150,000	40,000	110,000	1,500	73.33
B 71	90,000	30,000	60,000	590	101.69
C 76	140,000	40,000	100,000	650	153.85
D 88	190,000	60,000	130,000	900	144.44
E 95	180,000	50,000	130,000	2,200	59.09
F 112	80,000	30,000	50,000	1,000	50.00
Total	830,000	250,000	580,000	6,840	84.80

Deciding on the last option, and taking an active role in the brainstorming process to gain efficiencies in time and material usage, the CEO also applied the TARI of \$100 to new designs coming across his desk from the design team who very soon realised there was little point seeking approval for a design that achieved anything less. On the other hand, when he was told the marketing team would lose a quote if they insisted on achieving \$100 contribution per hour for a traditional style of product, but that they would win at \$90, he challenged the production and design teams to reduce the standard time by ten per cent in order to achieve the equivalent of \$100.

The CEO's growing awareness of the relationship between the level of activity in production and the gross profit contribution rate per man-

hour unit of activity resulted in at least one salutary lesson. Walking around the factory on a Friday afternoon observing staff sweeping up as had been the custom for years, he had difficulty controlling his emotions when he realised the negative impact on the bottom line of 100 or more production staff sweeping the floor for 2 hours a week for a full year at \$100 per hour.

Results were captured weekly and accumulatively, by the simple expedient of summarising the invoices by sale price, cost of materials, standard hours and comparing them with target. As with case study 1, management quickly realised the advantages over previous feedback. For example, to learn three to four weeks after the event, that productivity had slipped from 71% to 69% during the previous month, did not carry the same relevance as learning that 240 hours had been lost to production at a TARI of \$100 impacting the bottom line by \$24,000; nor did it offer the timeliness necessary to take corrective action to remedy the lost hours, which with weekly feedback could be made up in the subsequent week.

Given the regular flow of work through the plant and the recognition that timeliness and relevance (coupled with an improved cash flow flowing from weekly tracking of charged hours), outweighed the traditional attempts to achieve 100% accuracy, work in progress was ignored along with other accruals.

Having accepted the importance of identifying, targeting and monitoring contribution, the CEO directed the marketing team to push those products showing the higher contribution per hour of input, and adjusted bonuses accordingly. (It is worth noting that at the time of writing, Furnco has well and truly climbed back into profit).

### Case Study 3

#### Customer contribution identified

A new AS 400 coupled with a six month consultancy fee, established a completely new state of the art management accounting system in Appliance Co, a firm manufacturing kitchen appliances with a turnover of \$20m. The CEO however was concerned that in the midst of all the data now flowing, he was losing his grip on the business and requested a second opinion from a CBA consultant.

Given the number of planned hours to be charged together with a planned gross profit contribution of \$10m, TARI worked out at \$80 per man-hour unit of activity. Comparing the TARI of \$80 with the contribution extracted from total sales to date of a major customer with whom the firm had recently contracted to take 55% of total turnover, revealed the following:

### Exhibit 3

#### Analysis of Sales to New Customer showing Comparison with TARI of \$80

Invoiced Sales to date \$	Cost of Materials \$	Contribution or Gross Profit \$	Standard hours hr	Average per hour \$
\$100,000	\$70,000	\$30,000	1000	\$30.00
\$150,000	\$100,000	\$50,000	1500	\$33.30
\$90,000	\$60,000	\$30,000	850	\$35.30

It would be a gross understatement to report that the CEO was stunned; not least in view of the \$450,000 investment in upgrading the management accounting systems to improve the decision-making capability.

### Case Study 4

#### Quoting and Contribution and Human Comfort Level

An electrical contractor employing 20 qualified electricians was unable to win quotes close to the TARI of \$46 which had been developed on the basis of charging 75% of available hours. As the proprietor considered it was unlikely that he could achieve greater levels of activity given the type of work involved, he was concerned about the future of the business.

Asked what rate he thought would win quotes, he said \$40. Asked how he worked the times out when quoting, he referred to his estimator who extracted the times from the computer which in turn, were based on

time sheets handed in. It appeared from further questioning that there had been no updating of times by method or work study for some years and as time sheets without targets invariably sink to human comfort level (HCL), this seemed to be a case in point.

The contractor was told to tell the estimator to take 13% off his computer times on all future quotes, on the grounds that the difference between \$46 and \$40 amounted to 13% and what he couldn't make on the price he could make on the times e.g:  $(100 \times 40) = (87 \times 46) = \$4000$ .

The times for carrying out contract work were targeted down by 13% and the equivalent of \$46 was achieved without a murmur of discontent.

**Wholesaling/Retailing:** Developing a TARI for resale activities is carried out along the same lines as for the non resale sector. Planned gross profit contribution for the period ahead is divided by the planned number of sales to arrive at TARI. The number of sales, broken down into weeks to reflect seasonal expectations and multiplied by TARI become the weekly target contribution. The unit contribution is the contribution/gross profit per sale, which may be a cash ring-up or an invoice for one or more items.

For example, a retail outlet targeting \$1,000,000 contribution to cover expenses plus profit, anticipates 20,000 sales or an average of 400 sales a week at a TARI of \$50. Tracking results daily, weekly and accumulatively against target, develops a heightened awareness of product mix, as well as monitoring the effectiveness of advertising and merchandising, and lending point, purpose and motivation to staff training.

The concept of tracking the average contribution per sale against target, well understood and applied throughout multi-national fast food outlets, is valid for all retail/wholesale sectors despite considerable variations in the dollar value of sales made. For example, in a hardware store with 7000 or so product lines ranging from \$1,000 chain saws to 50 cent packets of screws, there is a statistical average of say \$25, which unless identified, is unlikely to be improved. (See notes 2 and 4).

**Summary:** The frustration of early attempts to produce timely and relevant decision making input led to a process of reengineering, in which traditional financial and management reporting advocated by the profession and taught by academia, was laid aside in favour of an approach which recognised that whilst there are many facets of business that interact in achieving a balanced performance, there were two, in particular, that gave management the woods view necessary to maintain a firm grip on the business, whilst fighting the daily battle down in the 'trees'. The resulting concepts, applied and tested across the spectrum of business, have crystallised to the point where they can be reliably offered as a significant input to management decision making.

The concepts are summarised as follows:

- activity lies at the heart of every business and is measurable in units of activity that can be identified as charged or uncharged;<sup>2</sup>
- contribution can be related to units of activity to create a target average rate index (TARI), against which the unit contribution of quotes, products, processes, jobs or sales can be compared for viability;
- comparison of a unit contribution with TARI provides management with a clear direction for action in production, marketing, tendering, quoting and pricing;
- focusing management's attention on the key aspects of charged activity and unit contribution, becomes an educational process leading to greater awareness of those factors inhibiting improved performance. It is this focus on 'where the rubber hits the road', that has been found to be instrumental in bringing about improved performance;
- timeliness and relevance of feedback available from source documentation, daily, weekly and accumulatively, is more important than 100% accuracy inclusive of accruals, work in progress etc., presented too long after the event for effective remedial action.

#### Conclusion

It was mentioned at the outset that CBA is management oriented whilst ABC (Activity Based Costing) is cost oriented. In awakening widespread interest in activity related costs in manufacturing and distribution with emphasis on the need for a more precise awareness of the type of activity involved, ABC has made a helpful contribution to improved decision-

making relevance in cost accounting.

It does not appear however, to have been part of the ABC charter to demystify or make the data flowing to management more timely or relevant.

Given the urgent need to present information that is both timely and relevant (two cornerstone conventions of accounting), and without in any way inhibiting the application of ABC concepts<sup>3</sup>, CBA presents the flip side of the ABC coin, merging activity with contribution to create a new dynamic for management decision-making<sup>5</sup>.

#### Notes

**1** Commencing under the business name of Pracdev in 1980, software was first developed in 1987 in association with Trevor Watters CPA, and marketed under the name Practician, which came under the umbrella of Focus Based Management in 1992. At the time of writing, an increased number of businesses are applying the concepts directly to their own business. In all, since 1980, more than 10,000 businesses across the spectrum of large and small manufacturing, service, retail/wholesale, contracting and the professions have been involved in the application of CBA.

#### 2 Identifying Charged Activity:

##### *Non resale sector*

Added value or charged activity in the case of those businesses engaged in manufacturing/service/contracting etc which have no physically measurable product output can be established by dividing the overall gross profit contribution of the business by the average gross profit contribution per unit of activity obtained from a representative sample of invoices. For example, the average contribution from a sample of invoices in Case Study 1 is \$66. Assume the gross profit contribution inclusive of the 20% mark-up on materials amounted to \$325,000 (\$250,000 from labour charge out plus \$75,000 from 20% mark-up on materials).

The guesstimated hours charged will be obtained by dividing \$325,000 by \$66 = 4924hrs. Compared with the 10,000 hours available, this amounts to 49.2% productivity or just under four charged hours per person per eight hours of pay. Given the average contribution of \$66 is from a small sample it will nevertheless serve the purpose of the exercise - to gain the interest of management - particularly if management presenting the information has indicated the sample as typical

##### *Resale sector*

Comparison of actual with potential sales and contribution in the retail / wholesale sector is not as straightforward as in non-resale, where the activity resource such as available man-hours can normally be identified. If we accept that the key activity in the resale sector is sales, and the unit of activity is a sale, then the potential number of sales can be determined by way of industry statistics, if available.

For example, if industry data available for hardware stores indicate average sales per full time employee of \$150,000, gross profit contribution of 30% and an average sale of \$25, then potential sales and contribution can be calculated, admittedly only based on average performance. Given the wide variation in store locations affecting position and competition, industry averages should be treated warily and certainly not taken as gospel.

#### 3 Activity Based Costing (ABC) and CBA

An important contribution of ABC has been to highlight the impact on pricing of spreading overheads evenly across labour or machine hours or per \$1 direct labour wage in manufacturing and also by applying an even percentage mark-up to manufacturing costs to cover marketing and distribution, along the lines traditionally adopted in cost accounting. The point being made is that there may well be overheads which are more correctly applicable to a specific job, product or process. For example, set-up time on one process may differ substantially from another, or depreciation of dedicated and expensive equipment required for a specific process, may need to be applied directly to the process and not included in the spread of all other overheads.

Likewise, where marketing/distribution expenses are identifiably related more to one product group than another, they should be so apportioned in order that the real costs may be better established as a basis for pricing.

There is nothing in the approach advocated by CBA to prevent the

application of a direct cost when and where known. For example, assume a directly identifiable cost related to overheads in production or in marketing or both for Product A42 in the FurnCo example, amounts to \$20,000 for the period in question. Then the following could apply:

#### Exhibit 4

##### Adjustment for Identifiable Direct Costs

Product Code	\$ Inv'd Sales	Material s at cost	\$ Gross Profit	Directs +/-	\$ Gross Profit	Hours	\$/Hr
A42	150,000	40,000	110,000	-20,000	90,000	1,500	60
B71	90,000	30,000	60,000	+171	60,171	590	102

Product A's contribution reduces from \$73 to \$60 per hour, whilst Product B's contribution together with the other products, increases by 29 cents per hour: \$20,000 / 68500 hrs = \$0.29: (\$20,000 is the direct cost attributable to A42 and represents \$13.3 for every hour of the 1500 hours charged to A42. This adjustment marginally improves the contribution by other products which had previously been debited with a proportion of the \$20,000 along with A42. 68,500 hours results from deducting the 1,500 hours charged to A42 from the total target charged hours of 70,000 hrs).

**4**"Parables" 21 case histories of the application of CBA in Manufacturing, Wholesaling, Retailing, Contracting and the Profession. Obtainable from Focus Based Management Pty Ltd Tel +61 2 9975 7800, Fax +61 2 9975 7852 Email trevorw@fbm.com.au

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