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Choosing a Basic Cost Plan

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**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**

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Vol. V November 1, 1923 No. 4

**Choosing the Basic Cost
Plan**

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

NATIONAL ASSOCIATION OF COST ACCOUNTANTS

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Vol. V, No. 4

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Choosing the Basic Cost Plan (Perspective in Control Accounting)

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130 WEST 42nd STREET, NEW YORK CITY

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National Association of Cost Accountants

CHOOSING THE BASIC COST PLAN

(Perspective in Control Accounting)

The following is a paper read recently before the New York Chapter.

Choosing the basic cost plan is a most prosaic subject and rather difficult to enthuse over. But there are infinite possibilities, of almost endless fascination in the problem if one has but the vision to see them.

OBJECTIVES OF CONTROL ACCOUNTING

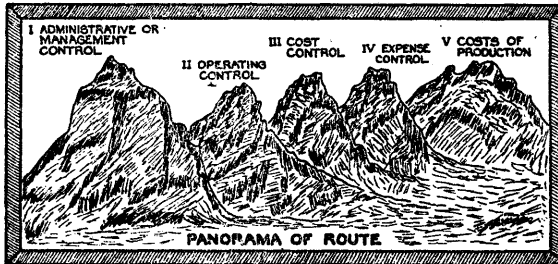
Choosing the basic cost plan may be likened somewhat to an aeroplane journey. To determine upon the starting point of our tour by aeroplane, the route we shall follow in our aeroplane, and the destination at which we wish to arrive, it is necessary at the outset to have in mind our objectives. Thus, in establishing the form of the basic cost plan, it is similarly wise to set out clearly in advance the principal objects to be attained. These peaks on our flying trip, or objectives of our cost plan, must be studied in advance and kept in view. (See Exhibit "1" B, page 4).

The essential objects of the modern adequate cost system, arranged somewhat in the order of their importance, although all are co-ordinated are as follows:

- 1 Administrative, or management control;
- 2 Operating control;
- 3 Cost control;
- 4 Expense control;
- 5 Cost of production.

First, let us explain what administrative or management control data comprise. If we are to make this aeroplane journey without fear of disastrous consequences, and with some assurance of arriving safely at our destination, we must have a pilot in whom we have confidence. While the pilot may have skill and experience in the operation of the airship, he is very largely dependent upon his instrument board, with its gauges, dials and barometers, which tell him in simple, instantly understandable characters, the momentary changes taking place all about him. He uses his skill and experience to interpret quickly and precisely the right thing to be done. Without the instrument board, it is possible that his judgment still might be adequate to see us through, but the chances are very much greater that we might have to make a forced landing. We might even crash, with the attendant unpleasant sensations.

CHOOSING THE BASIC COST PLAN or PERSPECTIVE IN CONTROL ACCOUNTING



OBJECTIVES OF CONTROL ACCOUNTING

- I ADMINISTRATIVE, OR MANAGEMENT CONTROL
- II OPERATING CONTROL
- III COST CONTROL
- IV EXPENSE CONTROL
- V COSTS OF PRODUCTION

BAROMETRIC KEY FIGURES, OR RATIOS (see sheet 2)

CONTROL MECHANISM:
BUDGETS
SCHEDULES
STANDARDS

"Control is possible only through properly focused agencies."

SUPPORTING ANALYSES

IMPORTANCE OF PERSPECTIVE

- FOREGROUND
- MIDDLE-GROUND
- BACK-GROUND

"The adequate cost plan must produce a complete picture; it must, therefore, have perspective. It must have foreground, middle-distance and back-ground."

TYPES OF BASIC COST PLANS (see sheet 3)

- 1 JOB, OR PART, COST PLAN
- 2 OPERATION COST PLAN
- 3 PROCESS COST PLAN
- 4 CLASS (Unit) COST PLAN
- 5 CLASS (Product) COST PLAN (USING STANDARDS)

"The job cost plan tends to give the least results for the most effort; and, in itself alone, will not give perspective."

"In any case of stock products, and even some repetitive special products, this method offers the most for the effort expended, developing, as it does, the RATIOS that facilitate control."

The instrument board of the airship is no more vital to the pilot than are similarly focused indicators to the administrative heads of industry. There is no question of their skill and experience, or of the adequacy of their judgment, but these qualities are made greatly more useful by the help of indicators on the essential daily changes and trends. Therefore, I would place as

first and foremost among the objects to be attained by the adequate control accounting plan, *barometric key figures, or ratios*, currently available for administrative, or management control.

The second objective I would specify as operating control. As the instrument board helps the administrative personnel to pick its way through the cross currents of policies, the operating organization must have means of quick control, to carry out the decisions of the administrators. These means are the piano wires running from the outspread wings to the pilot's seat, to give effect to his interpretation of the story on the instrument board. If, in your application of the basic cost plan, you omit these, you are lost on your first flight.

Third in the list of objectives of a cost system I would put cost control. You will notice the repetition of the word "control" in this article. It cannot be overemphasized. Control is possible only through properly focused agencies. Our pilot could not control the ship if his numerous control wires led in to the cockpit separately to as many different control levers. They are all brought together, or "focused," into two single control agencies, the stick and the foot-bar. Focused information is necessary to cost control.

Fourth in our peaks or objectives, is expense control. This deals more specifically with the single—but usually considerably important—element of factory expenses.

Fifth and last of the objectives, and, in my opinion, the one of the least importance, is costs; meaning thereby, costs of production.

These are the more prominent peaks on our tour. To repeat, five important objectives are to be held in view in applying the basic cost plan; namely, administrative, or management, control; operating control; cost control; expense control; and costs of production.

Strangely enough, these objectives will be of little influence in the choice of the basic plan to employ. You might properly ask, then: why are they brought into the discussion at all? Because they determine the foreground and middleground of the picture. They set the proportions. Ignore them, and I care not what your cost plan, nor how painstakingly it be worked out, it will be of comparatively limited usefulness—all background.

Your choice of the basic cost plan will depend largely upon two conditions: the nature of the product, and the process of manufacture. In many cases there is little choice, these conditions of themselves prescribing the plan. At other times two of the various plans might be used, perhaps either with equal success. The point I want to make is that the determination of the basic plan is only turning the door-knob; you are only on the threshold and have still to open the door to see beyond.

IMPORTANCE OF PERSPECTIVE

Choosing the basic cost plan is like selecting the medium on which to work. Have you ever seen an artist paint a picture? He first decides upon the medium he wishes to use. This may be paper, wood, silk, canvas. If it be canvas, he decides upon one of several ways of preparing the canvas, and when he has this done he is only beginning. He is only *preparing* to paint his picture. He has not started to give you an inkling of the picture he is to paint. Choosing the basic cost plan is like preparing the canvas.

Does the artist, having prepared his canvas, start at the upper left corner, and, with a handful of brushes, fill in his pigments from left to right, top to bottom? He does not. His first step is to sketch, in neutral tints, the outline of his picture. He gets his proportions right. The perspective is going to be vital to his picture. He next proceeds to fill in some of the detail, and as the final step only, fills in the background.

This process of producing a picture is an apt analogy to the design of the cost system. Your plan should produce a complete picture; it must, therefore, have proportion; perspective. It must have foreground, middle-distance and background. If it does not have these dimensions it will make little difference how carefully you prepare your canvas; the picture will be flat and uninteresting, if not unintelligible. This applies to the working out of the cost plan, because, as you know, we have many futurists abroad.

In the foreground of your picture, to bring our analogy close to the cost system, you must have the barometric key figures, or ratios, before mentioned. You must have the essential data properly focussed and brought prominently to the fore. Ratios of working capital; sales, production and unfilled orders; outgo versus income; purchase commitments; factory expense; such are barometric ratios. An illustration of a ratio trend summary report is given on Exhibit "2." (See page 7).

You will have middle ground, also; placing into their proper positions in your picture those data which are in support of the foreground but not so prominent, nor so far set back as to merge with the background. Your middle ground will perhaps be the mechanics that produce the barometric ratios: the budgets, sales quotas, production schedule plan, standards, and the like.

Finally you will have the back-ground of your picture, which makes it complete, and comprises all the multitude of detailed transactions and recordings necessary to support the whole. The general ledger and books of account; the sales analysis and production analysis; the manifold requisitions and time-tickets; the stock records.

This perspective in your cost plan is just as essential to the final picture as it is to the artist who paints. It is what you will see if you look out of your airship to view the panorama. It is

WEEKLY TREND SUMMARY

No. 34

August 25, 1923 - 34th Week - 201 Days

(Thousands of Dollars)

Working Capital									
Assets	Aug 25	Ratio	Jan 1	Ratio	Liabilities	Aug 25	Ratio	Jan 1	Ratio
	Cash	57 4	08	197 6		60	Loans	150 0	21
Cash Special	249 4	35	-	-	Notes	83 4	12	18 8	06
Notes	2 8	-	3 8	01	Accounts	225 2	31	307 0	93
Accounts	170 0	24	386 6	1 17	Special Accounts	255 2	36	-	-
Special Accounts	28 0	04	-	-	Accruals	3 8	-	4 8	-
Inventories	327 0	46	277 2	84					
Consigned Stock	145 4	20	-	-					
Sundries	1 6	-	1 0	-					
Total	981 6	1 37	866 2	2 62	Total	715 6	1 00	350 6	1 00

At List (200%)	Sales			Production			Shipments			Unfilled Orders		
	Aug	Year	Ratio	Aug	Year	Ratio	Aug	Year	Ratio	Aug	Year	Ratio
Product A	10 2	105 2	1 00	76 8	98 5	93	78 2	107 1	1 00	5 2	6 3	47*
Product B	15 7	135 6	1 00	14 5	136 7	1 00	32 7	141 2	1 04	1 6	1 6	08*
Product C	5 4	52 7	1 00	36 3	77 5	1 47	21 2	67 6	1 28	3 0	3 5	47*
Product D	20 6	122 0	1 00	97 0	84 3	70	82 6	122 1	1 00	33 6	45 7	2 95*
Totals	51 9	416 5	1 00	184 6	397 0	95	184 7	438 0	1 05	43 4	57 1	1 09*
Year 1922	76 3	575 2	1 00	82 9	570 8	99	75 3	575 2	1 00	-	-	-

Income vs. Outgo					Purchase Commitments				
	Aug	Ratio	Year	Ratio		Aug	Year	Ratio	
Billings	27 8	1 00	198 6	80	Forward	167 7	43 5	1 70*	
Sundries	-	-	50 3	20	Orders	45 4	359 6	1 72	
Total	27 8	1 00	248 9	1 00	Total	213 1	403 1	1 94*	
Payrolls	32 0	1 15	237 4	95	Invoices	74 8	289 7	1 40	
Purchases	56 3	2 03	268 1	1 08	Adjustments	5 7	-19 2	-10	
Sundries	0 5	02	0 5	-	Total	80 5	270 5	1 30*	
Total	88 8	3 20	506 0	2 03	Outstanding	132 6	132 6	2 48*	

	Trend Ratios												
	1922	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Working Capital	2 62	2 60	2 55	2 42	1 98	1 90	1 75	1 62	1 37				
Sales*	1 00	1 12	1 08	1 05	93	90	82	76	72				
Product:Sales*	99	92	97	1 03	1 06	98	98	97	95				
Unfilled:Sales	1 25	3 05	2 80	2 45	2 32	2 24	2 15	2 63	2 48				
Outgo:Income	92	1 38	1 56	1 61	1 76	1 83	1 90	1 98	2 03				
Commit:Sales (a)	2 50	3 60	3 52	2 40	2 21	1 83	1 79	2 02	2 48				
Collections:Accts													
Factory Expense*	1 06	1 10	1 12	1 08	98	89	86	97	1 04				
Capacity Used*	93	1 02	97	94	83	72	75	88	96				
No. Employees	275	305	311	309	295	289	240	241	262				
Per Cap. Prod.	\$92	\$106	\$89	\$101	\$97	\$93	\$90	\$89	\$94				

*Ratios accumulative for year. *As at July 31. *Ratios based on average monthly sales.

(Note: All figures hypothetical)

everywhere about us and, in fact, it is a difficult thing to imagine what the view would be like if it were cast all in one plane.

TYPES OF BASIC COST PLANS

Having defined our objectives, and gone into the reason for so doing, we are prepared to choose the cost plan to use; to pre-

pare our canvas. There are only five distinctly representative types from which to choose:

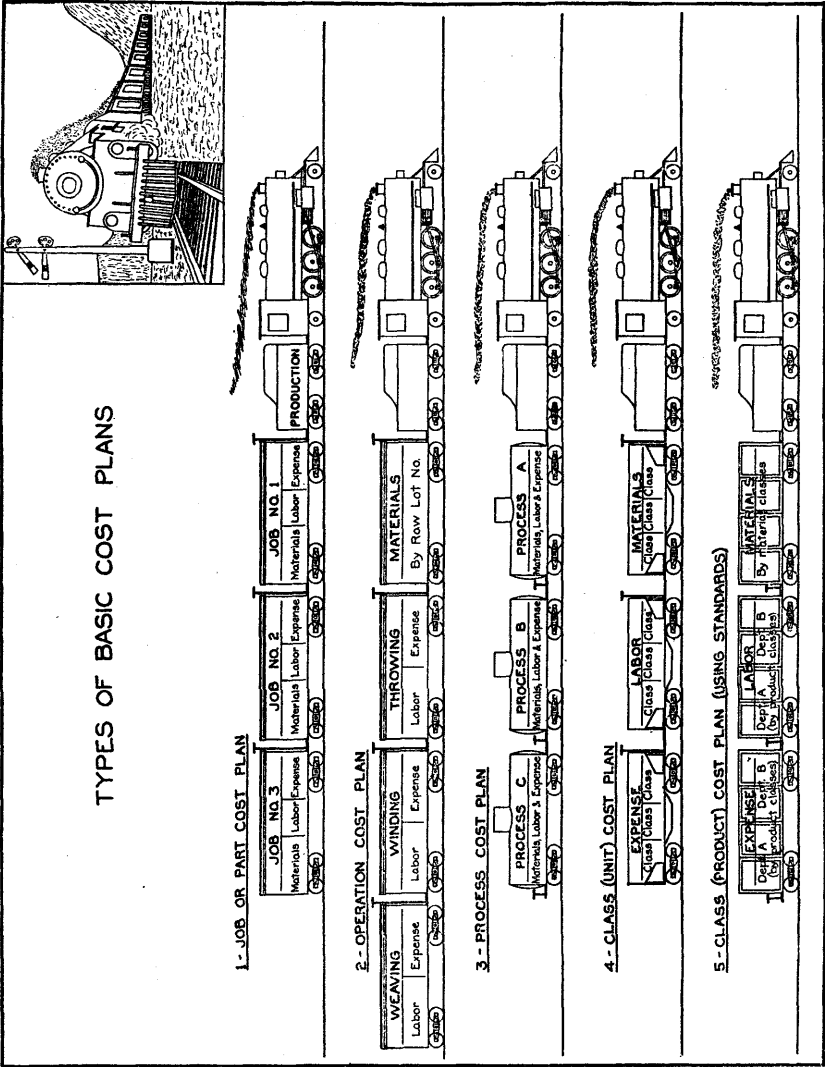
- 1 The Job, or Part, Cost Plan;
- 2 The Operation Cost Plan;
- 3 The Process Cost Plan;
- 4 The Class (Unit) Cost Plan;
- 5 The Class (Product) Cost Plan (using standards).

These are illustrated on a sheet (Exhibit "3," see page 8), by series of freight trains, showing how the elements of cost are brought together in each of the five types. Brief examples of the application of these may be given:

JOB OR PART COST PLAN

The first illustration, of the Job, or Part, cost plan shows each car of the train as representative of a job. In each car will be placed the appropriate materials, labor and expense applying to the job. Such a system might be used, for example, in some machine work. Take the drop-forging industry in making forgings to special order. Each order is a special job by itself, producing forgings according to drawings and specifications by the customer. The jobs may or may not be repeated at intervals. Such work is usually taken on the basis of an estimate and a quotation. The basic plan will provide for calculating material, labor and expense by job numbers, and when the job is finished, for summing up the cost.

The job cost plan tends to give the least results for the most effort, and, in itself alone, will not give perspective. It must be supplied in some manner. A condition in the drop-forging industry is that often from 75 to 95 per cent of the cost of the product has been incurred upon the completion of the initial operations of forging. To build up our foreground, therefore we may provide as a co-ordinated part of the procedure, measures for cost control, which will give daily, focused information on the preparation and progress of the initial operations on all jobs. To give some of the middle ground that is necessary to the picture, you may adopt a procedure for showing, as a whole over the periods of operation, deliveries on special orders in comparison with the estimates upon which they were taken. To do this, a method is to price deliveries at the estimated costs, carrying that value to cost of goods sold and setting out separately as costs, the gain or loss over estimates. This separation will be helpful. If the amounts accumulating in the variance accounts show substantial gains, it is not necessarily a favorable indication, that goods are being made under the estimates; it may mean that estimates are too high, on the average, which results in thrusting away business, through self-protection on the part of those making them. A healthy condition might better be the development of a slight loss in the variance accounts.



OPERATION COST PLAN

The second type illustrated is the Operation cost plan. Here the materials are all placed in the first car and succeeding cars represent an operation each, into which labor and expense are loaded. An illustration of the application of the Operation cost plan might be taken from the silk industry, where the operations of throwing, winding, quilling, warping and weaving are all more or less alike, while the job, or the shade or style, of the product differ. Under

this plan the material is calculated by kinds or lots, and labor and expense are applied in addition to the material cost for the operations involved.

Costs of production by this procedure give us background. What shall we place in the foreground? One of the important elements is the raw material. A pound of silk is worth from \$8 to \$12 and contains over 200 miles of single strand, 10 denier, silk. You will, perhaps, then set prominently in the foreground indications of the trend of purchases as to price and consumption as to usage. Possibly you will set out separately the loss or gain on purchases from that on manufacture and sale. Perhaps you will even go so far as to set up anticipatory profit and loss accounts, because oftentimes gain or loss is made when the order is taken, before manufacture has begun.

PROCESS COST PLAN

The next basic plan illustrated is the Process cost plan. It is shown by tank cars, and is largely used in chemical processes. This method is applicable where it is difficult to allot costs other than by steps in transformation, there being oftentimes a lack of a distinct product at various stages of manufacture. An example of the use of process costs might be taken from the corn refining industry. Corn is steeped and ground, and passes through sundry processes of refinement to make corn starch, corn syrup (glucose), mixed syrups, etc., as well as several by-products. The transformation is a continuous one, grain going in at one end of the mill and coming out at the other in the form of one of the products mentioned. You will, therefore, carry your charges for material, labor and expense into process accounts, dividing the total in each by the volume of product to obtain unit costs.

What will you use in this case to produce your foreground? Obviously one of the important conditions to control is the continuous operation of the mill; and another, the purchase of corn, subject to somewhat speculative fluctuations. You may, then, express corn buying contracts closed in terms of the number of days' grind such purchases will maintain, and compare them with the number of days' grind represented by unfilled orders. You may focus corn purchase trends in comparison with standards.

On the cost sheet itself, of corn products, you may try for proportion by dividing your unit costs into three steps. The first of these might show unit costs at standard price of corn and normal conversion costs, to project yield variances. The second might give unit costs packed, including corn cost at actual price but conversion costs still at normal; this would produce capacity costs with material as purchased. In the third unit costs you might add the operating expense variances (that have been omitted theretofore from the normal conversion costs) giving actual costs of manufacture.

CLASS (UNIT) COST PLAN

The fourth plan cited is the Class (unit) cost plan. By this method materials, labor and expense are analyzed by classes of product, definite ranges being included in each class, and such totals being divided by units to give unit costs by classes. Such method might be used in a jobbing foundry. Castings might be analyzed into ten or fifteen classes according to sizes, multiplied by three variations for difficulty of pattern, making from thirty to fifty classes. Costs may be developed per pound for each class and estimates figured by classifying the order.

It must be borne in mind that the establishment of the plan, however, produces mainly background, and perspective must be furnished. Indirect expenses are one of the considerable elements in foundry costs. You will, perhaps, find a way of focusing these and comparing them with an appropriate base that will throw fluctuations in them currently into prominence. Losses in the production of castings are important, and your barometer may reflect these also.

CLASS (PRODUCT) COST PLAN (USING STANDARDS)

The last plan illustrated is the Class (product) cost plan. It is used in conjunction with standards. Under this type material costs are developed by material classes; labor and expense by product classes; so devised that running ratios are reflected by these classes, of the relation of actual to standard costs. An example of the use of this type might be taken from the manufacture of hardware, taking a case where the product is a large and extremely varied stock line of hardware. In such a case it may be that the number of articles made is so great, and the variety and number of operations so overwhelming, that none of the previously described types can be followed. Sometimes standard costs only are compiled, and such effort as can reasonably be maintained is exerted to keep the standards up to date. At best this is inadequate. The conditions may be still more complicated by the features that many of the products are assembled articles, produced in a range of sizes and a number of finishes, and capable of being produced in any desired special finish.

Prominent in your foreground in such cases you will require means of supplying quickly replacement costs; mechanism for showing the trend of material purchases; of labor and expense changes. As the operations are many and the line extensive, factory expenses in the numerous departments will be no small item and you will furnish some indicators for their control.

In any case of stock products, and even in some repetitive special products, this method offers the most for the effort expended; developing, as it does, the ratios that facilitate control.

It is possible that in large plants you may find it necessary to use two or more of these types of cost plans in the various processes. Most conditions will be satisfied by these five types.

In no case, however, will the selection of the type alone be adequate, without the arrangement of ingenious means of producing proportion and perspective. It is only by studying the conditions in each case, and by so arranging the design of the plan that information may be developed in the order of its need and importance, to serve the objects originally in view, that you can produce a complete picture.

CONCLUSION

In choosing your basic cost plan you will study the industry, and the plant in all its departments; you will classify the product and observe the methods of its manufacture and distribution. You will let these determine the selection of job cost, operation, process or class cost plans, or their combinations. Seldom may one type of cost plan be used satisfactorily in all departments. At this point you will not fail to delineate your aims; administrative, or management control; operating control; cost control; expense control; and costs of production. Having set these out, you will sketch in your proportions, and establish your foreground, middle distance and back-ground. Proceeding in this manner, you will not only have produced a control accounting system instead of just a cost system; not only have transcended anything prosaic about your work; but you will have produced a picture that tells a story and will live.

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