

# **Performance Measurement for Cost Management: The Nature and Role of Kousuu**

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## **Abstract**

The practices of target costing and kaizen costing have received considerable prominence as cost management methods which can support competitive strategies. However these techniques do require the support of internal cost information systems which provide both guidance and feedback on policies to effectively reduce resource consumption within the organisation. This paper explores the operation of just such a system - the kousuu reporting system. It involves the monitoring of resource use in the conversion cost area by profiling the various work times associated with component functions. This gives visibility to resource consumption, it supports the kaizen philosophy of beating previous actual performance by revealing time trends and facilitates cost management by integrating budgetary targets and ideas for improvement. As it is based on straightforward non-financial measures it provides a relatively unambiguous source of feedback which indicates the impact of previous decisions and guides future action on resource consumption and reduction.

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## 1. *Introduction*

Japanese management accounting has consistently been characterised as strategically driven, supportive of cost effectiveness, and market oriented (see for example McMann and Nanni, 1995 for a review which emphasises these factors). Exemplifying these features and central to Japanese management accounting system design is the practice of target cost management (Tanaka, 1995; Tani et al, 1994; Kato, 1993; Monden, 1992). This approach is widely used among companies in Japan's key industrial sectors. While target costing has been high profile and accorded considerable credit for its contribution to the economic success of Japanese companies, it is, in essence, a very straightforward procedure. The determination of a target cost involves the estimation of expected market price from which an expected profit margin is deducted. Achievement of the resultant figure becomes the responsibility of product designers and all those involved in the production and selling process. Thus it is an approach which possesses the great attraction of creating an explicit market interface with the organisation's internal costing system. Another key attribute lies in its capacity to be used at the stage of product planning and design when the significant cost commitment decisions are made. At this stage its motivational impact can be most effective not only in ensuring the delivery of viable product innovation but also by screening out those new product ideas which are unlikely to meet the market test. However it is an approach that can also be used throughout the product life cycle to help maintain profitability and provide guidance on the composition of the existing product portfolio.

While the process of setting target costs and some of the work functions (e.g. value engineering, functional cost analysis, inventory and supplier management) associated with attempting to meet the target have been subject to research and review (Sakurai, 1990; Horvath 1993; Tanaka et al, 1992), there has been a comparative neglect of the technical attributes of the accounting information systems available within Japanese companies to support these activities. This paper provides some redress to this imbalance by examining one common, yet fundamental, aspect of Japanese internal accounting information provision, the Kousuu reporting system. A clear and current knowledge of how resources are consumed within the organisation is fundamental to the effective management of cost in accord with set targets. Managerial demand for this knowledge is one major reason why activity based costing (ABC) has become so popular so quickly in the West (Innes and Mitchell, 1995). However, in Japan, interest in the practical development of ABC has been both slower and later. In part this has occurred because one of the most common characteristics of costing systems in Japan is the detailed information which they generate on resource use in the various processes (manufacturing and support) which constitute the core internal value chain of the organisation. A key feature of the traditional Japanese costing system is the

regular and periodic generation of report sets which contain detailed profiles of how key resource sets have been used. Conventionally this is provided for management in both non-financial (Kousuu) and financial forms (Kousuu based charge rates). The Kousuu reporting system produces information which is used to both initiate cost reduction initiatives and provide feedback to help judge the success of action already taken. It thus supports the programmes of design modification and continuous improvement which underlie the effective utilisation of target costing methods.

## **2. *The Study***

This paper is based on a case study of the Kousuu reporting system in a large Japanese manufacturing company. The use of the case method is appropriate as the research is merely exploratory and descriptive (Yin, 1984; Scapens, 1990). The purpose of the study is to illustrate the nature of Kousuu and to explain the role which it played in cost accounting, cost management and performance measurement within the Japanese company. The emphasis of the research was therefore on the technical nature of the Kousuu system.

The study was undertaken in the first half of 1995 at the company headquarters. As the case focussed on the specific nature of certain accounting information being produced within the company, data were gathered by interviews and discussion with the cost management team responsible for both the design and operation of the Kousuu Reporting System and with a small sample of the key managerial users of the information. The interviews were conducted over a period of three months while the researchers assimilated the system and obtained clarification on problematic issues. In addition documentation comprising the various reports generated by the system were obtained and studied. The case report which follows is a condensation of the Kousuu Reporting System, but one which includes all of the key reports which comprised the information provided to company management. While no generalisations can be drawn from one case, the literature on Kousuu and the authors' experience suggest that this example is not untypical of the Kousuu systems which are widely used in Japan.

## **3. *The Nature of Kousuu***

Kousuu are units of resource consumption expressed in physical terms. They encompass all of the major resource elements of conversion and support cost and typically are measured in terms of either the direct or indirect labour time or machine time of the production factors which constitute the organisation. A complete set of Kousuu thus represents a detailed inventory of all of the conversion and support activity undertaken in the firm. Thus Kousuu can be based on production processes, work

cells, machines and service functions such as maintenance and materials handling. This type of information can be usefully presented in various ways. For example, with an input object focus it can be designed to represent the time distribution of the various work elements comprising a production line, a shift, or a factory for any specified period of time. However, by focussing on an output object, Kousuu may also be expressed in terms of the various time components of the work required to produce one unit of final product. In this latter form it is known as Gentani. A Gentani therefore profiles the pattern of conversion work resource consumption by individual product lines. This approach provides one basis for both the derivation and assessment of standard costs, as well as providing a working performance measure in its own right. Finally to accommodate the financial dimension, a charge rate can be computed for each Kousuu based on the cost of the resources which contribute to the labour and/or equipment and service input of the relevant activity. This can then be used to convert the Kousuu work times into costs which can be applied to all of the above types of cost object. In Japan, Kousuu are extensively used in the manufacturing sector and their design and operation are widely referenced in applied texts (eg DES, 1989; GBD, 1991).

One of the strengths of the system of Kousuu is the level of detail which it captures and feeds back to management. For example, Figure 1 contains an illustration of a Kousuu based on labour working hours for a particular production process for a specified time period. From left to right there is a hierarchical decomposition which first classifies working time into that which adds value (basic working hours) and that which does not (line management hours) and then a further subdivision is made into direct or support work and finally a segmentation into the detailed activities which constitute each of these components.

This decomposition is one of the advantages of Kousuu as it highlights how resource is consumed and in so doing it facilitates the identification of non-production time and guides managerial policy on continuous operational improvement. Monitoring the Kousuu over time (often daily) also assists in locating problems at an early enough stage to permit prompt remedial action not only by managers but by operatives.

These attributes are further enhanced by establishing responsibility linkages for Kousuu components. For example, all of the basic working hours will typically be the responsibility of the production engineering department. They will attempt to devise new work methods and work support services which will improve the utilisation of direct work time. The line management hours will be the responsibility of the production department who will attempt, over time, to reduce and/or eliminate the non value added work time from this component.

<p style="text-align: center;"><b>Figure 1</b> <b>Working Hours for Kousuu</b></p>			
Type of working hours			Activities
Working hours (WH)	Basic working hours (BWH)	Net working hours (NWH)	1. machine loading and unloading 2. working manually or operating machines 3. supplying parts daily 4. washing processed parts and finished products 5. measuring processed parts and finished products
		Incidental working hours (A)	1. walking between process 2. dressing parts and products 3. loading parts on automatic machines 4. adjusting machine tolerance 5. checking size of processed parts and finished products by random sampling 6. cleaning for checking size of processed parts and finished products by random sampling
	Line management hours (LMH)	Incidental working hours (B)	1. turn on and off the main switches 2. preparing parts for manufacturing 3. preparing and checking tools 4. checking machine and supplying oil 5. cleaning machines and floors 6. warming up and training machines 7. holding preliminary meeting and making contact with workers 8. checking blue print
		Incidental working hours (C)	1. changing cutting or grinding oil 2. changing running or lubricating oil
		Set up hours (SU)	1. changing fitting and fixing tools 2. changing manufacturing tools
		Artificial delay hours (AD)	1. relating to abnormal shop floor works 2. relating to factory management 3. relating to personal issues
		Waiting hours (W)	1. waiting for manufacturing parts and products

Kousuu therefore represents a set of regularly available performance measures for use at many levels within the business. In this role they relate to various dimensions of performance, including production line productivity, production support efficiency, cost management effectiveness and human resource management and allocation. Frequently for performance measurement they are expressed in the form of Gentani (computed by dividing the columns in Figure 1 by the number of funded products manufactured). This type of analysis highlights the significance of the various Kousuu components in a way which is directly related to actual achievements in respect of meeting target costs. They allow progress towards meeting a cost target to be monitored and reflect over time the success of the firm's efforts to continually improve.

One notable feature of Kousuu is the segregation of work time into its value added and non-value added components. Identification of non-value added hours provides a focus for cost reduction effort. It also facilitates the common use of the ratio of value added to non value added time components which represents another important kousuu based performance measure for production management. Pressure to reduce this measure intensifies the quest for elimination of non-value added work time. Indeed it is a key test of most Japanese cost management policies and initiatives that they will impact favourably on the organisation's Kousuu. Reduction of Kousuu is a key indication of cost effectiveness. Without clear evidence of this the cost implications of any new development can be called into question as they will lack managerial credibility. Thus the analysis of any new production initiative's impact on Kousuu will be a crucial element of the case for its adoption.

Kousuu do however require to be used with care as they impinge on the sensitive issue of employees' work time. They put the employee under the microscope, and in so doing they do promote a pressure on both the individual and group to continuously improve. If taken too far such pressure can be dysfunctional. For example, while the elimination of slack does appear to offer a ready means of improving costs it may have other consequences. Employees may lose some of their freshness as work intensity increases, innovation and creativity may be stifled and ultimately both workforce morale and output quality are compromised. Kousuu are therefore best used as a constructive support system for improvement rather than as a punitive control device.

#### **4. *Kousuu-Based Reports***

The above description provides a general perspective on the type of information provided by Kousuu. However to improve its analytical potential the Kousuu results need to be put into meaningful context. In addition to the tracing of actual trends, expectations and improvement targets can be incorporated into a system of Kousuu reporting. Consequently in addition to the decomposition analysis shown in Figure 1, Kousuu can also form the basis of a set of periodic reports. These permit management (1) to feedback and match operational performance with locations and employees, (2) to set it in the context of expectations and, (3) to link it to suggestions and policies for improvement. Five reports lie at the heart of the Kousuu-based reporting system which achieves these three objectives. The nature of each of these reports is now considered in turn.

**REPORT I****Detailed actual Kousuu Statement**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Working section	Line No.	Line Name.	Total Kousuu	Production units	Trial product units	1) Trial product	1) Process Management	1) Loss	1) Product Mix	1) Total extra hour	2) New production learning time	2) Teaching	2) Quality	2) Total

Columns 1-3 specify the Kousuu location. Column 4 and 5 provide the actual Kousuu allowance for the actual production units of established products. Where a new or trial product or technology is in process an additional section is included (columns 6-11). This specifies the units produced and the total expected Kousuu allowance. In addition the breakdown of any extra Kousuu time caused by product or technology novelty is provided (columns 8-10). Finally an analysis of support work times for all products is given (columns 12-14).

Report I is produced daily as a means of tracking the actual level of Kousuu achieved in the factory. A variety of this style of report is produced, each specified for individual work sections on particular production lines. Its content, which is summarised above, can be extended to incorporate the level of detail shown in Figure 1. To provide further detail and context, information is also produced on trial products which are being manufactured for the first time and on product mix, losses occurring, teaching or instruction time and quality of output. Thus the performance of several dimensions of actual operational work activity is captured in a regular and detailed manner which permits management to monitor key trends in its effectiveness and efficiency. To fulfil its feedback role the report is, typically, checked daily and also submitted on a monthly basis to managerial meetings. Importantly it is also used to provide useful daily feedback to those involved in carrying out the operational work. Its daily appearance shows trends clearly, guides remedial action and fosters the motivation for staff to keep improving on past actual performance.

Columns 1-7 locate and summarise the data from Report I. Columns 8-11 provide a comparison of current and past Gentani for established product work-time and for identifying work hour savings made. Columns 12-15 provide the same information for the support work.

**REPORT II****Detailed Kousuu Reduction Statement**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Working section	Line No.	Line Name.	Total Kousuu	Production units	Trial product units	1) Trial product	1) Process Management	1) Loss	1) Product Mix	1) Total extra hour	2) New production learning time	2) Teaching	2) Quality	2) Total

Report II is based on the daily actual Kousuu statement. Its focus is however on the savings made in Kousuu during the last six month period. These savings are presented by expressing the Kousuu in Gentani (hours per unit) form. Thus the average actual performance for the current and preceding half years can be compared and savings highlighted. The availability of this report emphasises managerial interest in continual improvement and therefore stimulates employees to continually make efforts to effect the savings which will show up as a positive attribute of their performance on this report. The use of Gentani helps all concerned to appreciate the potential significance of their efforts in terms of improving the unit cost of outputs and so enhancing the competitive strength of the firm.

**REPORT III****Kousuu Established Product Budget Statement**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Cost centre	Line section	Line Name.	Last % year actual Kousuu/unit	Current % year	Total Kousuu	Production units	Kousuu /unit	Saved Kousuu	Saved %	Next % year	Total Kousuu	Production units	Kousuu /unit	Saved %

Columns 1-3 locate the data. Column 4 provides the most recent Gentani as a comparator. Performance for the most current half year is then summarised in columns 5-10. Finally lines 11-14 provide a projection of the expected Kousuu for the forthcoming half year and the Kousuu savings expected are explicitly identified.

Report III incorporates the budget expectations for the firm's established products Kousuu for the forthcoming half year. To provide a context for this the actual performance for the most recent half year is provided. The budget specifically incorporates a



target for Kousuu savings expressed both in absolute and percentage terms and so again reinforces the quest for continual improvement. It is at this stage that the system can be formally linked to the practice of target costing by ensuring that the budget incorporates the levels of performance required to meet the market determined production standards established by target costing exercises.

## REPORT IV

### Kousuu for Kaizen Activity Statement

(1)	Working hour structures	(NWH)	(A)	(B)	(C)	(SC)	(AD)	(W)
(2)	Production Process							
(3)	Process X (Actual Working Hours)	(NWH)	(A)	(B)	(C)	(SC)	(AD)	(W)
(4)	Process Y (Actual Working Hours)	(NWH)	(A)	(B)	(C)	(SC)	(AD)	(W)
(5)	Process Z (Actual Working Hours)	(NWH)	(A)	(B)	(C)	(SC)	(AD)	(W)
(6)	Standard working hours (for each process)	(NWH)	(A)	(B)	(C)	(SC)	(AD)	(W)
(7)	Kaizen activities Proposal	1,2,3	1,2,3	1,2,3			1,2	1,2

Abbreviations: The abbreviations used are listed below, they correspond to those used for the component figures in Figure 1.

(NWH) = Net working hours, (A) = Incidental working hours of A (B) = Incidental working hours of B, (C) = Incidental working hours of C, (SU) = Setup hours, (AD) = Artificial delay hours, (W) = Waiting hours.

Line 1 gives the columnar headings. Lines 3-5 provides the actual Kousuu for three production processes. Line 6 identifies the standard Kousuu which applies to each of the production processes. Finally line 7 contains the Kaizen activities proposed to redress the unfavourable Kousuu variances. The numbers given relate to those contained in Figure 2.

Report IV links the Kousuu control and feedback system to managerial action. This is achieved by presenting the Kousuu in the segmented form outlined in Figure I and by providing a direct comparison of it with the budgeted specification. Variances between budget targets and actual performance are therefore identified and the report construction also visually highlights the extent of variances by recording the actual figures for the components of each process Kousuu in rectangles which are in proportion to their actual magnitude vis-a-vis the standards established. Thus the boxes (for each process) above for the actual working hours will normally be larger or smaller than the size of the corresponding standard working hours box to indicate favourable or unfavourable variances. Finally the proposals for addressing variances are listed in the report. For example, the specific suggestions listed in Figure 2 would, in fact, be

listed in the final box of the report and would provide the basis for improvements to bring actual performance, at least, in line with the budgeted specification. To ensure that remedial action is under way, these Kaizen activities would have to be specifically listed in some detail with their Kousuu impact quantified in order to facilitate future ex-post audits.

**Figure 2**  
**Kaizen Activities\***

Net Working Hour Variances	
1	Speed up work activity
2	Eliminate/reduce non-value added activity
3	Introduce new machinery
Incidental Working Hour (A) Variances	
1	Change work layout
2	Increase productivity of lines
3	Introduce more automation
Incidental Working Hour B, C and Set-up Hour Variances	
1	Change approach
2	Adopt one-lathe tool changing system
3	Reduce number of changes
Artificial Delay Hour Variances	
1	Reduce machine watch staffing
2	Re-balance work to staff
Waiting Hour Variances	
1	Re-schedule throughput to minimise
2	Find alternative work for employees to do

\* Numbers correlate to those on Report IV, line 7.

## REPORT V

### Kousuu Budget Statement when Investment and Kaizen Activity are Planned

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trial products for next % year	Extra Kousuu for next % year	Last % year actual Kousuu/unit	Current % year: Total Kousuu	Production units	Kousuu/unit	Saved Kousuu	Saved %	Next % year: Total Kousuu	Production units	Kousuu/unit	Investment effectiveness	Kaizen effectiveness	Saved Kousuu	Saved %

Columns 1-3 establish the products concerned and their budgeted total Kousuu. Columns 4-8 provide data on current performance and columns 9-11 and 14-15 provide comparable projections for the coming half year during which investment and Kaizen

activities are planned. Two further types of projection are included (columns 12 and 13). First (column 12) the expected reduction in Kousuu from new capital investments in manufacturing technology is specified. Second (column 13) the expected Kousuu reduction from Kaizen activities is also specified.

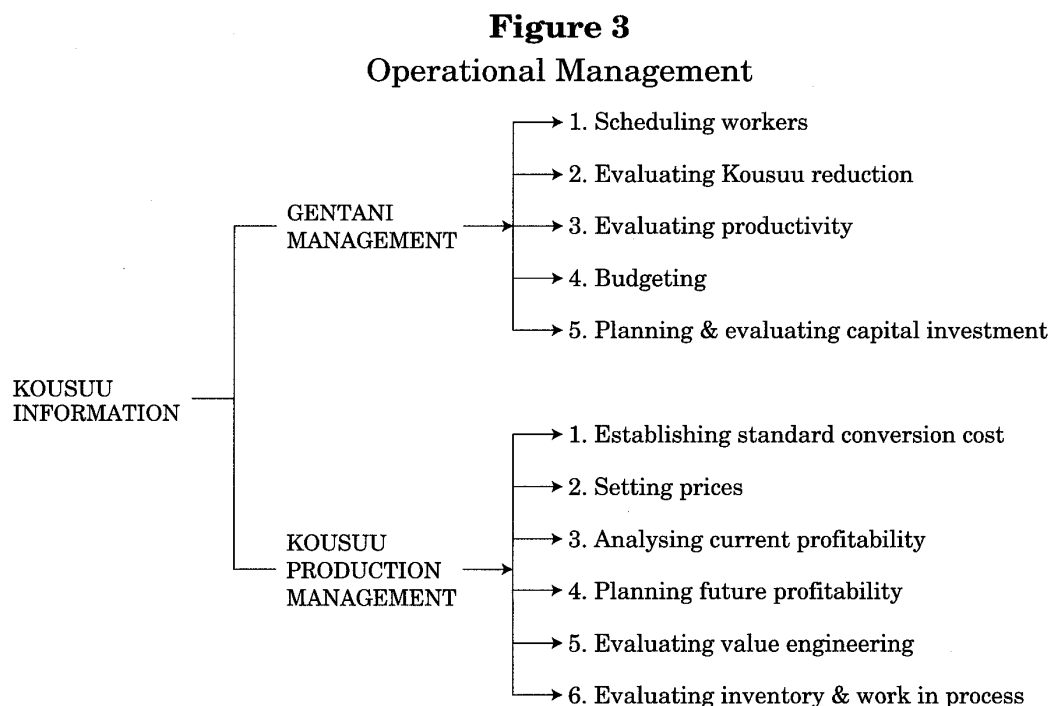
Report V is a close adjunct to the fourth. It is essentially a budget supplement which is specifically devoted to situations where capital investment and Kaizen activity are expected to occur. Columns are included which establish the returns which these initiatives should generate in terms of reductions in the Kousuu. It is particularly pertinent in organisations where the product range is extensive and the product life cycles are short. In these circumstances emphasis is given to the expected return (in terms of Kousuu reduction), to be achieved from investment in capital equipment and from Kaizen activities as these are normally the key ways in which new product manufacturing time can be reduced, lead times to market improved, cost effectiveness enhanced and the commercial exploration of innovation enhanced.

## 5. *Using The Kousuu System*

As illustrated above, Kousuu provides the basis for generating a regular flow of highly detailed information on operational performance. This information not only provides timely feedback to management but provides the foundation for three specific areas of cost management.

### (1) Operational Management

Figure 3 outlines how the analysis of Gentani and Kousuu can provide a wide ranging input into the management process.

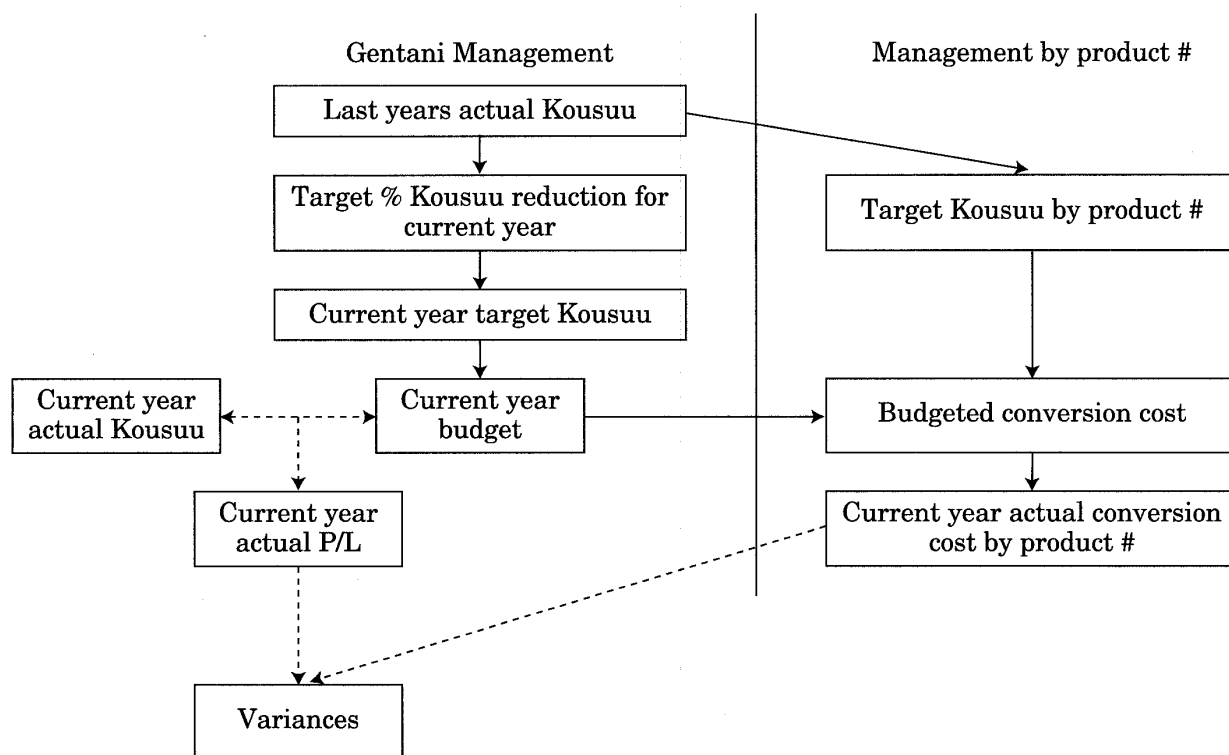


Kousuu information allows a comprehensive monitoring of the conversion cost elements of all in-house products, and enables relevant standards of performance to be established and communicated to all concerned. When multiplied by the appropriate charge rates, Kousuu forms the basis of a cost accounting system for products. Consequently it provides one of the key decision inputs for the manufacturing company. For example, in Gentani form it underlies unit cost levels and is therefore a useful basis for evaluating productivity and establishing future plans and targets. Moreover Kousuu provides insight into product portfolio analysis and planning. Controlling cost is one way of improving profitability and reductions in Kousuu are one means of achieving this aim. Alterations in Kousuu also have implications for pricing policies to be adopted by the firm. Finally, the success of value engineering activity (undertaken to achieve target cost levels) can also be achieved by delivering changes in Kousuu and the work time spent in producing for inventory rather than specific customer orders can be identified and assessed.

## (2) Kousuu, Budget and Costs

One important aspect of Kousuu is the key role which it plays in establishing meaningful targets for the production function and in the translation of these targets into budgets. Figure 4 outlines how Kousuu is used for these purposes.

**Figure 4**  
Kousuu, Budget and Costs



The generation of budgets in Kousuu form underlies the financial budgeting process. Thus the work time implications of budgets are also available and can be used to communicate both the budget and variance feedback to the appropriate areas of responsibility in the firm. In this way the Kousuu contributes to the conversion cost budgets and through this element of the master budget to the overall profit plans and budgets of the organisation.

### (3) Kousuu and Value Engineering

Kousuu provide an important part of the Japanese firm's value engineering work. Targets are established at divisional level in terms of revenues, costs and profit margins. These are then decomposed to provide guidelines for the production sections in the firm. For conversion cost these take the form of Kousuu. The production section will use the firm's value engineering section to assist it in modifying its process of manufacturing (and in altering the product design) to achieve the set targets. Where significant cost reductions are required the necessary changes are identified from analysis of past Kousuu and are expressed in the time and work changes profiled by the Kousuu. Thus Kousuu, rather than costing, provides the basic guidance for identifying and managing the continuous process of enhancing productivity and reducing cost.

## 6. *Conclusion*

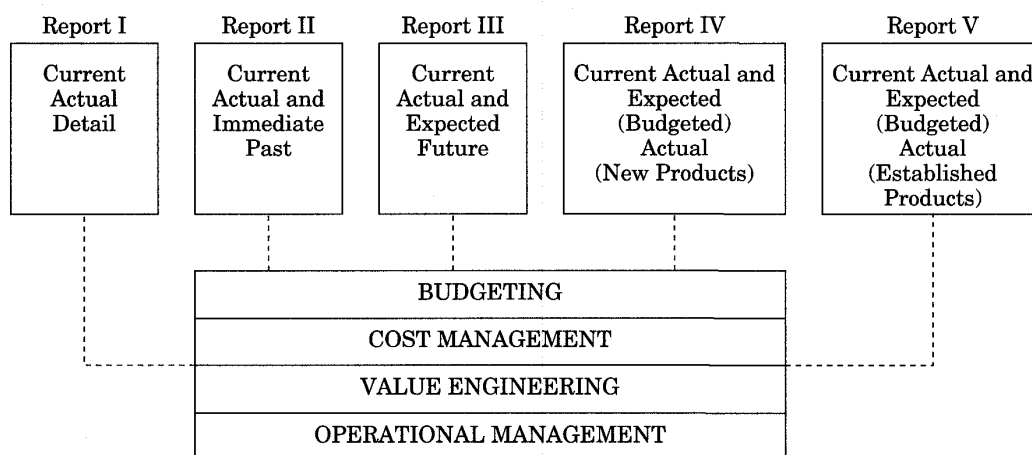
The set of five reports described above constitutes the formal documentation of the Kousuu system. Together they give a constructive visibility on how resources have been and are expected to be consumed in the organisation. They play an important role in operational management, budgeting, and value engineering and cost management. Figure 5 illustrates how these reports combine to support their underlying objective of improving the economy of resource use, so reducing cost and enhancing financial performance. All of the reports can (ex-ante) initiate and (ex-post) indicate the success of Kaizen activity. They therefore support an ongoing cycle of improvement and feedback which operates both at managerial and operative levels.

Each of the reports are related to the previous ones. Each draws on the information content of the prior one to ensure that together they first identify, and then place current work performance in the context of the recent past achievements and the expectations which were previously set for it. In this way an assessment can be readily made of how successful the operational conversion work has been and guidance provided for future action.

This information provides a basis for reporting to higher management. It readily allows the operational activity of the firm to be monitored by them. However it has an important dual function for it also contains the detail and is in a form (non-financial)

which makes it suitable as feedback (both the absolute figures and the comparisons with past and budgeted figures) to those carrying out the operational work. The formal linking of results with operational action on a daily basis re-enforces and intensifies the pressure to deliver cost savings. In addition it informs operational personnel about the success of their past efforts. Their responsibility for improving performance is clarified by the system and their actions given the visibility which encourages staff involvement. In these aspects lie the great strengths of Kousuu.

**Figure 5**  
**The Kousuu Reporting System**



Thus Kousuu is a fundamental part of many of the cost management systems in Japan. It allows managerial strategies to be translated into meaningful targets, it allows progress to be monitored closely and it gives visibility to employee efforts to improve Kousuu and therefore enables performance measurement to be linked in a constructive manner to the functions of control and decision making. It underlies the success of more prominent processes such as target cost management and continuous improvement. If cost reductions are to be effected it is to Kousuu that Japanese management and operatives look both for a source of ideas and for a measure of the success of their efforts. The acid test for new policies or practices aimed at improving cost effectiveness is their ability to eliminate or reduce Kousuu.

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