

# INTEGRATED PERFORMANCE MEASUREMENT SYSTEMS: AN AUDIT APPROACH

## Part 2: The Audit Process

Umit S Bititci, FIOM, University of Strathclyde

### OVERVIEW

Standards exist for quality management (ISO9000) and environmental management (ISO14000), and there is a model for Business Excellence. But, until very recently, there was no standard or reference model for performance measurement.

This article, based on a chapter published in the Performance Measurement Handbook (GEE Publishing, 2001), introduces the Integrated Performance Measurement System Reference Model, which is designed to be a framework against which performance measurement systems can be audited.

Presented in two parts. Part 1, published in February 2002 issue of *Control*, introduced the Competitive Business Structure, the foundation stone upon which the Reference Model and the Audit Process are built on. Part 2 (this part) introduces the Audit Structure and the Audit Process through three case studies.

### STRUCTURE OF AN INTEGRATED PERFORMANCE MEASUREMENT SYSTEM

The structure of an integrated performance measurement system is built upon the competitive business structure outlined in the previous section. In discussing the competitive business structure we indicated the performance measurement implications for each level, which could be summarised as: **the performance of each level must be managed not in isolation of one another but with respect to one another.**

This implies that an integrated performance measurement system would link these levels by:

- intelligently deploying higher level's objectives to lower levels, whilst ensuring that they remain locally meaningful
- facilitating an effective performance planning and resource-bargaining process to ensure that the lower level objectives are realistic and appropriately resourced.

To illustrate this point we have extended Example 1 from previous sections. This example clearly demonstrates the customer-supplier relationship between the operate and support processes. It also demonstrates deployment of objectives from one level to another in a meaningful way, as well as illustrating the concept of performance planning and resource bargaining.

Another important factor that relates to the structure of the performance measurement system is the need to have some form of external monitor, which would allow the internal performance levels to be compared to competitors. This is an essential requirement if the performance measurement system is going to drive improvement. We will illustrate this point through a simple example.

Let us assume that we are in charge of a simple business unit where the most critical competitive factors are:

- customer service, measured through 'percentage orders delivered on time'
- quality performance measured through 'customer returns'.

### EXAMPLE 1 - SGD Continued

In SGD the Fulfil Order process for the OEM Business Unit needs to have both volume and specification flexibility to achieve the level of responsiveness required by its markets. In order to achieve this, it employs skilled people and carries extra capacity to deal with large volume fluctuations.

**Deployment:** The Order Fulfilment process, to maximise its flexibility and responsiveness requires the Provide Engineering Support process (a support process) to respond to equipment breakdowns and specification changes within two hours of breakdown or order receipt.

**Performance Planning:** Current average response time achieved by the Provide Engineering Support process is 6.2 hours. Therefore, it becomes critical that this performance is improved. Current constraints to performance are studied and plans are created to remove these constraints, which includes necessary resource requirements.

**Resource Bargaining:** The plans are submitted and discussed at business unit level, necessary adjustments are made and a plan is approved. On implementation of these plans, average response time improves to 2.4 hours.

The current performance levels for these measures are:

- % orders delivered on time = 70
- customer returns = 2%

### Faced with the above data what would your improvement priorities be?

Most people's response would be to improve on time delivery first as the higher priority objective, because they feel that this would be an easier improvement to achieve.

Now let us provide you with some additional information:

- % orders delivered on time = 70% - which is a lot better than competitors who are averaging 60% on time delivery performance at best
- customer returns = 2% - which is worse than competitors who are averaging less than 1% customer returns.

### Faced with this new data how would you change your improvement priorities?

In this case, most people will take the view that we need to improve quality performance to achieve at least comparative quality levels with our competitors and maintain our existing lead in delivery performance.

Figure 5

An Extract from a Performance Report with External Monitor

	Measure	Ext. Monitor	Target	Comp Status	Jan	Feb	Mar	Apr	May	Jun
Brand Bus. Unit	Delivery Reliability %	Well Ahead	70	D	57	62	66	71	75	73
	Customer Satisfaction Index	Below Average	50	Q	60	55	53	49	54	48
	Quality (RTM) %	Well Ahead	2	D	5	6	5	4	3	2

Traffic light colours are used to provide a quick visual reference

This column represents competitive position

This column represents competitive status, ie. qualifier or differentiator

Let us illustrate this point with a short anecdotal story:

Two friends, an academic and an industrialist, were on an African safari taking photographs of lions. Suddenly a lion notices this pair and starts to charge towards them.

The pair decide that they need to run, but the industrialist kicks off his safari shoes and starts to put his running shoes on.

The academic's response to this is "don't be silly you will never outrun the lion". The industrialist's response is "I am not trying to out run the lion, as long as I outrun you I will be OK"

**Do you have your running shoes on?**

In fact one of our industrial collaborators who have adopted the reference model, now include their competitive stance (external monitor) in their monthly performance report. Figure 5 illustrates an extract from such a report.

In Figure 5 the coding used to establish the competitive position is based on the 'S' curve used in operations management, which provides a simple, but effective, tool by categorising competitive performance in five points as follows:

- well ahead of competitors
- ahead of competitors
- same as competitors
- below competitors
- well below competitors.

In summary, various levels that make up the competitive business structure must be linked together by:

- deploying higher level objectives to lower levels in a locally meaningful manner
- in deploying these objectives, a process of resource bargaining should take place between each level.

Within each level:

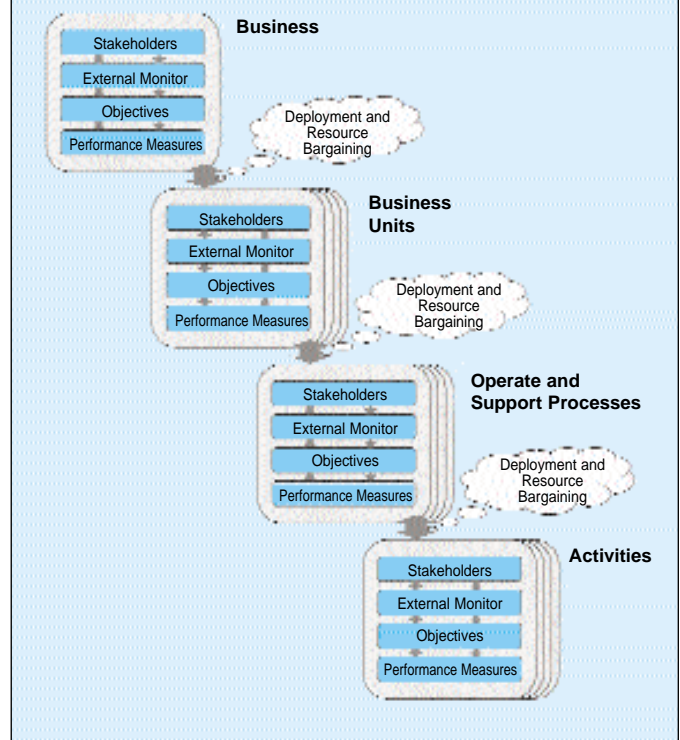
- the stakeholders' requirements and objectives need to be understood and measured in a locally meaningful way

- the competitive position of each level with respect to its stakeholders' requirements, needs to be understood through a system of external monitoring.
- local objectives should be set, based on stakeholders' requirements and objectives taking account of the performance gaps with respect to competitors.
- performance measures should then be employed to monitor progress towards these objectives.

This final structure of an Integrated Performance Measurement System is illustrated in Figure 6.

Figure 6

The Structure of an Integrated Performance Measurement System



## THE AUDIT PROCESS

In the previous section, in explaining the audit structure we have also explained the structure of the reference model developed as a result of our work. This reference model has been documented as a series of requirement statements against each level of the model. The booklet is available from the author on request.

There are two alternative approaches to auditing an organisation against the reference model. These are:

- Self Audit
- Facilitated Audit.

The structure of these audits and the tools available are explained in the following sections.

### Self Audit

Any person who has an overview of the business and who is sufficiently familiar with the business can easily conduct a self audit using the requirement statements in the reference model, as long as they thoroughly understand the structure of an integrated performance measurement system, as explained above.

Alternatively, we have also developed an audit workbook that gives less flexibility for an auditor to interpret the requirements statements. This provides a more rigorous audit tool, but it is considered to be too inflexible by experienced auditors.

In our experience, the choice of the self-audit tool is a matter of personal preference. Generally, people who are not confident with their understanding of the reference model prefer to use the audit workbook. Once a person becomes more confident with the audit process and the reference model, then they prefer to use the requirements statement in the reference model to guide them through the audit.

A self-audit usually takes about a week of an auditor's time depending on the size of the organisation, auditor's familiarity of the organisation and availability of the required information to the auditor.

### Facilitated Audit

This is where an external facilitator with a good understanding of the reference model and the audit process facilitates the organisation through the audit process. In our experience this approach is at least as effective as a self-audit, and in many cases uncovers gaps that were missed by the self-audit.

One other feature of this approach is that it takes considerably less time than a self-audit. For example, in an organisation employing 200 people, the audit could be completed and results reported within two days.

### Scope of the Audit

A general misconception by the novice users of the reference model is that it only applies to an organisation as a whole, therefore it cannot be applied to an operating unit level, such as a cost centre or profit centre.

In fact the reference model can be applied at any level of an organisation as long as it has a certain degree of autonomy. The audit examples quoted later in this article include profit centres and cost centres of multi-nationals, as well as complete SMEs.

It therefore becomes an important pre-requisite to define the scope of the audit by drawing a boundary round the business activities, which are going to be classified as 'the business'.

Any other activity outside this boundary becomes a stakeholder. This is typical in a production unit of a multi-national where the marketing and sales activities are distributed in various geographic locations around the globe. In this case the boundary is drawn round the production unit and all other activities of the business external to this boundary are classified as stakeholders, ie. the sales and marketing organisations become stakeholders of 'the business'.

Again, in our experience, a facilitated audit overcomes these types of difficulties at the outset and ensures a smooth and meaningful audit.

## AUDIT CASE STUDIES

In this section we will illustrate typical results of audits conducted in three different organisations. However, we must stress that due to space constraints and the volume of information generated in each audit, the results presented in these case studies have been summarised. For further information on typical audit results we would encourage you to contact the author.

### Case Study 1 – SGD

SGD is a cost centre within the S-Corporation, which specialises in the configuration of the companies' products to customer specification before delivery. Its customers can be broadly categorised as Original Equipment Manufacturers (OEM's) - such as Sun, Compaq, Digital, Dell, Apple, etc. - and distributors who in turn supply the High Street retail outlets and specialists shops. In addition S-Distribution has a service and repair centre that offers rapid repair and replacement service to its customer and end-user base.

Our team was invited to SGD to conduct a performance measurement system audit against the integrated performance measurement system reference model version 2.3. The audit results can be summarised as follows.

- The company's logical and physical structure is represented in Figure 7. Here it can be seen that, although logically there are three business units, the company treats the OEM and the retail business units as a single business.
- In general terms all stakeholders requirements were understood at all levels.
- There was a general absence of an external monitor with the exception of the areas that are monitored through the key customers quarterly business reviews. This lack of visibility could compromise the company's competitive position in the long term.
- The objectives set at each level reflected most of the stakeholder's requirements, however there were some critical gaps with respect to competitive requirements of some of the business units.
- The company did not differentiate between control and improvement measures. This led to a certain amount of confusion within the business.
- The business unit objectives, although clearly understood, were measured at the business level. This was because the company did not differentiate between the two logical business units (ie. OEM and retail). Consequently, the company did not have a clear understanding of the level of responsiveness they were achieving at a given cost.
- The business and business unit objectives were relatively well deployed to the core business processes (ie. the order fulfilment processes) with the exception of flexibility.

- Flexibility was identified as a key order winning criteria for the OEM business unit. However, there was no evidence of a performance measure, which measured the flexibility of the OEM business unit or the OEM order fulfilment process.
- The stakeholder and core business process requirements were not all deployed to the support processes such as engineering support and people capability management. There was no evidence of a practical resource bargaining process based on objective performance measures, relating to the support processes and their stakeholders' requirements.
- The performance reports did not include targets (except in some cases) and time scales which suggest that these measures are for control purposes rather than improvement.
- There was no evidence of active measures being used against each one of the performance measures relating to objectives. However, there is an improvement planning system in place in the form of action plans, which loosely relate to the business objectives.
- Although the company had detailed improvement plans, there were no measures which monitored the company's progress and achievement of milestone targets.
- There was no evidence of an agenda to review the relevance of the performance measures.

As a result of this audit the company has made significant changes to its performance measurement systems to overcome the gaps identified.

- Logically, DSL comprises of two business units. The contract business unit and the signature business unit. Physically, the company recognised the two different business units and clearly differentiated between the competitive criteria associated with each business unit
- In general terms DSL was aware of its stakeholders and their requirements, but failed to recognise society as a key stakeholder.
- There was no formal external monitor, which monitored DSL's performance with respect to its competitors. However, the senior management team demonstrated a good understanding of the company's financial performance with respect to its key competitors.
- In most areas the objectives failed to reflect the stakeholders requirements completely and directly.
- Majority of objectives were not associated with targets and timescales.
- Critical performance measures were missing against a large number of key objectives.
- The performance of key business processes were not measured consciously, eg. product development process.
- There was no differentiation between control and improvement measures.
- Majority of measures focused on cost and there was no balanced set of measures, which focused on business units or processes.

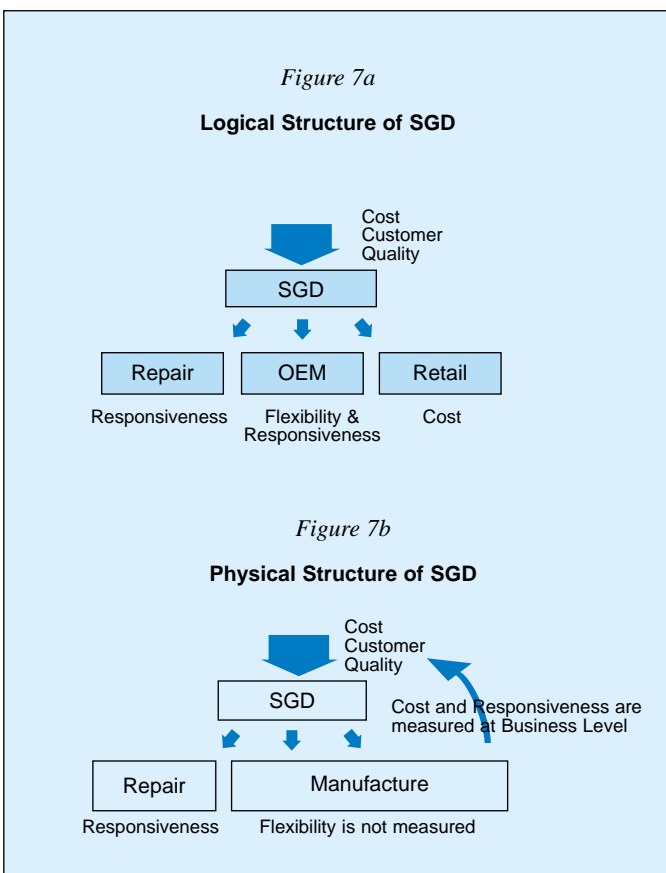
As a result of this audit, DSL included the re-design of its performance measurement system as a key objective into its BPR programme.

## AQL

An audit was conducted at AQL in September 1998. The audit was conducted over a two-day period, which started with an opening meeting where the reference model and the audit process was introduced. The audit report was presented to the management team at the end of day two.

An initial workshop with the management team identified some six potential business units within AQL's business. Tables 1, 2 and 3 show the results of the audit for the AQL business and two of its business units. Tables for other business units have not been included due to space restrictions. Table 1 in Figure 6 demonstrates that:

- At the business level AQL has identified three key stakeholders. These are: its parent company, people and community.
- The requirements of each stakeholder is clearly understood.
- The management has a clear understanding of the company's competitive position with respect to its competitors within the group (ie. competitors for the parent companies interest) with clearly defined objectives and measures (ie. ROS).
- IIP and 100% appraisal is used as the primary objective to achieve people satisfaction but people satisfaction is not directly measured and therefore it is not possible to develop an objective external monitor for people satisfaction.
- There are no objectives or performance measures with respect to the requirements of the community and the competitive position with respect to this requirement is not known.



DSL is a major textile manufacturer. Its main operations consist of design, manufacture, sale and distribution of gents' and ladies' garments such as jackets, trousers and skirts. An IPMS audit against reference model v.2.4 was conducted during January 1998. The results of which may be summarised as follows.

The arrows from Table 1 to 2 and 3 illustrate how the business objectives have been deployed to individual business units. Table 2 demonstrates that the performance measurement system for the pressure decay business unit is quite well developed with only two missing for performance measures - ie. downtime and servicing costs. The reader should note that in constructing Table 2, measures used by the company have not been included due to space restrictions and only the gaps in performance measurement have been identified.

Table 3, which is for the Trace Gas business unit, depicts a completely contrasting picture where the customer requirements are not understood, therefore any performance measures used for this business unit are aligned with the business requirements and may be surplus to requirements. However no performance measures aligning with the customers requirements.

The entire audit results were summarised as follows:

### General

- Not understanding the perception of society/community may have a negative impact on the company's growth objective
- General absence of business unit specific objectives and measures, except the pressure delay business unit, could lead to confusion and lack of clarity and focus between the business units.

### Trace Gas and Pack Test Business Units

- The absence of a clear understanding of competitive factors and competitive positions may cause a lack of focus within these business units.

### Systems Business Unit

- Customer support is not recognised as a critical business process with no performance measures. This may lead to unfocused management of the customer support process, which is a critical process for this business unit, compromising customer satisfaction.
- Absence of delivery measures for this business unit may also compromise customer satisfaction
- The criticality of product and process development process is recognised but not measured, which may lead to lack of focus and improvement.

### Get Order Process

- Weak new-customer measures with unclear market share measures may lead to lack of control.

### Product Development Process

- No measures to facilitate the monitoring and improvement of success, innovation and compliance to original specification which could lead to ineffectiveness of this critical process.

### Order Fulfilment Process - Systems Business Unit Only

- No measures or active monitors to assess the success of this critical process
- No supplier performance measures (as active monitors) which have been identified as a critical issue by the management.

### Product Support Process

- No measures to control and improve the success of the process.

### People Development Process

The internal customer-supplier relationship between this support process and other core processes were not recognised. There seems to be an issue concerning attracting the right employees, but this was not clearly articulated in terms of objectives and performance measures.

## CONCLUDING COMMENTS

In this article we introduced you to the reference model for integrated performance measurement systems. In doing this we provided you with an insight into how an integrated performance measurement system should be structured. We then went on to illustrate, through three case studies, how the reference model can be used to audit the integrity of a performance measurement system.

The reference model has been documented in a form to make the academic theories and concepts transparent to the user. The document presents the reference model as a simple series of requirements, which are easily understood without any specialist knowledge.

The reference model and the corresponding audit methodology has now been used in a number of organisations including:

- Pharmaceutical manufacturing
- Explosives manufacturing
- Bottling and packaging
- Textiles manufacturing
- Process
- Electronics manufacturing
- Construction
- Engineering consultancy
- Public sector organisation
- Food and drinks.

In all cases the application of the reference model and the IPMS audit identified gaps in the organisation's existing performance measurement systems. In all cases the senior management in the organisation decided to take action to rectify the identified gaps.

To support the potential value of the reference model and the corresponding audit method, we have included a selection of the comments we have received from companies after they had a chance to think about the results of the audit.

*" very useful .....The specific gaps, which were highlighted with the audit, are areas where we have problems."*

*" it made us look at our business in a new light".*

*" we thought we knew everything to know about our business..... we certainly learned new things."*

*" it refines the process quicker than we may have done".*

*" it showed us just how we complicated a simple business."*

Figure 8

Table 1. Business Level Audit at AQL

Business: Ai Qualitek			
Stakeholders	TGE (Parent Co)	People	Community
Requirements	Growth Trading Profit Return on sale (ROS)	Satisfaction	Positive impact
External Monitor	Clear view of the performance achieved by other companies in the group	No formal assessment of people satisfaction but informally known by the management	Not known
Objectives	ROS 10%	IIP - 100% appraisals	Absent
Performance Measures	ROS	Appraisals on time Communication survey People satisfaction not measured	Absent

Table 2. Business Unit Level Audit at AQL

Business Unit: Pressure Decay			
Stakeholders	Ai Qualitek	Customers	
Requirements	Increase volume Build market share	Fitness for purpose Low cost of ownership Qualifiers: Price, Quality and Delivery	
External Monitor	<ul style="list-style-type: none"> <li>● Better in Delivery</li> <li>● Better in Serviceability</li> <li>● More Expensive</li> <li>● Cost of ownership about the same</li> </ul>		
Objectives	<ul style="list-style-type: none"> <li>● Improve servicing costs</li> <li>● Improve downtime</li> <li>● Improve process speed</li> <li>● Improve sensitivity</li> <li>● Maintain fitness for purpose</li> <li>● To grow market share to 65% in 2 years</li> </ul>		
Performance Measures	No performance measures in relation to <ul style="list-style-type: none"> <li>● Downtime and</li> <li>● Servicing costs</li> </ul>		

Table 3. Business Unit Level Audit at AQL

Business Unit: Trace Gas			
Stakeholders	Ai Qualitek	Customers	
Requirements	Increase volume by going global	Not known	
External Monitor	Unknown		
Objectives	No specific sub-objectives for this business unit		
Performance Measures	No specific business unit measure except those aligned with the business requirements, ie: <ul style="list-style-type: none"> <li>● Contribution</li> <li>● Volume</li> <li>● Warranty Returns</li> </ul> No measures aligned with customers requirements		

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### About the author

**Umit Bititci**, FIOM, PhD, is the Director of Centre for Strategic Manufacturing (CSM) at the University of Strathclyde. As a management professional, consultant and an academic he has 18 years of experience working with a wide spectrum of UK, European and Asian companies on

Strategy Management, Performance Measurement, Value Development, Business Process Improvement, TQM and ERP. His broad range of experience has developed through a series of long term professional relationships with organisations in a variety of sectors including engineering manufacturing, fast moving consumer goods, construction, electronics, white goods, textiles and printing, as well as the service and public sectors.

As the Director of CSM, an organisation dedicated to facilitating performance improvements in manufacturing industries, he has been responsible for a number of European and UK research and development programmes funded through industry and research councils. To date Umit has published some 100 papers in international journals and conferences.

### Acknowledgement

#### The Handbook of Performance Measurement

The above article by Umit Bititci is based on material contributed to this loose leaf handbook and CD ROM published in 2001 by Gee Publishing. The Handbook looks at issue such as:

- What are the relative merits of the Balanced Scorecard and the Performance Prism?
- Why and how should we measure customer, and employee, satisfaction?
- How do we create an explicit shared model of business performance and its drivers?
- What are the key questions to ask when defining performance measures?
- Who and what should we benchmark against?
- What are the 10 components of the EFQM framework and how do we distinguish between results and drivers?

Available as a loose-leaf and CD-ROM package, the handbook provides in-depth information on the benefits of performance measurement, including the various methods and principles. Edited by Mike Bourne who is a member Cranfield's Centre for Business Performance and written and researched by an expert team of performance measurement specialists, the handbook provides a wealth of techniques that have been tested and applied in over 30 businesses.

A copy of this handbook is available in the Institute's library or can be purchased on 10-day free trial at a price of £282.75 (inc VAT) plus a shipping and administration charge of £15.45.