

Performance indicators and key performance indicators

Performance indicators (or performance measures) are methods used to assess performance. For example:

In profit-seeking organizations:

- Profit
- Earnings per share
- Return on capital employed

In not-for-profit organizations:

- Exam grades (a school)
- Waiting times for hospital admission (a health service)
- Condition of roads (a local government highways department)

Particularly in profit-seeking organizations, the prime financial performance indicators allow performance to be measured but they say little about how that performance has been achieved. So, high profits will depend on a combination of good sales volumes, adequate prices and sufficiently low costs. If high profits can only be achieved by a satisfactory combination of volume, price and cost, then those factors should be measured also and will need to be compared to standards and budgets.

Similar effects are found in not-for-profit organizations. For example, in a school, a CSF might be that a pupil leaves with good standards of literacy. But that might depend on pupil-teacher ratios, pupils' attendance and the experience of the teachers. If these factors contribute to good performance, they need to be measured and monitored.

Just as CSFs are more important than other aspects of performance, not all performance indicators are created equal. The performance indicators that measure the most important aspects of performance are the **key performance indicators (KPIs)**. To a large extent, KPIs measure how well CSFs are achieved; other performance indicators measure how well other aspects of performance are achieved

There are a number of potential pitfalls in the design of performance indicators and measurement systems:

- **Not enough performance measures are set**

Often, directors and employees will be judged on the results of performance measures. It has been said that 'Whatever gets measured gets done' and employees will tend to concentrate on achieving the required performance where it is measured. The corollary is that 'Whatever doesn't get measured doesn't get done' and the danger is that employees will ignore areas of behaviour and performance which are not assessed.

- **Too many performance indicators**

This occurs especially where performance measures are not ranked by importance and none have been identified as KPIs. Performance indicators have to be measured, calculated and reported to management, and discrepancies must be explained, or excuses invented. Too many measures can divert time from more important tasks and there is a danger that employees concentrate on the easier but more trivial measures than on the more difficult but vital targets.

- **The wrong performance measures**

An example of this would be applying strict cost measures in an organization where luxury products and services are sold (a differentiation strategy). This is likely to detract from the organization's strategic success.

- **Too tight/too loose performance measures**

Performance indicators that are too difficult to attain can lead to a loss of employee motivation and promote dysfunctional behaviours such as gaming and the misrepresentation of data. Performance measures that are too loose

can pull down performance. Benchmarking can help to avoid this. Internal benchmarking generally sets measures based on previous period's measures or set measures with respect to other branches or divisions. However, these internal benchmarks can lead to complacency as many organizations have to compete with others and benchmarks should be aligned to competitors' performance.

- **'Hit and run' performance indicators**

This means that a performance indicator is set and then it is assumed that things will look after themselves. Performance indicators need a management framework they are to be at all effective.

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Performance measures – a practical framework

Expanding on the last point, above, to establish a performance measurement system, something like the following is needed for each measure:

1. A meaningful title of the measure
2. What is its purpose and how does that purpose relate to strategic success?
3. What other performance measures might be affected by this one, how are they affected and how are conflicts to be resolved?
4. Who will be held responsible for it?
5. What is the source data, who is responsible for its supply, how is it measured and how is the measure calculated?
6. What investigations and explanations are required and who is responsible?
7. What target is set and how has that target been determined?
8. How often should the target be updated?
9. How often is the measure reported on?
10. Reporting and action?

For example, consider a passenger train company called TTTE:

1. Title of performance measure	Punctuality (the percentage of trains arriving at their destination on time)
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2. Purpose of performance measure	TTTE's strategic objective is to provide comfortable, reliable and punctual services to passengers. TTTE competes with other train companies, cars, buses and airlines. Punctuality is seen as a key competitive lever and therefore must be measured
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3. Other performance measures affected	<p>Safety – safety checks and speed limits will take priority over punctuality</p> <p>Cleanliness – it might be necessary to occasionally reduce cleaning to keep to the timetable</p> <p>Energy consumption running a train faster than normal (though within speed limits) will cause higher fuel consumption, but punctuality takes precedence</p>
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4. Who is held responsible?	Operations director
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5. Source data, measurement and	The duty manager at each station is responsible for logging the arrivals time of each train. A five-minute margin is allowed ie a
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calculation of the measure.

train is logged 'on time' if it is no later than 5 minutes after the advertised time. Beyond five minutes the actual time by which the train is late is logged. Results will be calculated in percentage bands: on time, up to 15 minutes late, >15–30 minutes late, >30 minutes – one hour late, >one hour late, and so on

6. Investigations and explanations

While logging late arrivals, station duty managers should also note the cause where possible. The operations director must collate this information using statistical analysis which highlights persistent problems such as particular times of the day, routes or days of the week

7. Target and how it is determined

The target is dictated by the railway timetable. The timetable should be reviewed twice a year to look for ways of reducing journey times to keep TTTE competitive with improvements in competing transport

8. Update of target

The banding and any tolerances will be updated annually

9. How often should the measure be reported

Weekly

10. Reporting and
action

The operations director will report performance on a monthly
basis to the board together with plans for service improvement

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Use of performance indicators in the SBL and APM syllabi

Performance indicators are relevant to the following models and theories:

Mission statements: these define the important aspects of performance that sum up the purpose of the organization.

Stakeholder analysis: recognizes that different stakeholders have different views on what constitutes good performance. Sometimes what stakeholders want is different to what the mission statement suggests as the purpose of the organization. This can be a particular problem when the stakeholders are key-players.

Generic strategies: the main generic strategies to achieve competitive advantage are cost leadership and differentiation. If a company's success depends on being a cost leader (a CSF) then it must carefully monitor all its costs to achieve the leadership position. The company will therefore make use of performance indicators relating to cost and efficiency. If a company has chosen differentiation as its path to success, then it must ensure that it is offering enhanced products and services and must establish measures of these.

Value chain: a value chain sets out an organization's activities and enquires as to how the organization can make profits: where is value added? For example, value might be added by promising fantastic quality. If so, that would be a CSF and a key performance indicator would be the rate occurrence of bad units.

Boston consulting group grid: this model uses relative market share and market growth to suggest what should be done with products or subsidiaries. In SBL if a company identifies a product as a 'problem child' BCG says that the appropriate action for the company is either to divest itself of that product or to invest to grow the product towards a 'star' position on the grid. This requires money to be spent on promotion, product enhancement, especially attractive pricing and perhaps investment in new, efficient equipment.

PESTEL and Porter's five forces: both the macro-environment and competitive environment change continuously. Organizations have to keep these under review and react to the changes so that performance is sustained or improved. For example, if laws were introduced which stated that suppliers should be paid within a maximum of 60 days, then a performance measure will be needed to encourage and monitor the attainment of this target.

Product life cycle: different performance measures are required at different stages of the life cycle. In the early days of a product's life, it is important to reach a successful growth trajectory and to stay ahead of would-be copycats. At the maturity stage, where there is great competition and the market is no longer growing, performance will depend on low costs per unit and maintaining market share to enjoy economies of scale.

Company structure: different structures inevitably affect both performance and its management. For example, as businesses become larger many choose a divisionalised structure to allow specialization in different parts of the business: manufacturing/selling, European market/Asian market/North American market, product type A/product type B. Divisional performance measures, such as return on investment and residual income, then become relevant.

Information technology (IT): new technologies will influence performance and could help to more effectively measure performance. However, remember that sophisticated new technology does not guarantee better performance as costs can easily outweigh benefits. If IT is vital to a business, then downtime and query response time become relevant as might a measure of system usability.

Human resource management: what type of people should be recruited, and how are they to be motivated, appraised and rewarded to maximize the chance of good organizational performance? Performance measures are needed, for example, to monitor the effectiveness of training, job performance, job satisfaction, recruitment and retention. In addition, considerable effort has to be given to considering how employees' remuneration should be linked to performance.

Fitzgerald and Moon building blocks

The APM syllabus mentions three specific approaches or models:

- Balanced scorecard
- Performance pyramid
- Fitzgerald's and Moon's building blocks

The balanced scorecard approach is probably the best known, but all seek to ensure that the net is thrown wide when designing performance measures for organizations so that factors such as quality, innovation, flexibility, stakeholder performance, and delivery and cycle time are listed as being important aspects of performance. Whenever an aspect of performance is important then a performance measure should be designed and used.

The Fitzgerald and Moon model is worth a specific mention here **as it is the only model which explicitly links performance measures to the individuals responsible for the performance.**

The model first sets out the dimensions (split into results and determinants) where key performance indicators should be established. You will see there is a mix of financial and non-financial, and both quantitative and qualitative:....**RFC-DQFRI**

- Results
- Financial performance
- Competitive performance
- Determinants
- Quality
- Flexibility

- Resource utilization
- Innovation

The model then suggests **standards for KPIs**:

- Ownership: refers to the idea that KPIs will be taken more seriously if staff have a say in setting targets. Staff will be more committed and will better understand why that KPI is needed.
- Achievability: if KPIs are frequently and obviously not achievable then motivation is harmed. Why would staff put in extra effort to try to achieve a target (and bonus) if they believe failure is inevitable.
- Fairness: everyone should be set similarly challenging objectives and it is essential that allowance should be made for uncontrollable events. Managers should not be penalized for events that are completely outside everyone's control (for example, a natural disaster) or which is someone else's fault.

The model then suggests how employee **rewards** should be set up to encourage employees to achieve the KPI targets:

- Clarity: exactly how does performance translate into a reward?
- Motivation: the reward must be both desirable and must be perceived as achievable if it is to be motivating.
- Controllable: achievement of the KPI giving rise to the reward should be something the manager can influence and control.

Adapted from an article originally written by Ken Garrett, a freelance lecturer and writer

Relevant to ACCA Qualification Papers P3 and P5

Critical success factors

Critical success factors (CSFs) are often quoted in management literature as those areas in which an organization needs to perform best if it is to achieve overall success. CSFs have frequently been used to help determine the requirements for executive information systems (EIS), supporting the 'key indicator' approach to management control.

A number of methods have been developed to identify these key indicators, and the CSF approach is one of the most widely used, which should be measured and monitored using EIS to help manage the strategic direction of an organization.

It is difficult and expensive to gather, store, validate and make available the various types of management information required for decision making. As such, it is important for managers and providers of information support systems to determine, in advance, what is most relevant to them.

It is necessary to identify the 'key indicators' that will help a manager to plan, manage, and control an area of responsibility. **This method is based on the need for managers to focus, at any point in time, on the most significant aspects of their responsibilities.** The development of an EIS, designed to support management control, is based on two main concepts:

- The selection of a set of key indicators of the health of the functional business area. Information will then be collected for each of these indicators.
- Exception reporting – the ability to make available to a manager, as required, information on only those indicators where performance differs significantly from expectations.

The underlying belief is that an effective control system must be tailored to the specific industry in which the organization operates, and to the specific strategies that it has adopted. It must identify the CSFs that should receive careful and continuous management attention if the organization is to be successful, and it must highlight performance with respect to these key variables in reports available

to all levels of management.

The first concept is frequently approached from the viewpoint of CSFs in that a limited number of areas are identified in which results, if they are satisfactory, will ensure successful performance. They are the few key areas, it is believed, **where 'things must go right'** if the organization is to flourish. In turn, each manager must identify the key areas that apply to them, in which results are identified as being absolutely necessary to achieve specific goals. The goals, in turn, support overall organizational goals. **The genesis of this approach goes back to the history of warfare, where writers on battles have identified the successful leader as the one who concentrated his forces on the most significant areas.**

The current state of performance in these areas should be continually measured. Because these areas are identified as being critical, each manager should have the appropriate information that indicates whether events are proceeding sufficiently well in each area. CSFs and associated performance indicators (PIs) can play a central role in this.

BACKGROUND TO THE APPROACH

The concept of CSFs was first introduced in 1962 by D Ronald Daniel, later managing director of the management consultancy McKinsey and Co. Introducing the concept, Daniel cited examples where major corporations had introduced computerized information systems, processed extensive amounts of data, and claimed to produce meaningful information. However, this information, on closer examination, appeared to be of little use in assisting managers to better perform their jobs, especially in terms of direction, planning, management of operations, and control. To draw attention to the type of information required, Daniel coined the phrase 'critical success factors'. Further, he provided examples of CSFs that he had identified for contemporary major industries. These included:

- In the automobile industry – styling, an efficient dealer network organization, tight control of management costs.
- In the food processing industry – new product development, good distribution channels, effective advertising.
- In the life insurance industry – the development of agency management personnel, effective control of clerical personnel, innovative new policies.
- In the supermarket industry – the right product mix available in each store, having it actually available on the shelves, advertising it effectively to pull

shoppers in, pricing it correctly (since profit margins were low in this industry).

Daniel identified CSFs as being necessary to support the attainment of organizational goals. Goals represent the end points that an organization hopes to reach. CSFs, however, are the areas in which good performance is necessary to ensure attainment of these goals. Daniel focused on those CSFs that are relevant for any company in a particular industry.

REFINING THE APPROACH

Early research in to the uses and usefulness of CSFs took place at the Massachusetts Institute of Technology (MIT) in the early 1970s, which took Daniel's work further (see Rockart, John F, Chief executives define their own information needs, Harvard Business Review, March–April 1979, Vol 57, pp 81–93 and John F Rockart and Christine Bullen, 1986, The Rise of Managerial Computing, Sloan School of Management and IT).

Daniel's initial thinking had been that CSFs are those that are common to organisations operating in a particular industry. However, MIT identified five prime sources of CSFs:....**SCEFT---CIG**

- the **structure** of the particular industry
- **competitive strategy**, **industry** position, and **geographic** location
- **environmental** factors
- **temporary** factors
- **functional managerial** position.

The structure of the particular industry

As first identified by Daniel, any industry has a set of CSFs that are determined by the characteristics of the industry itself. Each company in the industry must pay attention to these factors. For example, the manager of any supermarket would ignore at his peril the CSFs listed above.

Competitive strategy, industry position, and geographic location

Every company in an industry is in a unique situation determined by its history and

current competitive strategy. For smaller organizations within an industry dominated by one or two large companies, the actions of the major companies will often produce new and significant problems for their smaller competitors. The competitive strategy for the smaller companies may involve establishing a new market niche, getting out of a product line completely, or redistributing resources among various product lines. Their strategy is mainly a reaction to the larger companies' strategies.

In this way a major competitor's strategy can produce a CSF for a small company. For example, Dell's competitive approach to the marketing of small, inexpensive computers informs the CSF identification for all computer manufacturers. The smaller companies must identify what they will do in response, and how they measure the effectiveness of their response. Just as differences in industry position can dictate CSFs, differences in geographic location (eg distribution costs) and in strategic positioning (differentiation or focus strategies for smaller companies) can lead to different CSFs in companies within the same industry.

Environmental factors

As the Gross National Product of an economy can fluctuate with changes in political and demographic factors, CSFs can also change for an organization. In the early 1970s, virtually no chief executive in the US would have listed 'energy supply availability' as a CSF. However, following the organization of OPEC and its oil embargo, this factor is now closely monitored by most executives, because adequate availability of energy, and its price stability, is vital to organizational planning and bottom-line performance in manufacturing and distribution.

Temporary factors

Internal organizational considerations often lead to the monitoring of temporary CSFs. These are areas of activity that are deemed significant to the success of the organization for a particular period of time because they are considered below the threshold of acceptability, even though they may generally appear to be in good shape and not apparently in need of special attention. For instance, an insurance company that had just been fined by the industry regulator for miss-selling would probably generate a short-term CSF of ensuring that such miss-selling, and consequent financial penalties, would not happen again in **the near future.**

Functional managerial position

Each functional managerial position has a generic set of CSFs associated with it. For example, almost all manufacturing managers are concerned with product quality,

inventory control, and cost control.

Two further dimensions

These five sources of CSFs are one form of classification. CSFs can also be classified as follows:

Internal versus external sources of CSFs

Every manager will have internal CSFs relating to the department and the people they manage. These CSFs can range across such diverse interests as human resource development or inventory control. The primary characteristic of such **internal CSFs** is that **they deal with issues that are entirely within the manager's sphere of influence and control**. External CSFs relate to issues that are generally less under the manager's direct control such as the availability or price of a particular critical raw material or source of energy.

Monitoring versus building/adapting CSFs

Managers who are geared to producing short-term operating results invest considerable effort in tracking and guiding their organization's performance, and therefore employ monitoring CSFs to continuously scrutinize existing situations. Almost all managers have some monitoring CSFs, which often include financially oriented CSFs such as actual performance versus budget or the current status of product or service transaction cost. Another monitoring CSF might be personnel turnover rates.

Managers who are either in reasonable control of day-to-day operations, or who are insulated from such concerns, spend more time in a building or adapting mode. These people can be classified as future-oriented planners whose primary purpose is to implement major change programmes aimed at adapting the organization to the perceived emerging environment. Typical CSFs in this area might include the successful implementation of major recruitment and training efforts, or new product or service development programmes.

RESEARCH CONCLUSIONS – CSFs IN PRACTICE

Research has shown that, in general, individual managers focus on a mix of CSFs drawn from the above sources. From an organizational perspective, however, CSFs also have a number of hierarchical levels:

- industry CSFs
- corporate CSFs

- functional CSFs
- individual CSFs.

As mentioned at the beginning of this article, industry CSFs affect an organization in the development of its strategy, objectives, and goals. No organization can afford to develop a strategy that does not pay adequate attention to the principal factors that underlie success in its industry. In turn, the strategy, objectives, and goals developed by an organization lead to the development of a particular set of CSFs for the whole organization (corporate CSFs) unique to its own circumstances. In turn, corporate CSFs become an input into a similar CSF determination process for each sub-organisation or division in the corporation. Managers at each organizational level will have an individual set of CSFs that will depend heavily on their perspective of their role and on temporary factors.

It is at this point that we should discuss the concept that organizations are 'human activity systems', and that individuals within these systems bring their own 'world view' to their roles – encompassing their whole belief system – based on their training and previous experience. This world view will influence their perception of what they consider to be important in achieving their own organizational objectives. Thus, a new incumbent to a role may identify a number of new CSFs that may augment or replace the CSFs identified by the previous incumbent.

STEPS TOWARDS IMPLEMENTATION – MEASUREMENT

The main use of the CSF concept is as a focus for implementing organizational transformation by supporting beneficial change. This is achieved by:

- helping individual managers determine their priorities and their supporting information requirements
- aiding an organization in its general planning processes, for strategic and annual planning, and for budgeting purposes
- aiding an organization in its information systems planning processes.

A key driver for strategic and tactical information systems development is the provision of better performance management information, in order to match achievement against critical organizational goals. To achieve any benefit from using

the CSF concept it is also important to remember that choosing what to measure and report on will markedly influence behavior at every level. So, care needs to be taken in human activity systems to recognize that an unbalanced set of indicators, while valid for the short-term needs of an individual in the hierarchy, may have unintended consequences in influencing the behavior of subordinates. Therefore, there is a need to produce a Balanced Scorecard of indicators and measures.

As a starting point in a typical command and control organization, the following implementation tactics may help:

- Concentrate on measurement, not on counting. For example, focus on what the organization is trying to achieve, set targets, and measure progress towards achieving those targets.
- **Make it a priority to establish measures for the main core processes** (core being defined as those that touch the customer or client).
- Ensure that the chosen measures reflect what matters to the customer or client.
- Use historic data to establish existing capability – identify targets and have a plan to close the gap.
- Continually review measures in use and their impact – look at ‘what’ is being measured and ‘why’, and publicly discard those measures no longer most relevant.

As a starting point, four areas for measurement should be considered when managing for improvement: customers, response, process, and system. **CRPS**

Customers

What matters to customers? Can these things be measured (simply and efficiently)? Do we have any systematic methods for understanding what matters to customers? Do we translate what matters into measures for managing and improving performance?

Response

Can ‘what matters to customers’ be turned into response measures? Are there other ‘end to end’ measures that will help the organization learn about, for example, customer acquisition and the efficiency of services delivered? What

processes must be measured end to end? Consider risk management – what events in the outside environment do we need to watch out for? What do we need to know about competitor activity?

Process

What measures might be useful in the processes? Some measures should be permanent, and some should be temporary. For example, 'throughput' might be an important permanent measure, and 'waste' a useful temporary measure.

System

How should the above measures fit together to tell managers how they are performing, and how they will perform? Are other whole system measures needed? How well is the organization integrated into, and monitoring, its external environment?

Finally, CSF measures chosen should be SMART, that is:

- specific – in the context of developing CSF objectives this means that the action, behavior, or achievement described is always linked to a rate, number percentage, or frequency
- measurable – a system, method, or procedure exists that allows the tracking and recording of the behavior or action on which the CSF objective is focused
- agreed – there should be an agreement with those involved in achieving the objective that it is relevant and necessary
- realistic – that the objectives set are capable of being achieved
- time-based – the objective set should be linked to a date by which it is to be achieved.

These two articles each provide a brief overview of a model which can assist accountants, not only in the determination of business strategy, but also in the appraisal of business performance. As well as looking at the theory, the articles will also provide advice to show how the models can be examined and how to tackle those requirements.

Porter's Five Forces Model

The use of Porter's five forces model (see Figure 1) will help identify the sources of competition in an industry or sector. It looks at the attractiveness of a market, focused on the ability to make profits from it.

FIGURE 1: PORTER'S FIVE FORCES MODEL

Adapted from M E Porter, *Competitive Strategy*, Free Press, 1980



The model has similarities with other tools for environmental audit, such as political, economic, social, and technological (PEST) analysis, but should be used at the level of the strategic business unit, rather than the organization as a whole. A

strategic business unit (SBU) is a part of an organization for which there is a distinct external market for goods or services. SBUs are diverse in their operations and markets so the impact of competitive forces may be different for each one.

Five forces analysis focuses on five key areas: the threat of new entrants, the bargaining power of buyers, the bargaining power of suppliers, the threat of substitutes, and competitive rivalry.

The threat of new entrants

This depends on the extent to which there are barriers to entry. These barriers must be overcome by new entrants if they are to compete successfully. Johnson et al (2005), suggest that the existence of such barriers should be viewed as delaying entry and not permanently stopping potential entrants. Typical barriers are detailed below:

- Economies of scale exist, for example, the benefits associated with volume manufacturing by organizations operating in the automobile and chemical industries where high fixed costs exist. Lower unit costs result from increased output, thereby placing potential entrants at a considerable cost disadvantage unless they can immediately establish operations on a scale which will enable them to derive similar economies.
- Certain industries, especially those which are capital intensive and/or require very large amounts of research and development expenditure, will deter all but the largest of new companies from entering the market.
- In many industries, manufacturers enjoy control over supply and/or distribution channels via direct ownership (vertical integration) or, quite simply, supplier or customer loyalty. Potential market entrants may be frustrated by not being able to get their products accepted by those individuals who decide which products gain shelf or floor space in retailing outlets. Retail space is always at a premium, and untried products from a new supplier constitute an additional risk for the retailer.
- Supplier and customer loyalty exists. A potential entrant will find it difficult to gain entry to an industry where there are one or more established operators

with a comprehensive knowledge of the industry, and with close links with key suppliers and customers.

- Cost disadvantages independent of scale. Well-established companies may possess cost advantages which are not available to potential entrants irrespective of their size and cost structure. Critical factors include proprietary product technology, personal contacts, favorable business locations, learning curve effects, favorable access to sources of raw materials, and government subsidies.
- In some circumstances, a potential entrant may expect a high level of retaliation from an existing firm, designed to prevent entry – or make the costs of entry prohibitive.
- Government regulation may prevent companies from entering into direct competition with nationalized industries or implement complex rules that non-nationals may struggle to interpret and follow. In other scenarios, the existence of patents and copyrights afford some degree of protection against new entrants.
- Differentiated products and services have a higher perceived value than those offered by competitors. Products may be differentiated in terms of price, quality, brand image, functionality, exclusivity, and so on. However, differentiation may be eroded if competitors can imitate the product or service being offered and/or reduce customer loyalty.

The bargaining power of buyers

The power of the buyer will be high where:

- There are a few, large players in a market. For example, large supermarket chains can apply a great deal of pressure on their potential suppliers to attempt to get them to lower their prices. This is especially the case where there are a large number of undifferentiated, small suppliers, such as small farming businesses supplying fresh produce to large supermarket chains

who can then 'pick and choose'.

- The cost of switching between suppliers is low, for example from one haulage contractor to another. The service offered will have the same outcome and unless a long-term contract has been negotiated, deliveries can be arranged on a parcel-by-parcel basis.
- The buyer's product is not significantly affected by the quality of the supplier's product. For example, a manufacturer of paper towels and toilet paper will not be affected too greatly by the quality of the spiral-wound paper tubes on which their products are wrapped.
- Buyers earn low profits so will be very keen to negotiate lower prices from their suppliers in order to increase margins.
- Buyers have the potential for backward integration, for example where the buyer might purchase the supplier and/or set up in business and compete with the supplier. This is a strategic option which might be selected by a buyer in circumstances where favorable prices and quality levels cannot be obtained by bargaining with current suppliers alone.
- Buyers are well informed, for example, having full information regarding availability of supplies and can use that knowledge in the negotiation against the supplier.

The bargaining power of suppliers

The power of the seller will be high where (and this tends to be the reverse of the power of buyers):

- There are a large number of customers, reducing their reliance upon any single customer suggesting that they may not care if they were to lose a customer.

- The switching costs are high. For example, switching from one software supplier to another could prove extremely costly as all equipment and processes are specific to the supplier and all will need to change. This is on top of any costs of designing a new system itself.
- The brand is powerful/well known (Apple, Mercedes, McDonalds, Microsoft). Where the supplier's brand is powerful then a retailer might not be able to operate without a particular brand in its range of products.
- There is a possibility of the supplier integrating forward, such as a brewery buying restaurants to enable control of the customer.
- Customers are fragmented so that they have little bargaining power individually, such as the retail customers of a petrol station situated in a remote location.

The threat of substitute products

The threat of substitutes is higher where:

- There is direct product-for-product substitution – eg for email/fax and postal services. The products are performing the same task/outcome, albeit in different ways.
- There is substitution of need. For example, better quality domestic appliances reduce the need for maintenance and repair services. The information technology revolution has made a significant impact in this particular area as it has greatly diminished the need for providers of printing and secretarial services.
- There is generic substitution competing for disposable income, such as the competition between carpet and flooring manufacturers as with email and post, these are both essentially doing the same thing, being floor coverings but perform the task in differing ways.

Competitive rivalry

Competitive rivalry is likely to be high where:

- There are a number of equally balanced competitors of a similar size. Competition is likely to intensify as one competitor strives to attain dominance over another.
- The rate of market growth is slow. The concept of the life cycle suggests that in mature markets, market share has to be achieved at the expense of competitors as there are few new customers now entering the market.
- There is a lack of differentiation between competitor offerings, in such situations, there is little disincentive to switch from one to another, they are all the same.
- The industry has high fixed costs, perhaps as a result of capital intensity, which may precipitate price wars and hence low margins. Where capacity can only be increased in large increments, requiring substantial investment, then the competitor who takes up this option is likely to create short-term excess capacity and increased competition in order to fill this extra capacity.
- There are high exit barriers. This can lead to excess capacity as players will not be willing to leave and, consequently, increased competition from those firms effectively 'locked in' to a particular marketplace.

In summary, the application of Porter's five forces model will increase management understanding of an industrial environment which they may want to enter, or assist them to assess a market that they are currently in.

Now that the model has been explained you need to be able to apply it in the exam. Often candidates can struggle to perform this 'application' effectively – either, due to not following the precise questions requirement or not using the information in the scenario effectively or even at all. So, this next section will look at a few of the ways that this may be examined in the APM exam and provide some advice on how to tackle answering those questions.

When conducting a five forces assessment an organization will need to consider:

- how to measure the strength of the forces and how reliable those measurements are
- how to manage the forces identified to mitigate their influence on the organization's future performance, and
- what performance measures are required to monitor the forces.

Commented [JA1]: Exam areas

These factors are often the basis for questions requiring the use of this model.

Illustration:

The examples below are based on a company making semi-conductors/micro-chips and the SBU being addressed in the question makes them for the autonomous vehicle industry (self-driving cars), a specialized use in an already specialist industry.

EXAMPLE 1 – Using the model to perform the analysis

Required:

Using Porter's five forces model, assess the impact of the external business environment on the performance management of Scarlett Plc.

This is the first part of the requirement (the second part follows in the next example). This requirement does indeed require you to perform the analysis for the SBU. This must be done in the precise context of the scenario in the question and does not need to be preceded with explanations of the model or its parts.

An extract from a very good answer is reproduced below to show the approach that will score the maximum marks available for one force, threat of new entrants, in this scenario:

Answer – Extract showing threat of new entrants only

The threat of new entrants will be dictated by barriers to entry into the specialist semi-conductor market. These appear to be high, given the high fixed costs and the high levels of technical expertise required to develop a viable product. Also, the need to have cultivated strong relationships with the autonomous car producers and control systems manufacturers who will be the customers for the products.

Comments: The answer begins with a recognition of the issues affecting barriers, then moves on to identify the specifics for the industry. It justifies the identification of the barriers being high here, doing this both, for the microchip industry in general, then focusing in more closely on the specific use in this SBU.

EXAMPLE 2 – Providing performance measure for the forces

...and give a justified recommendation of one new performance measure for each of the five force areas at Scarlett.

Answer – Extract showing threat of new entrants only

A suitable performance measure would be percentage growth in revenue because as the industry grows Scarlett may expect their revenues to grow with it, as they gain new contracts and even new customers. Scarlett will need to compare this measure against the growth of the industry itself and competitors to ensure that they are at least keeping up with them.

[Other measures could include ratio of fixed cost to total cost (measures capital required) or customer loyalty (through long-term contracts to supply semi-conductors to manufacturers).]

Comment: As the comment at the end of the answer shows, there are many measures which could be applied here. The key to gaining pass marks is to identify a measure which is going to be useful for the organization in the scenario, given its industry and situation. This answer also clearly justifies the recommendation in this context.

In Performance Management models – part 2 the Boston Consulting Group matrix (BCG) will be the model focused on.

References

- Porter M E, Competitive Strategy, Free Press, 1980

This article provides a brief overview of the second of two models, which can assist accountants, not only in the determination of business strategy, but also in the

appraisal of business performance. It also looks at how to approach a particular style of question that may appear in the APM exam.

In this part the Boston Consulting Group matrix will be reviewed, you may also wish to read part 1, which covers Porters Five Forces.

The Boston Consulting Group Matrix

There is a fundamental need for management to evaluate existing products and services in terms of their market development potential, and their potential to generate profit. The Boston Consulting Group matrix, which incorporates the concept of the product life cycle, is a useful tool which helps management teams to assess existing and developing products and services in terms of their market potential. More importantly, the model can also be used to assess the strategic position of strategic business units (SBUs), and in this respect it is particularly useful to those organizations which operate in a number of different markets and offer a number of different products or services.

The matrix offers an approach to product portfolio planning. It has two axes, namely relative market share (meaning relative to the competition) and market growth. Management must consider each product or service marketed, and then position it on the matrix. This is done by considering the relative market share, which for the company with the largest share (market leader) means comparing to the next biggest player and for smaller players (market followers) it means comparing their share to the leader. The other axis on the matrix is the market growth rate – which is either growing quickly or the market is mature where it will grow slowly or may even have stopped growing altogether.

	High market share	Low market share
Growing market	Star	Problem Child
Mature market	Cash cow	Dog

Problem children

Problem children have a relatively low market share in a market that is growing quickly, often due to the fact that these are new products/services, or that they are yet to receive recognition by prospective purchasers. In order to realize the full potential of problem children, management needs to develop new business prudently, and apply sound project management principles if it is to avoid costly disasters. Gross profit margins are likely to be high, but overheads are also high, covering the costs of research, development, advertising, market education, and low economies of scale. As a result, the development of problem children can be loss-making until the product moves into the rising star category, which is by no means assured. This is evidenced by the fact that many problem children's products remain as such, while others become tomorrow's dogs.

Note: Problem children are also known as question marks.

Stars

Stars are products which are in the high market share and growing market quadrant. As a product moves into this category it is commonly known as a rising star. While a market is strong and still growing, competition is not yet fully established. Since demand is strong, and market saturation and over-supply is not an issue, the pricing of such products is relatively unhindered, and therefore these products generate very good margins. At the same time, costs per unit are minimized due to high volumes and good economies of scale. These are great products, and worthy of continuing investment for as long as they have the potential to achieve good rates of growth. In circumstances where this potential no longer exists, these products are likely to fall vertically in the matrix into the cash cow quadrant (fallen stars), and their cash generating characteristics will change. It is therefore vital that a company has rising stars developing from its problem children in order to fill the void left by the fallen stars.

Cash cows

A cash cow has a relatively high market share in a mature/low growth market and should generate significant cash flows. This somewhat crude metaphor is based on the idea of 'milking' the returns from a previous investment that established good distribution and market share for the product. Activities to support products in this quadrant should be aimed at maintaining and protecting their existing position,

together with good cost management, rather than aimed at investment for growth. This is because there is little likelihood of additional growth being achieved.

Dogs

A dog has a relatively low market share in a mature/low growth market, might well be loss making, and therefore have negative cash flow. A common belief is that there is no point in developing products or services in this quadrant. Many organizations discontinue dogs, but businesses which have been denied adequate funding for development may find themselves with a high proportion of their products or services in this quadrant. A dog product that forms an integral part of a portfolio may also be retained to ensure complete coverage – eg a furniture reseller may have some dog products but does so in order to remain a 'one-stop-shop' for all customer furniture needs and not lose customers.

Limitations of the Boston Consulting Group matrix

The popularity of the matrix has diminished a little as the criteria it is based on – market share and market growth are no longer reliable predictors of long-term success. Other models have been developed from it – with further criteria added (these are outside the scope of APM, however). It was also very useful when conglomerates were much more common, and these companies needed to review their portfolios of SBUs to ensure that effort/funds are focused on the correct markets. Management should therefore exercise a degree of caution when using the matrix. Some of its limitations are detailed below:

- The rate of market growth is just one factor in an assessment of industry attractiveness, and relative market share is just one factor in the assessment of competitive advantage. The matrix ignores many other factors that contribute towards these two important determinants of profitability.
- There can be practical difficulties in determining what exactly 'high' and 'low' (growth and share) can mean in a particular situation.
- The focus upon high market growth can lead to the profit potential of declining markets being ignored.

- The matrix assumes that each SBU or product/service is independent. This is not always the case, as organizations often take advantage of potential synergies.
- The use of the matrix is **best suited to SBUs as opposed to products, or to broad markets** (which might comprise many market segments).
- The position of dogs is frequently misunderstood, as many dogs play a vital role in helping SBUs achieve competitive advantage. For example, dogs may be required to complete a product range (as referred to earlier in this article) and provide a credible presence in the market. Dogs may also be retained in order to reduce the threat from competitors via a broad portfolio.

Notwithstanding these limitations, the Boston Consulting Group matrix provides a useful starting point in the assessment of the performance of products and services and, more importantly, of SBUs. Although when conducting a BCG assessment an organization will need to consider:

- how to measure each of the categories in the matrix and how reliable those measurements are
- how to manage the different categories identified to mitigate their influence on the organization's future performance
- what performance indicators are required as a result of the BCG categorization, how those indicators link into both overall organizational performance and individual performance.

Now that the model has been explained and demonstrated we will move on to look at how it can be examined in APM. An analysis using the model may be asked for, however often this will be done for you in the question and the requirements will focus on how these SBUs can be managed and what performance measures may be required. You may also be expected to evaluate the use of BCG matrix as a performance management system. This section of the article will provide advice about answering several types of requirements. In the examples, only extracts from the requirements and answers are provided, to keep the article to a sensible length.

Illustration

EXAMPLE 1 – Using the model to perform the analysis

FNI is a large, diversified entertainment business based in Zeeland. It has a main objective of maximizing shareholder wealth and is made up of four divisions:

Division	Position in the matrix
1 Bars	Cash cow
2 Dance clubs	Problem child
3 Restaurants	Dog
4 Online, live-streamed events	Problem child

A consultant has performed the BCG analysis of the four divisions and you are required to evaluate their positions in the model and discuss the measures necessary to monitor performance.

An extract from a very good answer is reproduced below to show the approach which will score the well, focused on the bar division which has been identified as a cash cow:

Answer

The bar division is a cash cow as it has a very strong share of a low growth market. The focus for this division will be on generating as much cash flow as possible in order to continue to invest elsewhere in the business. It will also have a focus on

cost control to ensure that it continues to be as profitable as possible. As a result, measures which would be suitable for the bar division would be profit margins and cash generation.

Comment: This answer begins by justifying the bar division's placement in the matrix. It then goes on to explain what this division's focus will be and why. It then concludes with measures that relate to its situation.

You could also be asked to evaluate the BCG analysis as a performance management system at the company.

Answer

The BCG matrix can be beneficial as it allows the company to view the prospects of its different divisions. A different style of management should be applied to each division based on this analysis. Those businesses which are in faster growing sectors will require more capital to be invested and may not generate cash as efficiently from profits. However, those businesses in slower growing mature markets should have a focus on cost control and cash generation. Business units identified as cash cows and, particularly, dogs should not be dismissed since if they are properly managed, they can provide a rich source of cash as they are run down.

The performance management systems and metrics used by the divisions should therefore be adjusted to reflect this analysis. The metrics for high growth prospects of dance clubs and live-streamed events will be based on profit and return on investment.

However, the BCG matrix is a very simple method of analysis. For example, using relative market share measured against the largest competitor, where a value of 1.0 is used as cut off between large and small, means there is only one star or cow per market. It was designed as a tool for product portfolio analysis rather than performance measurement. As a performance system, it seems to downgrade traditional measures of performance such as profit and shareholder wealth and therefore may not be well aligned with all of the key stakeholders' objectives. It should be seen as a starting point for considering the appropriate performance management for a business unit but not the final result for the overall company.

Additionally, it may be that different products with each business unit may not fit the unit's classification. For example, a newly launched street food format would be

under the restaurant division but may be in a higher growth sub-sector and so applying the performance systems and management style of a dog business would not be appropriate. It may also be difficult to distinguish the sectors from each other as, for example, it may be difficult to define the difference between a bar and a restaurant where both sell much of the same services. The model also fails to consider the links between the business units, for example, where the bars may serve the dance clubs.

Comment: An evaluation needs to look at the good and bad points of any model being discussed in the context of the question. This answer builds up a picture via looking at how the model works, then considering if it is appropriate when looking at the objectives of the company. It finishes with some clear negatives and limitations of the model for managing performance. This is a very good answer which focuses on the exact requirement – it is not simply looking at limitations of the model in itself but as a tool for performance management.

Conclusion

These two articles have covered two common models used in the APM exam. As well as explaining the models they have given advice and examples of how to answer questions set on them. It will be a good idea to now review questions in past APM exams which have been set using them. This will help you to see more examples of how they are examined and that it is not enough to simply quote theory to score well in APM.

References

- Johnson G, Scholes K, and Whittington R, Exploring Corporate Strategy, FT Prentice Hall, seventh edition, 2005

Analyzing Measurable Indicators

Star	Problem Child
Cash Cow	Dog

1. Analyze the **controllable factor** to move the present position to the desired position: Problem Child to Star; Star to a Star/Cash Cow(at worst, where the market fails to grow); Dog to Cash Cow (if possible)

2. Analyze

Using Fin. Statement:	Strategy for Star: Maintain Market Share (the market still growing with new customers)
Revenue	
(Cost)	
Gross Profit	
(FC)	Controlled Variable
Net Profit	Next fig. below it: Net Profit
	Short-term measures: Market Share, GP, Revenue/Investment, Profit long-term measures: Market share, ROI, Net Profit margin

Using Fin. Statement:	Strategy for Problem Child to Star: Increase Market Share
Revenue	
(Cost)	
Gross Profit	
(FC)	Controlled Variable
Net Profit	Next fig. below it: Net Profit
	Short-term measures: ROI, Net Profit Long-term measures: Market share

Using Fin. Statement:	Strategy for Cash Cow: Maintain Market Share (the market still growing with new customers)
Revenue	
(Cost)	Controlled Variable
Gross Profit	Next fig. below it : Gross Profit
(FC)	-
Net Profit	
	Short-term measures: Market Share, GP/cost(i.e. Contribution/unit); GP margin Longterm measures: Market share

Using Fin. Statement:	Strategy for Dog to CashCow: Increase Market Share or Exit
Revenue	
(Cost)	
Gross Profit	
(FC)	-
Net Profit	
	Short-term measures: Net Profit Longterm measures: Market share

The importance of sustainability

Since the 1990s, there has been increasing recognition amongst governments, businesses, consumers, investors and other stakeholders of the importance of sustainability and the impacts of businesses on society and environment. They have recognized that focusing solely on profit maximization, without considering the interaction of a business with its operating environment, will not be a sustainable approach.

At the same time, there has been increasing demand for environmentally friendly products and processes, for example, hybrid – and more recently – electric vehicles

in place of conventional petrol or diesel ones. As such, adopting a sustainable business model could be not only a challenge but also an opportunity for organizations.

There are many different definitions of sustainability, but a commonly used one is that in the Brundtland Report (1987): *meeting the needs of the present without compromising the ability of future generations to meet their own needs*.

Most discussions of sustainability also highlight the need for organizations to contribute to economic prosperity, environmental quality and social justice. We will focus on these three strands (economic, environmental, social) as the basis of our discussion in this article.

Sustainability and performance

In addition to the overall importance of sustainability, there could also be a direct link between environmental behavior and performance.

There are a number of ways poor environmental behavior could affect a business:

- fines (for pollution, or other breaches of regulations)
- increased liability to environmental taxes (for example, carbon taxes)
- damage to corporate reputation
- loss of sales or consumer boycotts
- inability to secure finance
- loss of insurance cover

Conversely, reducing material, energy and water usage should not only reduce environmental impact, it could also reduce operating costs. Similarly, a focus on reducing waste could, in turn, improve process efficiency, and reduce the amount (and therefore the cost) of materials used.

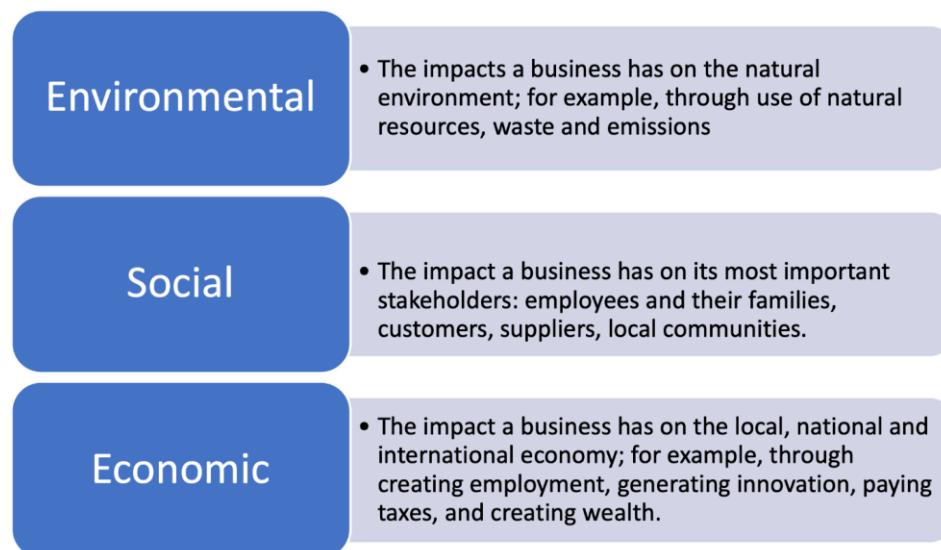
Equally, although health and safety measures might not add value to a business by themselves, they can help to protect a business from the cost of accidents which might otherwise occur. If a business has poor health and safety controls, this might

result in – amongst other things – increased staff absence from injury or illness, and possible compensation claims for any work-related injuries.

Triple bottom line

The increased focus on sustainability has important implications for performance management, and for accountants producing and reviewing management information. In addition to the financial information which they have traditionally measured, businesses now also need to consider the environmental and social aspects of performance, and they need the information on these areas to be relevant and reliable, and to be provided in a meaningful and comparable way.

The triple bottom line approach (Elkington, 1998) has emerged as a potential way to define a business's sustainable performance: measuring performance not only in the economic value businesses add, but also on the environmental and social value they add – or destroy.



It is important to note that the third element here – economic – does not simply mean the financial profit a business makes. Economic impact is wider than just financial impact. Financial profit focuses on the business itself, but the economic

impact of a business is on society as a whole, for example, through creating jobs and paying taxes.

It is also important to recognize that social and environmental issues are not confined within a business' normal financial reporting boundaries, but businesses also needed to consider sustainability issues across their supply chain, and the social and environmental practices of their suppliers (for example, supermarkets requiring suppliers to manufacture products from sustainable sources or eco-friendly materials, or to supply 'organic' produce).

Triple bottom line and different types of capital

We are all familiar with the logic that companies' underlying objective is to deliver value for their shareholders. However, there is now an increasing recognition that the long-term pursuit of shareholder value is linked to the preservation and enhancement of different types of capital – natural, human, social, manufactured and financial – which can be broadly related to the three aspects of the triple bottom line:

Aspect of triple bottom line	Type of capital affected
Environmental	- Natural capital: natural resources (eg air, water, land) and processes used by a business in delivering its products and services
Social	- Human capital: health, skills, motivation of employees.

	<ul style="list-style-type: none"> - Social capital: relationships, partnerships and co-operation (eg with suppliers)
Economic	<ul style="list-style-type: none"> - Manufactured capital: buildings, equipment and infrastructure used by the business - Financial capital: funds available to enable the business to operate. Reflects the value generated from the other types of capital.

Integrated reporting

The recognition that businesses depend on different forms of capital for their success is also an important part of the rationale for integrated reporting (IR). However, IR also encourages a focus on business sustainability and organization's long-term success. By encouraging businesses to focus on their ability to create and sustain value over the longer term, IR should help them take decisions which are sustainable, and which ensure a more effective allocation of scarce resources.

Integrated Reporting is discussed in more detail in a separate [article](#).

Sustainability and performance information

The argument that it is insufficient for businesses to consider only financial information alone is not new. There are echoes here to discussions around the need for multi-dimensional performance measurement systems (such as the balanced scorecard (Kaplan and Norton, 1996)) – which emphasize the need for financial *and* non-financial measures to be part of a business' information systems.

Equally, one of the criticisms sometimes made of the way businesses use balanced scorecards is that they are linked to delivering traditional economic value (eg shareholder wealth), rather than considering the importance of corporate social responsibility (CSR) and sustainability. As such, some commentators have suggested the need to add social and environmental perspectives to the balanced scorecard.

However, others have argued that sustainability could be incorporated into the existing four perspectives. The logic of the scorecard is to link a business' objectives and strategy to its performance measures, and the argument here is that businesses should include sustainability goals within their strategy.

As such, when selecting goals for the perspectives, a business should consider requirements for sustainability. For example:

- Customer perspective: Have the interests of sustainability stakeholders been taken into account eg green consumers; local communities; government regulators?
- Internal process perspective:
 - Have the environmental impacts of processes e.g. resource usage; waste and recycling; impact on water and air been considered?
 - Do HR processes take into account labor best practices around health and safety, diversity, equal opportunity etc.?
- Learning and growth:
 - How are training and development programmes helping to promote sustainability values and culture?
 - How are innovations leading to more efficient use of resources and the reduction of waste, or leading to the introduction of more environmentally friendly products?

More generally, regardless of the performance measurement system it uses, in order to improve sustainability performance, a business needs to translate its overall objectives into specific practices, linked to sustainability, in each key area of performance. It then needs to identify specific measurement indicators, so it can assess how well it is achieving its objectives in each key area.

Key performance indicators (KPIs)

Monitoring key performance indicators (KPIs) is recognized as a crucial part of performance management for any business. However, many businesses don't measure sustainability KPIs in the way that they would financial KPIs, for example. One of the key challenges with introducing sustainability KPIs is that the list of potential indicators is very large, so determining which are the most important to monitor (ie the *key* indicators) can be a complex task.

However, the following are some potential indicators a business could track in relation to sustainability:

Energy <ul style="list-style-type: none">- Energy consumption- Energy saved due to implemented improvements	Materials <ul style="list-style-type: none">- Raw material usage- % of non-renewable materials used- % of recycled materials used- Product recycling rate %
Water <ul style="list-style-type: none">- Water consumption/ Water footprint- % of water reused or recycled	Supply chain <ul style="list-style-type: none">- % of suppliers that comply with established sustainability strategy- Supply chain miles
Waste <ul style="list-style-type: none">- Waste generated- Waste by type and disposal	Social <ul style="list-style-type: none">- Number of health and safety incidents (workplace safety)- Number of sick days

method - Waste production rate	(employees' health and well-being)
Emissions - Toxic emissions - CO ₂ emissions - Greenhouse gas emissions - Carbon footprint	

As we have mentioned before, in addition to encouraging sustainability, monitoring these indicators could also help business performance more generally. For example, monitoring and trying to reduce energy consumption could help to lower energy costs as well as reducing environmental impact. Similarly, supply chain miles provide an indicator of how far a product is travelling before reaching its destination. If products are travelling large distances, this could mean they incur heavy costs along the way. Therefore, looking to reduce supply chain miles could influence a business's choice of suppliers; not just to reduce carbon footprint, but potentially costs as well.

Evaluating measurement of sustainability performance

Having established the need to embed 'sustainability' into an organization's performance measurement systems, a key question to ask will be: how well are businesses actually doing this?

By definition, performance measurement is always selective. Businesses cannot measure every aspect of performance, so they must decide the most important metrics and indicators to focus on. When evaluating an organization's performance measurement systems (in relation to sustainability) key questions to ask will be:

- What is being measured? What measures are chosen?

- To what extent are aspects of sustainability covered in an organization's performance measurement system? Are measures of sustainability included?
- To what extent do the chosen performance indicators enable management to measure performance from a sustainability perspective?
- Are the measures chosen the most appropriate ones for the organization to be using?
- Do the chosen measures provide a balanced picture of the organization's performance (rather than, for example, just focusing on areas which the organization is doing well)?

One potential approach here when selecting areas to measure could be to analyze a business's organization's value chain to identify the areas which have the greatest potential impact on sustainability. These should then be the priority areas to measure, so the business should select indicators which show well it is performing in these priority areas.

Reliability of measures

As well as the areas being measured, another important consideration is the extent to which the data being gathered is reliable and meaningful.

- How is performance measured (eg inputs; activities; outputs), and can the data be reliably captured?
- Are there benchmarks or comparators against which performance can be assessed?
- Are performance measures
- Is information presented in a way which maximizes its usefulness to its audience?

As with other performance indicators, it is important to monitor trends in indicators of sustainability performance to measure progress. However, for any trend to be meaningful, the indicators need to be measured consistently – over time, and across different parts of a business (and potentially between businesses).

One of the particular challenges in comparing sustainability performance between businesses is that, whereas financial performance can be monitored using a number of widely accepted indicators derived from the financial statements, the indicators of social and environmental impacts are less clearly established, and the information used to calculate them is often not part of mainstream information flows.

In addition, the perception of sustainability can vary across countries, communities and individuals. Some initiatives promoted by an organization as environmentally friendly might not be perceived as by relevant or beneficial by green consumers.

Reporting Sustainability: Global Reporting Initiative and the UN Sustainable Development Goals

Given the increasing importance of sustainability as a major global issue, there has been increasing recognition for a globally accepted framework within which organizations can frame their sustainability strategy.

The Global Reporting Initiative (GRI) Standards provide best practice for reporting on a range of economic, environmental and social impacts, and give companies specific guidance on what information they should report on. However, the GRI Standards are not mandatory. And while there is an increasing recognition of the need to set a sustainability equivalent of the International Financial Reporting Standards (IFRS), to put financial and non-financial information on the same footing, this has not been achieved yet.

The United Nations' Sustainable Development Goals (SDGs) could be more relevant at a strategic level, encouraging companies to embed sustainability measures into their 'core' performance reporting.

The SDGs are part of the United Nations (UN) 2030 Agenda for Sustainable Development. The Agenda, formally adopted by the UN in 2015, is a 15-year plan with the aim of ending poverty, combatting climate change, and fighting injustice and inequality. The SDGs are 17 high level goals for sustainable development, with each goal supported by a number of specific objectives. In turn, indicators are recommended for each objective to enable performance against it to be measured.

1: No poverty	10: Reduced inequalities
2: Zero hunger	11: Sustainable cities and communities
3: Good health and well being	12: Responsible consumption and production
4: Quality education	13: Climate action
5: Gender equality	14: Life below water
6: Clean water and sanitation	15: Life on land
7: Affordable and clean energy	16: Peace, justice and strong institutions
8: Decent work and economic growth	17: Partnerships for the goals
9: Industry, innovation and infrastructure	

Sustainable Development Goals – United Nations General Assembly (2015)

The overall goals are broad and aspirational. However, they are supported by a range of **associated targets (169 in total) and indicators**, which provide a quantifiable framework for assessing whether the goals are being achieved.

For example, Goal 8 'Decent work and economic growth' aims to 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.' One of the targets linked to this goal is to "Improve ... global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation". In turn, performance against this target is measured using the indicators:

- Material footprint, material footprint per capita and material footprint per GDP
- Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.

Implications of the SDGs on organizations and performance management

The principal responsibility for achieving the SDGs lies with national governments, but governments cannot tackle the issues on their own. Success in achieving the SDGs also depends on the active participation of businesses and non-governmental organizations (NGOs) across the world.

In this respect, two key challenges are:

- encouraging senior managers to evaluate the extent to which their business objectives create societal value and
- demonstrating the link between 'sustainability' and business.

One possible way to do this is to translate the language of sustainability into the language of everyday business and operations. For example, instead of asking a construction company 'How does climate change affect your business?', the issues could be identified more pertinently by looking at the risks that flooding or changes in water level might have on the company's projects and site operations.

More generally, the SDGs encourage businesses to adopt sustainable practices and integrate sustainability information into their reporting. As we mentioned earlier, in relation to the balanced scorecard, the challenge here is not so much adding additional perspectives for measuring performance, but embedding 'sustainability' into the existing perspectives, as an integral factor to consider in business decisions and business performance measurement.

Accordingly, in the APM exam, you should be prepared to evaluate how effectively a business measuring sustainability within its performance measurement system.

Written by a member of the Advanced Performance Management examining team

Clearly, risk permeates most aspects of corporate decision making (and life in general), and few can predict with any precision what the future holds in store

Risk can take myriad forms – ranging from the specific risks faced by individual companies (such as financial risk, or the risk of a strike among the workforce), through the current risks faced by particular industry sectors (such as banking, car manufacturing, or construction), to more general economic risks resulting from interest rate or currency fluctuations, and, ultimately, the looming risk of recession. Risk often has negative connotations, in terms of potential loss, but the potential for greater than expected returns also often exists.

Clearly, risk is almost always a major variable in real-world corporate decision-making, and managers ignore its vagaries at their peril. Similarly, trainee

accountants require an ability to identify the presence of risk and incorporate appropriate adjustments into the problem-solving and decision-making scenarios encountered in the exam hall. While it is unlikely that the precise probabilities and perfect information which feature in exam questions can be transferred to real-world scenarios, a knowledge of the relevance and applicability of such concepts is necessary.

In this first article, the concepts of risk and uncertainty will be introduced together with the use of probabilities in calculating both expected values and measures of dispersion. In addition, the attitude to risk of the decision maker will be examined by considering various decision-making criteria, and the usefulness of decision trees will also be discussed. In the second article, more advanced aspects of risk assessment will be addressed, namely the value of additional information when making decisions, further probability concepts, the use of data tables, and the concept of value-at-risk.

The basic definition of risk is that the final outcome of a decision, such as an investment, may differ from that which was expected when the decision was taken. We tend to distinguish between risk and uncertainty in terms of the availability of probabilities. Risk is when the probabilities of the possible outcomes are known (such as when tossing a coin or throwing a dice); uncertainty is where the randomness of outcomes cannot be expressed in terms of specific probabilities. However, it has been suggested that in the real world, it is generally not possible to allocate probabilities to potential outcomes, and therefore the concept of risk is largely redundant. In the artificial scenarios of exam questions, potential outcomes and probabilities will generally be provided, therefore a knowledge of the basic concepts of probability and their use will be expected.

Probability

The term 'probability' refers to the likelihood or chance that a certain event will occur, with potential values ranging from 0 (the event will not occur) to 1 (the event will definitely occur). For example, the probability of a tail occurring when tossing a coin is 0.5, and the probability when rolling a dice that it will show a four is $\frac{1}{6}$ (0.166). The total of all the probabilities from all the possible outcomes must equal 1, ie **some outcome must occur**.

A real world example could be that of a company forecasting potential future sales from the introduction of a new product in year one (**Table 1**).

TABLE 1: PROBABILITY OF NEW PRODUCT SALES					
Sales	\$500,000	\$700,000	\$1,000,000	\$1,250,000	\$1,500,000
Probability	0.1	0.2	0.4	0.2	0.1

From **Table 1**, it is clear that the most likely outcome is that the new product generates sales of £1,000,000, as that value has the highest probability.

Independent and conditional events

An independent event occurs when the outcome does not depend on the outcome of a previous event. *For example, assuming that a dice is unbiased, then the probability of throwing a five on the second throw does not depend on the outcome of the first throw.*

In contrast, with a conditional event, the outcomes of two or more events are related, ie the outcome of the second event depends on the outcome of the first event. For example, in **Table 1**, the company is forecasting sales for the first year of the new product. If, subsequently, the company attempted to predict the sales revenue for the second year, then it is likely that the predictions made will depend on the outcome for year one. If the outcome for year one was sales of \$1,500,000, then the predictions for year two are likely to be more optimistic than if the sales in year one were \$500,000.

The availability of information regarding the probabilities of potential outcomes allows the calculation of both an expected value for the outcome, and a measure of the variability (or dispersion) of the potential outcomes around the **expected value** (**most typically standard deviation**). This provides us with a measure of risk which can be used to assess the likely outcome.

Expected values and dispersion

Using the information regarding the potential outcomes and their associated probabilities, the expected value of the outcome can be calculated simply by multiplying the value associated with each potential outcome by its probability.

Referring back to **Table 1**, regarding the sales forecast, then the expected value of the sales for year one is given by:

Expected value

$$\begin{aligned} &= (\$500,000)(0.1) + (\$700,000)(0.2) + (\$1,000,000)(0.4) + (\$1,250,000)(0.2) + \\ &(\$1,500,000)(0.1) \\ &= \$50,000 + \$140,000 + \$400,000 + \$250,000 + \$150,000 \\ &= \$990,000 \end{aligned}$$

In this example, the expected value is very close to the most likely outcome, but this is not necessarily always the case. Moreover, it is likely that the expected value does not correspond to any of the individual potential outcomes. For example, the average score from throwing a dice is $(1 + 2 + 3 + 4 + 5 + 6) / 6$ or 3.5, and the average family (in the UK) supposedly has 2.4 children. *A further point regarding the use of expected values is that the probabilities are based upon the event occurring repeatedly, whereas, in reality, most events only occur once.*

TABLE 2: POTENTIAL RETURNS FROM TWO INVESTMENTS

Investment A		Investment B	
Returns	Probability of return	Returns	Probability of return
8%	0.25	5%	0.25
10%	0.5	10%	0.5
12%	0.25	15%	0.25

In addition to the expected value, it is also informative to have an idea of the risk or dispersion of the potential actual outcomes around the expected value. The most common measure of dispersion is standard deviation (the square root of the variance), which can be illustrated by the example given in **Table 2** above, concerning the potential returns from two investments.

To estimate the standard deviation, we must first calculate the expected values of each investment:

Investment A

$$\text{Expected value} = (8\%)(0.25) + (10\%)(0.5) + (12\%)(0.25) = 10\%$$

Investment B

$$\text{Expected value} = (5\%)(0.25) + (10\%)(0.5) + (15\%)(0.25) = 10\%$$

The calculation of standard deviation proceeds by subtracting the expected value from each of the potential outcomes, then squaring the result and multiplying by the probability. The results are then totalled to yield the variance and, finally, the square root is taken to give the standard deviation, as shown in **Table 3**.

Investment A Returns	Expected return	Returns minus expected returns	Squared	Probability	Column 4 x Column 5
8%	10%	-2%	4%	0.25	1%
10%	10%	0%	0%	0.5	0%
12%	10%	2%	4%	0.25	1%
				Variance	2%
				Standard deviation	1.414%
Investment B Returns	Expected return	Returns minus expected returns	Squared	Probability	Column 4 x Column 5
5%	10%	-5%	25%	0.25	6.25%
10%	10%	0%	0%	0.5	0%
15%	10%	5%	25%	0.25	6.25%
				Variance	12.5%
				Standard deviation	3.536%

In **Table 3**, although investments A and B have the same expected return, investment B is shown to be more risky by exhibiting a higher standard deviation. More commonly, the expected returns and standard deviations from investments and projects are both different, but they can still be compared by using the coefficient of variation, which combines the expected return and standard deviation into a single figure.

Coefficient of variation and standard error

The coefficient of variation is calculated simply by dividing the standard deviation by the expected return (or mean):

$$\text{Coefficient of variation} = \text{standard deviation} / \text{expected return}$$

For example, assume that investment X has an expected return of 20% and a standard deviation of 15%, whereas investment Y has an expected return of 25% and a standard deviation of 20%. The coefficients of variation for the two investments will be:

Investment X = $15\% / 20\% = 0.75$

Investment Y = $20\% / 25\% = 0.80$

The interpretation of these results would be that investment X is less risky, on the basis of its lower coefficient of variation. A final statistic relating to dispersion is the standard error, which is a measure often confused with standard deviation. Standard deviation is a measure of variability of a sample, used as an estimate of the variability of the population from which the sample was drawn. When we calculate the sample mean, we are usually interested not in the mean of this particular sample, but in the mean of the population from which the sample comes. The sample mean will vary from sample to sample and the way this variation occurs is described by the 'sampling distribution' of the mean. We can estimate how much a sample mean will vary from the standard deviation of the sampling distribution. This is called the standard error (SE) of the estimate of the mean.

The standard error of the sample mean depends on both the standard deviation and the sample size:

$$SE = SD/\sqrt{\text{sample size}}$$

The standard error decreases as the sample size increases, because the extent of chance variation is reduced. However, a fourfold increase in sample size is necessary to reduce the standard error by 50%, due to the square root of the sample size being used. By contrast, standard deviation tends not to change as the sample size increases.

Decision-making criteria

The decision outcome resulting from the same information may vary from manager to manager as a result of their individual attitude to risk. We generally distinguish between individuals who are risk averse (dislike risk) and individuals who are risk seeking (content with risk). Similarly, the appropriate decision-making criteria used to make decisions are often determined by the individual's attitude to risk.

To illustrate this, we shall discuss and illustrate the following criteria:

1. Maximin

2. Maximax
3. Minimax regret

An ice cream seller, when deciding how much ice cream to order (a small, medium, or large order), takes into consideration the weather forecast (cold, warm, or hot). There are nine possible combinations of order size and weather, and the payoffs for each are shown in **Table 4**.

TABLE 4: DECISION-MAKING COMBINATIONS

Order/weather	Cold	Warm	Hot
Small	\$250	\$200	\$150
Medium	\$200	\$500	\$300
Large	\$100	\$300	\$750

The highest payoffs for each order size occur when the order size is most appropriate for the weather, ie small order/cold weather, medium order/warm weather, large order/hot weather. Otherwise, profits are lost from either unsold ice cream or lost potential sales. We shall consider the decisions the ice cream seller has to make using each of the decision criteria previously noted (note the absence of probabilities regarding the weather outcomes).

1. **Maximin**

This criteria is based upon a **risk-averse (cautious) approach** and bases the order decision upon maximizing the minimum payoff. The ice cream seller will therefore decide upon a medium order, as the lowest payoff is £200, whereas the lowest payoffs for the small and large orders are £150 and \$100 respectively.

2. **Maximax**

This criteria is based upon a **risk-seeking (optimistic) approach** and bases the order decision upon maximizing the maximum payoff. The ice cream seller will therefore decide upon a large order, as the highest payoff is \$750, whereas the highest payoffs for the small and medium orders are \$250 and \$500 respectively.

3. **Minimax regret**

This approach attempts **to minimize the regret from making the wrong**

decision and is based upon first identifying the optimal decision for each of the weather outcomes. If the weather is cold, then the small order yields the highest payoff, and the regret from the medium and large orders is \$50 and \$150 respectively. The same calculations are then performed for warm and hot weather and a table of regrets constructed (**Table 5**).

TABLE 5: TABLE OF REGRETS

Order/weather	Cold	Warm	Hot
Small	\$0	\$300	\$600
Medium	\$50	\$0	\$450
Large	\$100	\$200	\$0

The decision is then made on the basis of the lowest regret, which in this case is the large order with the maximum regret of \$200, as opposed to \$600 and \$450 for the small and medium orders.

Decision trees

The final topic to be discussed in this first article is the use of decision trees to represent a decision problem. Decision trees provide an effective method of decision-making because they:

- clearly lay out the problem so that all options can be challenged
- allow us to fully analyze the possible consequences of a decision
- provide a framework in which to quantify the values of outcomes and the probabilities of achieving them
- help us to make the best decisions on the basis of existing information and best guesses.

A comprehensive example of a decision tree is shown in **Figures 1 to 4**, where a company is trying to decide whether to introduce a new product or consolidate existing products. If the company decides on a new product, then it can be developed thoroughly or rapidly. Similarly, if the consolidation decision is made

then the existing products can be strengthened or reaped. In a decision tree, each decision (new product or consolidate) is represented by a square box, and each outcome (good, moderate, poor market response) by circular boxes.

The first step is to simply represent the decision to be made and the potential outcomes, without any indication of probabilities or potential payoffs, as shown in **Figure 1** below.

The next stage is to estimate the payoffs associated with each market response and then to allocate probabilities. The payoffs and probabilities can then be added to the decision tree, as shown in **Figure 2** below.

The expected values along each branch of the decision tree are calculated by starting at the right hand side and working back towards the left recording the relevant value at each node of the tree. These expected values are calculated using the probabilities and payoffs. For example, at the first node, when a new product is thoroughly developed, the expected payoff is:

$$\text{Expected payoff} = (0.4)(\$1,000,000) + (0.4)(\$50,000) + (0.2)(\$2,000) = \$420,400$$

The calculations are then completed at the other nodes, as shown in **Figure 3** below.

We have now completed the relevant calculations at the uncertain outcome modes. We now need to include the relevant costs at each of the decision nodes for the two new product development decisions and the two consolidation decisions, as shown in **Figure 4** below.

The payoff we previously calculated for 'new product, thorough development' was \$420,400, and we have now estimated the future cost of this approach to be \$150,000. This gives a net payoff of \$270,400.

The net benefit of 'new product, rapid development' is \$31,400. On this branch, we therefore choose the most valuable option, 'new product, thorough development', and allocate this value to the decision node.

The outcomes from the consolidation decision are \$99,800 from strengthening the products, at a cost of \$30,000, and \$12,800 from reaping the products without any additional expenditure.

By applying this technique, we can see that the best option is to develop a new product. It is worth much more to us to take our time and get the product right, than to rush the product to market. And it's better just to improve our existing products than to botch a new product, even though it costs us less.

In the next article, we will examine the value of information in making decisions, the use of data tables, and the concept of value-at-risk.

FIGURE 1: EXAMPLE DECISION TREE
Should we develop a new product or consolidate?

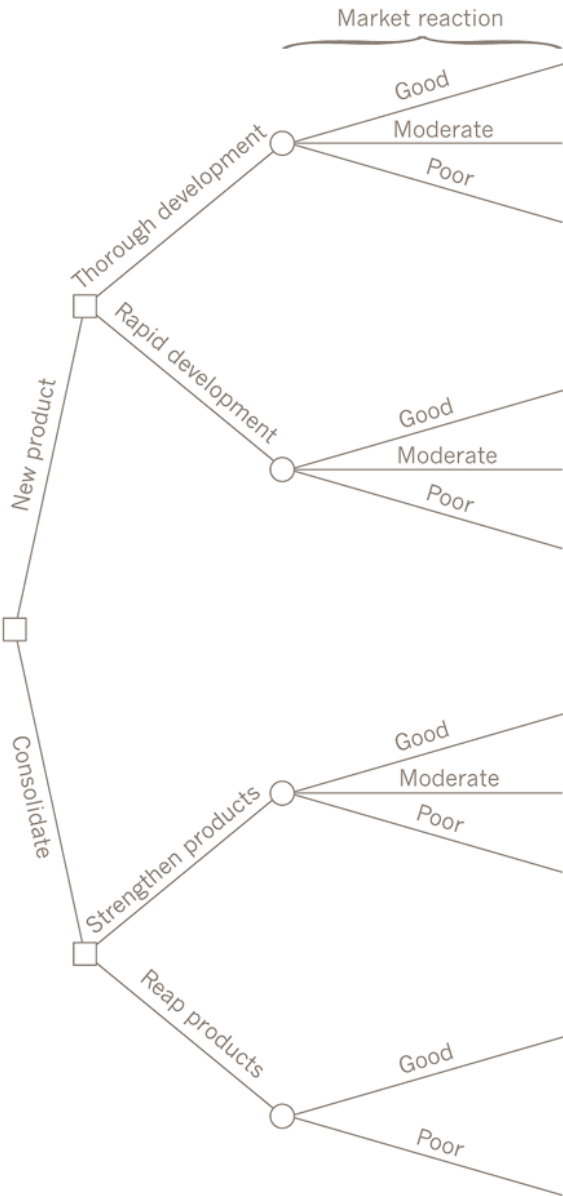


FIGURE 2: EXAMPLE DECISION TREE

Should we develop a new product or consolidate?

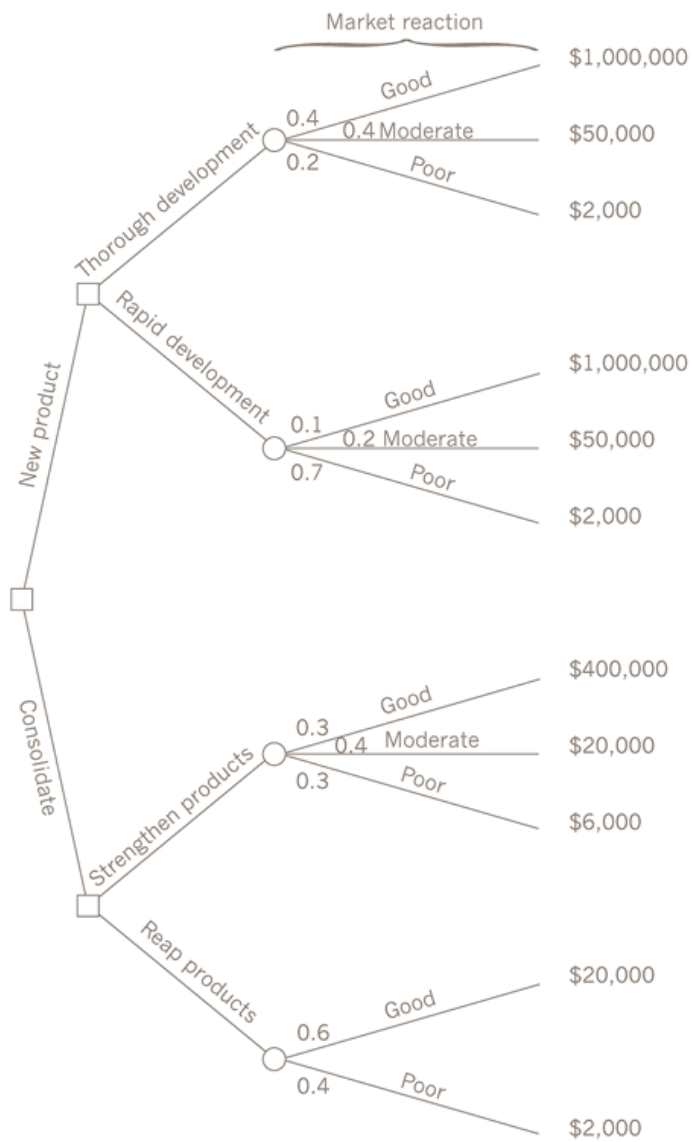


FIGURE 3: EXAMPLE
DECISION TREE
Should we develop
a new product
or consolidate?

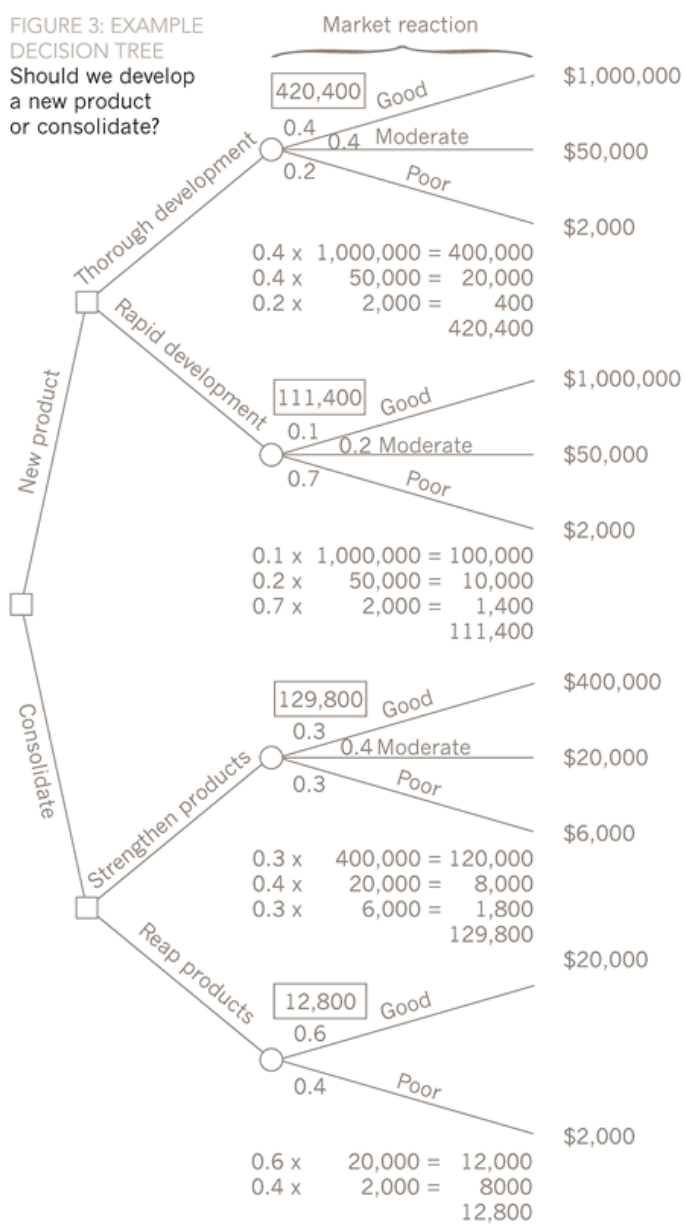
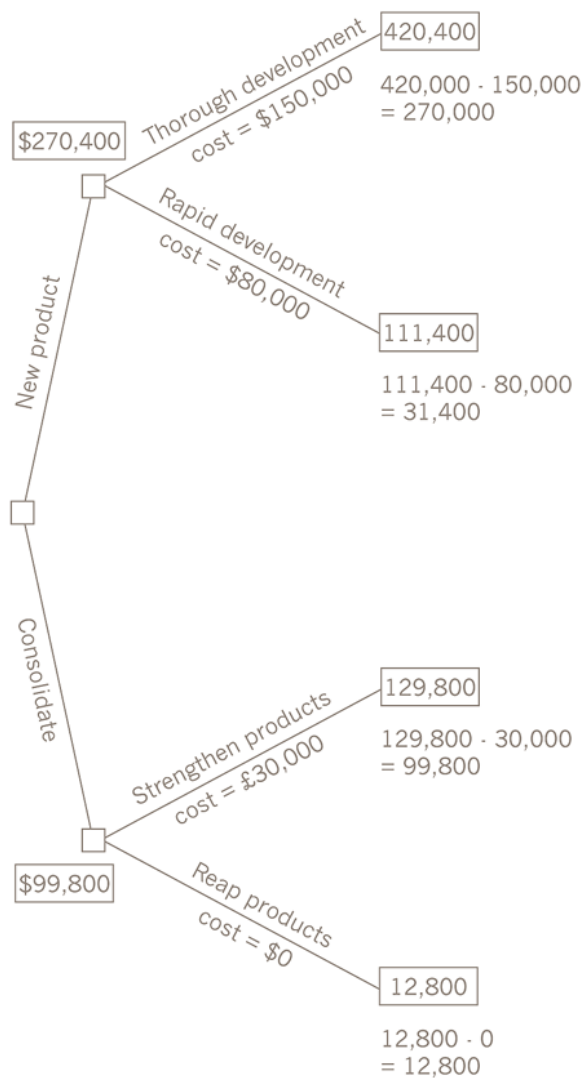


FIGURE 4: EXAMPLE DECISION TREE

Should we develop a new product or consolidate?



Written by a member of the APM examining team

In this second article on the risks of uncertainty, we build upon the basics of risk and uncertainty addressed in the first article published in April 2009 to examine more advanced aspects of incorporating risk into decision making

In particular, we return to the use of expected values and examine the potential impact of the availability of additional information regarding the decision under consideration. Initially, we examine a somewhat artificial scenario, where it is possible to obtain perfect information regarding the future outcome of an uncertain variable (such as the state of the economy or the weather), and calculate the potential value of such information. Subsequently, the analysis is revisited and the more realistic case of imperfect information is assumed, and the initial probabilities are adjusted using Bayesian analysis.

Some decision scenarios may involve two uncertain variables, each with their own associated probabilities. In such cases, the use of data/decision tables may prove helpful where joint probabilities are calculated involving possible combinations of the two uncertain variables. These joint probabilities, along with the payoffs, can then be used to answer pertinent questions such as what is the probability of a profit/(loss) occurring?

The other main topic covered in the article is that of Value-at-Risk (VaR), which has been referred to as 'the new science of risk management'. The principles underlying VaR will be discussed along with an illustration of its potential uses.

Expected values and information

To illustrate the potential value of additional information regarding the likely outcomes resulting from a decision, we return to the example given in the first article, of the ice cream seller who is deciding how much ice cream to order but is unsure about the weather. We now add probabilities to the original information regarding whether the weather will be cold, warm or hot, as shown in Table 1.

Table 1: Assigning probabilities to weather

Order/weather Probability	Cold 0.2	Warm 0.5	Hot 0.3
Small	\$250	\$200	\$150
Medium	\$200	\$500	\$300
Large	\$100	\$300	\$750

We are now in a position to be able to calculate the expected values associated with the three sizes of order, as follows:

- Expected value (small) = $0.2 (\$250) + 0.5 (\$200) + 0.3 (\$150) = \195
- Expected value (medium) = $0.2 (\$200) + 0.5 (\$500) + 0.3 (\$300) = \380
- Expected value (large) = $0.2 (\$100) + 0.5 (\$300) + 0.3 (\$750) = \395

On the basis of these expected values, the optimal decision would be to order a large amount of ice cream with an expected value of \$395. However, it may be possible to improve upon this value if better information regarding the weather could be obtained. Exam questions often make the assumption that it is possible to obtain perfect information, ie to predict exactly what the outcome of the uncertain variable will be.

The value of perfect information

In the case of the ice cream seller, perfect information would be certainty regarding the outcome of the weather.

If this was the case, then the ice cream seller would purchase the size of order which gave the highest payoff for each weather outcome - in other words, purchasing a small order if the weather was forecast to be cold, a medium order if it was forecast to be warm, and a large order if the forecast was for hot weather. The resulting expected value would then be:

$$\text{Expected value} = 0.2 (\$250) + 0.5 (\$500) + 0.3 (\$750) = \$525$$

The value of the perfect information is the difference between the expected values with and without the information, ie

$$\text{Value of information} = \$525 - \$395 = \$130$$

Exam questions are often phrased in terms of the maximum amount that the decision maker would be prepared to pay for the information, which again is the difference between the expected values with and without the information.

However, the concept of perfect information is somewhat artificial since, in the real world, such perfect certainty rarely, if ever, exists. Future outcomes, irrespective of the variable in question, are not perfectly predictable. Weather forecasts or economic predictions may exhibit varying degrees of accuracy, which leads us to the concept of imperfect information.

The value of imperfect information

With imperfect information we do not enjoy the benefit of perfect foresight. Nevertheless, such information can be used to enhance the accuracy of the probabilities of the possible outcomes and therefore has value. The ice cream seller may examine previous weather forecasts and, on that basis, estimate probabilities of future forecasts being accurate. For example, it could be that when hot weather is forecast past experience has suggested the following probabilities:

- P (forecast hot but weather cold)- 0.3

- $P(\text{forecast hot but weather warm}) = 0.4$
- $P(\text{forecast hot and weather hot}) = 0.7$

The probabilities given do not add up to 1 and so, for example, $P(\text{forecast hot but weather cold})$ cannot mean $P(\text{weather cold given that forecast was hot})$, but must mean $P(\text{forecast was hot given that weather turned out to be cold})$.

We can use a table to determine the required probabilities. Suppose that the weather was recorded on 100 days. Using our original probabilities, we would expect 20 days to be cold, 50 days to be warm, and 30 days to be hot. The information from our forecast is then used to estimate the number of days that each of the outcomes is likely to occur given the forecast (see Table 2).

Table 2: Likely weather outcomes

Outcome/forecast	Cold	Warm	Hot	Total
Hot	6**	20	21	47
Other	14	30	9	53
	20*	50	30	100

* From past data, cold weather occurs with probability of 0.2 ie on 0.2 of the 100 days in the sample = 20 days. Other percentages are also derived from past data.

** If the actual weather is cold, there is a 0.3 probability that hot weather had been forecast. This will occur on 0.3 of the 20 days on which the weather was poor = 6 days (0.3×20). Similarly, $20 = 0.5 \times 40$ and $21 = 0.7 \times 30$.

The revised probabilities, if the forecast is hot, are therefore:

- $P(\text{Cold}) = 6/47 = 0.128$
- $P(\text{Warm}) = 20/47 = 0.425$
- $P(\text{Hot}) = 21/47 = 0.447$

The expected values can then be recalculated as:

- Expected value (small) = $0.128 (\$250) + 0.425 (\$200) + 0.447 (\$150) = \184
- Expected value (medium) = $0.128 (\$200) + 0.425 (\$500) + 0.447 (\$300) = \372
- Expected value (large) = $0.128 (\$100) + 0.425 (\$300) + 0.447 (\$750) = \476
- Value of imperfect information = $\$476 - \$395 = 81$

The estimated value for imperfect information appears reasonable, given that the value we had previously calculated for perfect information was \$130.

Bayes' rule

Bayes' rule is perhaps the preferred method for estimating revised (posterior) probabilities when imperfect information is available. An intuitive introduction to Bayes' rule was provided in *The Economist*, 30 September 2000:

'The essence of the Bayesian approach is to provide a mathematical rule explaining how you should change your existing beliefs in the light of new evidence. In other words, it allows scientists to combine new data with their existing knowledge or expertise. The canonical example is to imagine that a precocious newborn observes his first sunset, and wonders whether the sun will rise again or not. He assigns equal prior probabilities to both possible outcomes, and represents this by placing one white and one black marble into a bag. The following day, when the sun rises, the child places another white marble in the bag. The probability that a marble plucked randomly from the bag will be

white (ie the child's degree of belief in future sunrises) has thus gone from a half to two-thirds. After sunrise the next day, the child adds another white marble, and the probability (and thus the degree of belief) goes from two-thirds to three-quarters. And so on. Gradually, the initial belief that the sun is just as likely as not to rise each morning is modified to become a near-certainty that the sun will always rise.'

In mathematical terms, Bayes' rule can be stated as:

$$\text{Posterior probability} = \frac{\text{likelihood} \times \text{prior probability}}{\text{marginal likelihood}}$$

For example, consider a medical test for a particular disease which is 90% accurate, ie if you test positive then there is a 90% probability that you have the disease and a 10% probability that you have been misdiagnosed. If we further assume that 3% of the population actually have this disease, then the probability of having the disease (given that you have tested positive) is shown by:

$$P(\text{Disease} | \text{Test} = +) =$$

$$\frac{P(\text{Test} = + | \text{Disease}) \times P(\text{Disease})}{P(\text{Test} = + | \text{Dis}) \times P(\text{Dis}) + P(\text{Test} = + | \text{No Dis}) \times P(\text{No Dis})}$$

$$= \frac{0.90 \times 0.03}{0.90 \times 0.03 + 0.10 \times 0.97}$$

$$= \frac{0.027}{0.027 + 0.097}$$

$$= 0.218$$

P(diseased sample, after testing positive) $P(A+|T) = 90\%$
 P(not diseased sample, after testing positive) $P(A-|T) = 10\%$
 P(population is diseased) $P(C+) = 3\%$ Therefore, $P(C-)=97\%$

 P(pop is diseased after testing +) = $P(C|A) = \frac{P(A|C+)P(C+)}{P(A|C-)P(C-) + P(A|C+)P(C+)}$

$$= \frac{.09 \times .03}{(.97 \times .03) + (.9 \times .03)}$$

Imagine you are a financial analyst at an investment bank. According to your research of [publicly-traded companies](#), 60% of the companies that increased their share price by more than 5% in the last three years replaced their [CEOs](#) during the period.

At the same time, only 35% of the companies that did not increase their share price by more than 5% in the same period replaced their CEOs. Knowing that the probability that the stock prices grow by more than 5% is 4%, find the probability that the shares of a company that fires its CEO will increase by more than 5%.

P(share > 5% changed CEO) P(A) = 60%

P(share < 5%, but changed CEO) P(B) = 35%.....(this is independent of 'A', therefore B)

P(shares > 5%) P(C) = 4%

$P(C|A) = \frac{P(A \cap C) \times P(C)}{P(A \cap C) \times P(C) + P(B \cap C) \times P(C)}$

$= \frac{.6 \times .04}{(.6 \times .04) + (.35 \times .04)}$

$$= \frac{.024}{.024 + .014}$$

$$= \frac{.024}{.038}$$

$$= 6.32\%$$

NB: In the absence of P(B), P(A-) would have been used...Just like P(A-|T), which is 10% in the first question above.

This result suggests that you have a 22% probability of having the disease, given that you tested positive. This may seem a low probability but only 3% of the population have the disease and we would expect them to test positive. However, 10% of tests will prove positive for people who do not have the disease. Therefore, if 100 people are tested, approximately three out of the 13 positive tests will actually have the disease.

Bayes' rule has been used in a practical context for classifying email as spam on the basis of certain key words appearing in the text.

Data tables

Data tables show the expected values resulting from combinations of uncertain variables, along with their associated joint probabilities. These expected values and probabilities can then be used to estimate, for example, the probability of a profit or a loss.

To illustrate, assume that a concert promoter is trying to predict the outcome of two uncertain variables, namely:

1. The number of people attending the concert, which could be 300, 400, or 600 with estimated probabilities of 0.4, 0.4, and 0.2 respectively.
2. From each person attending, the profit on drinks and confectionary, which could be \$2, \$4, or \$6 with estimated probabilities of 0.3, 0.4 and 0.3 respectively.

As each of the two uncertain variables can take three values, a 3 x 3 data table can be constructed. We shall assume that the expected values have already been calculated as follows:

Number/spend	300	400	600
\$2	(2,000)	(1,000)	3,000

Number/spend	300	400	600
--------------	-----	-----	-----

\$4	(750)	3,000	4,000
-----	-------	-------	-------

\$6	1,000	5,000	7,000
-----	-------	-------	-------

The probabilities can be used to calculate joint probabilities as follows:

Number/spend	300	400	600
--------------	-----	-----	-----

\$2	0.12	0.12	0.06
-----	------	------	------

\$4	0.16	0.16	0.08
-----	------	------	------

\$6	0.12	0.12	0.06
-----	------	------	------

			\$2	\$4	\$6		
			0.3	0.4	0.3		
	300	0.4	0.12	0.16	0.12		

No of pple	400	0.4	0.12	0.16	0.12		
	600	0.2	0.06	0.08	0.06		

			\$2	\$4	\$6		
			0.3	0.4	0.3		
	300	0.4	600	1200	1800		
No of pple	400	0.4	800	1600	2400		
	600	0.2	1200	2400	3600		

			\$2	\$4	\$6		
			0.3	0.4	0.3		
	300	0.4	(2,000)	(750)	1,000		
No of pple	400	0.4	(1,000)	3,000	5,000		
	600	0.2	3,000	4,000	7,000		

The two tables could then be used to answer questions such as:

1. The probability of making a loss? = $0.12 + 0.12 + 0.16 = 0.40$
2. The probability of making a profit of more than \$3,500? = $0.08 + 0.12 + 0.06 = 0.26$

Value-at-Risk (VaR)

Although financial risk management has been a concern of regulators and financial executives for a long time, Value-at-Risk (VaR) did not emerge as a distinct concept until the late 1980s. The triggering event was the stock market crash of 1987 which was so unlikely, given standard statistical models, that it called the entire basis of quantitative finance into account.

VaR is a widely used measure of the risk of loss on a specific portfolio of financial assets. For a given portfolio, probability, and time horizon, VaR is defined as a

threshold value such that the probability that the mark-to-market loss on the portfolio over the given time horizon exceeds this value (assuming normal markets and no trading) is the given probability level. Such information can be used to answer questions such as 'What is the maximum amount that I can expect to lose over the next month with 95%/99% probability?'

For example, large investors, interested in the risk associated with the FT100 index, may have gathered information regarding actual returns for the past 100 trading days. VaR can then be calculated in three different ways:

1. The historical method

This method simply ranks the actual historical returns in order from worst to best, and relies on the assumption that history will repeat itself. The largest five (one) losses can then be identified as the threshold values when identifying the maximum loss with 5% (1%) probability.

2. The variance-covariance method

This relies upon the assumption that the index returns are normally distributed, and uses historical data to estimate an expected value and a standard deviation. It is then a straightforward task to identify the worst 5 or 1% as required, using the standard deviation and known confidence intervals of the normal distribution - ie - 1.65 and -2.33 standard deviations respectively.

3. Monte Carlo simulation

While the historical and variance-covariance methods rely primarily upon historical data, the simulation method develops a model for future returns based on randomly generated trials.

Admittedly, historical data is utilised in identifying possible returns but hypothetical, rather than actual, returns provide the data for the confidence levels.

Of these three methods, the variance-covariance is probably the easiest as the historical method involves crunching historical data and the Monte Carlo simulation is more complex to use.

VaR can also be adjusted for different time periods, since some users may be concerned about daily risk whereas others may be more interested in weekly, monthly, or even annual risk. We can rely on the idea that the standard deviation of

returns tends to increase with the square root of time to convert from one time period to another. For example, if we wished to convert a daily standard deviation to a monthly equivalent then the adjustment would be :

$$\sigma_{\text{monthly}} = \sigma_{\text{daily}} \times \sqrt{T} \text{ where } T = 20 \text{ trading days}$$

For example, assume that after applying the variance-covariance method we estimate that the daily standard deviation of the FT100 index is 2.5%, and we wish to estimate the maximum loss for 95 and 99% confidence intervals for daily, weekly, and monthly periods assuming five trading days each week and four trading weeks each month:

95% confidence

$$\text{Daily} = -1.65 \times 2.5\% = -4.125\%$$

$$\text{Weekly} = -1.65 \times 2.5\% \times \sqrt{5} = -9.22\%$$

$$\text{Monthly} = -1.65 \times 2.5\% \times \sqrt{20} = -18.45\%$$

99% confidence

$$\text{Daily} = -2.33 \times 2.5\% = -5.825\%$$

$$\text{Weekly} = -2.33 \times 2.5\% \times \sqrt{5} = -13.03\%$$

$$\text{Monthly} = -2.33 \times 2.5\% \times \sqrt{20} = -26.05\%$$

Therefore we could say with 95% confidence that we would not lose more than 9.22% per week, or with 99% confidence that we would not lose more than 26.05% per month.

On a cautionary note, *New York Times* reporter Joe Nocera published an extensive piece entitled Risk Mismanagement on 4 January 2009, discussing the role VaR played in the ongoing financial crisis. After interviewing risk managers, the author suggests that VaR was very useful to risk experts, but nevertheless exacerbated the crisis by giving false security to bank executives and regulators. A powerful tool for professional risk managers, VaR is portrayed as both easy to misunderstand, and dangerous when misunderstood.

Conclusion

These two articles have provided an introduction to the topic of risk present in decision making, and the available techniques used to attempt to make appropriate adjustments to the information provided. Adjustments and allowances for risk also appear elsewhere in the ACCA syllabus, such as sensitivity analysis, and risk-adjusted discount rates in investment appraisal decisions where risk is probably at its most obvious. Moreover in the current economic climate, discussion of risk management, stress testing and so on is an everyday occurrence.

Written by a member of the APM examining team

DEVELOPMENT IN IT AND THE IMPACT ON PERFORMANCE MANAGEMENT

The impact of information technology on the work of the management accountant has been an area of discussion since Burns and Scapens published their famous article 'Accounting change project' which describes the way the work of the management accountant has changed. This article looks at some important IT developments and discusses how they have impacted on management information and measuring performance.

Enterprise resource planning systems

'Enterprise Resource Planning (ERP) Systems are groups of software applications integrated to form enterprise-wide information systems.' (1)

Before ERP systems, departments would develop their own separate applications. The warehouse might have a perpetual inventory recording system while the

manufacturing planning department would have a planning system, and the finance department would have an accounting programme system. These systems were not linked, which meant that sharing of information between departments relied on traditional communication methods. A lot of information was entered into two or more systems manually and often it was necessary to spend time reconciling information from one system with another.

In multi-national companies, subsidiaries around the world may have had their own systems which were not linked into head office. Head office had to wait for the monthly management accounts to find out what was happening in the subsidiaries, and the consolidated position might then not be known for another month.

The 1990s was the advent of the ERP system. The aim was that one system would serve the whole organisation. Typically ERP systems have a modular structure, such as a general ledger module for accounting, an inventory control module, manufacturing resource planning (MRP), sales ledger, purchase ledger, payroll, customer relationship management and sales and marketing modules. The best known providers of ERP systems are SAP, Oracle, PeopleSoft and Baan.

There are several advantages of ERP systems. Firstly, senior managers now have access to all the data in one place, rather than information being spread among separate systems. This enables managers to have a clearer knowledge of what is happening. It also leads to less duplication of data, which means less time is wasted entering information into two or more systems and reconciling information from different systems. The departments are aware of what other departments are doing – so the MRP system will be linked into the purchase system and inventory control system, for example, to ensure that inventory levels are sufficient to support planned production.

Scapens and Jazayeri (2) studied the impact that a global implementation of SAP had on management accounting practices at a multinational building company. What they concluded was that the management accounting data itself did not change, but the role of the management accountant did. Much of the management accounting data could be produced automatically by the system (eg once the standard costs were entered into the system, variances were calculated automatically, based on actual costs). This removed many of the routine tasks traditionally performed by management accountants. Non-financial managers also

increased their own accounting knowledge, and with the help of the SAP system, could often get their own accounting reports.

While many of the routine tasks of the management accountant were no longer required, the management accountant was needed to help to interpret operating performance and financial results. Thus, the management accountant had become an 'internal consultant' rather than a scorekeeper.

Unified corporate databases

Some of the early ERP systems did not share a common database, but were linked together by interfaces, so that data from one system would flow through to another. Information about purchases, for example, would flow from the inventory control system to the general ledger system so that the accounting records could reflect the correct inventory balances. The lack of a common database meant that each department's data was still inaccessible by other departments.

Truly integrated ERP systems work on a unified corporate database. What this means is that all the data from the organisation can be stored in one place, and accessed by the different modules of the ERP system. This allows management to interrogate the data more effectively to make use of the information available to gain additional insights into the business.

Integrated ERP systems support businesses that wish to move away from a functional structure to a more process based structure. This involves breaking down the barriers between the different departments, and focusing on the processes rather than the roles of each department. Many organisations have performed some business process reengineering at the same time as implementing new ERP systems. In terms of performance management, this supports initiatives such as activity based management and business process reengineering.

Data warehouses

A data warehouse is essentially a very large database that stores all the information from the different systems in one place. Assuming that the organisation does not have a unified corporate database, or that there is data stored in older systems that the company wishes to retain, data is fed from the various systems into one place.

The data is often 'cleaned' before being put into the warehouse, to remove duplicate or corrupted data.

The data in the warehouse can then be used by management to provide useful information. Big Data analysis such as data mining can be used to identify interesting trends that could provide insights into the business. This might include relationships, such as relationships between sales and marketing segments, which might help businesses to focus their products better.

Knowledge management systems

For many organisations, knowledge is one of the key resources that they have. In a company that makes high technology products, for example, the technical knowledge of its engineers, programmers and designers will have a significant impact on how good the organisation's products are. Knowledge is difficult to manage, because it exists in the brains of staff.

Knowledge management systems (KMS) aim to manage the knowledge that the organisation has. The aim of the systems is to store the information and share it, so it is available to other members of staff when they need it.

KMS can be broadly categorised as codified based systems and personalisation based. Codified based systems tend to include formal technical knowledge, such as laws or tax rules. A tax practitioner may use such a system to look up tax regulations, for example. Personalisation based systems are where staff within the business are asked to share their knowledge. The system will let staff input any information they think is necessary for others to know about. This information can be input using various formats – social media type pages, where information is posted, blogs, forums and wikis. (A wiki is a website on which users collaborate to input and update information.) Popular packages include Zoho.

An important aspect of performance management is ensuring that staff have the knowledge they need. Designing an appropriate KMS is therefore a good way of ensuring that the organisations knowledge can be maintained and shared. Some organisations have set up KMS for new staff, and discovered that it can reduce the time taken to learn the job. Customer service centres also use KMS to help them

answer customers' questions, and often customers are given access to such systems to help them find solutions in order to avoid having to call the call centre.

Customer relationship management

Customer relationship management (CRM) is the process of managing the relationship with a customer from the point where they are a potential customer, throughout their life as a customer. It starts with customer acquisition, which involves campaigns to find new customers, and continues with retention of customers, since retaining customers is easier than finding new customers.

CRM IT systems have become popular since the start of the millennium. Some of these are included as modules within an ERP system such as SAP, while others are stand alone, such as Salesforce. The systems support CRM activity by providing and storing data about customers, for example, information about conversations or interactions with the customer, pipeline management, and managing e-mail communications with the customer.

Networking

Historically, the first computerized information systems were held on large mainframe computers. Users would access the system using terminals that look like PCs, but did not have their own CPU so could only operate when connected to the mainframe. Access to the system was the preserve of a few privileged individuals such as the accounting staff and IT staff, and access was strictly limited.

Mainframes gave way to PCs in the 1980s, where staff had PCs on their desk. This supported 'distributed' processing, where data would be processed separately on PCs, for example accountants preparing spreadsheets.

The growth of client server computing gained popularity, whereby the PCs (the clients) would be linked up to a bigger PC called a server, which would provide services such as printing, file storage, and access to the internet. Systems such as ERPS could also be loaded onto the servers which allowed centralized processing. Local area networks enabled information to be shared within one location, while wide area networks allowed local area networks to interconnect, often using a devoted telephone line.

With the advent of the internet in the 1990s, organizations can now interlink over the internet. Intranets can also be set up. An intranet is a private network which is based on the internet, but only allows access to members of the organization. The internet and intranet have clearly revolutionized the way people within organization can communicate with each other. They have also led to an increase in teleworking, where staff often work at home, and connect to their workplace via the intranet. The internet has also opened up the opportunity for cloud computing.

Cloud computing

Traditionally, setting up a computerized information system involved buying hardware, such as servers and PCs, buying software licenses for all the applications, and loading these onto the servers or PCs that needed them. An IT department managed the organization's hardware, software and data, and was responsible for security.

Cloud computing involves buying the right to use computer applications which are held in a remote location and accessed via the internet. The most basic cloud services include storage spaces such as Dropbox or Google Drive. Software as a service (SaaS) is another trend, where the user buys the right to use an application held on the cloud provider's hardware, for example, many accounting products such as Xero and Quickbooks are cloud based. It is even possible to have complete system infrastructure via the cloud – the cloud service provider sets up the hardware and software architecture, and users access it via the web.

The advantage of cloud computing is that it changes what is normally a fixed cost into a variable cost. Users are generally charged for the amount they use, rather than having to make large upfront investments. This makes systems very 'scalable' which means that organizations buy exactly the amount of IT they need, rather than having to invest in steps. It also saves time – large, dispersed organizations can get access to a global centrally managed system via the internet in a fraction of the time it would have taken to set up local, interconnected networks at each location.

Cloud computing allows organizations to standardize their information systems globally, very much reinforcing the approach of ERP systems. Senior management can access the global data remotely, and there is more ability to share information among all employees as they will all be able to access data from wherever they are located.

One possible disadvantage of cloud computing is security. Having your information system or data on somebody else's hardware means that you lose control of it. However, the providers of cloud services generally have excellent security measures in place, so the data is probably safer than it would be if it were held in house.

Implications for managing and measuring performance

There are many implications of the IT developments describe above, both for organizations and for performance management and measurement. The role of the management accountant has always been to provide information to organizations to help them plan and control their organizations, and make decisions. Traditionally much of this information was financial.

The first, and perhaps most obvious implication of the developments described above is that there is a huge amount of information that is now available to organizations, which is very easily accessed, and shared. This means that traditional financial information perhaps becomes less important.

A second implication is that managers and employees can now find much of the information that they need for themselves. Historically, the management accountant was the provider of information for performance management, but often finds that his role has been usurped by the systems above.

A third implication is better collaboration and sharing, which should lead to better team working within organizations. This supports the process view of the organization, where staff recognize that they are working together to meet the needs of the customer, rather than doing a task that relates only to their internal department.

A possible weakness is that with so much information around, managers may not be able to see the big picture. This is where the management accountant can help. There is a greater role in terms of interpreting the information, and pointing senior management to the data that is really important. It also includes explaining how the financial and non-financial data interlink.

References

1. 'Enterprise information systems, a pattern based approach', Dunn CL
2. 'ERP systems and management accounting change. Opportunities or impacts?' by Scapens and Jazayeri, published in *European Accounting Review*, 2003

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Following on from 'Developments in IT and the impact on performance management – part 1' (see 'related links'), this article looks at some more recent developments in IT; specifically process automation, artificial intelligence (AI), data visualisation and the internet of things.

Process automation

Process automation is the concept of processes being performed by machines rather than by humans. Machines can perform some repetitive processes, to a consistent standard, quickly and without errors, so are often better at performing these tasks than the human. Robotic process automation implies the use of computer software in the automation.

In manufacturing industries, robots are common, for example in car production lines, where they perform many of the assembly tasks. In services industries too, many processes are being automated, such as bank transactions being processed entirely without human involvement. Robots are even assisting in surgical procedures in hospitals.

Automation is not a new concept. The first completely automated industrial process was a flour mill, developed by Oliver Evans in 1785. Recent developments in computer technology are providing scope for greater automation. These developments include better hardware and software, and developments such as artificial intelligence described below.

A report by the McKinsey Global Institute ¹ published in 2017 claims that in the global economy, 49% of the tasks that are currently performed by humans could be automated using technology that already exists. Only 5% of occupations could be

fully automated, but at least 30% of the activities performed could be automated in 60% of jobs.

From a global perspective, Mckinsey see automation as leading to greater productivity and higher economic growth. They predict that since the jobs that are automated would be replaced by new types of employment, automation would not lead to higher unemployment. For businesses, the benefits of automation are not limited to labour savings. Benefits include 'greater throughput, higher quality, improved safety, reduced variability, a reduction in waste and higher customer satisfaction'.

How will automation impact on the work of the management accountant? The tasks most likely to be automated include the more basic accounting work such as the collection and processing of data. Many accounting software packages upload bank transactions from the bank's systems, and supplier invoices scanned by smart phones can be automatically booked. The work of the management accountant which can't be automated are the more advisory aspects of accounting – interpreting and analyzing information and providing recommendations. This reinforces the role of the management accountant as a consultant and advisor to organizations, in relation to strategy development, decision-making and value creation.

Artificial intelligence (AI) and machine learning

Artificial intelligence (AI) can be defined as 'The ability of machines to exhibit human like capabilities in areas related to thinking, understanding, reasoning, learning or perception' TURLP. ² What this essentially means is machines that can think for themselves, like humans. Science fiction films provide many exciting examples of intelligent machines, such as C-3PO in the Star Wars films, but these do not yet exist in the real world.

Computer scientists talk about two levels of AI – weak and strong. Weak AI means that machines can think for themselves, but only to the extent of doing specific tasks, for example cars that can drive themselves. Strong AI means that machines have a general level of intelligence and can think like humans. Strong AI currently only exists in sci-fi fantasy, but weak AI is an area that is developing very quickly and has innumerable applications to business and society in general.

Early applications of AI included expert systems. Computers were programmed to make decisions that previously experts had made, such as giving quotations for car insurance. Relevant information about applicants, such as their age, gender and driving experience could be entered into a system, which would then evaluate their risk category and quote an appropriate premium, thus performing the role of an actuary. Other examples include systems which support doctors, whereby the doctor can enter information about the patient's symptoms, and the system will help to provide a diagnosis.

Expert systems can only make decisions based on rules that have been hard programmed into them by experts. Over time, their output for a given set of circumstances does not change, unless they are reprogrammed. With the advent of 'machine learning' machines can 'learn' from their experience, rather like humans do, and therefore provide more accurate output. Some accounting systems 'guess' where the debit side of a payment or the credit side of a receipt should be booked, based on what the bookkeeper did last time a similar receipt or payment arose.

Machine learning is used extensively in data analytics where computers performing the analysis learn more about the data population with experience. To take a simple example, imagine that we wanted to analyze all the companies on the stock exchange to predict which might go bankrupt within 12 months. We might programme a computer to calculate a score, such as Altman's Z-score model, and use this as the basis of our predictions. This is not AI as the computer is just doing what it is programmed to do. Unfortunately, the Altman Z-score model does not predict perfectly, sometimes classifying companies that are at risk of bankruptcy when they subsequently survive or failing to predict the bankruptcy of others. These errors are referred to as classification errors. Without machine learning, programming the computer to simply calculate z-scores would not reduce the probability of these errors.

Alternatively, we could programme a machine to analyze a sample of historic data and come up with its own version of the Z-score model. Machines can analyze much larger volumes of data than humans, so the machine would come up with a much more reliable version of the z-score, possibly incorporating many more variables than the five used in Altman's model. Here the machine is learning from the data, so this is AI. There would still be a probability of classification errors, but it is likely that this would be much lower than in the Altman model. What is more, the

machine would continuously update its model as it analyzed more and more companies. This demonstrates one use of AI, in classification of data.

There are several areas where artificial intelligence and machine learning are relevant to management accountants. Firstly, within data analytics, analysis that incorporates machine learning techniques can provide new insights to management. One of the roles of the management accountant has been to analyze data for the purposes of planning, decision making and cost control. For management accountants to remain relevant in this brave new world it is essential that they understand, and input into the AI which is being used in analysis.

AI can also be used for identifying unusual transactions that may help accountants to become better at detecting fraud. As fraudsters are continually developing new methods to practice their trade, machine learning provides an opportunity for accountants to keep up with them.

AI can also help accountants provide much more accurate forecasts, based on a more thorough analysis of the external environment, using machine learning to identify with greater accuracy the factors that will affect a business's revenues and costs.

Data visualization techniques

Data visualization refers to presenting data using visual techniques such as charts and diagrams so the story behind the data can be seen easily. As the old saying goes, a picture is worth 1,000 words. Providing information visually can assist decision makers to understand data much more quickly, providing that it is presented in a way that helps their understanding.

Charts and diagrams have been with us for hundreds of years, so there is nothing new in the concept of data visualization. A classic example is the map of the London Underground that was designed by Harry Beck in 1931. What has changed in recent years is the volume of data that is available for use by businesses, from devices such as smart phones, smart devices on the 'internet of things', the explosion of social media, and the use of sophisticated data analytic techniques to assist in analyzing all of this data. There is also increased demand from management for analysis of this data.

New technology has also become available to help perform data visualization. Market leaders are **Microsoft Power BI**, **Tableau** and **Qlik**. Such packages enable users to access data from many different platforms and provide reports that update in real time. They help users provide many different types of visualization using built in templates with high quality graphics.

From a practical point of view, businesses need to consider where the data for the reports comes from. It is important that the data can be extracted easily, particularly where it comes from several sources. It may be necessary to have a **data warehouse** where the data from different sources is deposited. The data can then be cleaned if necessary. The reports would extract the data from the data warehouse rather than from the original sources.

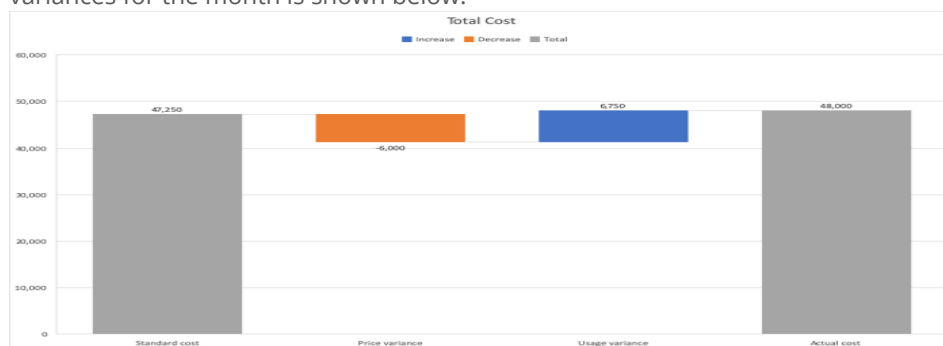
Common types of data visualization techniques are as follows:

Dashboards

Dashboards contain summarized information, typically by showing a small number of key performance indicators. **They allow managers to see the big picture quickly, focusing on the critical success factors**. They may also include drill down facilities whereby managers can click on the number in the dashboard to see more detailed analysis. This can give managers the ability to answer some of their own questions.

Waterfall charts

Waterfall charts, **also referred to as bridges**, can be used to show the components that make up a total. The components are shown as bars, where the length of the bars represents the value of the component. It will also show whether the components increase or decrease the total. A simple waterfall chart showing variances for the month is shown below:



Mapping charts

These present data geographically, for example, countries or regions can be clicked on and drilled into to find information specific to those areas.

Traditional methods of presenting information, such as tables, heatmaps, line, bar and pie charts are also ways to visualize information.

When users have information presented visually it can focus attention and allow outliers and trends to be identified more easily than if someone was looking a large spreadsheet of data.

The internet of things

The internet of things refers to the devices that are connected to the internet and which continuously send information. Examples include smart phones, smart speakers, exercise watches and machine control devices. Many homes have smart switches that enable homeowners to control the lighting and heating in their homes remotely.

Machinery can be fitted with sensors that enable maintenance departments to monitor their performance, which can enable faults to be identified earlier, before they become more serious. Other useful information such as the temperature of fridges in supermarkets can also be monitored in this way.

The relevance of the internet of things to management accountants is that it provides huge amounts of data that can be analyzed and is therefore another source of potentially useful information to management. Businesses can collect information about the behavior of their customers from devices such as smart phones and analyze this information to provide additional insights that can be used in many ways (see the articles on Big Data).

Ethical issues

There are ethical issues related to these developments. In particular, these developments enable businesses to find out more information about individuals and this threatens privacy and can even lead to harm. Governments and policymakers are trying to regulate this with laws such as the Data Protection

Regulation (GDPR) issued by the EU in 2018 that updated existing laws in member states.

Keeping up to date

Technology is a fast-moving industry, and it is important that you are aware of new developments and trends. Good sources of information are reports and briefings issued by Accounting Institutes such as ACCA, and accounting and consulting firms. There are also some interesting channels on YouTube, such as 'Crash Course Computer Science' that provide a layman's guide to complex technology developments.

References

1. 'A future that works: Automation, Employment, and Productivity' (executive summary), Mckinsey Global Institute, January 2017
2. '[Machine learning: more science than fiction](#)', ACCA, 2019

Machine learning offers new opportunities, but with power comes responsibility - ethical considerations cannot be ignored.

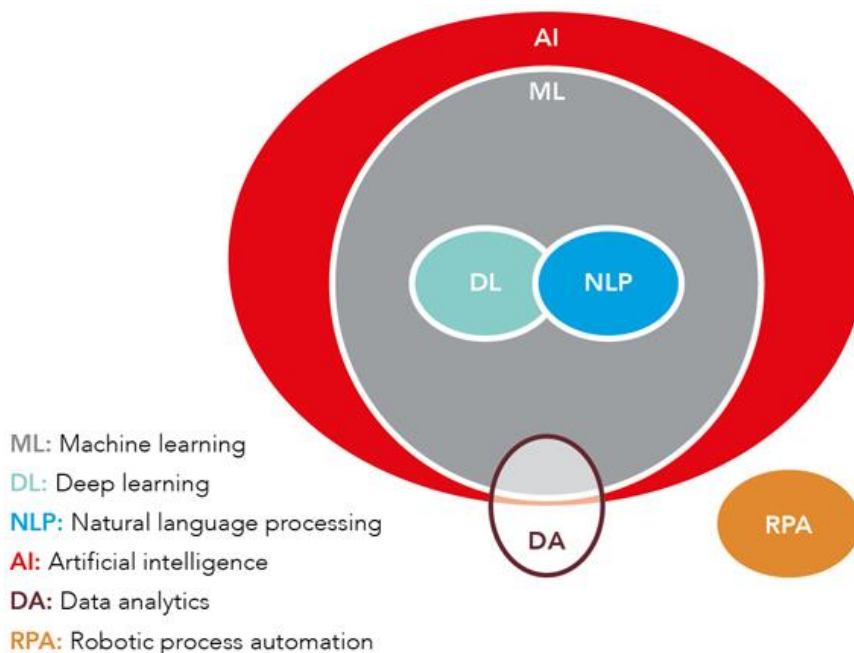
A video summary of the web article.

[Watch the video in a new window](#)

Machine learning (ML) is a sub-set of artificial intelligence (AI). It is generally understood as the ability of the system to make predictions or draw conclusions based on the analysis of a large historical data set.

The exponential increase in the availability of data, and unprecedented computing power for processing this data, have contributed to moving AI from fiction to fact.

AI means a lot of different things to different people and a wide range of terms are usually involved when talking about it. Broadly speaking, there are two levels of AI – specific/weak and general. Most business applications involving machine learning refer to weak AI. In order to make sense of the AI landscape, it can be helpful to learn what the different terms refer to.



ML is being increasingly used in accounting software and business process applications. And as a finance professional it is important to develop an appreciation of all this.

Ethical considerations

Professional accountants need to consider, and appropriately manage, potential ethical compromises that may result from decision making by an algorithm. They must remain engaged in AI and its component parts, including machine learning.

The ethical challenges posed by ML are explored in this section by focusing on five areas:

- Dealing with bias
- Strategic view of data
- Assigning accountability
- Looking beyond the hype
- Acting in the public interest

Skills in a machine learning environment

The ability of AI to take over jobs is a narrative often recited in the media. And there is certainly some truth about the ability of these technologies to do a variety of tasks more efficiently.

But even sophisticated technology such as AI struggles to replicate the full contextual understanding and integrated thinking of which humans are capable.

Now is a good time to start building greater knowledge and awareness in this area. The technology has moved beyond unrealistic fantasy to real business applications. Some will embrace it. Others will fear it. But only the reckless will avoid finding out more about it.

BIG DATA

What is big data?

There are many definitions of the term 'big data' but most suggest something like the following:

'Extremely large collections of data (data sets) that may be analyzed to reveal patterns, trends, and associations, especially relating to human behavior and interactions.'

In addition, many definitions also state that the data sets are so large that conventional methods of storing and processing the data will not work.

Sources of big data

Main sources of big data can be grouped under the headings of social (human), machine (sensor) and transactional.

Social (human) – this source is becoming more and more relevant to organizations. This source includes all social media posts, videos posted etc.

Machine (sensor) – this data comes from what can be measured by the equipment used.

Transactional – this comes from the transactions which are undertaken by the organization. This is perhaps the most traditional of the sources.

Characteristics of big data

The characteristics of big data, known as the 5Vs, are:

- Volume
- Variety
- Velocity
- Veracity
- Value

These characteristics have been generally adopted as the essential qualities of big data.

Volume

The volume of big data held by large companies such as Walmart (supermarkets), Apple and EBay is measured in multiple petabytes. A typical disc on a personal computer (PC) holds a gigabyte, so the big data depositories of these companies hold at least the data that could typically be held on 1 million PCs, perhaps even 10 to 20 million PCs.

The scale of this is difficult to comprehend. It is probably more useful to consider the types of data that large companies will typically store.

Retailers

Via loyalty cards being swiped at checkouts: details of all purchases you make, when, where, how you pay, use of coupons.

Via websites: every product you have ever looked at, every page you have visited, every product you have ever bought.

Social media (such as Facebook and Twitter)

Friends and contacts, postings made, your location when postings are made, photographs (that can be scanned for identification), any other data you might choose to reveal to the universe.

Mobile phone companies

Numbers you ring, texts you send (which can be automatically scanned for key words), every location your phone has ever been whilst switched on (to an accuracy of a few meters), your browsing habits and voice mails.

Internet providers and browser providers

Every site and every page you visit. Information about all downloads and all emails (again these are routinely scanned to provide insights into your interests). Search terms which you enter.

Banking systems

Every receipt, payment, credit card information (amount, date, retailer, location), location of ATM machines used.

Variety

Some of the variety of information can be seen from the examples listed above. In particular, the following types of information are held:

- Browsing activities: sites, pages visited, membership of sites, downloads, searches
- Financial transactions
- Interests
- Buying habits
- Reaction to advertisements on the internet or to advertising emails
- Geographical information
- Information about social and business contacts
- Text
- Numerical information
- Graphical information (such as photographs)
- Oral information (such as voice mails)
- Technical information, such as jet engine vibration and temperature analysis

This data can be both structured and unstructured:

Structured data: this data is stored within defined fields (numerical, text, date etc) often with defined lengths, within a defined record, in a file of similar records. Structured data requires a model of the types and format of business data that will be recorded and how the data will be stored, processed and accessed. This is called a data model. Designing the model defines and limits the data which can be collected and stored, and the processing that can be performed on it.

An example of structured data is found in banking systems, which record the receipts and payments from your current account: date, amount, receipt/payment, short explanations such as payee or source of the money.

Structured data is easily accessible by well-established database structured query languages.

Unstructured data: refers to information that does not have a pre-defined data-model. It comes in all shapes and sizes and it is this variety and irregularity which makes it difficult to store in a way that will allow it to be analyzed, searched or otherwise used. An often quoted statistic is that 80% of business data is unstructured, residing in word processor documents, spreadsheets, PowerPoint files, audio, video, social media interactions and map data.

Here is an example of unstructured data and an example of its use in a retail environment:

You enter a large store and have your mobile phone with you. That allows your movement round the store to be tracked. The store might or might not know who you are (depending on whether it knows your mobile phone number). The store can record what departments you visit, and how long you spend in each. Security cameras in the ceiling match up your image with the phone, so now they know what you look like and would be able to recognize you on future visits. You pass near a particular product and previous records show that you had looked at that product before, so a text message can be sent perhaps reminding you about it, or advertising a 10% price reduction. Perhaps the store has a marketing campaign that states that it will never be undersold, so when you pass near products you might be making a price comparison and the store has to check prices on other stores websites and message you with a new price. If you buy the product then the store might have

further marketing opportunities for related products and consumables and this data has to be recorded also. You pay with an affinity credit card (a card with associations with another organizations such as a charity or an airline), so now the store has some insight into your interests. Perhaps you buy several products, and the store will want to discover if these items are generally bought together.

So just walking round a store can generate a vast quantity of data which will be very different in size and nature for every individual.

Velocity

Information must be provided quickly enough to be of use in decision-making and performance management. For example, in the above store scenario, there would be little use in obtaining the price-comparison information and texting customers once they had left the store. If facial recognition is going to be used by shops and hotels, it has to be more or less instant so that guests can be welcomed by name.

You will understand that the volume and variety conspire against velocity and, so, methods have to be found to process huge quantities of non-uniform, awkward data in real-time.

Veracity

Veracity means accuracy and truthfulness and relates to the quality of the data. In the context of big data, for any analysis to provide useful findings for decision making, the data collected must be true. To assess how true the data collected is, companies must consider not only how accurate or reliable a data set might be but also how trusted is the source of the data. Companies must be able to trust the source of the data being collected and be confident that the data is reliable and accurate if they are to base important, and often costly decisions on the findings of its analysis.

The difficulty that companies face here is that by its very nature, the data collected comes from many different sources. Some will be more trustworthy than others. For example machine and transactional sourced data would be seen as more reliable than human sourced data. Data from transactional and machine sources would be easier to verify and less easy to manipulate. Human data, for example from social

media, however can be more easily manipulated and care must be taken when using this type of data, particularly given the recent increase in so called 'fake news' and growing reports of deliberately manipulated customer reviews on retail sites.

Veracity also ties in to velocity. To be useful in decision making, data needs to be analyzed as soon as possible. Velocity shows that the data being collected changes quickly. Analyzing out of date data could lead to poor decision making.

Value

The last V of big data (although some models have added more) is Value. There is little point in going to the effort and expense of gathering and analyzing the data if this does not ultimately result in adding value to the company. It is important for companies to consider the potential of big data analytics and the value it could create if gathered, analyzed and used wisely.

An example of how data analysis was used by British supermarket group Tesco to add value:

Tesco has operations in several countries around the world. In Ireland, the company developed a system to analyze the temperature of its in-store refrigerators. Sensors were placed in the fridges that measured the temperature every three seconds and sent the information over the internet to a central data warehouse. Analysis of this data allowed the company to identify units that were operating at incorrect temperatures. The company discovered that a number of fridges were operating at temperatures below the -21°C to -23°C recommended. This was clearly costing the company in terms of wasted energy. Having this information allowed the company to correct the temperature of the fridges. Given that the company was spending €10 million per year on fridge cooling costs in Ireland, an expected 20% reduction in these costs was a significant saving.

The system also allowed the engineers to monitor the performance of the fridges remotely. When they identified that a particular unit was malfunctioning, they could analyze the problem then visit the store with the right parts and replace them. Previously the fridges would only be fixed when a problem had been discovered by the store manager, which would usually be when the problem had developed into something more major. The engineers would have to visit the store, identify the problem, and then make a second visit to the store with the required parts.

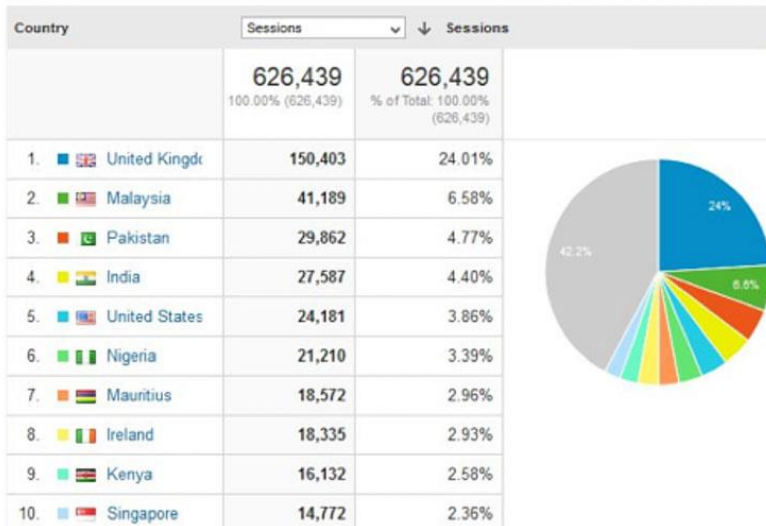
Processing and analyzing big data

The processing of big data is generally known as big data **analytics** and includes:

- Data mining: analyzing data to identify patterns and establish relationships such as associations (where several events are connected), sequences (where one event leads to another) and correlations.
- Predictive analytics: a type of data mining which aims to predict future events. For example, the chance of someone being persuaded to upgrade a flight.
- Text analytics: scanning text such as emails and word processing documents to extract useful information. It could simply be looking for keywords that indicate an interest in a product or place.
- Voice analytics: as above but with audio.
- Statistical analytics: used to identify trends, correlations and changes in behavior.

Google provides website owners with Google Analytics that will track many features of website traffic. For example, the website OpenTuition.com provides free ACCA study resources. Google analytics reports statistics such as the following:

GEOGRAPHICAL DISTRIBUTION OF USERS



TYPE OF BROWSER USED

		% of Total: 100.00% (626,439)
<input type="checkbox"/>	1. Chrome	300,165 (47.92%)
<input type="checkbox"/>	2. Safari	96,107 (15.34%)
<input type="checkbox"/>	3. Internet Explorer	82,165 (13.12%)
<input type="checkbox"/>	4. Firefox	70,411 (11.24%)
<input type="checkbox"/>	5. Android Browser	21,429 (3.42%)
<input type="checkbox"/>	6. Opera Mini	19,095 (3.05%)
<input type="checkbox"/>	7. Opera	7,674 (1.23%)
<input type="checkbox"/>	8. WeSEE_Bot:we_help_monitize_your_site	7,041 (1.12%)
<input type="checkbox"/>	9. UC Browser	6,122 (0.98%)
<input type="checkbox"/>	10. BlackBerry	4,264 (0.68%)

AGE OF USER

<input type="checkbox"/>	Age ?	Sessions ? ↓
		363,970 % of Total: 58.10% (626,439)
<input type="checkbox"/>	1. 25-34	170,225 (46.77%)
<input type="checkbox"/>	2. 18-24	102,618 (28.19%)
<input type="checkbox"/>	3. 35-44	56,652 (15.57%)
<input type="checkbox"/>	4. 45-54	22,648 (6.22%)
<input type="checkbox"/>	5. 55-64	8,318 (2.29%)
<input type="checkbox"/>	6. 65+	3,509 (0.96%)

The final table is instructive. OpenTuition.com does not ask for users' ages, so this data has been pieced together from other information available to Google. It has been able to do this for only about 58% of users.

These analytical findings can lead to:

- Better marketing
- Better customer service and relationship management
- Increased customer loyalty
- Increased competitive strength
- Increased operational efficiency
- The discovery of new sources of revenue.

The Big Data (DIKW) pyramid



The DIKW pyramid, also known as the knowledge pyramid became well known in 1989 from the work of Askoff. With the emergence of big data, the pyramid has also

become known as the big data pyramid. The work of Jennifer Rowley in 2007 explained the relationships between data, information, knowledge and wisdom.

Rowley explained the pyramid: 'Typically information is defined in terms of data, knowledge in terms of information, and wisdom in terms of knowledge.'

Data: a range of data can be collected from various sources – this is raw data and not particularly useful in this form.

Information: The raw data can be analyzed to look for trends or patterns, for example it may appear that there is a link between the purchase of a particular product and a particular group of customers. This is information.

Knowledge: The information can be analyzed further to establish how the identified links are connected. Knowing the details of exactly what types of customers buy a particular product or favor particular product features is knowledge.

Wisdom: The knowledge gathered can be used to make informed business decisions.

Example of how the pyramid could be used:

A soft drink manufacturer makes a range of fruity soft drinks in four different flavours (orange, apple, lime and pear). It has traditionally used plastic bottles but has recently run a trial whereby two flavours were also made available in glass bottles. It is making its plan for next year's production and is considering if it should expand the use of glass bottles.

Data: The company has collected a range of data from previous purchases, customer questionnaires, social media posts etc.

Information: The raw data was analyzed to look for trends or patterns. The company finds that there appears to be a link between the types of bottles purchased by different age groups.

Knowledge: Further analysis has shown that younger customers prefer the glass bottles while customers from the older age range prefer plastic bottles. Previous

analysis also showed that lime flavor is almost exclusively only purchased by older customers and pear is almost exclusively only purchased by younger customers.

Wisdom: How can this knowledge be used? The company should only produce lime flavor in plastic bottles and only produce pear flavor in glass bottles. Here, the company is using the insights gained in order to make a decision and therefore this is classed as wisdom.

Dangers/risks of big data

Despite the examples of the use of big data in commerce, particularly for marketing and customer relationship management, there are some potential dangers and drawbacks.

Cost: It is expensive to establish the hardware and analytical software needed, though these costs are continually falling.

Regulation: Some countries and cultures worry about the amount of information that is being collected and have passed laws governing its collection, storage and use. Breaking a law can have serious reputational and punitive consequences.

Loss and theft of data: Apart from the consequences arising from regulatory breaches as mentioned above, companies might find themselves open to civil legal action if data were stolen and individuals suffered as a consequence.

Incorrect data: If the data held is incorrect or out of date, incorrect conclusions are likely. Even if the data is correct, some correlations might be spurious leading to false positive results.

Updated article extracted from articles by Ken Garrett, a freelance lecturer and writer, and Nick Ryan, a lead tutor for performance management subjects

Big data refers to the large collections of data that may be analysed to reveal patterns, trends and associations, especially relating to human behaviour and

interactions. Big data has already been explained in another article ([Big data 1: What is big data?](#)). This article will describe some real life examples of the use of big data for performance management and measurement purposes.

Performance management involves managing the organization in order to ensure that it meets its objectives. Broadly, big data is relevant to performance management in the following ways:

- Gaining insights (eg about customers' preferences) which can then be used to improve marketing and sales, thus increasing profits and shareholders' wealth.
- Forecasting better (eg customer's future spending patterns, when machines will need replacing) so that more appropriate decisions can be made.
- Automating of high-level business processes (e.g., lawyers scanning documents) which can lead to organizations becoming more efficient.
- Providing more detailed and up to date performance measurement.

Examples of companies using big data

Netflix

Netflix began as a DVD mailing service and developed algorithms to help it to predict viewers' preferences and habits. Now it delivers films over the internet and can easily collect information about when movies are watched, how often films might be stopped and restarted, where they might be abandoned, and how users rate films. This allows Netflix to predict which films will be popular with which customers. It is also being used by Netflix to produce its own TV series, with much greater assurance that these will be hits.

Amazon

The world's leading e-retailer collects huge amounts of information about customers' preferences and habits which allow it to market very accurately to each customer. For example, it routinely makes recommendations to customers based on products previously purchased.

Airlines

Airlines know where you've flown, preferred seats, cabin class, when you fly, how often you search for a flight before booking, how susceptible you are to price reductions, probably which airline you might book with instead, whether you are returning with them but didn't fly out with them, whether car hire was purchased last time, what class of hotel you might book through their site, which routes are growing in popularity, seasonality of routes. They also know the profitability of each customer so that, for example, if a flight is cancelled, they can help the most valuable customers first.

This information allows airlines to design new routes and timings, match routes to planes and also to make individualized offers to each potential passenger.

Target

Target is a large discount retailer in the USA. There is an often-quoted story about their ability to predict when a customer is pregnant – frequently before the customer has informed her family. By looking at about 25 products it is claimed that they can create a pregnancy predictor. For example, early pregnancy often causes morning sickness; so, consumers would perhaps change to blander food and less perfumed shower gel. Why would Target be interested in knowing whether a consumer is pregnant? Well, that person will require different products during the pregnancy then in a few months the baby will have its own product needs: nappies, baby shampoo and clothes. Early identification of pregnancy can allow Target to establish the shopping habits of the mother and perhaps even the preferences of the child.

Walmart's Polaris search engine

Walmart is an American retailer that operates in 28 countries around the world. It is the world's largest company based on revenues. Many of Walmart's customers buy online through the company's website. Walmart wanted to make sure that customers can find what they are looking for on its website, so it developed its Polaris search engine. If customers are looking for a particular product, they enter the description in a search box, and the website displays products which meet that description.

What is unusual about Polaris is the way it ranks the search results. It attempts to show the products that the customer is most likely to buy towards the top of the list. The algorithm takes into account many factors, including the number of likes that the product has on social media networks and how many favorable reviews it has.

The system also uses artificial intelligence to learn so that it can continually provide better search results. If a phrase has been entered that the engine did not initially understand, for example, the engine can 'learn' what that phrase meant based on what the customer actually bought. Thus, the system was soon able to figure out that when a user entered 'House' into the search box, they were probably looking for merchandise connected with the TV series of that name, not furniture or other items for their house. If someone searches for 'Flats', the engine has learned that they probably want to buy shoes, not apartments or flat screen TVs.

The metric that is used to measure the success of the website is customer conversion rate – the number of customers that actually buy a product after a search. It is estimated that the Polaris search engine has increased the conversion rate by between 10% and 15%. That is worth billions of dollars in extra revenue.

Beredynamic

Beredynamic is a manufacturer of high-quality audio products such as microphones and headphones. The company is based in Germany but has a wide international sales and distribution network. The company wanted to improve its analysis of sales. Most ad hoc reports required data to be extracted from its legacy systems into a spreadsheet where the reports would then be manually compiled. This was time consuming, leading to delays in producing the reports. The reports themselves were not always accurate either.

The company developed a data warehouse that automatically extracts transactions from its existing ERP and financial accounting systems. The structure of this warehouse was carefully designed so that standard information is stored for each transaction such as product codes, country code, customer and region. This is supplemented by a web-based reporting solution that enables managers to create their own reports, both standard and ad hoc, based on the data held in the warehouse.

The system allows the company to perform detailed analysis of sales, which helps it to identify trends in different products or markets. This leads to two business advantages. The first is that the sales and distribution strategy can be changed when demand changes in certain markets – for example, when sales of gaming headphones began to increase in Japan, the company introduced promotions for all its gaming products in that country, including a large advertising campaign and introduction of product bundles specially for the Japanese market. The second advantage is that production plans can quickly be changed as demand changes. If demand is falling, production is slowed to ensure that the company is not left with excessive inventory. If demand is expanding, production is increased to take advantage of higher sales.

The ability to provide more detailed analysis quickly can also be used for performance measurement and appraisal, for example, comparing actual sales with targets by region, assessing whether a promotion achieved the expected increase in profits. Such reports can be produced quickly based on real time data, meaning that management can respond quickly to any adverse variances.

The success of the new system is measured in terms of the growth in revenues and profits. While this seems simple, it has to be recognized that some growth would have been expected even if the system had not been implemented, so determining how much revenue growth has resulted from the greater analysis can be difficult. Assumptions need to be made.

Morton's Steak House

A customer jokingly tweeted US chain Morton's and requested that dinner be sent to the Newark airport where he was due to arrive late. Morton's saw the tweet, realized he was a regular customer, pulled up information on what he typically ordered, figured out which flight he was on and then sent a waiter to meet him at the airport and serve him dinner.

Clearly this action was a publicity stunt which the restaurant hoped that their customer would publicize in future tweets. What it demonstrates is how easy it was for Morton's to identify the customer who sent the tweet, and to ascertain what his favorite meal was. It also shows how companies like to influence social media users who have a large following as a means of increasing their own publicity.

It is difficult to measure the impact of interventions into social media. No doubt the happy customer would have communicated this story, and this may have improved the reputation of the restaurant, but it is very difficult to measure the impact of this on sales.

Conclusion

The cases above have shown how detailed analysis of data can be used in a number of different ways to improve the performance of an organisation. Big data can be used to understand customers and trends better, to provide insights into costs, and to make it easier for customers to find what they want on the website. Companies are likely to continue to identify innovative uses of the increasing volumes of data available to them, and analysis of big data is likely to grow in importance as an important strategic tool for many businesses.

Updated article extracted from articles by Ken Garrett, a freelance lecturer and writer, and Nick Ryan, a lead tutor for performance management subjects

DATA ANALYTICS AND THE ROLE OF MANAGEMENT ACCOUNTANT

We are living through the digital revolution where the traditional business landscape is being pushed aside by internet-based companies. Large well established retail businesses are going into bankruptcy as consumers switch to buying online. Businesses use the internet to connect with new suppliers offering better prices and quicker delivery times. Many service businesses no longer have a physical high street presence but use their websites as their shop window.

This article describes performance metrics that are used by internet-based businesses and, in particular, looks at some of the metrics available in Google Analytics, the most widely used analytics tools for website traffic.

Performance management in e-commerce

In the world of e-commerce, the focus of performance management is on measuring the online experience, and focuses on the following facets:

- **Customer acquisition:** getting visitors to the company's website and converting those visits into sales.
- **Customer retention:** persuading first time customers return again. According to Reicheld and Schefter, retaining 5% more customers can increase profits by between 25% and 95%. This is due to the fact that better established customers usually buy more and are a valuable source of referrals.
- **Customer extension:** Selling additional goods or services to existing customers.

Much of the information needed to evaluate performance in these areas can be gained by recording data about visitors to the businesses website.

Google Analytics

Google analytics provides website owners with a range of information and analysis about website visitors. Users of Google Analytics install a tracking code on their website. When users visit the website, the tracking code is activated on the visitors' browser. This collects information about the visitor and their visit, which is collected by Google Analytics and used as a basis of the analysis. A weakness of this process is that visitors may use Ad blockers in their web browser that stop the tracking code from working, so information is not collected about all visitors.

The programme provides a large amount of standard data and analyses, and users can also customise it to provide their own reports or metrics. This article looks at the highlights of Google Analytics. Readers are encouraged to visit the Google Analytics website (2) and view the demonstration reports.

Audience reports

Audience reports provide information about the visitors to the site. The high-level overview report includes the percentage of visitors that are new, their location and language. This can be useful marketing information, for example to identify whether a marketing campaign in a particular territory was useful, or identifying territories where interest in the company's products appears to be growing. Analysis of visitors as new or returning enables businesses to measure customer retention rates.

In addition to this a host of demographic information, such as age of users, gender and even their interests are produced. This information is most useful when combined with other information such as visitor behaviour (see below). Marketers may be interested: for example, not only about what percentage of their visitors fall into a particular demographic group, but also what percentage of that group actually make a transaction (the conversion rate) when they visit the website. Google Analytics allows data from these different 'dimensions' to be combined in reports.

Such marketing data is invaluable as it enables the company to identify much more accurately what their target market segments are, and to monitor the success of new products or marketing campaigns aimed at such groups.

Acquisition reports

Acquisition reports show how visitors arrived at the website, and provide information about the effectiveness of the different channels that the company uses to attract visitors. Organic visitors are those who came to the website via a web search engine, such as Google, Bing or Ask.com. An important element of e-marketing is search engine optimisation (SEO), which involves strategies to ensure that the businesses website comes near the top of the list when users do a particular search. A small accounting practice for example, would want its website to be visible in search results for 'accountants near me' or 'tax advice' or any other key words that are appropriate to that business. The number of organic users gives an indication of how effective SEO strategies are.

Other visitor types include **direct**, which refers to visitors who simply typed the website address into their browser. Referrals and affiliates are visitors who arrived

at the website by clicking on an advert on another website. When viewing the high level reports, users can drill down to more detailed analysis of each of these, such as an analysis of visitors by search engine or by advert type.

While the acquisition reports show how many visitors each channel has attracted to the website, they do not provide information about the quality of the visitors. Visitors who are simply surfing the web with no intention of buying are obviously much less useful than visitors who place regular orders for the website's products.

Statistics about visitors' numbers may also be distorted by bots and spider programmes. These are programmes that scan web pages, 'reading' websites to find out what the content is of the web pages. The Google search engine uses bots to identify content in web pages which is then used by the search engine to help users find relevant pages.

Behaviour reports

Behaviour reports analyse what visitors actually do while on the website. This provides feedback to the designers of the site about how well it encourages users to engage with the site, and ultimately to achieve a goal, such as contacting the company or buying a product or service from the website.

A prominent statistic in behaviour reports is the 'bounce rate'. This is the portion of users who land on the website, but do not interact further. They may move onto another website, or remain inactive. A high bounce rate is often seen as a sign of poor performance, as it means that the website has failed to engage users. However, some information websites may not require users to interact – users may open the home page and see the information they need straight away, and not interact further, in which case they would be included as a bounce, but the business would be happy with the visit.

The conversion rate is a key statistic on an e-commerce website, and measures the portion of visitors that buy something from the site during their visit. A low conversion rate might suggest, among other things, that the prices are too high, the selection of products available is poor, or that the presentation on the website is poor, meaning that visitors are not tempted to transact.

Behaviour flow shows how visitors progressed through the website. Which page was the landing page? What pages did users progress to from the landing page? How many people 'dropped off' after the landing page, or each subsequent page? The drop off rate indicates how good a particular page is at maintaining the interest of the visitors. A high **drop off rate** might suggest that visitors' interest was not maintained, or perhaps links to other pages were not displayed prominently enough, or did not actually work.

Impact on the role of the management accountant

Traditionally, business managers relied on management accounts to enable them to monitor the performance of their business and plan for the future. Much of the information provided by management accountants was financial in nature, and focused on improving efficiency so that costs could be reduced. For an online business, the focus of management attention is on customer acquisition and costs. Information provided by the likes of Google Analytics is likely to be considered far more relevant than tools such as variance analysis. Data analytics are usually updated in real time – all a manager needs to do is log in and see up to the minute information.

Large organisations will utilise the services of data experts; data scientists who have advanced data mining skills and the ability to create predictive algorithms. This is a highly specialised field and the determination of the inputs and the translation of the outputs from this area are vital. Management accountants are in the ideal position to determine the data needs to support an organisation as they have a holistic view of the organisation and its existing information systems. It is essential to establish what areas an organisation should be monitoring to direct the focus of the data experts.

The first implication for management accountants is that they must be aware of metrics such as those included in Google Analytics and be able to explain and interpret them. Knowledge of big data analytics and website analytics should be considered a key skill for any accountant.

One traditional role of management accountants has been to interpret and explain data, having the ability to see the big picture, and communicate this to senior managers. This role is just as relevant today as it was in the past, so management accountants have to be able to understand the data analytics, and be able to

communicate that. Management accountants should have the business knowledge and commercial acumen to interpret the results of data analytics in order to provide meaningful commercial analysis and supply recommendations.

While managers may wish to focus on acquisition and retention of customers, ultimately those customers must lead to profits, so management accountants will still have a role in evaluating the overall financial performance of the business. Controlling costs is also as important today as it has always been. Management accountants will have a role in calculating profits per product, or profits per customer, controlling the marketing spend and looking for evidence of return on marketing expenditure.

Management accountants will use data analytics to support value creation, which can be through increasing efficiency, improving profitability and cash flow but also through customer management, innovation and intellectual property. All of this data is not just about focusing on new opportunities which can be targeted but also about internal drivers of value. Examples of activities where management accountants can utilise data analytics (depending on the size and scope of the organisation, could be inventory management, production planning, error rates, quality assurance, logistics, market segmentation, price optimisation, resource management and so on.

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Common mistakes and misconceptions in the use of numerical data used for performance measurement

This article considers the following learning outcome of the Advanced Performance Management syllabus: 'Advise on the common mistakes and misconceptions in the use of numerical data used for performance measurement'.

The APM syllabus contains the learning outcome:

'Advise on the common mistakes and misconceptions in the use of numerical data used for performance measurement'.

The mistakes and misconceptions can be divided into two causes:

- The quality of the data: what measures have been chosen and how has the data been collected?

- How has the data been processed and presented to allow valid conclusions to be drawn?

Inevitably, these two causes overlap because the nature of the data collected will influence both processing and presentation.

The collection and choice of data

What to measure?

What data to measure is the first decision and the first place where wrong conclusions can be either innocently or deliberately generated. For example:

- A company boasts about impressive revenue increases but downplays or ignores disappointing profits.
- A manager wishing to promote one of two mutually exclusive projects might concentrate on its impressive IRR whilst glossing over which project has the higher NPV.
- An investment company with 20 different funds advertises only the five most successful ones.

Not only might inappropriate amounts be measured, but they might be deliberately undefined. For example, a marketing manager in a consumer products company might report that the company's new toothbrush is reported by users to be 20% better.

But what's meant by that statement? What is 'better'? Even if that quality could be defined, is the toothbrush 20% better than, for example, using nothing, competitors' products, the company's previous products, or better than using a tree twig?

Another potential ruse is to confuse readers with relative and absolute changes. For example, you will occasionally read reports claiming something like eating a particular type of food will double your risk of getting a disease. Doubling sounds serious but what if you were told that consumption would change your risk from 1

in 10m to 1 in 5m? For most people doubling the risk does not look quite so serious now. The event is still rare and the risk very low.

Similarly, if you were told that using a new material would halve the number of units rejected by quality control, you might be tempted to switch to using it. But if the rate of rejections is falling from 1 in 10,000 to 1 in 20,000, the switch does not look so convincing – although it would depend on the consequences of failure.

Sampling

Many statistical results depend on sampling. The characteristics of a sample of the population are measured and, based on those measurements, conclusions are drawn about the characteristics of the population. There are two potential problems:

1. For the conclusions to be valid, the sample must be representative of the population. This means that **random** sampling must be used so that every member of the population has an equal chance of being selected for the sample. Other sorts of sampling are liable to introduce **bias** so that some elements of the population are over or underrepresented so that false conclusions are drawn. For example, a marketing manager could sample customer satisfaction only at outlets known to be successful.
2. Complete certainty can only be obtained by looking at the whole population and there are dangers in relying on samples which are too small. It is possible to quantify these dangers and, in particular, you need to know information like to a 95% confidence level, average salaries are \$20,000 \pm 2,300. This means that, based on the sample, you are 95% confident (**the confidence level**) that the population's average salary is between \$17,700 and \$22,300 (**the confidence interval**). Of course, there is a 5% chance that the true average salary lies outside this range. **Conclusions based on samples are meaningless if confidence intervals and confidence levels are not supplied.**

The larger the sample the greater the reliance that can be placed on conclusions drawn. In general, the confidence interval is inversely proportional to the square size of the sample. So, to halve the confidence interval the sample size has to be increased four times – often a significant amount of work and expense.

Confidence interval & 1/sample size

More on small samples

Consider a company that has launched a new advert on television. The company knows that before the advert 50% of the population recognises its brand name. The marketing director is keen to show to the board that the advert has been effective in raising brand recognition to at least 60%. To support this contention a small survey has been quickly conducted by stopping 20 people at 'random' in the street and their brand recognition was tested. (Note that this methodology can introduce bias: which members of the population are out and about during the survey period? Which street was used? What are the views of people who refuse to be questioned?)

Even if the advert were completely ineffective, it can be shown that there is a 25% chance that at least 12 out of the 20 selected will recognise the brand. So, if the director didn't get a favourable answer in the first sample of 20, another small sample could be quickly organised. There is a good chance that by the time about four surveys have been carried out one of the results will show the improved recognition that the marketing director wants. It's rather like flipping a coin 20 times – you intuitively know that there is a good chance of getting an 8:12 split in the results. If instead of just 20 people being surveyed, 100 were asked, then the chance of getting a recognition rate of at least 60% would be only 1.8%. (Note: these results make use of the binomial distribution, which you do not need to be able to use.)

In general, small samples:

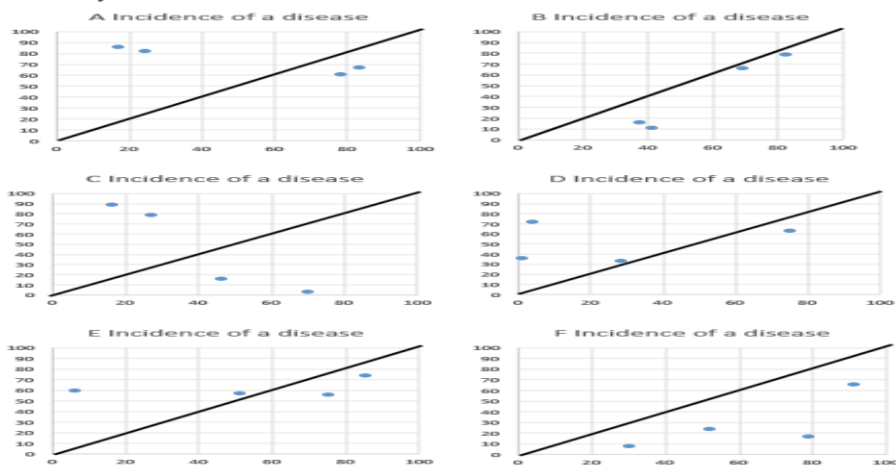
- Increase the chance that results are false positives
- Increase chance that important effects will be missed.

Always be suspicious of survey results that do not tell you how many items were in the sample.

Another example of a danger arising from small samples is that of seeing a pattern where there is none of any significance.

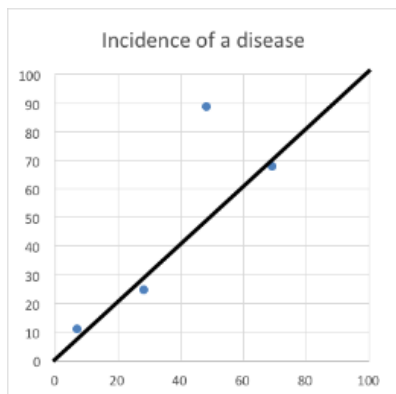
Imagine a small country of 100km x 100km. The population is evenly distributed and that four people will suffer from a specific disease. In the graphs below, the locations of the sufferers have been generated randomly using Excel and plotted on the 100 x 100 grid. These are actual results from six consecutive recalculations on the spreadsheet data and represent the six possible scenarios

Now imagine you are a researcher who believes that the disease might be caused high-speed trains. The dark diagonal line represents the railway track going through the country.



Have a look at the position of the dots (sick people) compared to the rail-tracks. If you wanted to see a clustering of disease close to the railway, you could probably do so in several of the charts. Yet the data has been generated randomly.

I didn't have to do many more recalculations before the following pattern emerged:



For people predisposed to believing what they want to believe, this graph is presenting them with a pattern they will interpret as conclusive evidence of the effect.

The problem is that if you are dealing with only four pieces of data then there is a good chance that they will often cluster around any given shape. The negative results such as seen in Graph C are easily dismissed and researchers concentrate on the patterns they want to see.

Now think about the following business propositions:

- A business receives very few complaints about its level of service, but in one year all complaints relate to one branch. Does that indicate that the branch is performing poorly or is it just an artefact of chance?
- In a year a business tenders for 1000 contracts but only three are won – all by the same sales team. Does that really mean that that sales team is fantastic or is it again simply the result of chance?

The processing and presentation of data

Averages

Almost certainly when you use the term 'average' you are referring to the arithmetic mean. This is calculated by adding up all results and dividing by the number of results. So, for example:

Person	Height (cm)
A	175
B	179
C	185
D	179
E	176
Total	894

So the arithmetic mean of these 5 people is $894/5 = 178.8$ and this feels as though it is a natural way to describe an important measurement about the data. However, as we will see below, it can lead you astray.

The arithmetic mean is one measure of the data's **location**. The other common measures are:

Mode: the most commonly occurring value. In the table above, the mode is 179. This measure would be more useful to you than the mean if you were a mobile phone manufacturer and needed to know customer preferences for phones of 8, 16, 32 or 64GB. You need to know the most popular.

Median: this is the value of the middle ranking item. So, for the data above arrange it in ascending order of height and find the height of the person at the mid-point.

Person	Height (cm)
A	175
E	176
B	179
D	179
C	185

So, the height of the mid-ranking person is 179 and this is the median

Unless the distribution of the data is completely symmetrical, the mean, mode and median will generally not have the same values. In particular, the arithmetic mean can be distorted by extreme values that give rise to its misinterpretation.

To demonstrate this, we will initially set up a theoretical symmetrical distribution of the annual income of a population:

Number of people (000)	10	20	30	40	50	40	30	20	10
------------------------	----	----	----	----	----	----	----	----	----

Annual income \$ 000	15	25	35	45	55	65	75	85	95
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The mean, median and mode are all \$55,000. If you earned that you would feel that you were on 'average' pay with as many people earning more than you as less than you.

Now let's say that into this population comes the founder of a hi-tech internet company called Martin Gutenberg who invented a social medium service. Mr. Gutenberg has a very high income – \$10m/year. The salary distribution now looks like:

Number of people (000)	10	20	30	40	50	40	30	20	10		M Gutenberg	1
------------------------	----	----	----	----	----	----	----	----	----	--	-------------	---

Annual income \$000	15	25	35	45	55	65	75	85	95		10,000
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The arithmetic mean of this distribution is \$55,400, so now earning only \$55,000 you feel that you are earning less than average. In fact, over 50% of the population is earning less than 'average' – something that at first glance would seem impossible.

This distortion could allow a government to claim that people are now better off because average earnings are higher. In fact, even if all the salary bands were reduced by 5%, the arithmetic mean including Gutenberg would be around \$55,380. So, the government could claim that on average the population is better off when, in fact, almost everyone is worse off.

In situations where the data is not symmetrical, the median value will often provide a more useful measure. The inclusion of Gutenberg does not change the median value and if everyone's income fell by 5%, so would the median.

Correlation

One of the most common misuses of data is to assume that good correlation

between two sets of data (ie they move closely together) implies causation (that one causes the other). This is an immensely seductive fallacy and one that needs to be constantly fought against.

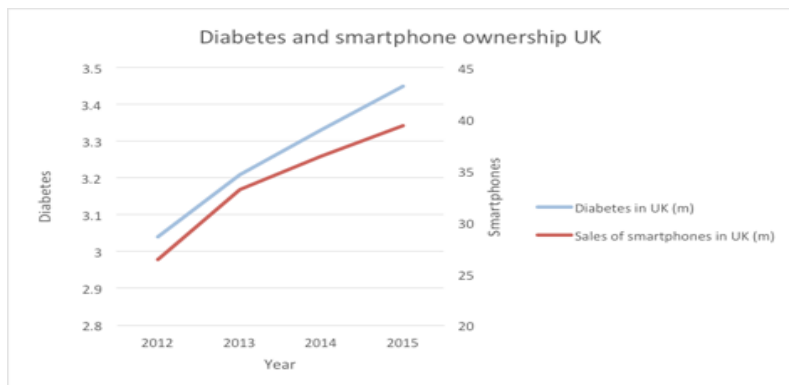
For example, consider this data set:

	Diabetes in UK ¹ (m)	Sales of smartphones in UK ² (m)
2012	3.04	26.4
2013	3.21	33.2
2014	3.33	36.4
2015	3.45	39.4

1 Diabetes UK

2 Statista/eMarketer

On a graph the data looks like:



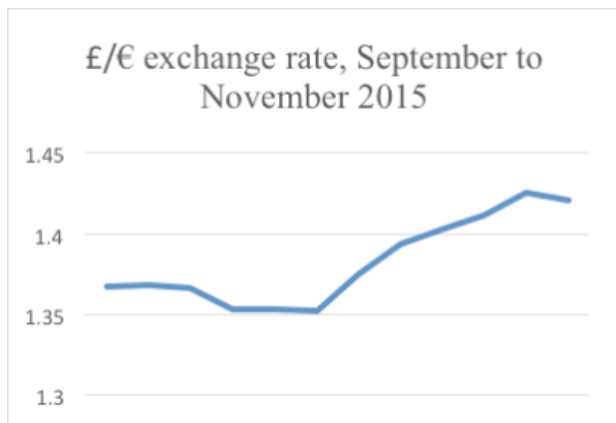
The two sets of data follow one another closely and indeed the coefficient of correlation between the variables is 0.99, meaning very close association.

It is unlikely that any of you believe that owning a smart phone causes diabetes or vice versa and you will easily prefer to believe that the high correlation is spurious. However, with other sets of data showing with high correlation it is easier to assume that there is causation. For example:

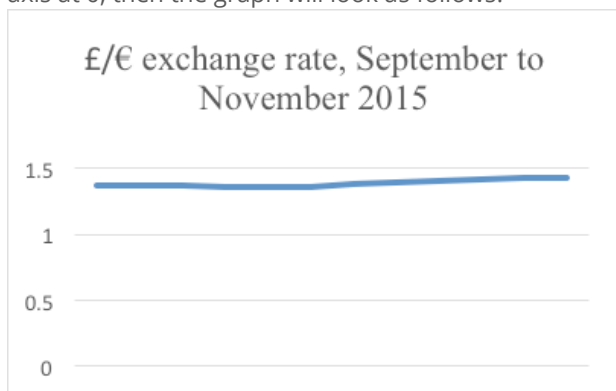
- Use of MMR vaccines and incidence of autism. Almost no doctors now accept there is any causal connection. In addition, the whole study was later discredited and the doctor responsible was struck off the UK medical register.
- Cigarette smoking and lung cancer. A causal effect is well-established, but it took more than correlation to do so.
- Concentration of CO₂ in the atmosphere and average global temperatures. Not universally accepted (but increasingly accepted).

Graphs and pictograms

Here's a graph of the £/€ exchange rate for September to October 2015. It seems to be quite a rollercoaster:



However, the effect has been magnified because the y axis starts at 1.3, not 0. The whole graph only stretches from 1.3 to 1.44. If the graph is redrawn starting the y axis at 0, then the graph will look as follows:



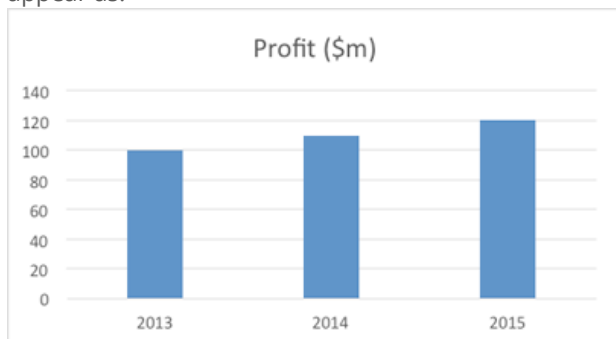
Not nearly so dramatic.

Note that a board of directors that wants to accentuate profit changes could easily make small increases look dramatic, simply by starting the y axis at a high value.

Pictograms are often used to make numerical results more striking and interesting. Look at the following set of results:

Year	Profit (\$m)
2013	100
2014	110
2015	120

The increase has been a relatively modest 10% per year and on a bar chart would appear as:



A pictogram could show this as:



Look at the first and last bag of money and think about how much you could fit into each. I would suggest the capacity of the third one looks at least 50% greater than the first one. That's because the linear dimensions have increased by 20%, but that means that the capacity has increased by $1.2^3 = 1.73$, flattering the results.

So it is important to consider how data is collected, processed and presented as it can be used to indicate that performance of an organisation is better or worse than it actually is.

Ken Garrett is a freelance lecturer and writer

Integrated reporting

Integrated reporting is included in the syllabus of many Strategic Professional exams. This article aims to show how the idea of integrated reporting is relevant to the APM syllabus.

Integrated reporting (IR) has been developed and promoted by the International Integrated Reporting Council (IIRC), a global coalition of regulators, investors, companies, standard setters, the accounting profession and non-governmental organisations. IR has been introduced to the syllabuses of many of the Professional level exams. This article aims to show how the idea of integrated reporting is relevant to the APM syllabus.

Relevance to APM

IR is focused on showing the connectivity of strategic objectives, risk and performance to demonstrate how organisations create value. This means that organisations need to understand and report on all areas of performance and not just focus on short-term financial results.

You will see that IR has many elements which easily relate to APM. The definitions of IR are:

- A concise communication of an organisation's strategy, governance and performance.
- Demonstrates the links between its financial performance and its wider social, environmental and economic context.
- Show how organisations create value over the short, medium and long term.

It is useful to imagine yourself investigating a company about which you know nothing to decide whether or not you want to invest in it. Going to the latest annual report and financial statements would probably be your starting point, but you will be left with many unanswered questions – certainly if the company shows the minimum information required by law and the accounting and financial reporting standards. You will learn relatively little about the company's business activities (though segmental reporting helps), their competitors, their future plans or how they intend to achieve sustainable competitive advantage. IR aims to fill the gaps so that existing or prospective investors better understand the company.

Think about the evolution of modern management accounting. A few decades ago management accounting was being criticised for being too internally and operationally focused. It was recognised that there was a need for management accounting to be useful for strategic decision-making and that management accountants should act essentially as business partners in organisations. The role of management accounting now is to assist in the analysis, formulation and monitoring and evaluation of strategy. It has a significant contribution to make in the validation of strategic plans and decisions.

APM is focused on how strategic objectives are linked to critical success factors and key performance indicators and how this is translated throughout an organisation. It encompasses the need to address risk, external influences, stakeholders, non-financial results, brand, etc. It addresses the importance of selecting the right performance management techniques, information systems, reporting functions to ensure performance is delivered at all levels and over the short and long-term.

The following IR Content Elements are particularly relevant to APM:

- Organisational overview and the external environment
- Opportunities and risks
- Strategy and resource allocation
- Business model
- Performance
- Future outlook

Let's add some detail and examples to these elements:

Organisational overview and the external environment

What does the organisation aim to do? Who are the major stakeholders? Where is it located? How is it structured? What external events will affect it most?

Fairly obviously the organisation's mission and objectives, stakeholder analysis, organisation chart and a PEST analysis would be relevant to this section of the IR.

Opportunities and risks

These must cover both internal and external matters. The traditional SWOT analysis usually categorises opportunities and threats (risks) as external, but it is essential to also look internally. A weakness (for example arising from gaps in new product development) is a risk to future revenues.

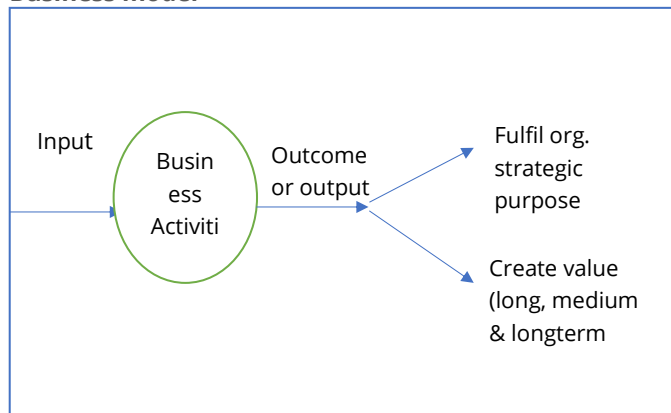
Similarly a strong brand name creates greater opportunities for future revenue streams. Historically, the board of companies would tend to emphasise a company's opportunities, but investors cannot make an informed decision about an investment without an appreciation of the associated risk. Some risks can be quantified (for example, by expected values and sensitivity analysis) but it is unlikely that quantified amounts would appear in an IR. A qualitative indication should be provided about both internal and external risks. The report should also mention how the risks are being managed and mitigated.

Strategy and resource allocation

Does the organisation intend to develop new products, set up new factories or expand to new markets? This section of the IR can make extensive use of Porter's models, BCG matrix and the value chain. It would be valuable to investors to be told

how their company is going to respond to these changes in the market, how much it might cost to achieve the new strategies and how this change will be managed effectively.

Business model



An organisation's business model is 'its system of transforming inputs, through its business activities, into outputs and outcomes that aims to fulfil the organisation's strategic purposes and create value over the short, medium and long term' (IIRC). Many of the performance management models are particularly relevant here: for example, the value chain explicitly sets out inputs, processes and outputs and requires organisations to understand how value is added so that profits can be made. If a company does not understand where it adds value then the company is existing in a temporary state of good fortune. It is making profits now, but does not understand why, so chance of continued success must low.

Inputs are the major inputs such as raw material or human resources. Outputs are the key products and services. The business activities include not just the manufacturing process, but also how the company innovates, carries out its marketing, what its after-sales services are, how it delivers its goods and how it acquires, trains and retains staff.

Business process re-engineering, value-based management, activity-based management are also all methods that can influence an organisation's business model.

Performance

This area of IR addresses how an organisation has performed against its strategy and what are its key outcomes. These outcomes can be internal or external – for example, revenue, cash flow, customer satisfaction, brand loyalty, environmental impacts, etc.

It is vital that the most appropriate performance indicators are chosen so that measurement of strategic goals is meaningful and that the value-adding activities of an organisation are identified and managed. It also recognises the importance of reporting on non-financial, qualitative results.

Future outlook

An integrated report should answer the question: What challenges and uncertainties is the organisation likely to encounter in pursuing its strategy, and what are the potential implications for its business model and future performance? (IIRC)

PEST and a five forces analysis are likely to be particularly relevant here. For example, if you were a stakeholder in a conventional television company you should want to know how the company will address challenges from internet-based companies such as Netflix.

Examples from ACCA's integrated report

Here are some relevant extracts from ACCA's Integrated Report 2013–14 (see 'Related links') demonstrating some of the reporting of the elements set out above. Remember, the IIRC guidelines are principles based and organisations can change element headings and groupings.

External environment

- We are seeing new economies and sectors emerging and developing at faster rates
- In the post-recession world, there is a greater demand for and understanding of the importance of financial stability as an underpinning for economic stability

- Consumers are more sophisticated and demanding, with an increasingly tech-savvy audience expecting a personalised and tailored experience
- The competitive environment is much broader, with more and different players and with technology enabling greater international competition

Risks [include]:

- **Market risks:** trade protectionism, global economic stagnation, loss of UK audit recognition.
- **Operational:** exam process issues, worldwide legislative complexity, pricing decisions, cybercrime and data protection.

The impact of each risk is assessed and mitigation measures are explained. For example, on cybercrime and data protection:

- **Impact:** Potential corruption or loss of organisational data which could lead to legal liability and reputational damage as more ACCA services are provided on-line
- **Mitigation:** ACCA's Information Security Officer monitors and advises on data security. Policies in place to address data security risks which are regularly reviewed, monitored and tested.

Business model

- **Key resources [include]:** market offices supported by global headquarters, people, partners, intellectual property and brand, suppliers, IT infrastructure, financial capital.
- **Key value-adding activities:** creating global networks, qualifying and regulating professional accountants to high standards, maintaining and developing a global brand that attracts students around the world, generating globally-relevant technical insight with public interest at its heart, digitally-enabled developments for an online, self-service world.
- **Key outputs [include]:** professional, ethical accountants, widespread recognition, best-in-class products and services.

- **Key outcomes [include]:** support and opportunities for members, joint initiatives, global mobility for our members, customer satisfaction.
- **Societal benefit:** Businesses in all sectors that are run efficiently and responsibly, that help grow economies sustainably and safeguard the interests of the public and society.

Conclusion

The inclusion of IR in the APM syllabus should not cause major difficulties for students. In many ways, it is corporate reporting catching up with the aspects of analysis and reporting which management accountants have been already been performing for internal, organisational use. Management accounting has, for many years, recognised that there's much more to appraising organisations than simply looking at their financial results.

Performance reports

The design of performance reports is regularly examined in the APM exam. This article aims to provide guidance on how to tackle this type of question.

The content and overall design of performance reports is regularly examined in the Advanced Performance Management (APM) exam. This article aims to provide guidance on how to tackle this type of question.

Examples of some recent exam questions are listed below (extracts from the exhibits to assist with context are in brackets after the main requirement):

- September/December 2019 Q1 (i): **the performance reporting at Arkaig** (In preparation for the next board meeting, the CEO needs an evaluation of the current report.) (11 marks)
- March 2020 Q1 (i): **Current performance reporting** (Therefore, the CEO wants a full evaluation of the current performance report) (15 marks)
- March/June 2021 Q1 (ii): **Whether the report addresses the company's objectives and the reports presentation** (assessing whether the current report addresses the company's objectives and briefly, any other issues in its presentation. (14 marks)

Of course, performance means different things to different organisations, there is certainly no single correct way of measuring or presenting performance. For example, profit-seeking organisations will certainly be interested in sales and profits, but charitable organisations have neither sales nor profit. Furthermore, even within a single organisation different aspects of performance may have to be examined in more detail at different times and for different audiences.

Mission and objectives

An organisation's mission and subsidiary aims/objectives should define its purpose, and any evaluation of a performance report must address the extent to which these are being measured and allow the organisation's executive to see if its mission etc. is being achieved.

March 2020 Q1 (Achilty) contained the following:

Achilty's mission is 'to deliver long-term returns to shareholders through a combination of sustainable growth in earnings per share and payment of cash dividends'. This mission will be achieved by the following subsidiary objectives:

- *Improving product ranges;*
- *Increasing the number of customers and their individual spend;*
- *Focusing on customer service; and*
- *Improving profitability by efficient cost control in purchasing and inventory management.*

Using the above exam question as an example, the first matter to consider is whether the performance report addresses the mission. It is useful here to determine if the mission has multiple parts, which is the case with Achilty. Its mission has two parts – sustainable growth in EPS and linked to that cash dividends, it is essential that each of the component parts is considered in turn, in terms of whether the performance report adequately measures each one.

Once the mission has been addressed, then each of the subsidiary aims need to be assessed. Once more the focus should be on whether the report measures each of these key areas effectively.

If the performance report does not address the mission and subsidiary aims effectively then this should be called out and a justified explanation provided as to what the organisation should do instead. The justification is key here as for example saying that 'the fourth subsidiary aim is only being measured through gross profit margin and there is nothing on inventory' would score one mark but if the answer said 'the fourth subsidiary aim is only being measured through gross profit margin and there is nothing on inventory which would be useful as it could measure how much obsolescence and inventory write offs were costing Achilty', this would score two marks.

General considerations and layout

The audience for performance reports will normally be the board of directors, managers, owners, government or, more generally, those charged with governance.

Care has to be taken to assess the appropriate level of detail, layout and terminology used in reports so that users will properly understand the information that is provided. It should be considered whether the report has too much or too little information. One of the most common criticisms of reports is that they present too much information and are much too cluttered. There might be valuable information there, but it is almost impossible to find and interpret it. There is

always the suspicion that large volumes of information have been deliberately provided to obfuscate the facts and to blunt the message.

In addition, the level of the information being reported should be considered – ie lots of operational details should not be necessary in a report which is for the board and ought to focus on strategic performance indicators.

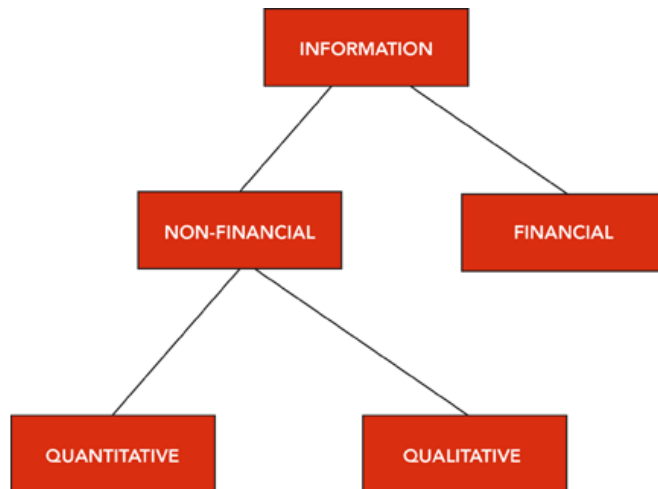
Layout must help users to understand the information presented and to quickly see the important amounts, trends, results, and explanations. Graphical displays can be used to greatly enhance performance information.

The inclusion of a narrative commentary explaining the information is also usually needed for drawing attention to important matters and explaining their significance or causes. For example, even something as simple as an adverse material price variance needs an explanation about what caused it. If no explanation is given it will simply mean that questions will be raised later. Explanations might be accepted or might be challenged, but simply to report a variance without stating how it might have arisen is not going to help the report's recipient at all.

As well as the evaluation of whether the report measures the mission and objectives, consideration should be given to whether any other important information is missing, for example, external benchmarks like competitor information, previous years for trend analysis and/or budget information. Again, though, if you are recommending the inclusion of this information, you must justify why it would be useful to the organisation in the question. It is insufficient to say 'include more external information like competitor information' without saying why. The why is absolutely vital for scoring marks.

Types of information

Information can be classified as follows:



Examples are:

- Financial: sales, profits, costs, GP%, return on capital employed.
- Non-financial quantitative: percentage of product rejects, volume of sales, number of complaints.
- Non-financial qualitative: reputation, effectiveness, customer satisfaction, staff morale, innovation.

The information provided must match the purpose of the performance report. In particular, non-financial performance is a very important determinant of the long-term success of any enterprise. For a business, short-term financial performance can often be improved by reducing quality, innovation, and training. However, a business pursuing these approaches is likely to suffer financially in the long term. It is not so much that a business is interested in making high quality products for their own sake, but if the business positions itself as a high-quality manufacturer, it must deliver high quality and, therefore, quality needs to be monitored. If the business were known as a 'cheap and cheerful' supplier, the measurement of quality would be much less important but costs per unit would become more important.

The need for non-financial information is more obvious in not-for profit organisations and, indeed, in those organisations non-financial performance is often an end in itself, rather than an enabler of profitability.

Non-financial qualitative information is likely to be as important as quantitative information but is harder to measure and present in reports. Technically, qualitative information is known as a 'construct', an attribute that cannot be measured directly. Examples of constructs are enthusiasm and empathy. Both are very important in business, but there is no direct way in which they can be measured. Usually, for communication, assessment, and comparative purposes an effort has to be made to try to turn qualitative information into quantified information. For example, in a hospital it would be important for patients to feel that they were treated sensitively and with dignity. Assuming management feels that these are important qualities, targets need to be set for them and performance assessed. Inevitably this will be done by setting up some type of numerical assessment system so that qualitative information becomes quantitative.

The transition from qualitative to quantitative can introduce distortions to the information. For example, does what is measured truly reflect what the undertaking organisation wants to assess? For example, in an effort to measure enthusiasm an organisation might measure when staff arrive in the morning. However, the person who always arrives early might simply be a victim of an hourly train service: arrive 40 minutes early or 20 minutes late.

Conclusion

When evaluating a performance report remember to:

- Assess whether it measures the components of the organisation's mission
- Assess whether it measures the subsidiary aims and objectives of the organisation
- Review its general content, level of detail and layout

This approach is key as it identifies the priority order to address the requirement and will help to keep your ideas in a structured order.

Also remember that as part of the evaluation do not be afraid to recommend changes or alternatives (unless told otherwise) but ensure these recommendations are justified as to why they should be considered.

Written by members of the APM examining team

Lean enterprises and lean information systems

This article considers Toyota's lean principles that have led to a new approach to management in many industries, with a focus on satisfying the needs of the customer, and not wasting time and money on activities that do not ultimately add value to the customer.

History of Lean

The term lean was first used by Womack, Jones and Roos to describe the Toyota Production system. It means far more than simply cutting costs, as the history of lean production shows.

In the early 20th century, American car manufacturers such as Ford and General Motors developed mass production systems. These allowed car manufacturers to produce thousands of identical cars, using standardised parts and components. The moving production line was introduced, where the car body moved along a conveyor belt, and at each stage, factory workers added components to it until the finished product came off the production line. The resulting economies of scale meant that the motor car became much more affordable to the average family.

In 1950, Eiji Toyoda, an engineer, and member of the family that started the Toyota Company, visited the Ford Rouge plant in Detroit. He studied the production techniques being used at Ford closely and on return to Japan discussed them with his production manager Taiichi Ohno. The two of them came to the conclusion that the methods used at Ford could not be copied directly at Toyota. Over the years, they made several innovations that we now refer to as lean:

1. More flexible production lines allowing smaller batch sizes
2. Greater involvement of employees
3. Elimination of non-value adding functions
4. Identifying the root causes of problems
5. Constructive relations with suppliers
6. Greater contact with customers

1. More flexible production lines

One feature of mass production was the difficult set up processes for the machinery. A particular machine might be used to make parts for several different cars. Setting up the machine to make a particular part was a difficult process requiring precision. If the set-up was not correct the parts being made would be useless. It often took two days to set up a machine, and skilled engineers were required to perform the task.

In the mass production factories, the solution to the long set-up process was to have long production runs, making hundreds or even thousands of a particular part before resetting the machine to make parts for a different model. Alternatively, a dedicated set of machines might be used for one particular car, meaning that once the initial set up had taken place, no further set ups were required.

In the early post-war years, Toyota was a small company producing for the domestic market. Demand was insufficient to allow the company the luxury of having long production runs when only a small number of units of each part were required. Toyota spent time investigating a quicker way of setting up the machines so that production could feasibly take place in small batch sizes. In some cases, such as the stamping machine, they managed to reduce set up times from typically one day to three minutes. What's more, the production line staff were trained to do the set-ups, so it was not necessary to employ engineers.

The small batch sizes meant that the volume of work in progress and the associated inventory holding costs were much lower; as soon as a part was made in one process, it was used in the next. An unintended advantage was also discovered; because parts from one process were used almost straightaway in the next, any defects were noticed very quickly. Thus, any faulty machine set-ups would be corrected before many bad units had been made.

A further advantage was that the factories became much more flexible, allowing a wider variety of products to be made. Having shorter set-up times allowed machines to be used to produce a greater variety of parts and, therefore, cars.

2. Greater involvement of employees

The motor industry is very cyclical. Workers in the mass production plants were well aware that their job might be lost in the next economic downturn. Not surprisingly staff had little motivation to do more than the minimum.

Staff at Toyota on the other hand were offered jobs for life – a guarantee that they would not be laid off during the next downturn. They were also provided with a steep career path, where promotion led to a high increase in salary. In return, employees at all levels would be expected to become involved in helping to continuously improve the operations.

The teams would be expected to have meetings periodically with the industrial engineers, to discuss ways to improve the production process. Toyota recognised that the assembly workers on the floor, far from being replaceable, were a great source of knowledge.

3. Elimination of non-value adding functions

In the mass production factories, the assembly workers were given very basic monotonous tasks to perform. The foremen who supervised the workers did not perform any assembly tasks. Engineers reset the machines, housekeepers cleaned the factory area, and so on. The assembly workers were treated with little respect and considered to be easily replaceable.

In Toyota, production was based on teams. All members of a team were highly trained, and could do all tasks – assembly, machine sets-ups, and cleaning the factory area. The team leader replaced the foreman, but unlike the foreman the team leader would perform assembly tasks as well as coordinating the team. This led to more motivated teams and ensured that no wages were wasted on indirect labour that did not add value to the final product.

4. Identifying the root cause of problems

In the production lines of Ford and General Motors, workers were required to perform their tasks at the right speed to avoid slowing the production line. Defects inevitably did occur, such as the discovery that a part was defective after it had

been assembled. The production line could not be stopped, however, and so the defective unit would continue its journey through the rest of the production line, with the defect becoming compounded. At the end of the line was a rectification department where faulty cars would be investigated and fixed. It was fairly typical that 20% to 25% of all cars produced would end up here.

In the Toyota factory, if a worker spotted a defect, he would pull a cord that would stop the production line, so the error could be fixed. Workers were then required to identify the cause of the error using a technique called 'the five whys'. The five whys approach involved firstly asking why the defect arose. Having identified the cause, then it was asking why the cause arose, and so on, thus drilling down to find the root cause that would then be fixed. Such errors were unlikely to arise again. These days, virtually no Toyota cars require reworking when they come off the production line.

5. Constructive relations with suppliers

The mass production approach to sourcing the various parts for the vehicles was to design the parts in-house. The majority of the parts would also be made in-house, while various suppliers who would be asked to bid to make the parts that could not be. Often, the lowest price suppliers would win the business. Suppliers would therefore be more interested in keeping their costs down than in helping the manufacturers to improve their products by offering the latest innovations.

Toyota did not design the parts, but would tell the suppliers what was needed – for example, a braking system that would stop a 1,000kg car that was moving at 100 kilometres per hour within 60 metres. The supplier would then be required to use their own expertise to design and produce such a system. Thus, Toyota could benefit from the expertise of their suppliers and save time on detailed design of all components needed.

Toyota would pay their suppliers a price that would enable them to make a fair profit, but would work with the suppliers to reduce costs using techniques such as target costing. Cost savings would then be shared by the two organisations.

In order to overcome the problem of coordinating the supply of parts from suppliers and avoiding over or under production, Ohno had the idea of the famous

'just in time' or 'pull' system. The idea of this was that a part would only be produced when an instruction was received from the next link in the supply chain. There would be no producing for inventory and no need for buffer inventory. The point of this was not only to reduce inventory levels and associated costs, but to put pressure on all parts of the supply chain to become more responsive to changes in demand.

Zero inventory is an ideal that has not been achieved in practice, even at Toyota. A small amount of inventory is still maintained, particularly in the final processes of the production line. This is to avoid failing to meet demand when there is a sudden spike. In spite of this, the principle of just in time leads to a more responsive supply chain focused on meeting the changing demands of customers quickly.

6. Contact with customers

The Western car manufacturers tended to sell through dealers, who would be pressured to buy a certain number of cars from the factory with their own finance. Toyota, on the other hand, had sales teams that sold directly to customers. Contact was maintained with customers with the object of ensuring product loyalty when the customer replaced their existing cars. Customer feedback was also fed back into the design process much more thoroughly than the Western manufacturers who typically relied on a small number of focus groups to establish what customers wanted.

Toyota's flexible approach to manufacturing enabled the company to produce a wider product range, and to design new models much quicker than the western car manufacturers. Womack *et al* reported that, in 1990, Toyota was producing as many different products as General Motors, even though at the time the company was half the size of GM.

In 2001, Toyota launched 'The Toyota Way', which aimed to take lean beyond its manufacturing and product development into all other areas of the business. Even after 60 years, lean is still evolving within Toyota.

Adoption of lean outside of Toyota

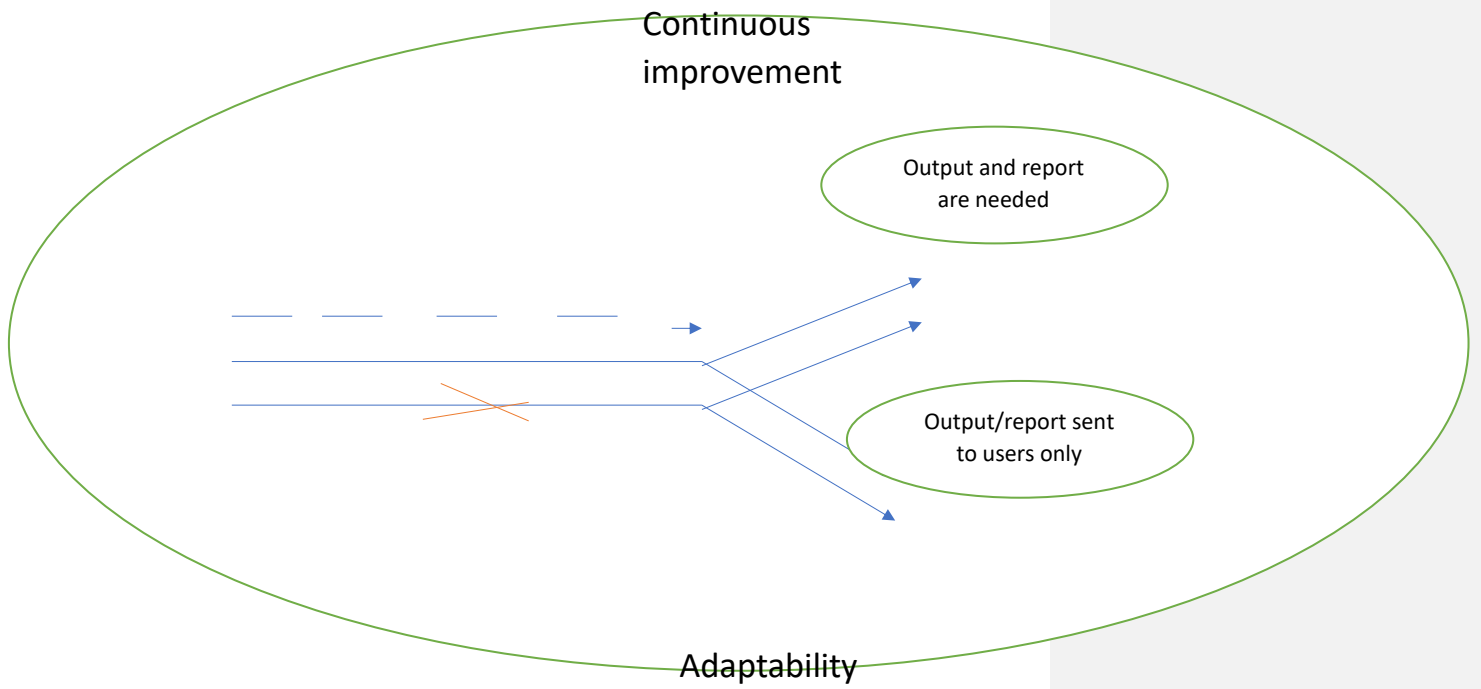
Thanks to the success of Toyota, many organisations in various industries have aimed to copy the lean principles, and a variety of lean methodologies have evolved to help organisations become lean such as The Flow Framework, developed by Kate Mackle, described by Bicheno and Holweg in *The Lean Toolbox*. The Flow Framework is a methodology that focuses the attention of organisations on the flow of goods or services through the system and aims to eliminate lead time and bottlenecks.

Plenty of lean implementations have not been successful. Bicheno and Holweg believe the reason for this is that many organisations think lean is a one-off programme. It is actually a culture of continuous improvement, and its success relies on the continued support of management. Predictably, managers in many businesses lose interest in initiatives that do not produce immediate improvements to the bottom line.

Lean information systems

Lean principles can be applied to information systems. Features of a lean information system are:

- reports and other outputs from the system should only be produced if they add value – that is if they are useful to the decision makers
- reports should only be sent to those who need them
- information should be processed quickly so that users do not have to wait for it. Generally, real-time processing is preferred to batch processing as batch processing introduces delays
- waste should be avoided. Duplication of data should be eliminated so data is only entered into the system once
- continuous improvement – the providers and users of information should meet regularly to review the usefulness of existing information and identify improvements
- adaptability – information systems should be flexible enough to meet special ad hoc needs or changing needs of managers over time. An information system that can only produce a standard set of reports is not lean. A system that allows managers to create their own customised reports from databases is more likely to be lean.



The Five S Model

The Five S model is a popular tool that has been used by many organisations as part of a lean methodology. The Five S model lends itself neatly to information systems. The objectives of the model are to reduce waste, improve productivity and remove variation. Variation means variation in production or output. It is variations that lead to stress at peak times, and that leads to errors.

The Fives Ss are: S(OICTU)-S(TYATE)

- sort (structurise)
- simplify (systemise)
- scan (sanitise)
- standardise
- sustain (self-discipline)

Sort means sort out the items in the workplace. Items that are not used should be thrown out as they are just taking up space and getting in the way. Those items that are used less frequently should be kept away from the workplace, in cupboards or in storerooms. Sorting should be repeated regularly – for example, every six months.

Simplify involves putting items in the best place, where they will easily be found when needed (eg a carpenter might keep the tools that he uses every day on shelves or in cupboards close to his work bench, while those tools that are used less often will be located further from the bench).

Scan refers to continuously scanning the workplace for things that are out of place and need tidying away. It also involves performing routine maintenance tasks, such as lubricating the machines.

Standardise means setting standards or procedures once the sort and simplify processes have been performed to make it easier to keep the workplace sorted and simplified. Colour coded stickers could be introduced – for example, indicating which locations items should be stored in.

Sustain – the use of the Five S Model should not be a one-off exercise, but should continue to be used after its introduction, and become part of the routine in the workplace.

The Five S Model can be applied to information systems as follows:

Sort the information transactions that flow around the organisation. Questions should be asked about what is the minimum information that is required for planning, controlling and decision making, and operating the various business processes. The time accuracy trade-off can also be applied here, where 90% accurate in half the time may be preferred.

Simplify means identifying the best methods of communicating the information. At Toyota, key information was communicated to all employees on the factory floor using large TV screens. Simplify also considers the way the information is stored in the system, such as the file structures to avoid duplications.

Scan involves regularly auditing the reports and who is actually using them. It also involves removing obsolete data such as old customers or inventory items that are no longer used.

Stabilise includes coming up with standards such as standards for reports and rules about who should be copied in on emails.

Sustain involves continuously performing the above four steps and therefore continuously improving the information systems.

Conclusion

The lean principles that evolved in the Toyota car factories have led to a new approach to management in many industries. They attempt to focus on satisfying the needs of the customer, and not wasting time and money on activities that do not ultimately add value to the customer. Lean principles can also be applied to information systems to ensure that only useful information is produced on a timely basis.

Nick Ryan is lead tutor for performance management subjects.

Bibliography

(1) Womack, Jones and Roos, *The Machine that Changed the World*, published by Simon & Schuster, 2007

Strategic performance measurement (C)

Reward schemes

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Reward schemes for employees and managers

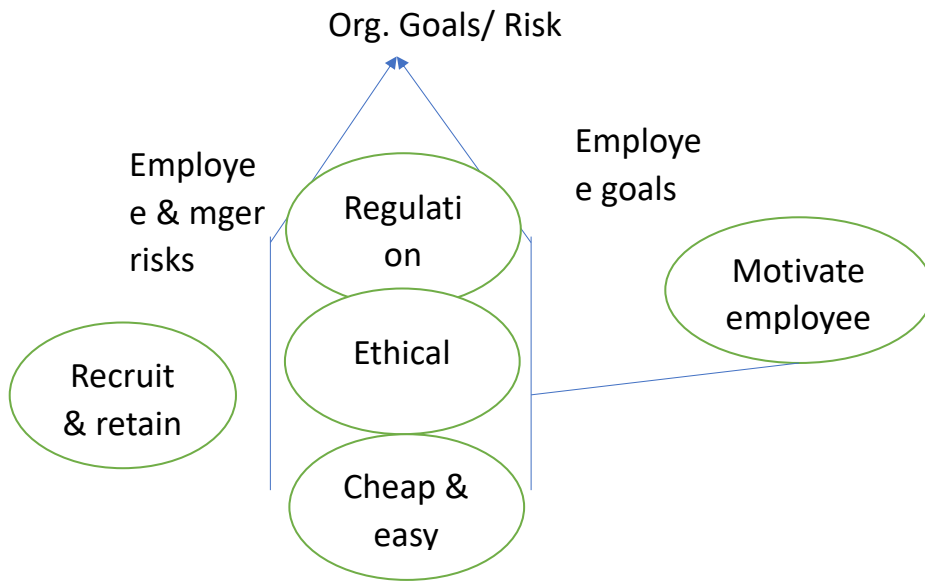
A previous technical article, '[Reward schemes for employees and managers](#)', discussed the nature of reward schemes and the factors which could affect their effectiveness and their impact on employees' behaviour.

Objectives of reward schemes

As the previous article highlights, the key objectives of reward schemes include:

- supporting an organisation's goals, by aligning employees' goals with these
- ensuring an organisation is able to recruit and retain a sufficient number of employees with the right skills
- motivating employees
- aligning the risk preferences of managers and employees with those of the organisation
- complying with legal regulations
- being ethical
- being affordable and easy to administer.

Objectives of Reward Schemes



Conversely, poorly designed reward schemes could create several risks for an organisation, including:

Strategic risk	Arising from the misalignment of reward strategy to the organisation's goals. This can lead to the inability to attract and retain the employees needed for success.
Behavioural risk	Arising from the misalignment of reward strategy to the required employee behaviours. This can lead to rewarding inappropriate or unproductive activity and behaviour.
Financial risk	Arising from inadequate reward cost management. This can lead to poor value for money from the reward scheme, and potentially lower profitability or even cause loss.
Legal and ethical risk	Arising from non-compliance with organisational and societal values and legal and regulatory requirements. This can lead to employee claims or regulatory actions, which can have financial and reputational effects on the organisation.

(Based on: CIPD, 2012)

Assessing reward schemes in your APM exam

In your APM exam, you could be asked to assess an organisation's existing reward scheme, or compare a proposed reward scheme against the existing one.

A key part of that assessment should be judging how well the reward scheme being described fulfils the objectives of effective reward schemes; in particular, the extent to which the scheme supports the organisation's goals and helps to align employees' goals with these.

Equally, an important part of your assessment could involve judging how well a scheme demonstrates the principles of effective standards and reward schemes, as identified in the Building Block model (see later example).

In this article, we will look at two illustrative examples of reward schemes, and we will discuss some of the key issues affecting the appropriateness of those schemes, illustrating the sorts of things you should consider if you are asked to make a similar assessment in your APM exam.

Worked example 1 – Insura

Insura is an insurance company which sells a range of insurance products (eg motor and home insurance) directly to customers. About a quarter of Insura's sales are made through its website but the majority are made through its contact centre by contact centre agents, who are employees of the company.

The contact centre provides a point for all interactions between customers and the company, including customer service as well as sales. The quality of service provided by contact centre staff, and the amount of time customers have to wait to speak to an agent, are both seen as important factors influencing customer satisfaction. Customer satisfaction levels, in turn, influence a customer's decision about whether to buy or renew an insurance policy.

Staff turnover rates in Insura's contact centre have increased significantly in the last two years, with a number of staff saying that they are leaving because they have found better paid jobs with other companies. Insura views the high staff turnover rate as a major cause for concern because the loss of experienced contact centre staff could adversely affect the quality of service it provides customers; for example, because experienced staff could be more knowledgeable in advising

customers on products, or in resolving queries, and can therefore do so more effectively than less experienced staff.

Two of the contact centre's stated goals for the coming year are:

- to increase customer satisfaction, and
- to improve staff retention

To support this, a reward scheme has been proposed for the contact centre, with agents being eligible for a bonus of up to 20% of their salaries, based on their performance against two key targets:

- average call length, and
- customer satisfaction scores.

Customers are asked to complete a short survey at the end of a call giving a satisfaction rating. Insura's IT systems collect the scores and assign them to the agent handling each call.

The average call length for the last year was 12 minutes. However, the target is for agents' average call length to be below 10 minutes.

You have been asked to assess how effectively the proposed scheme meets the objectives of reward schemes, specifically how well it supports the contact centre's goals.

Thinking about the key objectives of reward systems (which were mentioned at the start of this article) could provide a useful framework for your assessment; in particular, whether the proposed scheme supports the contact centre's goals by aligning employees' goals with these.

Supporting the call centre's stated goals

Customer satisfaction

The first of the stated goals is: increasing customer satisfaction. Therefore, to be effective, the reward scheme needs to help improve customer satisfaction.

However, including a target to reduce the length of calls could encourage agents to rush calls, because they are rewarded for doing so. Rushing calls may lead to a decline in customer satisfaction because the agent may not have taken time to explain points clearly to customers, or to answer any questions the customer had.

The notion that **'What gets measured gets done'** is one that you may have seen elsewhere in your APM studies, but it is relevant in this context too. If agents know they are being assessed on how long their calls are, they are likely to pay greater attention to this – to help ensure they are eligible for their bonus.

Equally, though, reducing the length of calls should enable agents to deal with more customers, and thereby reduce the amount of time a customer has to wait to speak to an agent. This may have a positive effect on the satisfaction as caller will not want to hold on for the next available agent for too long.

Therefore, introducing the reward scheme could potentially lead to two contradictory impacts in relation to the centre's objective to improve customer satisfaction. However, the risk that it encourages of agents to rush calls should be seen as a significant risk of the proposed scheme.

Staff retention

The centre's second stated goal is to improve staff retention, so to be effective, the reward scheme needs to help achieve this. (More generally, the impact that a reward scheme has on recruiting and retaining staff is also one of the key objectives of reward schemes, so is an important factor to think about when assessing potential schemes.)

Helping to recruit and retain employees

Although monetary rewards aren't necessarily sufficient to attract employees to a job, or to retain in it, in this scenario the level of pay does appear to be an important factor in Insura's problems in retaining agents. A number of agents have left the company because they have found better paid jobs with other companies.

As such, introducing the reward scheme could be seen as a direct response to the objective to improve staff retention. If staff receive their full bonus that would, in effect, increase their pay by 20%.

However, it is important to remember that although staff might be eligible for a bonus of up to 20% there is no guarantee they will get the full bonus. As is the case with any bonus scheme, it is discretionary. Therefore, the prospect of a (guaranteed) higher salary elsewhere might prove more attractive, and still encourage agents to leave for jobs in other companies.

Equally, although 20% might seem quite a generous bonus for operational staff, we don't know the extent of the pay gap between Insura and the other firms which agents are moving to. If the gap is greater than 20%, the bonus wouldn't affect the agent's decision.

Nonetheless, we would expect that, overall, introducing this bonus scheme should help to reduce staff turnover, even if we cannot be sure of the extent.

Targets and rewards: target setting

Another important issue to consider when assessing reward schemes, is the way employees' performance is assessed, and – consequently – employees' eligibility for performance-related rewards, such as bonuses.

Here again, the previous technical article, ['Reward schemes for employees and managers'](#), provides some useful context; in particular with reference to the Building Block model (Fitzgerald & Moon, (1996)) and the principles which that model identifies for designing effective standards (targets) and rewards.

Many reward schemes are based on employees achieving pre-determined targets, so when assessing the overall effectiveness of a reward scheme it will often be necessary to consider the targets set, as well as the characteristics of the reward scheme itself.

Principles of effective standards:

- Ownership
- Achievability
- Equity (Fairness)

Principles of effective rewards:

- Clarity
- Controllability
- Motivation

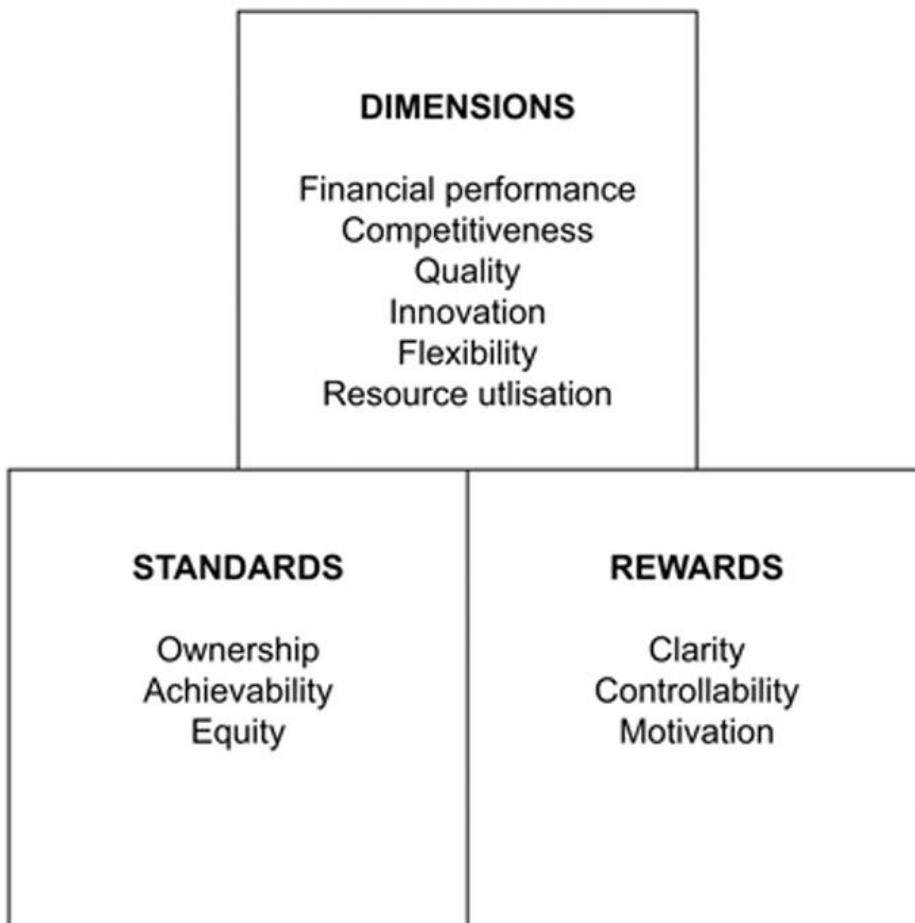


Figure 1: Building Block model (Fitzgerald and Moon, 1996)

Using the Building Block model to assess reward schemes in your APM exam

In some exam questions, the 'standards' and 'rewards' elements of the model could be useful frameworks to use when assessing the effectiveness of a reward scheme.

Consider the following example.

Worked example 2 – Deeboard Services

Deeboard Services ('Deeboard') is a listed company, which provides facilities management services, where it manages activities such as cleaning and security on behalf of its clients. Deeboard's mission is 'to give the shareholders maintainable, profitable growth by developing the best talent to provide world-class services with maximum efficiency'.

The idea of an employee share ownership plan (ESOP) has always been at the heart of Deeboard's remuneration schemes. Deeboard's aim, in promoting ESOP is to support an entrepreneurial culture, and the ESOP scheme is a key differentiator for Deeboard in the market for new employees.

The current reward system grants shares based on an individual's appraisal by their line manager against vague categories such as leadership and entrepreneurship. The results of this scheme have been that only about 5% of staff received their maximum possible bonus in previous years and half of them received no bonus at all. Increasingly, this has led to the staff ignoring the reward scheme and describing it as 'only for the bosses' favourite people'.

In response to this, the board has been discussing methods of analysing and improving the reward system at Deeboard. The CEO has provided you with the details of a potential scheme the board has been considering.

Under the new scheme, employees' performance targets will be derived from strategic KPIs depending on the employee's area of responsibility. Each employee will have five targets, set by their line manager in consultation with senior management, and the employee can get up to 50% of their basic salary as a cash bonus (10 percentage points for each target achieved).

Use the characteristics of effective rewards in Fitzgerald & Moon's building block model to assess the effectiveness of Deeboard's existing remuneration scheme, and the proposed scheme.

The building block model identifies the three characteristics of effective rewards as: clarity, controllability, and motivation. So, a useful approach to a question like this would be to take each characteristic in turn, and then assess how well the scheme demonstrates it.

Existing scheme

Clarity – 'the current system grants shares based on an individual's appraisal by their line manager against vague categories such as leadership and entrepreneurship'. The use of 'vague categories' as the basis of appraisal suggests it will not be clear to staff how their performance is being assessed. It may not be clear for the line managers who are making the assessment either, which will compound the problem with the lack of clarity.

Controllability – Similarly, performance is being assessed against vague, high-level categories such as leadership and entrepreneurship, but these are unlikely to be areas which have much relevance to the majority of facilities management staff (as they will be cleaners and security staff), or to be areas they can influence.

Motivation – The motivation aspect of reward can often link to the **achievability** of targets set. The fact that over half of the staff have received no bonus at all, and only 5% received the maximum bonus, suggests that the targets set at Deeboard are – at best – very challenging, and – more likely – verging on being unachievable. Once staff think that targets aren't achievable, they will no longer be motivated to try to achieve them. This is the case at Deeboard, with staff increasingly 'ignoring the reward scheme'.

The fact that the scheme is perceived as being 'only for the bosses' favourite people' also suggests staff have concerns about the **fairness** of the scheme. Equity (fairness) is another of Fitzgerald & Moon's principles of effective standards, which does not appear to be being upheld in this scenario.

Overall, therefore, the existing scheme doesn't appear to demonstrate any of Fitzgerald & Moon's characteristics of an effective reward scheme.

Proposed scheme

Clarity – Whereas performance under the existing scheme is assessed against 'vague categories', the new system has more clearly defined targets; five targets set by the employee's line manager. Therefore, employees should be clearer about how their performance is being assessed.

Controllability – the targets although derived from the strategic KPIs, will be tailored to the employee's area of responsibility, so this should also improve controllability.

The fact that targets are based on strategic KPIs, should also help to align employee's goals with the organisation, which is one of the key objectives of effective reward schemes in general.

Motivation – The scenario noted that the opportunity to own shares in the company (through the employee share ownership (ESOP) scheme) is an important factor in differentiating Deeboard from its competitors and helping to attract employees. However, the proposed scheme removes the share element, and only offers a cash bonus, so in this respect it could be seen as reducing motivation. This change also reduces the alignment with shareholder returns and focuses more on the short term.

Having said that, a bonus of up to 50% of salary seems a significant amount (especially for non-managerial staff), and so the size of the potential bonus should increase staff motivation in trying to achieve it.

Overall, in this scenario, the proposed scheme does appear to be more effective than the existing scheme.

A word of caution

While we would hope that new reward schemes being proposed by an organisation in exam questions will be more effective than existing schemes, there is no guarantee this will be the case. If, in your APM exam, you are asked to assess a proposed reward scheme alongside an existing scheme, don't automatically assume the proposed scheme will be better than the existing scheme. It might well

be. But you need to reach that conclusion by evaluating the detail of the scheme and assessing how effectively it demonstrates the objectives and principles of an effective reward scheme, rather than assuming it will be better, just because it is new.

Appraisal

In the worked example we have just considered – Deeboard – the existing reward scheme relies on a manager's appraisal of an employee's performance to assess their eligibility for shares.

This highlights one further issue to think about when assessing reward schemes: the way performance is assessed, and – in particular – the use of appraisals in the assessment process.

If an employee's bonus is based on a manager's assessment of their performance this increases the potential for **subjectivity** in the process. For example, one manager may assess an employee's performance differently to the way another manager might assess it. In turn, this reduces the **fairness (equity)** of the process.

Two important considerations in this respect are that:

- Targets need to be clearly defined **in advance** (to give clarity, and to reduce the scope for subjectivity. (This should be beneficial not only for the employee being appraised, but also for the manager having to make the appraisal.)
- Managers should give an explanation to staff for their appraisal rating, and why they have (or haven't) met targets. Even if staff haven't met a target in the current assessment, if they know why that is, and what they need to do in order to achieve the target in future, this should improve their motivation to achieve future targets (provided the basis for the targets remains consistent).

In this respect, it would also be beneficial for employees to have interim reviews with their manager during the year, rather than only having an appraisal at the end of the year. This will give employees the opportunity to improve performance, and thereby improve their chances of meeting targets at the end of the year. (Equally importantly, the employees' improved

performance should also be beneficial for the organisation, because it means they will be performing their job more effectively).

Final words

In any APM question, the detail of your answer always needs to be guided by the information in the scenario. The detail of your assessment of the reward scheme needs to be based on the information provided in the scenario – about the scheme, and about the organisation in which it is being used.

However, this article shows how you could use some overall approaches to help structure your answers: by assessing how well a proposed scheme demonstrates the objectives of an effective reward scheme; and by assessing how well a proposed scheme demonstrates the characteristics of effective standards and rewards.

References

- Chartered Institute of Personnel and Development (CIPD), (2012), *Reward risks*. Available online from: www.cipd.co.uk/Images/reward-risks_2012_tcm18-12386.pdf
- Fitzgerald, L and Moon, P (1996) *Performance Measurement in Service Industries: Making it Work*, Chartered Institute of Management Accountants

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Reward Schemes for Employees and Management

A major part of performance management involves managing employees and managers, as their performance will have a major effect on the performance of the organisation as a whole. This article looks at how reward schemes can be used to influence the behaviour of employees

Meaning of reward schemes

A broad definition of reward schemes is provided by Bratton:

'Reward system refers to all the monetary, non-monetary and psychological payments that an organisation provides for its employees in exchange for the work they perform.'

Rewards schemes may include extrinsic and intrinsic rewards. Extrinsic rewards are items such as financial payments and working conditions that the employee receives as part of the job. **Intrinsic rewards relate to satisfaction** that is derived from actually performing the job such as personal fulfilment, and a sense of contributing something to society. Many people who work for charities, for example, work for much lower salaries than they might achieve if they worked for commercial organisations. In doing so, they are exchanging extrinsic rewards for the intrinsic reward of doing something that they believe is good for society.

Objectives of a reward scheme

What do organisations hope to achieve from a reward scheme? The following are among the most important objectives:

1. To support the goals of the organisation by aligning the goals of employees with these.
2. To ensure that the organisation is able to recruit and retain sufficient number of employees with the right skills.
3. To motivate employees.
4. To align the risk preferences of managers and employees with those of the organisation.

5. To comply with legal regulations.
6. To be ethical.
7. To be affordable and easy to administer.^[11]_[SEP]

Aligning the goals of the organisation and employees

The reward scheme should support the organisation's goals. At the strategic level, the reward scheme must be consistent with the strategy of the organisation. If a strategy of differentiation is chosen; for example, staff may receive more generous benefits, and these may be linked to achieving certain skills or achieving pre-determined targets. In an organisation that has a strategy of cost leadership, a simple reward scheme offering fairly low wages may be appropriate as less skilled staff are required, new staff are easy to recruit and need little training, so there is less incentive to offer generous rewards. The US supermarket group Walmart competes on low cost. It recruits employees with low skills, and pays low wages. It discourages staff from working overtime, as it wishes to avoid paying overtime rates.

To recruit and retain sufficient employees with the right skills

If rewards offered are not competitive, it will be difficult to recruit staff since potential employees can obtain better rewards from competitors. Existing staff may also be tempted to leave the organisation if they are aware that their reward system is uncompetitive.

High staff turnover can lead to higher costs of recruitment and training of new staff. Losing existing employees may also mean that some of the organisation's accumulated knowledge is lost forever. For many knowledge-based organisations, the human capital may be one of the most valuable assets they have. High technology companies such as Microsoft are companies that trade on knowledge, so offer competitive remuneration to key staff.

To motivate employees

Motivation of employees is clearly an important factor in the overall performance of an organisation. Organisations would like their employees to work harder, and be

flexible. The link between reward schemes and motivation is a complex issue that is hotly debated in both accounting and human resource-related literature.

A well-known theory relating to motivation is Maslow's hierarchy of needs. Maslow stated that people's wants and needs follow a hierarchy. Once the needs of one level of the hierarchy are met, the individual will then focus on achieving the needs of the next level in the hierarchy. The lower levels of the hierarchy are physiological, relating to the need to survive (eg eating and being housed); once these have been met, humans then desire safety, followed by love, followed by esteem, and finally at the top of the hierarchy, self actualisation, or self fulfilment.

Applying Maslow's hierarchy of needs to reward schemes suggests that very junior staff, earning very low wages will be motivated by receiving higher monetary rewards, as this will enable them to meet their physiological needs. As employees become progressively more highly paid, however, monetary rewards become relatively less important as other needs in the hierarchy, such as job security, ability to achieve one's potential, and feeling of being needed become more important.

Herzberg argued that increasing rewards only motivates employees temporarily. Once they become de-motivated again, it is necessary to 'recharge their batteries' with another increase. A far better way to motivate employees is to 'install a generator in an employee' so they can recharge their own batteries; in other words to find out what really motivates them. According to Herzberg, it is the intrinsic factors in a job that motivate employees, such as 'achievement, recognition for achievement, the work itself, responsibility and growth or advancement.' Giving greater responsibility to employees, for example, can increase motivation.

Perhaps the conclusion to be gained from this is that monetary rewards alone are insufficient to motivate employees. Other factors such as giving greater recognition and greater responsibility may be equally important, for example giving praise at company meetings, promoting staff, and involving staff more in decision making.

Aligning the risk preferences of managers and employees with those of the organisation

Managers and senior employees make decisions on behalf of the company, acting as agents of the company. It is desirable that the risk preferences of these employees should match the risk preferences of the organisation and its stakeholders. One

problem with many reward schemes is that managers are too risk averse, and will not make investments that may risk their targets not being met.

The events leading up to the financial crisis of 2008 are a good example of the opposite situation, where the risk appetites of employees at investment banks did not match the risk appetites of the owners. During this period, individuals working in the banks were paid large commissions for selling mortgage loans to customers. The problem was that the employees were selling loans to customers that posed a large risk to the banks, due to their low credit worthiness.

The problem was compounded by the fact that in many cases, the employees of the banks were paid commissions on the date that the loan agreements were signed, while the loans lasted for 25 years. In situations where the borrower defaulted, however, there was no claw back, so the employee would not be required to repay the commission.

Many countries have put in place new laws and codes to change this situation. In the UK for example, the financial services authority introduced a code whereby remuneration structures should be based on sound risk management practices, incentive payments should be deferred over a number of years, and there should be claw back provisions whereby employees are required to repay bonuses in the event that the longer-term results of their actions lead to similar problems experienced in the financial crisis.

Share options may also create a miss-match between the risks faced by the organisation and the risks faced by the holders of the options, since the holders benefit if share prices increase, but do not bear any losses if the share price falls. Share options are discussed in more detail later in this article.

Complying with legal regulations

Rewards should comply with legal regulations. Typically, employment laws include areas such as minimum pay, and equal pay legislation to ensure that no groups are prejudiced against. There have been high profile cases of female investment bankers winning legal cases against their employers because their bonuses were far less than those paid to male colleagues.

Ethics and reward schemes

In recent decades there has been a move away from fixed remuneration systems towards reward systems where at least parts of an employee's rewards are based on performance of the individual and the business as a whole. Some writers claim that this is unethical for two reasons. First, such systems tend to place increased business risk onto employees. Second, such systems undermine collective bargaining systems, and reduce the power of unions. This leads to a situation where employees as a collective have less bargaining power.

The size of total remunerations paid to directors of large public companies has also become a hot political issue, with a perception that the gap between top earners, and average earners is becoming larger. In the US, the average directors of S&P 500 companies earn 200 times more than the average household income in the US. Defenders of such large differences in pay point out that this difference has actually declined in recent years; in the year 2000, directors of S&P 500 companies earned 350 times the average household income. According to some research, such high packages are justified as they do reflect the performance of those directors.

Affordable and easy to administer

It is an obvious fact that there is an inherent conflict of interest in the relationship between employer and employee. The employee's rewards represent a cost to the employer, which the employer wants to minimise. Clearly whatever reward scheme is in place, it must be affordable to the employer.

Target setting

Many reward schemes are based on employees achieving pre-determined targets, so some consideration of target setting is required.

In Fitzgerald and Moon's building block's model, three principles are given when setting standards or targets: equity, ownership and achievability. Equity in this context means fairness; when setting targets for the various managers, those targets should be equally challenging. Ownership means that the targets should be accepted and agreed by those managers for whom they are set. This can usually be achieved

by participation. Finally, targets must be achievable; otherwise, the employees for whom they were set will become demotivated.

The building block's model then goes on to specifically cover reward schemes. It states that there are three principles of a good reward scheme. First, there should be clarity – it should be clear how the reward scheme works. If your boss tells you that you will receive a bonus at the end of the year 'if you do a good job,' that is not very clear, since the boss has not specified what doing a good job means. Rewards should be motivational. Finally, there is the important controllability principal. Employees should only be judged and rewarded based on things within their control. This is why profit-related pay might not be relevant to a junior administrative assistant, for example.

Hope and Fraser warn against the use of linking rewards to fixed performance targets, as this leads to gaming. In particular, managers whose rewards depend on fixed targets may be tempted to 'always negotiate lowest targets and highest rewards,' which suggests that management plans will understate the potential that the organisation can make. 'Always make the bonus, whatever it takes,' is another example of gaming suggested by Hope and Fraser, which suggests that managers may indulge in unethical behaviour such as fraudulent accounting in order to ensure that targets are met.

Hope and Fraser suggest divorcing the planning process and the target setting process, and basing rewards on relative targets and benchmarks. A relative target might be market share, for example, where rather than setting an absolute target for a sales manager, a market share (%) target is provided. If the market rises, then more is expected in absolute terms. This adds to controllability, since the sales manager could not be held responsible for a rise (or fall) in the overall market, which is outside of his control, but would be able to control whether or not he achieves the expected share of the market.

Types of reward scheme

Base pay Base pay, or basic pay, is the minimum amount that an employee receives for working for an organisation. For example, the employee may be paid \$10 per hour for a minimum of 40 hours per week. The employee will therefore earn at least \$400 per week. This will be paid regardless of how many of those 40 hours the employee is actually working. A fixed annual salary is another example of basic pay.

Basic pay may be supplemented by other types of remuneration. A blue-collar worker may be paid overtime for example if he works more than 40 hours per week, and a manager may receive some form of performance pay in addition to the base pay. Basic pay is likely to address the lower levels of Maslow's hierarchy of needs mentioned above.

Performance-related pay Performance-related pay is a generic term for reward systems where payments are made based on the performance, either of the individual (individual performance-related pay) or a team of employees (group performance-related schemes).

In recent decades there has been a move toward performance-related pay schemes in many organisations. This has led to a situation where a higher portion of the employees pay is dependent on performance. This rationale for performance-related pay is that it motivates employees to work harder, and rewards those who make a greater contribution to the organisation's goals. This should lead to efficiency savings. There are many types of performance-related pay, and the most popular ones are described below:

1. Piecework schemes

Under Piecework schemes, a price is paid for each unit of output. Piecework schemes are the oldest form of performance pay, and were used for example in the textile industries in Great Britain during the industrial revolution. Piecework schemes are appropriate where output can be measured easily in units. They are typically used for paying freelance, creative people. Freelance writers for example are often paid based on the number of words.

The benefit of piecework schemes is their inherent fairness. The higher the output, the more the employee (or subcontractor) receives. From the employer's perspective, the employer does not have to pay for idle time or inefficiencies.

From the employee's perspective, such schemes mean that the employee bears commercial risk if demand for their product falls.

A further disadvantage of piecework schemes is that the payment is not based on the quality of output. However, some sort of quality control is likely, and if the quality is not of a required standard, the employee or subcontractor will not be paid.

2. Individual performance-related pay schemes

Individual performance-related pay schemes are where the employee receives either a bonus, or an increase in base pay on meeting previously agreed objectives or based on assessment by their manager, or both. They are typically used for middle managers in private sector organisations and for professional staff.

The advocates of individual performance-related pay schemes claim that they are an obvious way to align objectives of middle managers with the goals of the organisation. If performance targets set are based on the goals of the organisation, then it appears obvious that making part of the rewards of employees' contingent on achieving those targets will mean that employees are motivated to achieve the goals of the organisation.

Individual performance-related schemes also have the advantage over group schemes that the employee has control over her rewards, as they do not depend on the effort (or lack of) of other members of the team.

Critics of such schemes point out that the link between rewards and motivation is far from clear, as discussed above. It is also argued that performance-related schemes lead a situation of **tunnel vision whereby if something is not measured, and then rewarded, it won't get done.**

Individual reward schemes may lead to a lack of teamwork and may lead to variances in pay among individuals, which can lead to ill feeling.

An example of an individual performance-related pay scheme is one that is operated by a UK bank. Under the scheme, a bonus pool is allocated to each region based on the performance of that region. From this pool, individual awards are made based on assessment of performance, taking into account the rating on a five-point scale. Those with scores of 1 to 3 qualify for a discretionary bonus. The assessment depends on how much new business the individuals have brought in, or how much efficiency savings they have generated. The rewards are usually paid in cash, although for senior employees receive a portion as **deferred stock.**

3. Group-related performance-related pay schemes

Group-related performance-related schemes are similar to individual, in that rewards are paid based on the achievement of targets. However, the targets are set for a group of employees, such as a particular department, or branch of a company, rather than for an individual. Since the rewards apply to a group, they are likely to be based on a pre-determined quantitative formula, rather than on assessment of staff.

A bonus pool is calculated based on the performance of the team, and this is shared among the members of the team. Bonuses may be paid up at the end of the year, or may be deferred, and paid at a later date, as this may encourage staff and managers to take a longer-term view, rather than simply focusing on the current year's bonus.

The advantage claimed for group schemes is that they encourage teamwork. The disadvantage is that the lazier members of the team benefit from the hard work of the more dedicated.

Hope and Fraser give the example of a scheme operated by Svenska Handelsbanken, where each year, a portion of the bank's profits are paid to a profit sharing pool for employees, provided that certain conditions are met. The main conditions are that the Handelsbanken Group must have a higher return on shareholder's equity than the average of its peer group. The upper limit of the amount paid into the scheme is 25% of the total dividends paid to shareholders. Employees do not actually receive anything from the pool until they reach the age of 60, at which point they receive a payout based on the number of years that they have worked for the bank. The CEO of Handelsbanken claimed that employees are not motivated by financial targets, but by the challenge of beating the competition. The reward scheme is designed to be a dividend on their intellectual capital.

4. Knowledge contingent pay

Knowledge contingent pay is where an employee will receive a pay rise or a bonus, or both, for work-related learning. An ACCA candidate, for example, may receive a higher salary once he has passed all the knowledge level papers, and an even higher salary after passing all of his exams.

5. Commissions

Commissions are a form of remuneration normally used for sales staff. The staff may receive a low basic pay, but will then receive commission, based on a percentage of the amount of their sales.

The advantages of commission are that they should motivate sales staff to achieve higher sales, as their rewards depend on it, and they mean that the large part of the salesman's salary becomes variable. If sales are low, the organisation will have to pay less.

The disadvantage of commission is that it may lead to dysfunctional behaviour. Sales staff may indulge in window dressing, for example to meet this year's sales target, by selling on a 'sale and return basis' in the final month of the year, with the inherent understanding that the goods will be returned in the following month of next year. They may also lead to short termism, where sales staff 'never put the customer above the sales target' to quote Hope and Fraser.

6. Profit-related pay

Profit-related pay is a type of group performance-related pay scheme where a part of the employee's remuneration is linked to the profits of the organisation. If the company's profits hit a pre-determined threshold, a bonus will be paid to all members of the scheme. Typically, the bonus will be a percentage of the basic pay. The bonus may be paid during the year in question; for example, quarterly, or it may be deferred until some later date, such as the retirement of the staff.

Advocates of profit-related pay argue that it motivates employees to become more interested in the overall profitability and therefore become more motivated to 'do their bit' to improve it. It may also encourage loyalty in cases where staff may lose their bonus if leaving the organisation means that they lose the right to it.

The obvious disadvantage with profit-related pay is that it does not match the primary objective of commercial organisations, which is to maximise the wealth of the shareholders. Managers may be motivated to increase profits by taking short-term actions that will harm the business in the long run, for example, or destroy wealth by investing in projects that increase the profits of the organisation, but produce a return that is below the cost of capital of the organisation.

Profit-related pay might not be a motivator for junior employees, who may fail to see the link between their effort and the overall profits of the organisation.

7. Stock option plans

Stock option plans have become very popular since the 1990s, when greater emphasis started to be given to shareholder value. Under stock option plans, staff receive the right to buy shares in their company at a certain date in the future, at a price agreed today.

For example, Alpha Co is listed on the stock exchange of Homeland. Today, shares in Alpha Co are trading at \$100 each. The company has just awarded the CEO of Alpha Co the option to buy 1 million shares for \$100 each in exactly ten years time. These options have no intrinsic value at the granting date.

If the share price rises to say \$200 in 10 years time, the CEO could exercise his options, buying 1 million shares at a price of \$100 each. Since the shares would be worth \$200 each by then the CEO would make a gain of \$100 per share, or \$100m in total.

Stock option plans are most appropriate for the senior management of organisations as they are the people who have the most influence over its share price. The rationale for using stock option plans is that they align the objectives of the directors with the objectives of shareholders. If the share price rises, the senior management benefit because their options increase in value. Thus, senior managers will start to think like investors.

The big weakness of stock option plans is that share prices may depend on external factors as much as on the performance of the directors. During the bull markets of the 1990s and 2000s, many companies share prices rose simply because the market rose.

Another weakness is risk misalignment. Share options reward managers if the share price goes up. If the share price falls, however, there is no difference in reward between the share price remaining the same (\$100) and falling to (\$1) – so managers may be motivated to take extreme risks where the exercise price may not be met.

What shareholders really want is the performance of their company to be better than the market. One solution to this is to use an indexed exercise price, where the price at which the director can buy the shares is equal to the current market price, plus the increase in the stock market index between the date that the options are issued, and the exercise date. This means that the share option reflects the controllability principle more closely, as directors would not be rewarded for rises in the stock market in general.

Pension schemes

Defined benefit pension schemes used to be a popular form of reward. Under such schemes, the employee pays a pension to former employees based on their final salary, and the number of years that the employee worked for the organisation. A typical example is that the former employee receives 1/60ths of their final salary for every year of service. An employee who works for 40 years for the same organisation would therefore receive a pension equal to 40/60ths of their final salary from the date of retirement to the date of death.

Defined benefit schemes leave organisations with an uncertain, often large liability, and for this reason, many organisations have now discontinued such schemes.

Defined contribution schemes are another form of pension scheme where the employer pays a certain percentage of the employee's salary into an account for the employee in a pension 'pot.' The employee may also have the option of making additional voluntary contributions into this pension pot. The pension pot is then invested, and the employee receives whatever is in their account on retirement. In some countries, employees may be required to use what is in the pot to buy an annuity, which pays them a fixed income for the rest of their lives.

Many countries offer tax incentives for such pension schemes, such as allowing employees to reduce their taxable income by the value of contributions made to the schemes.

Benefits in kind

Benefits in kind (or indirect pay) are paid to employees in addition to their base salary and performance-related pay. Benefits in kind include items such as health insurance

and meal vouchers. They are usually provided to more junior staff in order to provide additional incentives at a lower cost. They are often used as a form of recognition, so the employee of the month for example will be given a benefit rather than a cash payment.

The advantage of benefits in kind is that greater flexibility can be given in designing a reward scheme for an individual.

'Cafeteria' schemes have also become popular, whereby employees are told that they may select benefits from a menu up to a certain value. The advantage of this is that employees will select the benefits that they value most. Benefits from which the employees can choose typically include such items as health insurance, holiday vouchers, company cars or sports vouchers.

Cafeteria schemes may be difficult to administer. Staff may also find them complex to understand, as they will have to select a number of benefits that have a value that is within the agreed limit.

Establishing the level of benefits

How much should employees be paid? Two factors need to be taken into account here. First, **competitiveness**, and second **internal equity**.

As already mentioned above, unless the level of pay is competitive, it will be difficult to recruit and retain the right number of skilled employees. If it is too much, the cost to the organisation will be too high. Here the organisation will compare its pay levels with competitors. Such information may be available from job adverts in newspapers or on the Internet, or from recruitment consultants.

Internal equity relates to the pay differentials within the organisation itself. Staff will become demotivated if they feel that the remuneration system is 'unfair' and that other people are being paid more generously. Job evaluation techniques are used that try to determine the value of a specific job to the organisation. Based on this, the level of rewards for that particular position will be determined.

The role of appraisal in reward systems

Many of the performance-related reward schemes depend on the performance of the employees. As such, the employees' performance has to be assessed. This usually takes place during the appraisal process. Staff will be assessed on a regular basis, for example twice a year. During the appraisal, targets will be set for the next period, and rewards agreed if the targets are met.

Conclusion

A good reward system aims to motivate employees to work harder, and align their goals with those of the organisation they work for. The current trend towards performance-related reward systems is designed to lead to greater rewards and motivation for those who contribute the most. However, designing such reward systems is complex, as they aim to influence human behaviour. As the human resources director of Flowpack Engineering said (quoted in Bratton) 'There is no such thing as a good pay system; there is only a series of bad ones. The trick is to choose the least bad one.'

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References Bratton and Gold, *Human Resource Management Theory and Practice*, 4th edition chapter 10, Palgrave Macmillan, 2007 Hope and Fraser, *Beyond Budgeting*, Harvard Business School Press, 2003 Frederick Herzberg, 'One More Time: How Do You Motivate Employees?' *Harvard Business Review*, Sept/Oct 1987

Economic value added versus profit-based measures of performance – part 1

Relevant to ACCA Qualification Paper P5

A successful performance measure evaluates how well an organisation performs in relation to its objectives. Since the primary objective of commercial organisations is normally assumed to be the maximisation of the wealth of its shareholders, it follows that performance measures should evaluate this. In practice, many organisations use profit-based measures as the primary measure of their financial performance. Two problems relating to profit in this area are:

- **Profit ignores the cost of equity capital.** Companies only generate wealth when they generate a return in excess of the return required by providers of capital – both equity and debt. In financial statements, the calculation of profit does take into account the cost of debt finance, but ignores the cost of equity finance.
- Profits calculated in accordance with accounting standards **do not truly reflect the wealth that has been created**, and are subject to manipulation by accountants.

Economic Value Added – or EVA – is a performance measurement system that aims to overcome these two weaknesses. EVA was developed by the US consulting firm Stern Stewart & Co, and it has gained widespread use among many well-known companies such as Siemens, Coca Cola and Herman Miller.

Residual income

EVA is based on the residual income technique that has been used since the early 20th century. Residual income is a performance measure normally used for assessing the performance of divisions, in which a finance charge is deducted from the profits of the division. The finance charge is calculated as the net assets of the division, multiplied by an interest rate – normally the company's weighted average cost of capital.

Example 1

Division A made a profit of \$10,000 during the most recent financial year. The capital used by the division (equity plus long-term debt) was \$70,000. The weighted average cost of capital of the company is 13%, and this is used when calculating the

finance charge. The residual income of Division A was therefore:

	\$
Profit	10,000
Finance charge	<u>9,100</u> (70,000 x 13%)
Residual income	900

The finance charge of \$9,100 represents the minimum return required by the providers of finance on the \$70,000 capital they provided. Since the actual profit of the division exceeds this, the division has recorded residual income of \$900.

EVA is similar in structure to residual income. It can be stated as:

$$\text{EVA} = \text{NOPAT} - (k \times \text{capital})$$

Where: NOPAT = Net operating profits after tax.

(k x capital) is the finance charge, where k = the firms weighted average cost of capital

and

capital = equity plus long-term debt of the company **at the start of the period**.

This formula will not necessarily be given in the exam, so you need to learn it.

NOPAT

NOPAT means net operating profit after tax. This profit figure shows profits before taking out the cost of interest. The cost of interest is included in the finance charge that is deducted from NOPAT when calculating EVA. Two approaches to adjusting for interest are taken. Either:

- start with operating profit. Then deduct the adjusted tax charge. The tax charge should be adjusted because it includes the tax benefit of interest. Since interest is a tax-deductible item, having interest in the income statement means that the tax charge is lower. Since we are taking the cost of interest out of the income statement, it is also necessary to remove the tax benefit of it from the tax charge. To do this, multiply the interest by the tax rate, and add this to the tax charge, or
- start with profit after tax, and add back the net cost of interest. This is the interest charge multiplied by (1 – rate of corporate tax).

Example 2

An extract from the income statement of Alpha Inc shows the following:

	\$
Operating profit	1,000
Interest charge	<u>(100)</u>
Profit before tax	900
Tax at 25%	<u>(225)</u>
Profit after tax	675

NOPAT is either:

Profit after tax	675
Add after tax interest (100 x 75%)	<u>75</u>
NOPAT	750

or:

Operating profit	1,000
Less tax charge adjusted to exclude tax relief on interest (225 + (100 x 25%))	<u>(250)</u>
NOPAT	750

Accounting adjustments

The major departure from residual income is the adjustments made to reported financial profits and capital. Proponents of EVA argue that profits calculated in accordance with financial reporting principles do not reflect the economic value generated by the company. There are three main reasons for these adjustments:

1. To convert from accrual to cash accounting. Investors are interested in cash flows, so many of the accounting adjustments made, such as allowances for doubtful debt, should be eliminated.
2. Spending on 'market building' items such as research, staff training and advertising costs should be capitalised to the extent that they have not been in the financial statements. This may contradict IAS 38, but Stern Stewart believes that financial reporting standards are too strict in this regard, and discourage managers from investing in items that bring long-term benefits.

3. Unusual items of profit or expenditure should be ignored.

Stern Stewart famously remarked that, for some companies, 160 adjustments were made to the accounting profits in calculating NOPAT. The Paper P5 exam will test only the most common adjustments, which are as follows:

1. Expenditure on promotional activities, research and development and employee training should be capitalised. If they have been treated as an expense in the income statement, they should be added back to profit, and added to capital employed in the year in which the expenses were incurred.
2. The depreciation charge is added back to profit, and instead a charge for economic depreciation is made. Economic depreciation reflects the true change in value of assets during the period, unlike accounting depreciation. If no detail is given on economic depreciation, then candidates should assume that accounting depreciation represents a reasonable approximation for it.
3. Items such as provisions, allowances for doubtful debts, deferred tax provisions and allowances for inventory should be added back to capital employed, since these represent over-prudence on the part of financial accountants, and this understates the true value of capital employed. Any expenses or income recognised in the income statement in respect of movements in such items should also be removed from NOPAT.
4. Non-cash expenses are treated with suspicion, as these are likely to reflect the finance director manipulating the profits rather than any real costs. If the costs were real, then cash would have been paid for them. Therefore, non-cash expenses should be added back to profits, and to capital employed.
5. The treatment of operating leases is inconsistent with the treatment of finance leases, with finance leases being capitalised and operating leases being excluded from the statement of financial position. This inconsistency means that firms can take advantage of operating leases to reduce the reported capital employed and, therefore, increase the calculated EVA. When calculating EVA therefore, operating leases should be capitalised and added to capital employed.

On the income statement side, operating lease charges should be added back. In principle, interest and depreciation should then be charged on the assets acquired under finance leases. However, any interest would then be added back to profit in calculating NOPAT, and accounting depreciation would be

replaced with economic depreciation. The lease adjustments may soon become irrelevant as the International Accounting Standards Board (IASB) is currently revising IAS 17 and the revised standard may require the same treatment for both finance and operating leases.

6. The tax charge. This is based on 'cash taxes' rather than the accruals based methods used in financial reporting. The cash taxes are calculated as follows:

	\$
Tax charge per income statement	X
Less increase (add reduction) in deferred tax provision	(X)/X
Add tax benefit of interest	X
Cash taxes	X

Note: no further adjustments are made in respect of the tax on the other items adjusted for during the calculation of NOPAT.

The adjustments can be summarised by the following table:

	Change to profit	Change to capital employed
Advertising, research and development items expensed, staff training	Increase current year profit Deduct economic depreciation on previous year's EVA adjustment	Increase capital employed at the end of the year Increase capital employed in respect of similar add backs of previous year's investments not treated as such in financial statements, net of economic depreciation
Depreciation	Add accounting depreciation Deduct economic depreciation	Adjust value of non-current assets (and capital employed) to reflect economic depreciation not accounting depreciation
Operating leases	Add back lease payments to profit Deduct depreciation on assets	Add present value of future lease payments to capital employed
Provisions	Add increases in provision/ deduct decreases in provisions to/from profits	Add back the value of provisions to capital employed
Non-cash expenses	Add back to profit	Add to retained profits at the end of the year

The finance charge

The finance charge is calculated by multiplying the capital employed by the weighted average cost of capital (WACC). Capital employed is taken to mean equity plus long-term debt, and it is normal to take capital employed at the start of the year. In practice, the best approach is to start with capital employed from the published statement of financial position, and then to make the adjustments mentioned in the section above.

The formula for WACC is as follows:

$$\text{WACC} = K_e \times \frac{E}{E + D} + K_d (1 - t) \times \frac{D}{E + D}$$

Where: K_e = required return on equity, and $K_d (1 - t)$ = after tax return on debt finance. This formula is not given in the exam.

Example 3

Adam Co's summarised income statements for the past two years are shown below:

	2010	2009
	\$000	\$000
Operating profit	6,500	5,500
Interest expenses	<u>1,000</u>	<u>900</u>
Profit before tax	5,500	4,600
Tax at 25%	<u>1,375</u>	<u>1,150</u>
Profit after tax	4,125	3,450

Further information is as follows:

1. The allowance for doubtful debts was \$300,000 at 1 January 2009, \$250,000 at 31 December 2009 and \$350,000 at 31 December 2010.
2. Research and development costs of \$500,000 were incurred during each of the years 2009 and 2010 on Project Z. These costs were expensed in the income statement, as they did not meet the requirements of financial reporting standards for capitalisation. Project Z is not complete yet.
3. At the end of 2008, the company had completed another research and development project, Project X. Total expenditure on this project had been \$1,500,000, none of which had been capitalised in the financial statements. The product developed by Project X went on sale on 1 January 2009, and the product was a great success. The product's life cycle was only two years, so no further sales of the product are expected after 31 December 2010.
4. The company incurred non-cash expenses of \$15,000 in both years.

5. Capital employed (equity plus debt) per the statement of financial position was \$33,500 at 1 January 2009, and \$37,000 at 1 January 2010 .
6. The pre - tax cost of debt was 5% in each year. The estimated cost of equity was 12% in 2009 and 14% in 2010. The rate of corporate income tax was 25% during both years.
7. The company's capital structure was 60% equity and 40% debt.
8. There was no provision for deferred tax.

Required

Calculate Economic Value Added (EVA).

Solution**1. Calculation of NOPAT**

	2010	2009
	\$000	\$000
Operating profit	6,500	5,500
Add research costs expensed (Project Z)	500	500
Less amortisation of prior year expenses (Project X)	(750)	(750)
Add expense relating to increase in allowance for doubtful debts	100	(50)
Add non-cash expenses	15	15
Less cash taxes (working)	<u>(1,625)</u>	<u>(1,375)</u>
NOPAT	4,740	3,840

2 Calculation of adjusted capital employed at 1 January

	2010	2009
	\$000	\$000
Capital at 1 January per statement of financial position	37,000	33,500
Add: Allowance for bad and doubtful debts	250	300
Add capitalisation of research and development:		
Project Z	500	0
Project X	750	<u>1,500</u>
Add non-cash expenses incurred during 2009	<u>15</u>	
Adjusted capital employed at 1 January	38,515	35,300

3. Weighted average cost of capital

2010: $(60\% \times 14\%) + (40\% \times 5\% \times (1 - 25\%)) = 9.9\%$

2009: $(60\% \times 12\%) + (40\% \times 5\% \times (1 - 25\%)) = 8.7\%$

4. EVA™

$EVA^{\text{TM}} = \text{NOPAT} - (k \times \text{capital})$

2010: $\$4,740\text{k} - (9.9\% \times 38,515\text{k}) = \$927,000$

2009: $\$3,840\text{k} - (8.7\% \times 35,300\text{k}) = \$769,000$.

Working – calculation of net tax

	\$000	\$000
Tax charge per income statement	1,375	1,150
Add tax relief on interest (interest charge x 25%)	<u>250</u>	<u>225</u>
Cash taxes	1,625	1,375

Note: The research and development expenditure on both Project X and Project Z was expensed in the income statement in accordance with financial reporting standards. Since it is considered to be market building expenditure, however, it is added back to profits in the year it was incurred, and added back to capital employed at the end of the year in which it was incurred, when calculating EVA.

Such capitalisation should also be amortised over the period that it brings benefits. Therefore, in the case of Project X, this has been amortised over the two years during which the company sold products based on it. Project Z has not been completed yet, so no amortisation has taken place.

A reconciliation of the balance can be shown as follows:

	Project Z	Project X	Total
	\$000	\$000	\$000
Balance at 1 January 2009	0	1,500	1,500
Expenditure incurred during 2009	500	0	500
Less amortisation during 2009	0	(750)	(750)
Balance at 1 Jan 2010	500	750	1,250

In the second part of this article, to be published in the next issue of Student Accountant, we will focus on interpreting the calculated EVA , and its use as both an organisational performance measure and divisional performance measure.

Nick Ryan is lead tutor for performance management subjects.

References

- John D Martin and J William Petty, Value Based Management, Harvard Business School Press 2000.
- Shane Johnson and Matt Bamber, 'Economic Value Added', Student Accountant (2007), ACCA
- Erik Stern, EVA Has Potential to Boost Employees' Motivation, www.SternStewart.com/2011/04/erik-stern-eva/

Economic value added versus profit-based measures of performance – part 2

The second part of an article on Economic Value Added (EVA) focuses on how to interpret the calculated EVA and its use as both an organisational and divisional performance measure

In the first part of this article, we considered the rise in popularity of Economic Value Added – or EVA – as an alternative to traditional performance measurement systems. This second part focuses on interpreting the calculated EVA, and its use as both an organisational and divisional performance measure.

Interpreting the calculated EVA
When using EVA to assess the performance of an organisation or a division, the following should be considered:

1. Is it positive? If so, that is favourable, as it means that the organisation is providing a return that is greater than that required by providers of finance. It is creating wealth.
2. What is the trend over time? Is the calculated EVA increasing or not? Even if the trend is down, the organisation has still performed favourably if the calculated EVA is positive.
3. Reasons for changes in EVA also need to be investigated. For individual projects, EVA is only really meaningful when looking at the whole lifespan of a project. In the early years of a project's life, when the net book value of the assets is higher, the finance charge may also be higher, leading to a lower value of EVA, whereas in later years the reverse is true.

Use of EVA as an organisational performance measure

EVA is a performance measure that can be used to assess the performance of the directors of a company. The idea is that directors will be motivated to improve EVA in one of four ways:

1. Invest in divisions where the returns on those divisions exceed the costs of capital.

2. Increase the operating performance of its existing divisions – thus increasing the net operating profits after tax (NOPAT) without increasing the finance charge.
3. The firm can 'harvest assets' by closing down divisions where the return is less than the costs of capital, and either re-invest the proceeds in other divisions, or return the cash to share holders as a dividend.
4. The firm can increase its debt to equity ratio, and thus reduce the weighted average cost of capital (as the cost of debt is less than the cost of equity). Clearly this must be done within the bounds of prudence, and the company should not become over-gearred.

As such, EVA is a useful tool for assessing the performance of the directors of a company and should motivate them to maximise the wealth of the shareholders.

Use of EVA as a divisional performance measure

EVA can also be used as a performance evaluation tool for divisional managers. In decentralised organisations, divisions are effectively companies in their own right, with the head office acting as a holding company. As such, using EVA encourages divisional managers to maximise the wealth of the division. Divisional managers may not have sufficient autonomy to make decisions about financing or gearing, so will not be able to change the weighted average cost of capital (WACC). However, using EVA should ensure that divisional managers only invest in projects where the return on the projects exceed the costs of the company's capital.

Consistency with net present value

The ultimate measure of how much value an organisation creates is the net present value of the projects it invests in. Net present value shows the return on projects in excess of the cost of financing them. If the financial markets are functioning efficiently, it should be the case that the market value of an organisation is the same as the book value of the net assets of the organisation, plus the present value of future cash flows. Maximising shareholders' wealth therefore means maximising the net present value of future cash flows.

It can be shown that residual income – and therefore EVA – is consistent with net present value. Consider the following example:

Example 1

A company will invest \$10,000 in a new project. The \$10,000 represents

investments in non-current assets. The project will last for three years, and will generate cash inflows of \$5,000 in year one, and \$7,000 in years 2 and 3. The assets will have no residual value at the end of the life of the project. The relevant discount rate is 10%.

The net present value of the project can be calculated as follows:

			Factor	Value
T ₀	Investment	(10,000)	1	(10,000)
T ₁	Cash inflow	5,000	0.909	4,545
T ₂	Cash inflow	7,000	0.826	5,782
T ₃	Cash inflow	7,000	0.751	<u>5,257</u>
	Net present value			5,584

It can also be shown that if the residual income of the project is calculated and discounted, this will also give the net present value of the project, as follows:

	Year 1	Year 2	Year 3
Cash inflows	5,000	7,000	7,000
Less depreciation (note 1)	<u>(3,333)</u>	<u>(3,333)</u>	<u>(3,334)</u>
Profit	1,667	3,667	3,666
Finance charge (note 2)	<u>(1,000)</u>	<u>(667)</u>	<u>(334)</u>
Residual income	667	3,000	3,332
Discount factor at 10%	0.909	0.826	0.751
Discounted residual income	606	2,478	2,502

Sum of discounted residual income (606 + 2,478 + 2,502) = \$5,586. This is the same as the net present value calculated using the cash flow method above. The small difference of \$2 is due to rounding.

Note 1: Straight-line depreciation has been used, so annual depreciation is \$10,000/3.

Note 2:

The finance charge is 10% of the net book value of the assets of the project at the start of each year:

	Year 1	Year 2	Year 3
Opening net book value	10,000	6,667	3,334
Less depreciation (note 1)	<u>(3,333)</u>	<u>(3,333)</u>	<u>(3,334)</u>
Closing net book value	6,667	3,334	0
Finance charge	1,000	667	334

This relationship between residual income – and therefore EVA – and net present

value is important.

Return on capital employed and return on investment

So what of those well-known, traditional profit-based measures, return on capital employed and return on investment? We normally use the former description when discussing organisations, and the latter when describing divisions of organisations.

A commonly used version of these calculations is as follows:

$$\text{Return on capital employed (ROCE)} = \frac{\text{profit BEFORE interest and tax}}{\text{shares} + \text{reserves} + \text{long-term liabilities}} \times 100$$

$$\text{Return on investment (ROI)} = \frac{\text{controllable profit}}{\text{capital employed}} \times 100$$

In principle, using these measures to assess the performance of the managers of an organisation should not conflict with the goal of maximising shareholder value. However, the following problems may exist:

1. Profit can be manipulated – for example, by changing accounting policies or using different judgments. As one commentator noted: ***'Profit is a matter of opinion, cash flow is a matter of fact.'***
2. Managers may take decisions that improve profits in the short term, but may harm the business in the long term – such as cutting back on staff training or research expenditure.
3. Using ROI as a performance measure for a divisional manager may lead to 'goal incongruence', where a manager rejects a potential project that may generate a positive net present value, if the project would reduce the manager's measured return on investment.

These three potential problems should not exist when using EVA because:

- the adjustments made to profits in calculating NOPAT are designed to remove such accounting manipulations
- the fact that long-term value-adding expenditure can be capitalised when calculating EVA should remove any incentive that managers may have to take such short-term views

- any project that will generate a positive net present value will also increase EVA .

Disadvantages of EVA

EVA suffers from several disadvantages, such as:

- the adjustments to profits and capital can become cumbersome, especially if performed every year
- estimating the WACC can be difficult. While many organisations use models such as the CAPM, this is not a universally accepted method of determining the cost of equity
- the calculation of WACC is based on market values of equity and debt, while the finance charge applies this WACC to adjusted book values of equity and debt – so there is some inconsistency
- EVA is an absolute measure, so it cannot be used to compare companies of different sizes, unlike return on investment.

In spite of these disadvantages, EVA as a performance measure does assess the value created by managers, so is a more appropriate tool for measuring the performance of commercial organisations than profit-based ones.

Nick Ryan is lead tutor for performance management subjects.

References

- John D Martin and J William Petty, Value Based Management, Harvard Business School Press 2000.
- Shane Johnson and Matt Bamber, 'Economic Value Added', Student Accountant (2007), ACCA
- Erik Stern, EVA Has Potential to Boost Employees' Motivation, www.SternStewart.com/ 2011/04/erik-stern-eva/

Divisional performance management

This article focuses on financial performance measures: how different measures are used to assess performance, and the advantages and disadvantages of the different measures.

Abstract

In a divisional organisation, head office management needs to evaluate the performance of its divisions. This article discusses three measures which could be used to measure divisional financial performance – Return on investment (ROI), residual investment (RI) and economic value added (EVA™) – and assesses the advantages and disadvantages of each. The article also discusses the importance of distinguishing between divisional performance and managerial performance

Introduction

Many large organisations have divisionalised structures. In these organisations, a vital part of the head office management's role is measuring the performance of the divisions and of divisional managers.

In this context, it is important to recognise the distinction between divisional performance and managerial performance. An important question is the extent to which a manager's performance should only be evaluated in relation to factors they can control, rather than the overall performance of their division.

Another key question relates to the choice of measure (or measures) which are used to assess performance; in particular, return on investment (ROI), residual income (RI) or economic value added (EVA™).

This article will focus on financial performance measures: how different measures are used to assess performance, and the advantages and disadvantages of the different measures. However, if an organisation focuses only on financial measures this be an underlying disadvantage because it overlooks the non-financial factors – market position, productivity, quality, and innovation – which could contribute to its longer-term success.

Characteristics of performance measures

You should already be familiar with the characteristics of good divisional performance measures from your studies of *Performance Management* at Applied Skills:

- **Goal congruence** – measures should encourage divisional managers to make decisions which are in the company's best interests overall
- **Controllability** – managers, and divisions, should only be assessed in relation to aspects of performance they can control
- **Long-term and short-term** – Recognise the long-term objectives as well as short-term objectives of the organisation

The issue of goal congruence, in particular, will be important in relation to the advantages and disadvantages of the different methods. But first the importance of controllability when assessing what aspects of performance are measured will be considered.

Controllability – distinguishing controllable vs non-controllable profit

As mentioned in the introduction, it is important to distinguish between a division's performance and its manager's performance. The issue of controllability is key to this: managers should only be assessed in relation to aspects of performance they can control, whereas a division should be assessed in relation to its overall performance.

In turn, the importance of controllability highlights the need to distinguish between controllable and traceable costs, and therefore controllable and traceable profit.

Controllable costs are those which are controllable by the manager of the division.

Traceable costs include controllable costs plus other costs directly attributable to a division, but which the manager doesn't control.

When assessing the divisional manager's performance, only those items which are controllable by the manager should be included in the performance evaluation. Expenditure relating specifically to the division but agreed by head office – not by

the divisional manager – should be treated as traceable costs, not controllable ones. For example, marketing fees relating to the division but agreed by the Head Office marketing director (not the divisional manager) are traceable, not controllable. Similarly, legal fees or audit fees relating to the division but agreed by head office.

Controllable profit should be used to assess the manager’s performance, while traceable profit should be used to assess the division’s performance.

However, there is a further distinction to recognise: that between traceable and divisional profit:

Traceable profit should exclude overhead costs which are incurred centrally and then re-apportioned to a division. These costs are provided by head office for the benefit of multiple divisions, rather than relating directly to one division (eg central marketing services, HR, IT or finance).

	\$
Revenue	X
Costs controlled by divisional manager	<u>(X)</u>
Controllable profit	X

	\$
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Divisional costs, not controlled by divisional manager (X)

Traceable profit	X
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Allocated head office costs (X)

Divisional profit	X
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Recognising the share of head office costs is important though in order to reflect the costs the division would have to incur if it were independent. If divisional performance is assessed on only traceable profit, it is likely to be overstated compared to an external competitor. If the division were a separate company, it would have to incur some of the corporate costs itself (for example, HR, IT, finance costs, which are incurred by head office within a group structure). As such, a company should use **divisional profit** to compare the performance of one of its divisions to that of an external company.

EXAMPLE 1 – Controllable, traceable and divisional profit

Consider the following information about a division's revenue and costs for the last year:

	\$m
Revenue	529
Variable costs (controlled by divisional manager)	286
Fixed costs (controlled by divisional manager)	137
Marketing campaigns	28
Apportioned head office costs	43

Marketing campaigns are controlled by the head office, but relate specifically to the division's products.

Based on this information, calculate controllable, traceable and divisional profit for the last year:

	\$m
Revenue	529
Variable costs (controlled by divisional manager)	286
Fixed costs (controlled by divisional manager)	137
Controllable profit	106
Marketing campaigns	28
Traceable profit	78
Apportioned head office costs	43

\$m**Divisional profit****35**

Issues with controllability

Although in Example 1, costs which are 'controllable' and those which aren't are distinguished, this distinction can be more difficult to make in practice, with some costs being partially controllable. For example, costs of raw materials could be affected by supply shortages outside a manager's control. However, a manager could take action to reduce the adverse impacts of a price change by trying to substitute alternative materials.

Equally, some traceable costs (such as the marketing campaigns in Example 1) could contribute to a division's revenue. As such, if all of the division's revenue is considered to be 'controllable', but not all of the costs are, the manager's performance (ie controllable profit) will be overstated. However, the difficulty in such a situation is assessing how much revenue relates directly to the non-controllable cost and should therefore be deducted from divisional revenue to make a 'like for like' comparison of controllable costs and revenues, which would more fairly assess the manager's performance.

One potential solution to the issue of classifying controllable and non-controllable factors is to specify which budget lines are to be regarded as controllable and which are not.

Measuring performance

The issue of 'controllability' is important because it will affect the figures used in any performance measurement calculations depending on whether it is a division or a manager whose performance is being assessed. However, perhaps an even more important consideration for corporate management is which performance measures they use in order to make that assessment.

Two commonly used measures of divisional performance are return on investment (ROI) and residual income (RI).

Return on investment (ROI): measures operating profit as a percentage of the assets employed in the division. ***ROI needs to be greater than the cost of capital for a division to be profitable in the long term.***

ROI (%) = Traceable (controllable*) profit / Traceable (controllable*) investment

**: If manager's performance is being assessed, rather than the division's, ROI should be based on 'controllable' figures, not 'traceable' ones.*

Residual income (RI): the income that the division is earning less a cost of capital charge (imputed interest) on the assets employed in the division.

RI = Traceable (controllable) profit – imputed interest on traceable (controllable) investment**

***: Imputed interest is calculated by multiplying the traceable (or controllable) investment by the cost of capital. This is typically the weighted average cost of capital (WACC). However, instead of using WACC, a company might also set a target rate of return on the capital provided. In such a situation, a positive RI will indicate a division is generating a level of return greater than the target.*

Return on capital employed (ROCE)

As our focus here is on divisional performance measurement, we are looking at ROI rather than ROCE. The two are very similar, but ROCE would be more appropriate for looking at a company as a whole or at the division when treating it as if it were an external company or against an external company. In this case we would use **divisional profit**

Return on capital employed (ROCE): measures how efficiently a company/division uses its capital to generate profits.

$$\text{ROCE (\%)} = \frac{\text{Profits before interest and tax (or divisional profit)}}{\text{Capital employed}}$$

(Where Capital employed = total assets minus current liabilities)

ROCE should be greater than the cost of capital for a company to be profitable over the long-term.

ROCE can be useful for comparing the use of capital by different companies or divisions engaged in the same business. However, the value of any comparison (ROCE; ROI) will be affected by the similarities (or differences) between the entities whose performance is being measured. For example, ROCE is most useful when comparing performance between companies in the same industry, but its usefulness will be reduced if there are significant differences in the industry, or competitive environment, in which companies are operating).

EXAMPLE 2 – Calculating ROI and RI

A company has two divisions, Division A and Division B.

In the second half of 20X2, Division B launched a new product. It has invested \$50 million in new machinery needed to manufacture that product. The company's marketing department spent \$14 million on a major marketing campaign (on behalf of Division B) to accompany the product launch.

The divisional results for the last two financial years (20X1 and 20X2) show:

	Division A		Division B	
	20X2	20X1	20X2	20X1
	\$m	\$m	\$m	\$m
Revenue	103	100	140	125
Controllable costs	59	57	70	66
Traceable costs	13	12	31	16
Apportioned head office costs	17	16	22	20
Divisional profit	14	15	17	23
Capital employed	195	200	285	230

The company's weighted average cost of capital is 10%, and management believe this is appropriate for both divisions.

(i) Based on this information, calculate ROI and RI for both divisions for 20X1 and 20X2, using traceable profit.

(ii) Comment on the usefulness of ROI and RI in assessing the performance of Division B in 20X2.

Return on investment

	Divison A		Division B	
	20X2	20X1	20X2	20X1
	\$m	\$m	\$m	\$m
Divisional profit	14	15	17	23
Add back apportioned head office costs	17	16	22	20
Traceable profit	31	31	39	43
Capital employed	195	200	285	230
ROI (%)	15.90%	15.50%	13.70%	18.70%

Residual income

	Divison A		Division B	
	20X2	20X1	20X2	20X1
	\$m	\$m	\$m	\$m
Traceable profit	31	31	39	43
Imputed interest charge (Capital employed x WACC)	19.5	20	28.5	23
RI	11.5	11	10.5	20

Usefulness of ROI and RI in assessing performance of Division B

Both measures suggest that Division B's performance appears to have deteriorated significantly in 20X2, so that it is now performing worse than Division A, although it appeared to be performing better than Division A in 20X1.

However, this is due to the new investment for the new product launch and the associated marketing expenditure. The \$50 million capital investment in new machinery has increased the capital employed, while the company's marketing expenditure increased traceable costs.

However, the product was only launched in the second half of the year, so Division B's revenue does not fully reflect the benefits from selling the product yet. Moreover, provided the new product is successful we could expect it to continue to generate additional revenues in subsequent years.

Given investment in new equipment, it would be better to use an average capital employed figure for Division B:

	20X2
	\$m
Traceable profit	39
Average capital employed $(230 + 285)/2$	257.5
ROI (%)	15.10%
RI (\$m)	13.3

Using this average, Division B's RI is now greater than Division A's, although it is still significantly lower than it was in 20X1. Even using the average, Division B's ROI is still lower than Division A's in 20X2.

This illustrates one of the major potential problems with ROI and RI as performance measures: **encouraging short-termism**.

Investing in new capital has seemingly made Division B's performance worse. Therefore, a manager might choose not to invest in new assets, to avoid the apparent negative impact on performance. However, not investing in new assets in the short term could be damaging to a division's competitive performance in the longer term. As such, using ROI and RI as performance measures could encourage **dysfunctional decision-making**, rather than promoting goal congruence (one of the key characteristics of effective performance measures).

More generally, this example also illustrates a wider potential issue in performance measurement (regardless of the specific measures), being the validity of comparisons between different entities.

Comparisons of performance are most useful when the divisions (or companies) being compared are similar. In this case, the issue is that one division has had a significant increase in capital employed while the other hasn't.

However, there could be a range of other issues which could reduce the validity of comparisons: for example, relative age of assets (and therefore the amount of accumulated depreciation reducing net book value); assets held at cost compared to assets which have been revalued; differences between the industries in which divisions operate (and differences in their potential for growth and profit).

Evaluation of ROI and RI as performance measures

As mentioned earlier, one of the key characteristics of effective divisional performance measures is that they encourage goal congruence. However, using ROI to evaluate division performance can lead to sub-optimal (or dysfunctional) decision-making.

The company in Example 2 has a cost of capital of 10%. Therefore, projects which generate a return of greater than 10% will have a positive net present value and should be undertaken, because they will increase the overall value of the company in the future.

However, consider a situation where Division A from Example 2 had an opportunity in 20X2-3 to invest in a project with an expected return of 12%. If ROI is used as the main performance measure, the manager of Division A would be likely to reject the

project because the return is lower than the division's current ROI (15.9%), so undertaking will reduce divisional ROI.

This is one of the key disadvantages of ROI: that divisional managers may decide not to undertake a project with a return in excess of the cost of capital, because it has a lower ROI than the division's current ROI.

The conventional wisdom is that, to help overcome this problem, companies should use RI as their measure of performance rather than ROI.

In the hypothetical situation facing the Manager of Division A, the choice of performance measure being used could affect the manager's decision:

ROI: Won't invest

Current ROI = 15.9%. Expected rate of return on new project: 12%. Manager won't invest because expected return is below current ROI, so investing will reduce the division's ROI.

RI: Will invest

Target rate of return (WACC) = 10%. Expected rate of return on new project: 12%. Manager will invest, because RI is positive (ie expected rate > target rate).

In this respect, RI is a better measure to use because it encourages decision-making which is consistent with the logic of net present value (NPV), which is considered the best method of investment appraisal because it looks at the value which will be generated for shareholders if a project is undertaken.

Another potential advantage of using RI instead of ROI is that it is more flexible: different costs of capital can be applied to different divisions or investments to reflect differing levels of risk.

However, there are also problems with using RI:

Difficulty in estimating cost of capital – it can be difficult to estimate the cost of capital (or to calculate the required return from a project). However, the imputed interest charge is vital to the RI calculation.

The cost of capital should include cost of equity as well as cost of debt. In practice, investment centres are often only charged the debt portion of corporate capital, which understates the true cost of the centre's capital.

Comparing performance between divisions – to compare the performance of different divisions, a measure needs to take into account variations in size or differing levels of investment. ROI enables this, because it shows percentages, so can be used to compare returns on divisions of different sizes. By contrast, RI is an **absolute measure**, which makes it difficult (but not impossible) to compare performance.

Advantages and disadvantages of ROI and RI

ROI*

Advantages	Disadvantages
<ul style="list-style-type: none">• Comparable – easy to compare performance between divisions (or companies of different sizes) because it provides a ratio (%) rather than an absolute value	<ul style="list-style-type: none">• May encourage dysfunctional decision-making – eg not investing in an opportunity whose return is greater than WACC, because the projected return is less than existing ROI• Likely to encourage short-termism

*: The advantages and disadvantages of using ROCE as a performance measure are the same as for ROI.

RI

Advantages	Disadvantages
<ul style="list-style-type: none"> • Goal congruence – If RI of an investment is positive, then the investment will be undertaken. • Ties into the logic of NPV • Flexibility – can use different costs of capital to reflect levels of risk 	<ul style="list-style-type: none"> • Absolute values – use of absolute values rather than % makes it harder to compare performance between divisions of different sizes. • Difficulty in estimating cost of capital

There are also potential problems which are common to both ROI and RI:

- **Comparability:** The basis of asset valuation can distort comparison. For example, if a comparison is being done of the performance of two hotel companies, one of which revalued its properties, and the other didn't; the company with the revalued properties will have a relatively higher asset base, and therefore a relatively lower ROI or RI.
- If assets are valued at net book value, then (all other things being equal) ROI and RI will increase as assets get older, and depreciation leads to a decline in the value of the tangible asset base. This could encourage managers to retain outdated assets (so dysfunctional behaviour, rather goal congruence).
- **Short-termism:** More generally, financial performance measures are typically based on short-term measurement periods, which can encourage managers to become short-term oriented. For example, managers may reject investments with a positive net present value, and high payoffs in later periods, because they initially have an adverse impact (eg as a result of capital expenditure, increasing the value of capital employed.)

- **Differences in accounting policies** (for example for tangible assets, inventory, intangible assets) can make it difficult to compare performance between companies.

This point about reducing the impact of different accounting policies (and reducing the impact of accounting adjustments and estimates) is part of the rationale behind economic value added (EVA™) as an alternative method of performance measurement to ROI or RI.

Economic Value Added (EVA™)

EVA™ is a performance evaluation tool developed, and trade-marked, by Stern Stewart & Co consultants. The rationale behind it is similar to RI, in that a finance charge is deducted from profits in order to identify value added.

The calculation of EVA™ can be summarised as:

	\$m
Net operating profit after tax (NOPAT)	X
Cost of capital charge (WACC) on divisional assets	(X)
Economic value added	X

However, a major difference between EVA™ and RI is the adjustments made to reported financial profits and capital in EVA™. Proponents of EVA argue that accounting profits – calculated in accordance with financial reporting principles – do not reflect the economic value generated for shareholders by a company.

As such, a number of adjustments need to be made to assess performance on **economic profit rather than accounting profit**. These adjustments result in:

- The capitalisation of many value-building expenditures (eg research; marketing and advertising; staff training)
- The use of gross (replacement) costs for asset values, rather than net book value, and the use of economic depreciation rather than accounting depreciation
- The elimination of non-cash items (such as provisions for doubtful debt),

Economic value added is discussed in more detail in two separate articles:

- [Economic value added versus profit-based measures of performance - part 1](#)
- [Economic value added versus profit-based measures of performance - part 2](#)

Advantages and disadvantages of EVA™

Advantages

The focus on economic profit rather than accounting profit makes EVA™ better aligned to companies' objectives of maximising shareholder wealth. However, EVA™ still depends on historical data, while shareholders are ultimately concerned with future performance, and future cash flows.

Capitalising value-building expenditure and spreading the cost over the periods in which the benefits from it are received, should reduce short-termist decision-making. For example, under EVA™, the marketing expenditure linked to the launch of Division B's new product in our Example 2, would be capitalised, rather than expensed in 20X2.

Similarly, using the gross book value of assets (rather than net book value) should make it less attractive for managers to delay replacing old assets, whereas under ROI or RI managers can appear to improve performance in the short term by operating with older assets with a low written-down value.

Disadvantages

EVA™, like RI, is an absolute measure, so it will have limited value in judging the relative performance of divisions (or companies) of different sizes.

The number of adjustments needed to convert from accounting profit to NOPAT and therefore the time taken to calculate EVA™.

Transfer pricing

Transfer prices are almost inevitably needed whenever a business is divided into more than one department or division

Transfer prices are almost inevitably needed whenever a business is divided into more than one department or division

In accounting, many amounts can be legitimately calculated in a number of different ways and can be correctly represented by a number of different values. For example, both marginal and total absorption cost can simultaneously give the correct cost of production, but which version of cost you should use depends on what you are trying to do.

Similarly, the basis on which fixed overheads are apportioned and absorbed into production can radically change perceived profitability. The danger is that decisions are often based on accounting figures, and if the figures themselves are somewhat arbitrary, so too will be the decisions based on them. You should, therefore, always be careful when using accounting information, not just because information could have been deliberately manipulated and presented in a way which misleads, but also because the information depends on the assumptions and the methodology used to create it. Transfer pricing provides excellent examples of the coexistence of alternative legitimate views, and illustrates how the use of inappropriate figures can create misconceptions and can lead to wrong decisions.

When transfer prices are needed

Transfer prices are almost inevitably needed whenever a business is divided into more than one department or division. Usually, goods or services will flow between the divisions and each will report its performance separately. The accounting system will usually record goods or services leaving one department and entering the next, and some monetary value must be used to record this. That monetary value is the transfer price. The transfer price negotiated between the divisions, or imposed by head office, can have a profound, but perhaps arbitrary, effect on the reported performance and subsequent decisions made.

TABLE 1: EXAMPLE 1

	Division A	Division B	
	\$	\$	
Transfer-in price	-	50	
Own costs	30	20	
Divisional profit/mark-up	20	20	
Transfer-out/final sale price	50	90	→ Outside customers

Example 1

Take the following scenario shown in **Table 1**, in which Division A makes components for a cost of \$30, and these are transferred to Division B for \$50. Division B buys the components in at \$50, incurs own costs of \$20, and then sells to outside customers for \$90.

As things stand, each division makes a profit of \$20/unit, and it should be easy to see that the group will make a profit of \$40/unit. You can calculate this either by simply adding the two divisional profits together ($\$20 + \$20 = \$40$) or subtracting both own costs from final revenue ($\$90 - \$30 - \$20 = \40).

You will appreciate that for every \$1 increase in the transfer price, Division A will make \$1 more profit, and Division B will make \$1 less. Mathematically, the group will make the same profit, but these changing profits can result in each division making different decisions, and as a result of those decisions, group profits might be affected.

Consider the knock-on effects that different transfer prices and different profits might have on the divisions:

Performance evaluation. The success of each division, whether measured by return on investment (ROI) or residual income (RI) will be changed. These measures might be interpreted as indicating that a division's performance was unsatisfactory and could tempt management at head office to close it down.

Performance-related pay. If there is a system of performance-related pay, the remuneration of employees in each division will be affected as profits change. If they feel that their remuneration is affected unfairly, employees' morale will be damaged.

Make/abandon/buy-in decisions. If the transfer price is very high, the receiving division might decide not to buy any components from the transferring division because it becomes impossible for it to make a positive contribution. That division

might decide to abandon the product line or buy-in cheaper components from outside suppliers.

Motivation. Everyone likes to make a profit and this ambition certainly applies to the divisional managers. If a transfer price was such that one division found it impossible to make a profit, then the employees in that division would probably be demotivated. In contrast, the other division would have an easy ride as it would make profits easily, and it would not be motivated to work more efficiently.

Investment appraisal. New investment should typically be evaluated using a method such as net present value. However, the cash inflows arising from an investment are almost certainly going to be affected by the transfer price, so capital investment decisions can depend on the transfer price.

Taxation and profit remittance. If the divisions are in different countries, the profits earned in each country will depend on transfer prices. This could affect the overall tax burden of the group and could also affect the amount of profits that need to be remitted to head office.

As you can see, therefore, transfer prices can have a profound effect on group performance because they affect divisional performance, motivation and decision making.

The characteristics of a good transfer price

Although not easy to attain simultaneously, a good transfer price should:

Preserve divisional autonomy: almost inevitably, divisionalisation is accompanied by a degree of decentralisation in decision making so that specific managers and teams are put in charge of each division and must run it to the best of their ability. Divisional managers are therefore likely to resent being told by head office which products they should make and sell. Ideally, divisions should be given a simple, understandable objective such as maximising divisional profit.

Be perceived as being fair for the purposes of performance evaluation and investment decisions.

Permit each division to make a profit: profits are motivating and allow divisional performance to be measured using positive ROI or positive RI.

Encourage divisions to make decisions which maximise group profits: the transfer price will achieve this if the decisions which maximise divisional profit also happen to maximise group profit – this is known as goal congruence. Furthermore, all divisions must want to do the same thing. There’s no point in transferring divisions being very keen on transferring out if the next division doesn’t want to transfer in.

Possible transfer prices

In the following examples, assume that Division A can sell only to Division B, and that Division B’s only source of components is Division A. **Example 1** has been reproduced but with costs split between variable and fixed. A somewhat arbitrary transfer price of \$50 has been used initially and this allows each division to make a profit of \$20.

TABLE 2: EXAMPLE 2

	Division A	Division B	
	\$	\$	
Transfer-in price	-	50	
Own costs – variable	18	10	
– fixed	12	10	
Divisional profit/mark-up	20	20	
Transfer-out/final sale price	50	90	→ Outside customers

Example 2

See **Table 2**. The following rules on transfer prices are necessary to get both parties to trade with one another:

For the transfer-out division, the transfer price must be greater than (or equal to) the marginal cost of production. This allows the transfer-out division to make a contribution (or at least not make a negative one). In **Example 2**, the transfer price must be no lower than \$18. A transfer price of \$19, for example, would not be as popular with Division A as would a transfer price of \$50, but at least it offers the prospect of contribution, eventual break-even and profit.

For the transfer-in division, the transfer in price plus its own marginal costs must be no greater than the marginal revenue earned from outside sales. This allows that division to make a contribution (or at least not make a negative one). In **Example 2**, the transfer price must be no higher than \$80 as:

$\$80$ (transfer-in price) + $\$10$ (own variable cost) = $\$90$ (marginal revenue)

Usually, this rule is restated to say that the transfer price should be no greater than the net marginal revenue of the receiving division, where the net marginal revenue is marginal revenue less own marginal costs. Here, net marginal revenues = $\$80 = \$90 - \$10$.

So, a transfer price of $\$50$ (transfer price $\geq \$18, \leq \80), as set above, will work insofar as both parties will find it worth trading at that price.

The economic transfer price rule

The economic transfer price rule is as follows:

Minimum (fixed by transferring division)

Transfer price \geq marginal cost of transfer-out division

And

Maximum (fixed by receiving division)

Transfer price \leq net marginal revenue of transfer-in division

As well as permitting interdivisional trade to happen at all, this rule will also give the correct economic decision because if the final selling price is too low for the group to make a positive contribution, no operative transfer price is available.

So, in **Example 2**, if the final selling price were to fall to $\$25$, the group could not make a contribution because $\$25$ is less than the group's total variable costs of $\$18 + \10 . The transfer price that would make both divisions trade must be no less than $\$18$ (for Division A) but no greater than $\$15$ (net marginal revenue for Division B = $\$25 - \10), so clearly no workable transfer price is available.

If, however, the final selling price were to fall to $\$29$, the group could make a $\$1$ contribution per unit. A viable transfer price has to be at least $\$18$ (for Division A)

and no greater than \$19 (net marginal revenue for Division B = \$29 – \$10). A transfer price of \$18.50, say, would work fine.

Therefore, all that head office needs to do is to impose a transfer price within the appropriate range, confident that both divisions will choose to act in a way that maximises group profit. Head office therefore gives each division the impression of making autonomous decisions, but in reality, each division has been manipulated into making the choices head office wants.

Note, however, that although we have established the range of transfer prices that would work correctly in terms of economic decision making, there is still plenty of scope for argument, distortion and dissatisfaction. **Example 1** suggested a transfer price between \$18 and \$80, but exactly where the transfer price is set in that range vastly alters the perceived profitability and performance of each sub-unit. The higher the transfer price, the better Division A looks, and the worse Division B looks (and vice versa).

In addition, a transfer price range as derived in **Example 1** and **2** will often be dynamic. It will keep changing as both variable production costs and final selling prices change, and this can be difficult to manage. In practice, management would often prefer to have a simpler transfer price rule and a more stable transfer price – but this simplicity runs the risk of poorer decisions being made.

Practical approaches to transfer price fixing

In order to address these concerns, some common practical approaches to transfer price fixing exist:

1. Variable cost

A transfer price set equal to the variable cost of the transferring division produces very good economic decisions. If the transfer price is \$18, Division B's marginal costs would be \$28 (each unit costs \$18 to buy in then incurs another \$10 of variable cost). The group's marginal costs are also \$28, so there will be goal congruence between Division B's wish to maximise its profits and the group maximising its profits. If marginal revenue exceeds marginal costs for Division B, it will also do so for the group.

Although good economic decisions are likely to result, a transfer price equal to marginal cost has certain drawbacks:

Division A will make a loss as its fixed costs cannot be covered. This is demotivating.

Performance measurement is distorted. Division A is condemned to making losses while Division B gets an easy ride as it is not charged enough to cover all costs of manufacture. This effect can also distort investment decisions made in each division. For example, Division B will enjoy inflated cash inflows.

There is little incentive for Division A to be efficient if all marginal costs are covered by the transfer price. Inefficiencies in Division A will be passed up to Division B. Therefore, if marginal cost is going to be used as a transfer price, at least make it standard marginal cost, so that efficiencies and inefficiencies stay within the divisions responsible for them.

TABLE 3: EXAMPLE 3

	Division A	Division B	
Transfer-in price	\$ -	\$ 30	
Own costs – variable	18	10	
– fixed	12	10	
Divisional profit/mark-up	(0)	40	
Transfer-out/final sale price	30	90	→ Outside customers

2. Full cost/full cost plus/variable cost plus/market price

Example 3.

See **Table 3**.

A transfer price set at full cost as shown in **Table 3** (or better, full standard cost) is slightly more satisfactory for Division A as it means that it can aim to break even. Its big drawback, however, is that it can lead to dysfunctional decisions because Division B can make decisions that maximise its profits but which will not maximise group profits. For example, if the final market price fell to \$35, Division B would not trade because its marginal cost would be \$40 (transfer-in price of \$30 and own marginal costs of \$10). However, from a group perspective, the marginal cost is only \$28 (\$18 + \$10) and a positive contribution would be made even at a selling price of only \$35. Head office could, of course, instruct Division B to trade but then divisional autonomy is compromised, and Division B managers will resent being instructed to make negative contributions which will impact on their reported performance. Imagine you are Division B's manager, trying your best to hit profit targets, make wise decisions, and move your division forward by carefully evaluated capital investment.

The full cost *plus* approach would increase the transfer price by adding a mark up. This would now motivate Division A, as profits can be made there and may also allow profits to be made by Division B. However, again this can lead to dysfunctional decisions as the final selling price falls.

A transfer price set to the market price of the transferred goods (assuming that there is a market for the intermediate product) should give both divisions the opportunity to make profits (if they operate at normal industry efficiencies), but again such a transfer price runs the risk of encouraging dysfunctional decision making as the final selling price falls towards the group marginal cost. However, market price has the important advantage of providing an objective transfer price not based on arbitrary mark ups. Market prices will therefore be perceived as being fair to each division, and will also allow important performance evaluation to be carried out by comparing the performance of each division to outside, stand-alone businesses. More accurate investment decisions will also be made.

The difficulty with full cost, full cost plus, variable cost plus, and market price is that they all result in fixed costs and profits being perceived as marginal costs as goods are transferred to Division B. Division B therefore has the wrong data to enable it to make good economic decisions for the group – even if it wanted to. In fact, once you get away from a transfer price equal to the variable cost in the transferring division, there is always the risk of dysfunctional decisions being made unless an upper limit – equal to the net marginal revenue in the receiving division – is also imposed.

Variations on variable cost

There are two approaches to transfer pricing which try to preserve the economic information inherent in variable costs while permitting the transferring division to make profits, and allowing better performance valuation. However, both methods are somewhat complicated.

Variable cost plus lump sum. In this approach, transfers are made at variable cost. Then, periodically, a transfer is made between the two divisions (Credit Division A, Debit Division B) to account for fixed costs and profit. It is argued that Division B has the correct cumulative variable cost data to make good decisions, yet the lump sum transfers allow the divisions ultimately to be treated fairly with

respect to performance measurement. The size of the periodic transfer would be linked to the quantity or value of goods transferred.

Dual pricing. In this approach, Division A transfers out at cost plus a mark up (perhaps market price), and Division B transfers in at variable cost. Therefore, Division A can make a motivating profit, while Division B has good economic data about cumulative group variable costs. Obviously, the divisional current accounts won't agree, and some period-end adjustments will be needed to reconcile those and to eliminate fictitious interdivisional profits.

TABLE 4: EXAMPLE 1 – MARKETS FOR THE IMMEDIATE PRODUCT

	Division A	Division B	
Transfer-in price	\$ -	\$ 50	
Own costs – variable	18	10	
– fixed	12	10	
Divisional profit/mark-up	20	20	
Transfer-out/final sale price	50	90	Outside customers

Markets for the intermediate product

Consider **Example 1** again, but this time assume that the intermediate product can be sold to, or bought from, a market at a price of either \$40 or \$60. See **Table 4**.

(i) Intermediate product bought/sold for \$40

Division A would rather transfer to Division B, because receiving \$50 is better than receiving \$40. Division B would rather buy in at the cheaper \$40, but that would be bad for the group because there is now a marginal cost to the group of \$40 instead of only \$18, the variable cost of production in Division A. The transfer price must, therefore, compete with the external supply price and must be no higher than that. It must also still be no higher than the net marginal revenue of Division B (\$90 – \$10 = \$80) if Division B is to avoid making negative contributions.

(ii) Intermediate product bought/sold for \$60

Division B would rather buy from Division A (\$50 beats \$60), but Division A would sell as much as possible outside at \$60 in preference to transferring to Division B at \$50. Assuming Division A had limited capacity and all output was sold to the outside market, that would force Division B to buy outside and this is not good for the group as there is then a marginal cost of \$60 when obtaining the intermediate product, as opposed to it being made in Division A for \$18 only. Therefore, we must encourage Division A to supply to Division B and we can do this by setting a transfer price that is high enough to compensate for the lost contribution that Division A could have made by selling outside. Therefore, Division A has to receive enough to

cover the variable cost of production plus the lost contribution caused by not selling outside:

Minimum transfer price = $\$18 + (\$60 - \$18) = \60

Basically, the transfer price must be as good as the outside selling price to get Division B to transfer inside the group.

The new rules can therefore be stated as follows:

Economic transfer price rule

Minimum (fixed by transferring division)

Transfer price \geq marginal cost of transfer-out division + any lost contribution

And

Maximum (fixed by receiving division)

Transfer price \leq the lower of net marginal revenue of transfer-in division and the external purchase price

Conclusion

You might have thought that transfer prices were matters of little importance: debits in one division, matching credits in another, but with no overall effect on group profitability. Mathematically this might be the case, but only at the most elementary level. Transfer prices are vitally important when motivation, decision making, performance measurement, and investment decisions are taken into account – and these are the factors which so often separate successful from unsuccessful businesses.

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Value for Money (VFM) and performance measurement in not-for-profit organisations

This article discusses the concept of value for money, and how it can be used to measure performance in not-for-profit organisations.

In the Advanced Performance Management exam, you could be asked to evaluate the performance of not-for-profit organisations (for example, public sector organisations) as well as profit-seeking ones.

This article discusses the concept of value for money, and how it can be used to measure performance in not-for-profit organisations. The article uses a past exam question (from the September/December published sample questions) to illustrate this. The scenario from the exam question is summarised in the article, but it is essential to read the scenario and requirement in full and keep these to hand while reading the article.

The importance of value for money (VFM)

A key theme in contemporary performance management is that organisations need to measure, and manage, non-financial aspects of performance, rather than focusing solely on financial aspects. However, in profit-seeking organisations, there remains an underlying financial objective: typically, to maximise profit in order to maximise value for shareholders.

By definition though not-for-profit organisations do not have this underlying objective. Nonetheless, financial performance remains important in not-for-profit organisations (for example, comparing actual expenditure against budget, or comparing the surplus (or deficit) of income over expenditure).

However, these organisations also need to monitor how efficiently they are using the resources available to them, and how well they are performing in relation to their key objectives. For example, for hospitals and medical centres, how effectively they are providing health care to their patients; for schools and universities, the quality of education they are providing to their students.

In this respect, three important aspects of performance to measure are: **economy**, **efficiency** and **effectiveness**; the so-called 'three Es'. Achieving

these three Es will help an organisation to ensure it is delivering good value for money.

Value for money is seen as an appropriate framework for measuring performance in not-for-profit organisations, because value for money reflects not only the cost of providing a service but also the benefits achieved by providing it. In the absence of an underlying profit motive, assessing the benefits provided by a service is a particularly important part of evaluating its performance: for example, the benefits received by patients from hospital treatment they receive; the quality of education that students receive at their school or college.

Importantly also, value for money is not simply about minimising cost. To use the UK National Audit Office's definition: "Good value for money is the optimal use of resources to achieve the intended outcomes" where 'optimal' means "the most desirable possible given expressed or implied restrictions or constraints".¹

Value for money – the three Es

The key to achieving good value for money is finding an appropriate balance between the three Es (as summarised in Figure 1).

Economy	Efficiency	Effectiveness
<ul style="list-style-type: none">• Are the appropriate quantity and quality of inputs bought at the lowest cost possible?	<ul style="list-style-type: none">• How well are inputs (resource used) converted into outputs?	<ul style="list-style-type: none">• How well do these outputs achieve objectives?

Figure 1: Drivers of value for money

Economy: obtaining the appropriate quantity and quality of resources at the lowest cost possible; optimising the resources (inputs) which an organisation has.

Efficiency: maximising the output generated from units of resource used; optimising the process by which inputs are turned into outputs.

Efficiency can often be measured in terms of the cost of providing a service *per unit* of resource used, *per unit* of output, or per beneficiary served (in the context of a service).

For example, if the number of teachers employed by two schools is the same, but the first school has twice as many pupils as the second, we could say the first school is more efficient, because the staff costs per pupil will be lower.

Effectiveness: the relationship between the organisation's intended and actual results (outputs); the extent to which it achieves its **objectives**.

For example, one of the indicators which is often used to measure schools' performance is exam results, and this provides a measure of effectiveness. Is the tuition which pupils receive building their knowledge and, in turn, helping them to pass their exams?

Potential conflicts between the three Es

Although the aim of value for money is to achieve an appropriate balance between the three Es, this can often be difficult to achieve. Each of the Es aims to achieve different – potentially conflicting – outcomes in an organisation.

For example, increasing the number of pupils in each class at a school could help to improve efficiency (by reducing staff costs per pupil), but the quality of the pupils' learning experience might suffer as a result. So, in effect, increasing efficiency could be detrimental to effectiveness.

In recent years, there have been many stories in the news about cost savings or budget cuts in public sector services (health care; education; police forces). These

suggest an emphasis on 'economy' – and potentially 'efficiency' – rather than the 'effectiveness' of the services.

However, it is very important to remember that the value for money framework highlights the importance of measuring (and managing) **all three Es**, rather than focusing just on one aspect of performance.

This also has implications in relation to choosing performance measures. Organisations will need data to assess how well they are achieving value for money, and therefore in order to assess value for money appropriately, the range of performance measures used will need to address all three Es, rather than, for example, focusing primarily on cost (economy) or efficiency.

Equity

Sometimes a fourth 'E' is also included when measuring value for money performance: **equity**.

This reflects the extent to which services are available to, and reach, the people they are intended for, and whether the benefits from the services are distributed fairly.

For example, if an advice service provided to residents by a local authority is provided in a language that some residents do not speak, those residents will not be able to benefit from the service.

Evaluation of VFM from the Section A question published in the September/December 2020 sample questions.

The case study scenario identified that, following a recent change of government, the new minister in charge of policing in the country of Deeland has been instructed to improve the performance of the Deeland Police (DP).

The scenario identified DP's mission statement – 'to protect the community and prevent crime while providing a value for money service' – and four critical success factors (CSFs) which had been proposed to support this:

1. Greater protection and more support for those at risk of harm
2. Be better at catching criminals
3. Reducing the causes of crime by increased involvement with local communities
4. Create a task force to develop skills in detection and prosecution of virtual crime.

A table of data was also provided – as replicated below.

Deeland Police data for each year ending 30 June

	20X5	20X4	20X3
Population of Deeland ('000s)	11,880	11,761	11,644
Number of police officers	37,930	38,005	38,400
Number of administrative staff	12,320	12,197	12,075
Number of crimes reported in the year	541,735	530,900	520,282
Number of violent crimes reported in the year	108,347	106,180	104,056
Number of crimes solved in the year	297,954	300,934	303,943
Number of complaints	7,624	7,512	7,483
Response to an incident within the allocated time limit	84%	86%	87%
Cost of police force for the year (\$m)	2,248	2,226	2,203
Staff costs (all staff, including police officers) (\$m)	2,026	2,103	2,141

Requirement

The first part of the question focused on CSFs and key performance indicators (KPIs) and included a requirement to provide up to two justified KPIs for each CSF.

Then, the second part – which is the one we will focus on here – asked candidates for an explanation of the 3Es (economy, efficiency and effectiveness) and how this links to the work on CSFs and KPIs. Candidates were also asked to use the data provided to evaluate whether DP provides a value for money service.

The requirement was worth 13 marks.

Tackling the question

As the question asks for an explanation of the 3Es, a sensible starting point would be to give brief definitions of each of economy, efficiency and effectiveness.

As we mentioned earlier, effectiveness relates to the extent to which an organisation achieves its **objectives** and intended results. So, this is an important link to CSFs and KPIs. Having identified its key performance indicators (eg the percentage of crimes solved; reducing the total number of crimes), how effectively has DP achieved these? How has its performance in these areas changed over time?

In this scenario, we are only given data for DP, so we can only assess its own performance over the three years. However, if the data were available, it would also be useful to compare actual performance against targets, and to benchmark DP's performance against that of other police forces. (Although we don't discuss league tables in this article, these are often used to benchmark performance in public sector organisations; and another requirement in this exam question looked at the potential introduction of league tables).

Is DP providing a value for money service?

The key part of this question, though, is analysing the data provided and evaluating what this shows about the economy, efficiency and effectiveness of the service DP provides.

Economy

Cost is the key issue here – is DP obtaining appropriate resources at the lowest costs possible? – so the final two rows of data are important.

The overall costs of the police have increased slightly each year. However, staff costs, which make up most DP's costs, are falling. A positive factor in terms of economy?

The data also gives information about the numbers of police officers and administrative staff, and this shows that the number of police officers has been falling while the number of administrative staff has increased.

	20X5	20X4	20X3
Number of police officers	37,930	38,005	38,400
Number of administrative staff	12,320	12,197	12,075
Total number of staff	50,250	50,202	50,475
% of staff who are officers	75.5%	75.7%	76.1%
Staff costs (\$m)	2,026	2,103	2,141
Cost per employee	40,318	41,891	42,417

Again, this could be a positive factor in terms of economy, if DP is recruiting cheaper administrative staff to do jobs previously carried out by police officers. Remember our definition of economy: “obtaining the appropriate **quantity and quality** of resources at the lowest cost possible”. If certain aspects of the work can be done by administrative staff, why pay more to have them done by a police officer?

Efficiency

As we have mentioned earlier, a key aspect of efficiency is output per unit of resource.

We have looked at staff *costs* in the context of economy, but as a measure of efficiency we could look at the number of police officers relative to the population of Deeland. (The logic here being the more people served per police officer, the more efficient the police officers are.)

	20X5	20X4	20X3

Population of Deeland ('000)	11,880	11,761	11,644
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Number of police officers	37,930	38,005	38,400
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	20X5	20X4	20X3
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People per police office	313.2	309.5	303.2
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Number of police officers per '000 people	3.19	3.23	3.30
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So, on this basis, it might seem that reducing the number of police officers has helped to improve efficiency as well as economy.

But what about DP's efficiency in terms of solving crimes? We know the number of crimes solved each year, and we know the numbers of staff, so we can calculate the number of crimes solved per police officer or per employee as a key measure of efficiency.

	20X5	20X4	20X3
Number of crimes solved in the year	297,954	300,934	303,943

	20X5	20X4	20X3
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Number of police officers	37,930	38,005	38,400
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Total number of staff (officers + administrative staff)	50,250	50,202	50,475
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Crimes solved per police officer	7.86	7.92	7.92
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Crimes solved per employee	5.93	5.99	6.02
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Whichever measure is used (crimes solved per police officer, or per employee) the number of crimes solved is falling, and therefore DP's performance in this respect is worsening.

So, this raises the possible concern that although reducing the numbers of police officers and changing the mix of staff has reduced costs (and improved 'economy') it has reduced efficiency. This concern is also reinforced by the fall in the percentage of incidents which DP responds to within the allocated time limit.

And what impact has the reduction in the number of police officers had on DP's effectiveness?

Effectiveness

As we have already mentioned, effectiveness relates to how well an organisation is performing in relation to its objectives or goals. So, in this scenario, the issue is: how well is DP performing against its CSFs (and the related KPIs)?

The data provided doesn't allow us to assess DP's performance against all its CSFs (for example, there is no data about virtual (or cyber) crimes), but there are still some useful measures we can calculate:

Protecting those at risk

	20X5	20X4	20X3
Number of violent crimes	108,347	106,180	104,056
% change year on year	2.04%	2.04%	

	20X5	20X4	20X3
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Number of violent crimes per 1,000 population	9.12	9.03	8.94
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% change year on year	1.02%	1.03%	
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Be better at catching criminals

	20X5	20X4	20X3
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Number of crimes reported in the year	541,735	530,900	520,282
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Number of crimes solved in the year	297,954	300,934	303,943
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	20X5	20X4	20X3
% clear-up rate in solving reported crimes	55.0%	56.7%	58.4%

These figures are particularly stark in showing the DP is becoming less effective, because while the number of crimes reported is increasing each year, the number of crimes solved has fallen.

Reduce the causes of crime

	20X5	20X4	20X3
Number of crimes reported	541,735	530,900	520,282
% change	2.04%	2.04%	

The logic behind the CSF here would appear to be 'prevention rather than cure'. If DP can reduce the causes of crime, this should lead to a reduction in the number of crimes. However, the numbers of reported crimes are increasing.

In each case, the indicators suggest that DP is not performing effectively; with the numbers of crimes increasing, and DP's rate in solving them falling.

Although we need to be careful not to assume that correlation implies causality, it is nonetheless likely that the reduction in police officer numbers, and the apparent restrictions on staffing costs, have contributed to a decline in DP's effectiveness.

Conclusion

This question from the September/December published sample questions provides an excellent illustration of the issues which organisations face when trying to achieve value for money; in particular, the potential relationships between the three Es, and the impact that changing of the Es could have on the others.

More generally, an organisation which fails to achieve its principal objectives will not be successful. As such, organisations (and wider stakeholders, such as governments and funding agencies) need to be aware of the danger of becoming too focused on economy or efficiency (or both) to the detriment of effectiveness.

Focusing on the wrong measures – or focusing on one 'E' at the expense of the others – can be very damaging to an organisation. So, the challenge in achieving good value for money is how to balance and manage all three Es: being effective in achieving your objectives yet doing so in an economic and efficient manner.

Written by a member of the Advanced Performance Management examining team

Performance management in public sector organisations

Many governments around the world have undertaken reforms aimed at making public sector organisations more accountable. One of the key features of these reform programmes has been the increasing use of performance measures like benchmarking, where one organisation compares its performance in a specific area with another – the benchmark – to identify areas for improvement in **Public sector organisations**.

Public sector organisations come in many shapes and forms. The most obvious examples are schools and hospitals, police forces and local transport providers, but there are many less visible organisations such as regulatory bodies. The objectives of public sector organisations are very different from those of commercial organisations, and this can make performance management more complicated. The following factors in particular differentiate public sector organisations from commercial:

1. They have a broader group of stakeholders than commercial organisations. This can lead to greater conflicts. Commercial organisations are likely to be mainly concerned with shareholders, employees, customers and their lenders. Public sector organisations are likely to be interested in pleasing the providers of funding (the government), the users of the service and the taxpayer. In the case of schools, for example, parents would be happy to see more money spent on education – but, as taxpayers, they may not wish to pay more taxes.
2. Customers do not pay directly for the services they receive, and there may be little relationship between the costs of providing the service and the amount it is used. Consider a subsidised bus service, for example. The daily costs of running the buses are likely to be largely fixed, and do not depend on the number of passengers using them – at least in the short term. This makes it harder to decide how much should be spent on the service.
3. Many public sector organisations operate as monopoly providers. Even if customers are not happy with the service they receive, they cannot switch to an alternative supplier. In commercial organisations, this is generally not the case, and bad performance will lead to a loss of customers and, therefore, loss of funding.
4. The output of public sector bodies is often difficult to measure. How do you determine how much work a police force has performed? Statistics such as the number of crimes reported may be used. If the police force is doing a

good job however, and crime is falling, the number of crimes reported may fall. So, the lower number of crimes reported would wrongly suggest that the police force is not working so hard.

There is a perception that performance in public sector organisations is poorer than in the private sector, both in terms of efficiency and quality of service.

Greater use of targets in public sector organisations

Since the early 1980s the governments of some countries – notably the UK, Sweden, Australia and New Zealand – have undertaken reforms aimed at making public sector organisations become more accountable. These reforms have been driven by the need to:

- improve the overall efficiency and effectiveness of public expenditure
- reduce overall levels of expenditure
- improve accountability and transparency of the public sector
- enhance the responsiveness of public sector organisations to the needs of citizens.

Such reforms have been dubbed the 'new public management'.

One of the key features of these reform programmes has been the increasing use of performance measures and targets to evaluate all aspects of the performance of an organisation's activities. Typically, objectives are identified based on the mission statement. Targets are set for each objective. Managers must explain any variances between actual performance and the targets.

The targets are normally based on some output of the organisation. Typical targets might be the number of patients treated by a doctor, or the number of passports issued by the passport issuing authority. Qualitative targets may also be used, such as the level of patient care, which could be measured using surveys of patients.

This highly rational approach to performance management has its roots in the writings of Drucker and Argenti, who emphasised detailed planning and the use of

quantified targets. They argued that this gives greater direction to the management and staff of an organisation.

The use of and publication of targets also increases accountability. In the public sector, the managers are the agents, who act on behalf of the principal. The principal would be the general public, although the role of principal is often played by the government on their behalf. Much discussion of accountability focuses on whether or not managers have acted ethically – ie have not stolen the funds provided to them, and can account for their use. An equally important aspect of accountability, however, is how well the agent has performed in terms of efficiency.

Linking reward schemes to targets

Performance-related pay schemes are usually introduced alongside the targets, whereby bonuses are paid if particular targets are achieved. In the UK, for example, the government introduced an incentive programme for doctors in 2004, whereby bonuses are awarded based on the achievement of 146 targets. These targets focus on a wide range of areas, including clinical care, practice organisation and patient satisfaction. The bonuses are on a sliding scale – so even if not all of the targets are achieved, some of the available bonus would be paid.

Having such reward schemes is designed to improve the motivation of the management and staff, and it is argued that this improves the overall performance of the organisation.

Difficulties of using targets in the public sector

The use of targets in the public sector is not without problems, however:

1. The larger number of stakeholders makes it difficult to decide which metrics should be used. Often, governments focus on reducing costs. This has led to situations such as hospitals refusing to buy life saving medicines because they are too expensive, or police being removed from the beat to save money.
2. There may be less of a direct link between effort and outcomes in the public sector. In a hospital, for example, mortality rates may depend on many factors that are outside of the control of the hospital. Individual targets may not be a fair measure of performance in such situations; however, using a range of targets may overcome these problems.

3. It may be difficult to identify quantifiable outputs in the public sector. How does one measure the output of the local fire brigade, for example?
4. If systems are implemented in a very rigid way, without giving consideration to local issues, or special situations relating to the organisations being measured, then this may lead to problems such as manipulation of data, tunnel vision, sub optimisation and so on.
5. Many critics of targets in the public sector argue that their use has not resulted in lower costs or better quality of service. They claim that what has actually happened is that a higher portion of the organisation's budget is spent on employing managers and accountants to set the targets and measure performance, and a lower portion has been spent on frontline services.

This final criticism does not appear to have been confirmed by the facts. In the UK National Health Service (NHS), for example, the period from 1999 to 2009 saw a large rise in the use of targets. During this period, the average increase in support staff was 3.6% per annum, while the average increase in total staff was 3% per annum, according to statistics released by the NHS information centre (www.ic.nhs.uk). There was clearly some increase in the portion of budgets spent on managers, but hardly a significant increase.

Empirical evidence

It is extremely difficult to assess the impact of the use of targets in public sector organisations, due to the fact that it is difficult to assess what would have occurred had they not been introduced. Unlike scientific experiments, where there is a control experiment, no such control experiment exists in the public sector. In some situations, governments introduce pilot schemes in an attempt to gain some sort of comparison, but it is often difficult to get precise comparisons.

Another problem is that numerous changes have been made to the practices of setting and monitoring targets over the years, making the picture even less clear. Debate has largely focused on anecdotal evidence rather than on proper studies of the outcomes.

Studies into the impact of performance-related reward schemes are fairly few and far between, but do appear to show a positive relationship between the use of performance-related pay and the performance of the staff of the organisation (5).

While such studies have shown that individuals work harder, the impact on the provision of services overall is far from certain.

Use of benchmarking in public sector bodies

Benchmarking has also been used in many countries as a means of reducing the perceived gap between the performance of public sector organisations and their private sector counterparts, with the aim of improving the quality of service, and ultimately saving the taxpayer's money.

Benchmarking is where one organisation compares its performance in a specific area with another organisation, the benchmark, to identify how much room there is for improvement. It then attempts to implement practices similar to the benchmark in an attempt to narrow the gap in performance.

The specific area for benchmarking could be a particular business process – such as inventory control, or it could be a broader area such as 'quality of customer service'. The benchmark could be another organisation, or it could be another department within the same organisation.

Seven-step approach to benchmarking

The consulting firm Kaiser Associates proposes a seven-step approach to benchmarking as follows:

1. Determine which areas or functions to benchmark. It would probably not be feasible to benchmark all functions at one time, so it is necessary to choose those activities where benchmarking can bring the greatest benefits to the organisation. This may be based on which activities offer the greatest scope for cost savings, or which are 'key service differentiators'.
2. Identify the performance indicators and performance drivers that will be measured during the benchmarking exercise.
3. Select the organisations that will be used as the benchmark.
4. Measure the performance of the benchmark using the measures identified in step two above.
5. Measure your own performance, and compare it to the benchmark to identify the gaps.

6. Specify actions and programmes to close the gap. This involves analysing how the benchmark achieves superior performance, and identifying similar practices that could be adopted.
7. Implement and monitor the actions and programmes. Monitoring should not be a one-off process, but should continue for a longer period after the benchmarking exercise.

Identifying the performance indicators

In public sector benchmarking, the performance indicators used tend to focus on cost and efficiency or differentiation. Cost variables might include items such as labour efficiency, or total costs for a particular function as a percentage of income.

Regarding differentiation, many of the metrics used would be of a qualitative nature, such as client satisfaction or quality of service. It is difficult to measure these directly due to their subjectivity. One approach is to use customer surveys for these.

In attempting to find relevant metrics, benchmarking exercises carried out in the past by similar organisations can be a useful source. Much information about these is available in accounting and business journals, and online, or by contacting organisations that have already performed a benchmarking exercise. This is easier in the public sector, as the government – as overseer and beneficiary of the benchmarking – can often force other organisations to disclose information. This would not be the case in the private sector.

Selecting the benchmark

When choosing the benchmark, we can talk about different types of benchmarking:

- Internal benchmarking uses another organisation within the same organisation. For example, a comparison of the performance of the procurement department of one hospital with the procurement department of another hospital.
- External functional benchmarking is where a particular function is compared with that function for the organisation that performs that function best, regardless of which industry they are in.

- Competitive benchmarking is where a competitor is used as the benchmark. This may not be so common in the public sector.

When using external functional benchmarking, using a similar organisation in terms of objectives and size can make the process easier. It is not necessary then to take into account differences between the two organisations when comparing their performance, and it should be easier to adopt the practices of the benchmark if they are similar. For example, if a school uses a similar school in a different area as a comparator.

External functional benchmarking can also be performed successfully using out of category organisations – ie organisations that may have totally different objectives and even different primary activities. Using such benchmarks will make the process more complex, but may provide the opportunity for an organisation to overtake, rather than simply to catch up with comparable organisations. For example, a public sector logistics department could use one of the private sector international courier companies as a benchmark for its logistics.

The most important factor when selecting the benchmark is to identify the ‘best in class’ for the activity or business process being benchmarked.

Measuring the performance of the benchmark

Prior to starting to perform measurement, the organisation will have identified what it wants to measure (in step two), so it should already be clear what information is required. The question now is how to obtain it.

Much information is already in the public domain. Many organisations publish information about best practice benchmarks for particular industries. Financial reports may provide information about cost efficiency. There may be newspaper reports or analysts’ reports available for larger listed companies. Publicly available information is a good place to start, but it is unlikely to provide all the information required for a successful benchmarking exercise.

Another source of information is ‘data sharing’ where other organisations are contacted, either directly and formally, or through professional conferences. This can be supplemented by interviewing of staff at the benchmark.

Factors that influence the effectiveness of benchmarking

Based on some empirical research, Sandra Tillema tried to identify what factors determine whether or not a benchmarking exercise actually leads to improved performance. A study of benchmarking carried by four Dutch water boards concluded that the performance of those water boards had not improved after the benchmarking.

Tillema claims that one reason for the lack of success of many public sector benchmarking exercises is that they focus only on measuring performance against the benchmark. They do not attempt to learn from, and adopt the practices of, the benchmark. Thus, the benchmarking is often a measuring exercise, not a learning exercise.

A second factor is the influence of stakeholders. A benchmarking exercise will only lead to improvements if pressure is put on the organisation from its stakeholders to narrow the gap identified between the organisation and the benchmark. This pressure can come from internal stakeholders, such as supervisory boards, or external stakeholders, such as users of the service. In the case of the Dutch water boards, no pressure had been exerted on the managements of the board, which is why no improvement was experienced.

In some situations, benchmarking may lead to economic pressure on an organisation to improve. If poor benchmarking results are published, users of the service may switch to alternative providers. So, benchmarking can lead to economic pressure on poorer organisations. In the case of state universities, for example, students have a choice which university to go to, and their choice may be influenced by published results of benchmarking.

Such economic pressure only works in situations where users can switch service provider. This is not always the case, and monopoly providers of services will not feel this economic pressure. Another issue is that users may not always understand the results of benchmarking, and their decisions may be based on factors other than the benchmarking exercise – for example, the student that chooses a university based on the better nightlife in the city where it is located, rather than the publicly available results of benchmarking.

Dysfunctional effects of benchmarking

Tillema notes that in common with all performance measurement, benchmarking may lead to dysfunctional behaviour. Management may take actions to improve

their measured scores without improving underlying performance. A criticism by some of UK schools is that management focus on improving their performance in the government league tables, not on providing a good education for pupils. This is part of a general problem in performance management, which is the 'what gets measured gets done' concept.

Benchmarking can also be used to defend rather than improve poor performance. In such cases, management focus on explaining why their organisation performed poorly, citing factors that make their organisation different from its peers. In such cases, the benchmarking leads to little or no improvement in performance.

One factor that leads to greater levels of dysfunctional behaviour is where stakeholders misinterpret the results. For example, they do not take account of different operating environments, or different objectives of the organisation and benchmark, and this leads to unrealistic pressure to close the performance gaps.

Misinterpretation is less common where the results are only made available to expert stakeholders. Because the expert stakeholders have a better understanding of the performance, and the factors that may differentiate the organisation from its peers, they will be more realistic in their assessment of the results. This reduces the incentive for managers to manipulate the results.

League tables

League tables are commonly used in the public sector to present the results of benchmarking. Under league tables, the various metrics are summarised into a weighted average overall score. A league table is then prepared, showing all organisations ranked according to their overall score – for example, UK schools are ranked by exam results.

The benefit of league tables is that many different areas of performance are summarised into one final score, showing how well the organisation has performed over all. League tables are also designed to improve competition among the organisations, giving an incentive to the poorer performers to improve so that they move up the table.

Common criticisms of league tables are that they apply arbitrary weighting to the various factors that are used in the calculation of the final score. It is also argued that they do not take into account differences between the organisations being measured. In schools, for example, one factor that affects the performance of

schools quite strongly is the demographics of the area where the schools are located, with schools in poorer areas typically appearing towards the bottom of the table.

Conclusion

There has been a move towards making public sector bodies more efficient and effective, using more targets and benchmarking. It is not clear whether targets have improved the performance of public sector bodies or not. Benchmarking can lead to improved performance in some public organisations. However, it is most successful where stakeholders have the ability to apply pressure to the organisations to narrow the gap between their actual performance and that of the benchmark. If not, then the benchmarking may not lead to improved performance.

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Human resource management and the appraisal system

This article looks at the nature of human resource management, and at the link between human resource management and performance management. It then examines aspects of the staff appraisal system, and considers the impact of these on the performance of an organisation.

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Nature of Human Resource Management

Human resource management is defined by Bratton as '*a strategic approach to managing employment relations, which emphasises that leveraging people's capabilities is critical to achieving competitive advantage.*' (1)

From this definition, we can see that human resource management has grown in importance from the traditional view of the personnel department, whose role was primarily seen as that of hiring and firing employees to a much broader role. Human resource management includes the recruitment of employees, the development of policies relating to human resources, and the management and development of employees.

It also follows that human resources management is not carried out exclusively by the HR department. Line managers are involved in managing the human resources in their departments.

Importance of human resources

The modern terms 'human resources' and 'human capital' reflect the increasing recognition of the strategic importance of employees. The terms actually refer to the traits that people bring to the workplace, such as knowledge, intelligence, enthusiasm, an ability to learn, and so on. Employees are seen less and less as an expensive necessity, and more and more as a strategic resource that may provide

an organisation with competitive advantage.

In service industries such as restaurants, for example, where employees have direct contact with customers, having employees that are friendly and helpful has a large impact on how customers will view the business. In IT industries, having staff with good technical knowledge is essential.

The problem with human resources is that they require more management than other factors of production. We humans are complex, emotional creatures, and it can be challenging to ensure that we behave in the right way, remain motivated and give our best to the employer. William James, the 19th century American sociologist, once remarked that most people only use 15% of their combined intelligence, skills and aptitudes in their employment. Whether this still remains the case or not, it is clearly a challenge to get employees to contribute more of their abilities in the workplace.

Strategic human resource management

Given that human resources are a strategic capability, many human resource practitioners talk about 'strategic human resource management'. This means aligning the human resource management of organisations with the organisations' strategy.

The human resources management process should support the corporate strategy by:

- ensuring that the organisation has the right number of qualified employees
- employees have the right skills and knowledge to perform efficiently and effectively
- employees exhibit the appropriate behaviours consistent with the organisation's culture and values
- employees meet the organisation's motivational needs.

A low-cost supermarket, for example, may have an HR policy of recruiting unskilled staff, who are prepared to work for low wages, but would not provide customers with excellent service. A more upmarket supermarket on the other hand would want to provide excellent customer care. HR strategies would include the

recruitment of individuals who have excellent personal skills, and training of all staff in customer care.

Recruitment and selection

'Recruitment is the process of generating a pool of capable people to apply to an organisation for employment. Selection is the process by which managers and others use specific instruments to choose from a pool of applicants the person or persons most likely to succeed in the job given management goals and legal requirements.' (2)

Recruitment is the first stage in the process of human resource management. The organisation needs to recruit individuals with the right skills, and the right attitudes to contribute to the strategic goals of the organisation. Employees should also have the personality that will fit into the culture of the organisation.

From the point of view of potential employees, the recruitment process provides them with the opportunity to see if the organisation matches their expectations. The organisation should provide honest information about the position so that the potential employee forms the right expectations about the role that they are applying for. If not, this may lead to disappointment and high staff turnover.

When recruiting, the amount of time and effort spent in selecting the right employee depends on the amount of responsibility that the position requires. Managerial or problem-solving positions, where employees would be required to have deeper skills, a higher level of responsibility and greater commitment, thus contributing to the strategy of the organisation, would merit a much greater effort in the selection process. The selection process will need to ensure that candidates should possess the ability to acquire the skills needed, and the attitude that fits the culture of the organisation. Organisations may use psychometric tests to assess candidates for such positions. Psychometric tests are described later in this article.

Lower level employees would be employed if they have the right skills. Less screening would take place for this group of employees.

Competency frameworks

In many organisations, competency frameworks may be developed prior to the recruitment stage. A competency framework shows a set of behaviour patterns and skills that the candidate needs in order to perform a job with competence.

ACCA has developed a comprehensive competency framework for ACCA students to help plan careers in different roles. In ACCA's competency frameworks, competencies are categorised into exams, experience, ethics, job profiles, technical competencies and behavioural competencies. An example of a technical competence relating to management accounting is performance objective 13, *Contribute to budget planning and production*.

Appraisal system

An appraisal is the analysis of the performance of an individual, which usually includes assessment of the individual's current and past work performance. Broadly speaking, there are two main reasons for the appraisal process. The first is the control purpose, which means making decisions about pay, promotions and careers. The second is about identifying the development needs of individuals.

Control objective of appraisals

In recent years, there has been a drive towards linking the appraisal of employees to the strategic objectives of an organisation. The idea is that the organisation sets its own goals and performance measures. These goals are then translated into goals for managers and employees. Measurable targets are identified and set for employees, and their performance against the targets will be used as part of their appraisal.

Appraisal is, therefore, seen as part of management control. By measuring the performance of employees against targets, management is seen to be proactively managing the performance of employees and therefore improving the performance of the organisation.

While such an approach may appear rational, in practice it is very unpopular with employees, who do not like to feel they are being controlled. It can also be criticised

for trying to make a complex relationship between employees and managers appear to be too simple. In practice, however, such control models are the most popular models of assessment.

Developmental objectives of appraisals

A second way in which the appraisal system can support performance management is by identifying the development needs of staff and managers. Some organisations use a development centre, where an individual is assessed, often by a qualified occupational psychologist, against the required competencies for his role. Personal development plans are then made to develop the individual in areas where weaknesses are recognised.

Difficulties in appraisal

In assessing employees, managers are required to make judgments about an employee's performance and capabilities. Such judgments are naturally subject to potential bias in favour of some and against others. There are many statistics showing how prejudice may affect the promotional prospects of some groups. In the UK, for example, 40% of the workforce are women, but only 30% of managers are women.

Another difficulty is the effect that negative criticism can have on performance. A study carried out in the 1960s by Meyer, Kay and French (3) investigated the impact of the appraisal process at a factory in the US. The study concluded that where staff are given criticism, they react defensively to the criticism and try to blame others for their shortcomings. They will also become demotivated. Interestingly, praise given during the process had little impact on performance.

One potential solution to the difficulties mentioned above in relation to appraisal is to be aware that, in addition to the formal appraisal process, employees receive continuous informal feedback from their managers on the job. Employees generally accept this informal feedback more readily, and it is more likely to lead to improvement in their performance. Placing more emphasis on this informal type of assessment, and less on the formal appraisal process, may improve the overall performance of employees.

Measurement of performance

When measuring the performance of employees for the purpose of appraisal, three different approaches can be used:

- Measurement of inputs
- Behaviour in performance
- Measurement of results and outcomes.

Measurement of inputs

Measurement of inputs means attempting to assess the traits of an individual. Traits are those skills, knowledge and attitudes that the employee possesses. Assessment aims to identify whether the staff member has the competencies (or traits) for a job, perhaps with reference to a competency framework. Attributes such as leadership, commitment, ability to work within a team and loyalty are traits that are typically desired.

Where assessment is performed by the line manager, the subjectivity of the exercise may well lead to real or perceived bias in the assessment. As a result of this, many organisations now use professionally designed psychometric tests.

Psychometric testing aims to 'measure' the abilities and personal skills of an individual. An example of an ability would be the number of words per minute that the individual can type on a keyboard. Personal skills focus on areas such as emotional stability of the individual, whether the individual is introvert or extrovert, and how flexible the employee is.

Some organisations hold 'moderation meetings' for bigger teams. The purpose of these meetings is to ensure that the various managers involved in assessing the different members of staff within a team are doing so consistently.

Behaviour in performance

This type of appraisal looks at the behaviour of the employee during work, and at how the employee applies his or her skills. Both quantitative and qualitative data is collected on a continuous basis relating to how the employee displays the expected

behaviour for the position – for example, ‘gives praise where it is due to others on the team’ might be one of the behaviours looked for.

A common method for assessing behaviour in performance is the use of behaviour-anchored rating scales (BARS). Descriptions of desired (and undesirable) behaviour are listed, and the appraiser gives a score for each one. A good example of BARS is the course assessment forms used by many ACCA tuition providers, where students are asked to rate the tutor on various attributes, such as ‘clarity of explanations’, and ‘approachability’. Students then give the tutor a grade for each of these attributes – for example, from 1 to 5, where 5 is excellent, and 1 is poor.

Behavioural observation scales (BOS) are where specific actions are listed, and the appraisee is judged on how many times he performs that action. For example, how often does a supervisor provide constructive feedback to colleagues?

An obvious problem with BARS and BOS is the subjectivity involved. BOS are designed to be slightly less subjective as they are based on the number of times behaviour is observed, which is more factual.

Measurement of behaviour in performance generally is beneficial because not only is information about the employee’s performance obtained, but more detailed understanding of the requirement of the job can be ascertained, and this can be used for defining standards in future.

Measurement of results and outcomes

Under these types of appraisals, individuals are assessed on quantifiable outcomes – for example, the amount of sales achieved by a salesman, the volume of production achieved, the number of customer complaints. Where competency frameworks are used, it may also be possible to measure the number of competencies achieved during a period.

Frequently, targets may be set for individuals and their performance will be judged against these. In setting such targets, it is appropriate to consider the principles relating to the setting of standards from the Fitzgerald and Moon building blocks model. In particular, standards should be achievable, or staff will become demotivated; they should be controllable – that is, staff should not be judged on

targets that are outside of their control.

Measurement of results and outcomes is usually easy to perform, but suffers from the problem that it does not take into account the differing external factors that may have occurred. It may also lead to measure fixation among staff, such as the famous example in the call centres, where the performance of call centre staff was measured based on the number of calls per day. It was quite common for call centre staff to keep this high by simply hanging up when presented with difficult customers.

Control mechanisms for employees

Ouchi developed a model for helping to determine what types of controls are most appropriate for employees in different situations:

- Personnel controls, also known as clan controls, are based on fostering a sense of solidarity in the people who work for an organisation. If personnel believe in the objectives that the organisation is trying to achieve, then they will be motivated to work towards those objectives and will not require detailed supervision or control. Personnel controls include recruitment of people with the right attitudes, training and job design. These are closely related to appraisal systems based on inputs.
- Behavioural controls involve observing the employee – for example, the foreman on a production line watches the employees to ensure that the work is done as prescribed. Such controls are consistent with appraisal systems that focus on the behaviour of employees.
- Output or results controls that focus on measuring some aspect of work performed. Examples could include measuring the number of defective products. Appraisal systems based on results or outcomes are examples of output controls.

The type of control system that is appropriate depends on two variables – the ability to measure output, and the knowledge of the transformation process. Ouchi forms a matrix from these two that helps to determine what types of control system are most appropriate for a particular organisation:

		Knowledge of the transformation process	
		<i>Perfect</i>	<i>Imperfect</i>
Ability to measure output	<i>High</i>	Behavioural and or output controls	Output controls
	<i>Low</i>	Behavioural measurement	Personnel controls

Knowledge of the transformation process is low in situations where there is no obvious way to do a task. Those performing the task may have to learn on the job, rather than be provided with a detailed instruction manual showing them how to do it. This may occur in project-based work, for example, where each project brings new tasks and challenges to the project team.

In manufacturing industries, it is likely that it is easy to measure output, and knowledge of the transformation process is high – the tasks have been performed many times before. So behavioural or output controls are appropriate, and appraisal will focus on the behaviour of employees or on results and outcomes.

A situation where the knowledge of the transformation system is imperfect but measurement is easy might be a sales department. Management may not be aware of the exact processes involved by the sales team, and there may not be one 'right way' of making sales. However, measurement of sales is easy to do, so output controls may be used. The problem with this approach, however, is that it does not take into account external factors. It may be difficult to make sales in some markets, for example, and so appraising employees on results alone might be deemed unfair.

The ability to measure output may be difficult in certain activities, such as research work. Where people work in teams, measuring the output of the individuals within the team may be difficult. Some individuals may put in more effort than others, for example. If knowledge of the transformation process is also low, then the organisation may have to rely on personnel and clan controls. In such situations, the appraisal process may focus on traits.

Linking appraisal to the reward scheme

The appraisal process may be linked to a reward scheme whereby employees or managers earn some incentives, such as promotion or financial incentives if targets are met. Reward schemes were discussed in another article, 'Reward schemes for employees and management' (see Related links).

Nick Ryan is the lead tutor for ACCA Performance Management.

Reward schemes for employees and management

A major part of performance management involves managing employees and managers, as their performance will have a major effect on the performance of the organisation as a whole. This article looks at how reward schemes can be used to influence the behaviour of employees.

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Meaning of reward schemes

A broad definition of reward schemes is provided by Bratton:

‘Reward system refers to all the monetary, non-monetary and psychological payments that an organisation provides for its employees in exchange for the work they perform.’

Rewards schemes may include extrinsic and intrinsic rewards. Extrinsic rewards are items such as financial payments and working conditions that the employee receives as part of the job. Intrinsic rewards relate to satisfaction that is derived from actually performing the job such as personal fulfilment, and a sense of contributing something to society. Many people who work for charities, for example, work for much lower salaries than they might achieve if they worked for commercial organisations. In doing so, they are exchanging extrinsic rewards for the intrinsic reward of doing something that they believe is good for society.

Objectives of a reward scheme

What do organisations hope to achieve from a reward scheme? The following are among the most important objectives:

1. To support the goals of the organisation by aligning the goals of employees with these.

2. To ensure that the organisation is able to recruit and retain sufficient number of employees with the right skills.
3. To motivate employees.
4. To align the risk preferences of managers and employees with those of the organisation.
5. To comply with legal regulations.
6. To be ethical.
7. To be affordable and easy to administer.

Aligning the goals of the organisation and employees

The reward scheme should support the organisation's goals. At the strategic level, the reward scheme must be consistent with the strategy of the organisation. If a strategy of differentiation is chosen, for example, staff may receive more generous benefits, and these may be linked to achieving certain skills or achieving pre determined targets. In an organisation that has a strategy of cost leadership, a simple reward scheme offering fairly low wages may be appropriate as less skilled staff are required, new staff are easy to recruit and need little training, so there is less incentive to offer generous rewards. The US supermarket group Walmart competes on low cost. It recruits employees with low skills, and pays low wages. It discourages staff from working overtime, as it wishes to avoid paying overtime rates.

To recruit and retain sufficient employees with the right skills

If rewards offered are not competitive, it will be difficult to recruit staff since potential employees can obtain better rewards from competitors. Existing staff may also be tempted to leave the organisation if they are aware that their reward system is uncompetitive.

High staff turnover can lead to higher costs of recruitment and training of new staff. Losing existing employees may also mean that some of the organisation's accumulated knowledge is lost forever. For many knowledge-based organisations, the human capital may be one of the most valuable assets they have. High

technology companies such as Microsoft are companies that trade on knowledge, so offer competitive remuneration to key staff.

To motivate employees

Motivation of employees is clearly an important factor in the overall performance of an organisation. Organisations would like their employees to work harder, and be flexible. The link between reward schemes and motivation is a complex issue that is hotly debated in both accounting and human resource-related literature.

A well-known theory relating to motivation is Maslow's hierarchy of needs. Maslow stated that people's wants and needs follow a hierarchy. Once the needs of one level of the hierarchy are met, the individual will then focus on achieving the needs of the next level in the hierarchy. The lower levels of the hierarchy are physiological, relating to the need to survive (eg eating and being housed); once these have been met, humans then desire safety, followed by love, followed by esteem, and finally at the top of the hierarchy, self actualisation, or self fulfilment.

Applying Maslow's hierarchy of needs to reward schemes suggests that very junior staff, earning very low wages will be motivated by receiving higher monetary rewards, as this will enable them to meet their physiological needs. As employees become progressively more highly paid, however, monetary rewards become relatively less important as other needs in the hierarchy, such as job security, ability to achieve one's potential, and feeling of being needed become more important.

Herzberg argued that increasing rewards only motivates employees temporarily. Once they become de-motivated again, it is necessary to 'recharge their batteries' with another increase. A far better way to motivate employees is to 'install a generator in an employee' so they can recharge their own batteries; in other words to find out what really motivates them. According to Herzberg, it is the intrinsic factors in a job that motivate employees, such as 'achievement, recognition for achievement, the work itself, responsibility and growth or advancement.' Giving greater responsibility to employees, for example, can increase motivation.

Perhaps the conclusion to be gained from this is that monetary rewards alone are insufficient to motivate employees. Other factors such as giving greater recognition and greater responsibility may be equally important, for example giving praise at company meetings, promoting staff, and involving staff more in decision making.

Aligning the risk preferences of managers and employees with those of the organisation

Managers and senior employees make decisions on behalf of the company, acting as agents of the company. It is desirable that the risk preferences of these employees should match the risk preferences of the organisation and its stakeholders. One problem with many reward schemes is that managers are too risk averse, and will not make investments that may risk their targets not being met.

The events leading up to the financial crisis of 2008 are a good example of the opposite situation, where the risk appetites of employees at investment banks did not match the risk appetites of the owners. During this period, individuals working in the banks were paid large commissions for selling mortgage loans to customers. The problem was that the employees were selling loans to customers that posed a large risk to the banks, due to their low credit worthiness.

The problem was confounded by the fact that in many cases, the employees of the banks were paid commissions on the date that the loan agreements were signed, while the loans lasted for 25 years. In situations where the borrower defaulted, however, there was no claw back, so the employee would not be required to repay the commission.

Many countries have put in place new laws and codes to change this situation. In the UK for example, the financial services authority introduced a code whereby remuneration structures should be based on sound risk management practices, incentive payments should be deferred over a number of years, and there should be claw back provisions whereby employees are required to repay bonuses in the event that the longer term results of their actions leads to similar problems experiences in the financial crisis.

Share options may also create a miss-match between the risks faced by the organisation and the risks faced by the holders of the options, since the holders benefit if share prices increase, but do not bear any losses if the share price falls. Share options are discussed in more detail later in this article.

Complying with legal regulations

Rewards should comply with legal regulations. Typically, employment laws include areas such as minimum pay, and equal pay legislation to ensure that no groups are prejudiced against. There have been high profile cases of female investment bankers winning legal cases against their employers because their bonuses were far less than those paid to male colleagues.

Ethics and reward schemes

In recent decades there has been a move away from fixed remuneration systems towards reward systems where at least part of an employee's rewards are based on performance of the individual and the business as a whole. Some writers claim that this is unethical for two reasons. First, such systems tend to place increased business risk onto employees. Second, such systems undermine collective bargaining systems, and reduce the power of unions. This leads to a situation where employees as a collective have less bargaining power.

The size of total remunerations paid to directors of large public companies has also become a hot political issue, with a perception that the gap between top earners, and average earners is becoming larger. In the US, the average directors of S&P 500 companies earn 200 times more than the average household income in the US. Defenders of such large differences in pay point out that this difference has actually declined in recent years; in the year 2000, directors of S&P 500 companies earned 350 times the average household income. According to some research, such high packages are justified as they do reflect the performance of those directors.

Affordable and easy to administer

It is an obvious fact that there is an inherent conflict of interest in the relationship between employer and employee. The employee's rewards represent a cost to the employer, which the employer wants to minimise. Clearly whatever reward scheme is in place, it must be affordable to the employer.

Target setting

Many reward schemes are based on employees achieving pre-determined targets, so some consideration of target setting is required.

In Fitzgerald and Moon's building block's model, three principles are given when setting standards or targets: equity, ownership and achievability. Equity in this context means fairness; when setting targets for the various managers, those targets should be equally challenging. Ownership means that the targets should be accepted and agreed by those managers for whom they are set. This can usually be achieved by participation. Finally targets must be achievable; otherwise the employees for whom they were set will become demotivated.

The building block's model then goes on to specifically cover reward schemes. It states that there are three principles of a good reward scheme. First, there should be clarity – it should be clear how the reward scheme works. If your boss tells you that you will receive a bonus at the end of the year 'if you do a good job,' that is not very clear, since the boss has not specified what doing a good job means. Rewards should be motivational. Finally there is the important controllability principal. Employees should only be judged and rewarded based on things within their control. This is why profit-related pay might not be relevant to a junior administrative assistant, for example.

Hope and Fraser warn against the use of linking rewards to fixed performance targets, as this leads to gaming. In particular, managers whose rewards depend on fixed targets may be tempted to 'always negotiate lowest targets and highest rewards,' which suggests that management plans will understate the potential that the organisation can make. 'Always make the bonus, whatever it takes,' is another example of gaming suggested by Hope and Fraser, which suggests that managers may indulge in unethical behaviour such as fraudulent accounting in order to ensure that targets are met.

Hope and Fraser suggest divorcing the planning process and the target setting process, and basing rewards on relative targets and benchmarks. A relative target might be market share, for example, where rather than setting an absolute target for a sales manager, a market share (%) target is provided. If the market rises, then more is expected in absolute terms. This adds to controllability, since the sales manager could not be held responsible for a rise (or fall) in the overall market, which is outside of his control, but would be able to control whether or not he achieves the expected share of the market.

Types of reward scheme

Base pay Base pay, or basic pay, is the minimum amount that an employee receives for working for an organisation. For example, the employee may be paid \$10 per hour for a minimum of 40 hours per week. The employee will therefore earn at least \$400 per week. This will be paid regardless of how many of those 40 hours the employee is actually working. A fixed annual salary is another example of basic pay.

Basic pay may be supplemented by other types of remuneration. A blue collar worker may be paid overtime for example if he works more than 40 hours per week, and a manager may receive some form of performance pay in addition to the base pay. Basic pay is likely to address the lower levels of Maslow's hierarchy of needs mentioned above.

Performance-related pay Performance-related pay is a generic term for reward systems where payments are made based on the performance, either of the individual (individual performance-related pay) or a team of employees (group performance-related schemes).

In recent decades there has been a move toward performance-related pay schemes in many organisations. This has led to a situation where a higher portion of the employees pay is dependent on performance. This rationale for performance-related pay is that it motivates employees to work harder, and rewards those who make a greater contribution to the organisation's goals. This should lead to efficiency savings. There are many types of performance-related pay, and the most popular ones are described below:

1. Piecework schemes

Under Piecework schemes, a price is paid for each unit of output. Piecework schemes are the oldest form of performance pay, and were used for example in the textile industries in Great Britain during the industrial revolution. Piecework schemes are appropriate where output can be measured easily in units. They are typically used for paying freelance, creative people. Freelance writers for example are often paid based on the number of words.

The benefit of piecework schemes is their inherent fairness. The higher the output, the more the employee (or subcontractor) receives. From the employer's perspective, the employer does not have to pay for idle time or inefficiencies.

From the employee's perspective, such schemes mean that the employee bears commercial risk if demand for their product falls.

A further disadvantage of piecework schemes is that the payment is not based on the quality of output. However, some sort of quality control is likely, and if the quality is not of a required standard, the employee or subcontractor will not be paid.

2. Individual performance-related pay schemes

Individual performance-related pay schemes are where the employee receives either a bonus, or an increase in base pay on meeting previously agreed objectives or based on assessment by their manager, or both. They are typically used for middle managers in private sector organisations and for professional staff.

The advocates of individual performance-related pay schemes claim that they are an obvious way to align to objectives of middle managers with the goals of the organisation. If performance targets set are based on the goals of the organisation, then it appears obvious that making part of the rewards of employees' contingent on achieving those targets will mean that employees are motivated to achieve the goals of the organisation.

Individual performance-related schemes also have the advantage over group schemes that the employee has control over her rewards, as they do not depend on the effort (or lack of) of other members of the team.

Critics of such schemes point out that the link between rewards and motivation is far from clear, as discussed above. It is also argued that performance-related schemes lead a situation of tunnel vision whereby if something is not measured, and then rewarded, it won't get done.

Individual reward schemes may lead to a lack of teamwork and may lead to variances in pay among individuals, which can lead to ill feeling.

An example of an individual performance-related pay scheme is one that is operated by a UK bank. Under the scheme, a bonus pool is allocated to each region based on the performance of that region. From this pool, individual awards are

made based on assessment of performance, taking into account the rating on a five-point scale. Those with scores of 1 to 3 qualify for a discretionary bonus. The assessment depends on how much new business the individuals have brought in, or how much efficiency savings they have generated. The rewards are usually paid in cash, although for senior employees receive a portion as deferred stock.

3. Group-related performance-related pay schemes

Group-related performance-related schemes are similar to individual, in that rewards are paid based on the achievement of targets. However the targets are set for a group of employees, such as a particular department, or branch of a company, rather than for an individual. Since the rewards apply to a group, they are likely to be based on a pre-determined quantitative formula, rather than on assessment of staff.

A bonus pool is calculated based on the performance of the team, and this is shared among the members of the team. Bonuses may be paid up at the end of the year, or may be deferred, and paid at a later date, as this may encourage staff and managers to take a longer term view, rather than simply focusing on the current year's bonus.

The advantage claimed for group schemes is that they encourage teamwork. The disadvantage is that the lazier members of the team benefit from the hard work of the more dedicated.

Hope and Fraser give the example of a scheme operated by Svenska Handelsbanken, where each year, a portion of the banks profits are paid to a profit sharing pool for employees, provided that certain conditions are made. The main conditions are that the Handelsbanken Group must have a higher return on shareholder's equity than the average of its peer group. The upper limit of the amount paid into the scheme is 25% of the total dividends paid to shareholders. Employees do not actually receive anything from the pool until they reach the age of 60, at which point they receive a pay out based on the number of years that they have worked for the bank. The CEO of Handelsbanken claimed that employees are not motivated by financial targets, but by the challenge of beating the competition. The reward scheme is designed to be a dividend on their intellectual capital.

4. Knowledge contingent pay

Knowledge contingent pay is where an employee will receive a pay rise or a bonus, or both, for work-related learning. An ACCA candidate, for example, may receive a higher salary once he has passed all the knowledge level papers, and an even higher salary after passing all of his exams.

5. Commissions

Commissions are a form of remuneration normally used for sales staff. The staff may receive a low basic pay, but will then receive commission, based on a percentage of the amount of their sales.

The advantages of commission are that they should motivate sales staff to achieve higher sales, as their rewards depend on it, and they mean that the large part of the salesman's salary becomes variable. If sales are low, the organisation will have to pay less.

The disadvantage of commission is that it may lead to dysfunctional behaviour. Sales staff may indulge in window dressing, for example to meet this year's sales target, by selling on a 'sale and return basis' in the final month of the year, with the inherent understanding that the goods will be returned in the following month of next year. They may also lead to short termism, where sales staff 'never put the customer above the sales target' to quote Hope and Fraser.

6. Profit-related pay

Profit-related pay is a type of group performance-related pay scheme where a part of the employee's remuneration is linked to the profits of the organisation. If the company's profits hit a pre-determined threshold, a bonus will be paid to all members of the scheme. Typically the bonus will be a percentage of the basic pay. The bonus may be paid during the year in question; for example, quarterly, or it may be deferred until some later date, such as the retirement of the staff.

Advocates of profit-related pay argue that it motivates employees to become more interested in the overall profitability and therefore become more motivated to 'do their bit' to improve it. It may also encourage loyalty in cases where staff may lose their bonus if leaving the organisation means that they lose the right to it.

The obvious disadvantage with profit-related pay is that it does not match the primary objective of commercial organisations, which is to maximise the wealth of the shareholders. Managers may be motivated to increase profits by taking short-term actions that will harm the business in the long run, for example, or destroy wealth by investing in projects that increase the profits of the organisation, but produce a return that is below the cost of capital of the organisation.

Profit-related pay might not be a motivator for junior employees, who may fail to see the link between their effort and the overall profits of the organisation.

7. Stock option plans

Stock option plans have become very popular since the 1990s, when greater emphasis started to be given to shareholder value. Under stock option plans, staff receive the right to buy shares in their company at a certain date in the future, at a price agreed today.

For example, Alpha Co is listed on the stock exchange of Homeland. Today, shares in Alpha Co are trading at \$100 each. The company has just awarded the CEO of Alpha Co the option to buy 1 million shares for \$100 each in exactly ten years time. These options have no intrinsic value at the granting date.

If the share price rises to say \$200 in 10 years time, the CEO could exercise his options, buying 1 million shares at a price of \$100 each. Since the shares would be worth \$200 each by then the CEO would make a gain of \$100 per share, or \$100m in total.

Stock option plans are most appropriate for the senior management of organisations as they are the people who have the most influence over its share price. The rationale for using stock option plans is that they align the objectives of the directors with the objectives of shareholders. If the share price rises, the senior management benefit because their options increase in value. Thus senior managers will start to think like investors.

The big weakness of stock option plans is that share prices may depend on external factors as much as on the performance of the directors. During the bull markets of the 1990s and 2000s, many companies share prices rose simply because the market rose.

Another weakness is risk misalignment. Share options reward managers if the share price goes up. If the share price falls, however, there is no difference in reward between the share price remaining the same (\$100) and falling to (\$1) – so managers may be motivated to take extreme risks where the exercise price may not be met.

What shareholders really want is the performance of their company to be better than the market. One solution to this is to use an indexed exercise price, where the price at which the director can buy the shares is equal to the current market price, plus the increase in the stock market index between the date that the options are issued, and the exercise date. This means that the share option reflects the controllability principle more closely, as directors would not be rewarded for rises in the stock market in general.

Pension schemes

Defined benefit pension schemes used to be a popular form of reward. Under such schemes, the employer pays a pension to former employees based on their final salary, and the number of years that the employee worked for the organisation. A typical example is that the former employee receives 1/60ths of their final salary for every year of service. An employee who works for 40 years for the same organisation would therefore receive a pension equal to 40/60ths of their final salary from the date of retirement to the date of death.

Defined benefit schemes leave organisations with an uncertain, often large liability, and for this reason, many organisations have now discontinued such schemes.

Defined contribution schemes are another form of pension scheme where the employer pays a certain percentage of the employee's salary into an account for the employee in a pension 'pot.' The employee may also have the option of making additional voluntary contributions into this pension pot. The pension pot is then invested, and the employee receives whatever is in their account on retirement. In some countries, employees may be required to use what is in the pot to buy an annuity, which pays them a fixed income for the rest of their lives.

Many countries offer tax incentives for such pension schemes, such as allowing employees to reduce their taxable income by the value of contributions made to the schemes.

Benefits in kind

Benefits in kind (or indirect pay) are paid to employees in addition to their base salary and performance-related pay. Benefits in kind include items such as health insurance and meal vouchers. They are usually provided to more junior staff in order to provide additional incentives at a lower cost. They are often used as a form of recognition, so the employee of the month for example will be given a benefit rather than a cash payment.

The advantage of benefits in kind is that greater flexibility can be given in designing a reward scheme for an individual.

'Cafeteria' schemes have also become popular, whereby employees are told that they may select benefits from a menu up to a certain value. The advantage of this is that employees will select the benefits that they value most. Benefits from which the employees can choose typically include such items as health insurance, holiday vouchers, company cars or sports vouchers.

Cafeteria schemes may be difficult to administer. Staff may also find them complex to understand, as they will have to select a number of benefits that have a value that is within the agreed limit.

Establishing the level of benefits

How much should employees be paid? Two factors need to be taken into account here. First, competitiveness, and second internal equity.

As already mentioned above, unless the level of pay is competitive, it will be difficult to recruit and retain the right number of skilled employees. If it is too much, the cost to the organisation will be too high. Here the organisation will compare its pay levels with competitors. Such information may be available from job adverts in newspapers or on the Internet, or from recruitment consultants.

Internal equity relates to the pay differentials within the organisation itself. Staff will become demotivated if they feel that the remuneration system is 'unfair' and that other people are being paid more generously. Job evaluation techniques are used

that try to determine the value of a specific job to the organisation. Based on this, the level of rewards for that particular position will be determined.

The role of appraisal in reward systems

Many of the performance-related reward schemes depend on the performance of the employees. As such, the employees' performance has to be assessed. This usually takes place during the appraisal process. Staff will be assessed on a regular basis, for example twice a year. During the appraisal, targets will be set for the next period, and rewards agreed if the targets are met.

Conclusion

A good reward system aims to motivate employees to work harder, and align their goals with those of the organisation they work for. The current trend towards performance-related reward systems is designed to lead to greater rewards and motivation for those who contribute the most. However, designing such reward systems is complex, as they aim to influence human behaviour. As the human resources director of Flowpack Engineering said (quoted in Bratton) 'There is no such thing as a good pay system; there is only a series of bad ones. The trick is to choose the least bad one.'

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Performance evaluation (D)

The pyramids and pitfalls of performance measurement

This article outlines the issues which are central to the understanding and assessment of performance measurement.

It has become increasingly important for organisations to develop systems of performance measurement which not only reflect the growing complexity of the business environment but also monitor their strategic response to this complexity. The need for good performance management is an ongoing issue which should be addressed by the management of all organisations.

This article considers issues which are central to the understanding and assessment of performance measurement within any organisation. The main issues requiring consideration by management are:

- linking performance to strategy
- setting performance standards and targets
- linking rewards to performance
- considering the potential benefits and problems of performance measures.

In attempting to establish a clear link between performance and strategy it is vital that management ensures that the performance measures target areas within the business where success is a critical factor. The performance measures chosen should:

- measure the effectiveness of all processes including products and/or services that have reached the final customer
- measure efficiency in terms of resource utilisation within the organisation
- comprise an appropriate mix of both quantitative and qualitative methods
- comprise an appropriate focus on both the long-term and short-term
- be flexible and adaptable to an ever-changing business environment.

The last point stresses how important it is that performance measurement systems are dynamic so that they remain relevant and continue to reflect the issues important to any business. There are a number of models of performance measurement which can be used by management. This article considers the

'performance pyramid' of Lynch and Cross (1991)¹. The model represents an acknowledgement by the writers that traditional performance measurement systems were falling short of meeting the needs of managers in a much-changed business environment.

Lynch and Cross suggest a number of measures that go far beyond traditional financial measures such as profitability, cash flow and return on capital employed. The measures that they propose relate to business operating systems, and they address the driving forces that guide the strategic objectives of the organisation. Lynch and Cross propose that customer satisfaction, flexibility and productivity are the driving forces upon which company objectives are based. They suggest that the status of these driving forces can be monitored by various indicators which can be derived from lower level (departmental) measures of waste, delivery, quality and cycle time. The performance pyramid derives from the idea that an organisation operates at different levels each of which has a different focus. However, it is vital that these different levels support each other. Thus, the pyramid links the business strategy with day-to-day operations.

In proposing the use of the performance pyramid Lynch and Cross suggest measuring performance across nine dimensions. These are mapped onto the organisation - from corporate vision to individual objectives.

Within the pyramid the corporate vision is articulated by those responsible for the strategic direction of the organisation. The pyramid views a range of objectives for both external effectiveness and internal efficiency. These objectives can be achieved through measures at various levels as shown in the pyramid. These measures are seen to interact with each other both horizontally at each level, and vertically across the levels in the pyramid.

George Brown (1998)² explains what Lynch and Cross refer to as 'getting it done in the middle' focuses on business operating systems where each system is geared to achieve specific objectives, and will cross departmental/functional boundaries, with one department possibly serving more than one operating system. For example, an operating system may have new product introduction as its objective, and is likely to involve a number of departments from design and development to marketing. At this level, performance focus will be on three needs. First, there will be a focus on the need to ensure customer satisfaction. Second, there will be a focus on the need for flexibility in order to accommodate changes in methods and customer

requirements. Third, there will be a focus on the need to achieve productivity which necessitates looking for the most cost effective and timely means of achieving customer satisfaction and flexibility.

At the bottom level of the pyramid is what Lynch and Cross refer to as 'measuring in the trenches'. Here the objective is to enhance quality and delivery performance and reduce cycle time and waste. At this level a number of non-financial indicators will be used in order to measure the operations. The four levels of the pyramid are seen to fit into each other in the achievement of objectives. For example, reductions in cycle time and/or waste will increase productivity and hence profitability and cash flow

The strength of the performance pyramid model lies in the fact that it ties together the hierarchical view of business performance measurement with the business process review. It also makes explicit the difference between measures that are of interest to external parties - such as customer satisfaction, quality and delivery - and measures that are of interest within the business such as productivity, cycle time and waste.

Lynch and Cross concluded that it was essential that the performance measurement systems adopted by an organisation should fulfil the following functions:

The measures chosen should link operations to strategic goals. It is vital that departments are aware of the extent to which they are contributing - separately and together - in achieving strategic aims.

The measures chosen must make use of both financial and non-financial information in such a manner that is of value to departmental managers. In addition, the availability of the correct information as and when required is necessary to support decision-making at all levels within an organisation.

The real value of the system lies in its ability to focus all business activities on the requirements of its customers.

These conclusions helped to shape the performance pyramid which can be regarded as a modelling tool that assists in the design of new performance

measurement systems, or alternatively the re-engineering of such systems that are already in operation. See Figure 1.

Figure 1: the performance pyramid (Lynch and Cross, 1991)

David Otley (2005)³ has observed that other related frameworks exist, such as the results and determinants framework by Fitzgerald et al (1991), the balanced scorecard by Kaplan and Norton (1992) and Neely et al's performance prism. A common thread in all of them is that performance measures should:

- be linked to corporate strategy
- include external as well as internal measures
- include non-financial as well as financial measures
- make explicit the trade-offs between different dimensions of performance
- include all important but difficult to measure factors as well as easily measurable ones
- pay attention to how the selected measures will motivate managers and employees.

Setting standards and targets

To set standards and targets, management could choose to make use of benchmarking and/or target costing while being mindful of the critical need to link rewards to performance as appropriate.

Benchmarking

Benchmarking is 'a continuous, systematic process for evaluating the products, services, and work processes of organisations that are recognised as representing best practices for the purposes of organisational improvement' (Spendolini 1991)⁴. The most common approach is process benchmarking, where the standard of comparison is a 'best practice' firm which may be entirely unconnected with the benchmarking organisation. It may not even operate within the same industry. The objective is to improve performance. This is best achieved through the sharing of information which should be of mutual benefit to both parties taking part in the benchmarking programme. As a result of receiving new information, each party will be able to review their policies and procedures. The process of comparing respective past successes and failures can serve as a stimulus for greater innovation within each organisation.

Target costing

Target costing should be viewed as an integral part of a strategic profit management system. The initial consideration in target costing is the determination of an estimate of the selling price for a new product which will enable a firm to capture its required share of the market. It is then necessary to reduce this figure to reflect the firm's desired level of profit, having regard to the rate of return required on new capital investment and working capital requirements. The deduction of required profit from the proposed selling price will produce a target price that must be met in order to ensure that the desired rate of return is obtained. The main theme of target costing is, therefore, what a product should cost in order to achieve the desired level of return.

Target costing will necessitate comparison of current estimated cost levels against the target level. This must be achieved if the desired levels of profitability, and hence return on investment, are to be achieved. Where a gap exists between the current estimated cost levels and the target cost, it is essential that this gap is closed.

Performance rewards

Management will encourage employees to achieve organisational goals by having rewards linked to their success or failure in achieving desired levels of performance. It is critical that management establish an appropriate performance-rewards linkage. Management should consider a rewards package comprising both financial and non-financial rewards. Typical organisational rewards include salary increases, bonuses, promotion, and recognition. Employees may also earn intrinsic rewards through a sense of achievement and perceived success. Management should also give serious consideration to the establishment of 'negative rewards' or 'punishments' which should be linked to failure to achieve desired levels of performance. These may include failure to obtain potential rewards, demotions, and possibly the loss of employment.

Potential benefits

There are several potential benefits for an organisation that implements a reward scheme:

- Rewards and incentives can make a positive contribution to strategy implementation by shaping the behaviour of individuals and groups. A well-designed reward scheme will be consistent with organisational objectives and structure.

- There is evidence which suggests the existence of a reward scheme provides an incentive to achieve a good level of performance. Moreover, the existence of effective schemes helps not only to attract but also to retain employees who make positive contributions to the running of an organisation.
- Key values can be emphasised by incorporating key performance indicators in the performance-rewards mechanisms which underpin the scheme. This helps to create an 'understood environment' in which it is clear to all employees the performance aspects that contribute to organisational success.
- An effective reward scheme will create an environment in which all employees are focused on continuous improvement.
- Schemes that incorporate equity share ownership for managers and employees alike can encourage behaviour which, in the longer-term, focuses on actions aimed at increasing the market value of the organisation.

Some of the principal areas that warrant management consideration in the design of a reward scheme include:

- Whether performance targets should be set with regard to results or effort. It is more difficult to set targets for administrative and support staff since in many instances the results of their efforts are not easily quantifiable. For example, good sales administrators will improve levels of customer satisfaction but quantifying this is extremely difficult.
- Whether rewards should be monetary or non-monetary. Money means different things to different people. In many instances people will prefer increased job security which results from improved organisational performance and adopt a longer-term perspective. For these employees share option schemes might appeal. Well-designed schemes will correlate the prosperity of the organisation with that of the individuals it employs.
- Whether the reward promise should be implicit or explicit. Explicit reward promises are easy to understand but in many respects management will have their hands tied. Implicit reward promises such as the promise of promotion for good performance is also problematic since not all organisations are large enough to offer structured career progression. In situations where not everyone can be promoted, a range of alternative

reward systems need to be in place to acknowledge good performance and encourage commitment from the workforce.

- The size and time span of the reward. This can be difficult to determine especially in businesses which are subject to seasonal variations. Activity levels may vary and there remains the potential problem of assessing performance when an organisation operates with surplus capacity.
- Whether the reward should be individual or group-based. Whether the reward scheme should involve equity participation. Such schemes invariably appeal to directors and senior managers but should arguably be open to all individuals if 'perceptions of inequity' are to be avoided.
- Tax implications also need to be considered.

Performance measures - benefits and problems

Berry, Broadbent and Otley (1995)⁵ suggest that the following benefits can be derived from the use of performance measures:

- Clarification of the objectives of the organisation.
- The development of agreed measures of activity.
- A greater understanding of the processes within the organisation.
- The facilitation of comparisons of performance between different organisations.
- The facilitation of the setting of targets for the organisation and its managers.
- The promotion of the accountability of the organisation to its stakeholders.

However, they also draw attention to the potential problems that may develop from the use of performance measures by an organisation. These could include:

- tunnel vision
- sub-optimisation
- myopia
- measure fixation

- misrepresentation
- misinterpretation
- gaming
- ossification.

It is vital that management give detailed consideration as to whether there are likely to be problems in using performance measures as targets for the organisation and its managers. Of particular importance is the need to assess whether the use of performance measures will help to provide accountability of the organisation and its employees to the stakeholder. This raises the question of the compatibility (congruence) of individual and organisational goals.

Individual goals may focus on financial and non-financial areas such as remuneration, promotion prospects, job security, job satisfaction, and self-esteem. There may be a conflict for each individual between actions to ensure the achievement of individual goals and/or organisational goals. The list of potential problems cited by Berry, Broadbent and Otley may be illustrated in the context of any type of organisation. The comments which follow are illustrated in the context of what could occur (although should not occur) in a firm of practising accountants.

- Tunnel vision may be seen as undue focus on performance measures to the detriment of other areas. For example, efforts to ensure a staff utilisation ratio of 72%, measured in terms of chargeable hours as a proportion of total hours available, may lead to inadequate documentation of client records and developments in areas such as communication and teamwork.
- Sub-optimisation may occur where undue focus on some objectives will leave others not achieved. For example, an audit partner may be focused on winning new clients, but this may result in inadequate supervision regarding the work of current clients.
- Myopia refers to short-sightedness leading to the neglect of longer-term objectives. An undue focus on generating current client income could be to the detriment of longer-term goals such as practice development or innovations in approaches to the management of client affairs.
- Measure fixation implies behaviour and activities in order to achieve specific performance indicators which may not be effective. For example, using too

junior staff on an audit in order to limit costs might result in much re-work, costly delays, and client dissatisfaction.

- Misrepresentation refers to the tendency to indulge in creative reporting in order to suggest that a performance measure result is acceptable. For example, a client survey report statistic might indicate that 95% of respondents indicated their satisfaction with a particular service provided by the practice while in actual fact only a carefully selected 20% of clients were sent the questionnaire.
- Misinterpretation involves the failure to recognise the complexity of the environment in which the organisation operates. Within an accountancy practice, one partner might be focused on the achievement of profit whereas another partner might be focused on winning high-profile clients, and another paying attention to establishing a local reputation. Within such a scenario, the existence of multiple motives creates a complex environment in which the objectives of the principal players may not always coincide.
- Gaming is where there is a deliberate distortion of the measure in order to secure some strategic advantage. This may involve deliberate under-performing in order to avoid higher targets being set. For example, when conducting an audit, a manager might become aware of a potentially lucrative opportunity to supply consultancy services. If such services were not budgeted for in respect of the forthcoming year then the manager would undoubtedly be perceived in a good light when a contract for those services suddenly came to fruition. Another example of gaming would be the restriction of departmental consultancy earnings in one year in order that the target for the next year will not be increased and/or to hold back consultancy possibilities which are in the pipeline in order to create slack.
- Ossification, which by definition means 'a hardening', refers to an unwillingness to change the performance measure scheme once it has been set up. An example might be the use of a standard set of questions in a questionnaire to test client satisfaction with a particular service. Good responses may simply indicate a poorly-structured questionnaire, rather than a high degree of client satisfaction.

Addressing the problems

One should acknowledge that imperfections will exist in any performance measurement scheme. George Brown (1998) has outlined a number of actions that

may be taken in order to minimise the impact of imperfections which may exist. These are as described below.

Involving staff at all levels in the development and implementation of the scheme

People are involved in the achievement of the performance measures at all levels, and in all aspects, of an organisation. It is important that all staff are willing to accept and work towards any performance measures which are developed to monitor their part in the operation of the organisation and in the achievement of its objectives. This should help to reduce the extent of gaming and tunnel vision.

Being flexible in the use of performance measures

It is best to acknowledge that performance measures should not be relied on exclusively for control. A performance measure may give a short-term measure which does not relate directly to actions which are taking place in order to lead to an improved longer-term level of performance. To some extent it should be acknowledged that improved performance may be achieved through the informal interaction of individuals and groups. This flexibility should help to reduce the extent of measure fixation and misrepresentation.

Keeping the performance measurement system under constant review

This should help to overcome the problems of ossification and gaming. Another requirement in overcoming problems is to give careful consideration to the dimensions of performance. Actions that may be taken include quantifying all objectives (however difficult this may appear to be) and to try and focus on measuring customer satisfaction. Efforts to quantify an objective will improve the efforts to understand and take action to achieve the intended output of the objective. Such actions should help to overcome sub-optimisation. Measuring customer satisfaction is a vital goal. Without continuing and improved levels of customer satisfaction, any organisation is underachieving and is likely to have problems in its future effectiveness. Positive signals from performance measures earlier in the value chain are only of relevance if they contribute to the ultimate requirement of customer satisfaction. Once again, tunnel vision and sub-optimisation should be reduced through recognition of this requirement.

Consideration should also be given to the audit of the system. Seeking expert interpretation of the performance measurement system should help in considering the likely incidence of any or all of the problems cited above. It is important that

this issue is considered at arm's length and is not influenced by the views of those operating the scheme. In addition, maintaining a careful audit of the data used should help to reduce the incidence and impact of measure fixation, misinterpretation, or gaming. This is because any assessment scheme is only as good as the data on which it is founded and how such data is analysed and interpreted. It is also relevant to recognise key features necessary in any scheme. Once again, such measures should help to overcome the range of problems outlined above. Key features will include:

- nurturing a long-term perspective among staff. This may be difficult to achieve where rewards such as bonus or promotion are based on relatively short-term measures.
- trying to limit the number of performance measures. Better to focus on the key events which are likely to result in customer satisfaction. Too many performance measures may simply dissipate effort and could lead to conflicting actions.
- developing performance benchmarks which are independent of past activity. This refers to the need to focus on the way ahead - and how, by appropriate action, to improve from whatever the current situation may be.

Performance measures to support competitive advantage

A focus on the success of airlines such as EasyJet and Ryanair and how the balanced scorecard might be utilised to maintain the low-cost carriers' competitive edge.

The emergence in the 1990s of low-cost airlines and the expansion of the European travel market has shown how competition can significantly affect the structure of an industry.

Ryanair and easyJet are now well-established and their on-going success will depend upon a continuing ability to attract customers and maintain operational efficiency. This must be done in the context of increased competition from schedule and charter airlines that now recognise the effectiveness of the business model adopted by the low-cost carriers. This article examines how the balanced scorecard might be used to maintain the low-cost carriers' competitive edge.

The business model adopted by low-cost carriers can be viewed as having three broad elements on which success is based:

- route network development
- brand development and marketing effectiveness
- low-cost operations.

These aspects can be seen to be structural as they reflect major decisions and developments which set the context for operational performance and day-to-day management.

The route network is the product dimension of first importance to customers. Before European air travel was deregulated in the mid-1990s, the market was neatly divided. Schedule carriers focused primarily on business travellers with 75% of the market, the other 25% being provided by charter airlines as part of the package holiday industry. Low-cost carriers use aircraft which for European routes are generally larger than those used by schedule airlines and routes the balanced scorecard must be selected to provide high load factors, ie percentage of available seats sold.

Routes chosen should be new routes or those served by high-cost carriers, and have appeal to leisure and private travellers. This approach allows low-cost carriers to use secondary airports at major European cities or regional airports which provide overseas homeowners greater access to properties with minimum travel in the destination country. Another major aspect of the route network decision is the departure airport. Low-cost carriers' use of secondary airports in the UK provides convenience to travellers, and important cost savings for the company.

Another important factor in the development of the route network is to avoid direct competition from other low-cost carriers. In 2002, of 128 low-cost routes, only 17 involved the same departure and destination airports - and Ryanair and easyJet adopted distinct positions in the market. While Ryanair has become the 'least-cost provider', easyJet has positioned itself to have a significant appeal to the business traveller by flying three times a day to major cities such as Amsterdam, Madrid, Paris, and Zurich from London's Luton and Gatwick airports, which are generally viewed as more accessible from London than Stansted (Ryanair's base airport). The success of the route network strategy is supported by the fact that easyJet carried 11 million passengers in 2004, operating 153 routes to 44 European airports.

Brand development and marketing effectiveness is essential for a product which has a high level of market acceptance which is evidently the case with the low-cost carriers' route network strategy outlined already.

There are two major factors which have allowed both Ryanair and easyJet to capitalise on product strengths to become leading UK brand names. First, the accepted practice in the industry of discounting prices just before departure dates was reversed so that fares are initially low and rise as departure dates approach. This practice, especially when supported by aggressive promotional campaigns such as '200,000 seats at 99p - must be booked before September 200X' promotes the company's central market message in an extremely effective manner. This strategy is particularly effective since the average price paid per seat is greatly in excess of the 'loss leader' promotional price and is comparable to that obtained by traditional charter airlines. Secondly, the brand is promoted by the adoption of direct selling to the customer either via the telephone or the Internet. The customer deals with Ryanair or easyJet and not the travel agent, with a consequent increase in brand identification. The removal of the latter from the purchase transaction also provides a significant cost saving since no commission is paid.

Low-cost operations are in part based on the cost advantages of operating from secondary airports, and the direct selling strategies outlined above. These cost advantages in relation to schedule airlines are enhanced by aircraft fleet utilisation decisions. Firstly, increased number of seats per aircraft provides a considerable reduction in passenger unit costs. Secondly, the daily flying time per aircraft is increased significantly. Thirdly, the elimination of free in-flight passenger services, particularly catering, removes a cost which is not necessarily value-adding to the customer and allows faster turnaround times between flights. The final factor providing significant cost savings are crew compensation and utilisation factors based on the higher usage time of aircraft. Lower costs and high load factors permit the low-cost carriers to offer fares 50 to 70% below those offered by schedule airlines. Binggeli and Pompeo¹ have estimated that the cumulative cost savings for a lower cost carrier such as Ryanair are reflected in the cost per available seat kilometre (ASK) statistic. They estimate that in 2001, this cost to the top three major schedule airlines was 12 cents (US) compared with 4.5 cents (US) for Ryanair. On this basis, Ryanair's breakeven load factor is 55%.

The scorecard approach

In maintaining the competitive position arising from the business model of the low-cost carriers, it is necessary for management to develop a set of performance measures which focus on key aspects of performance. The balanced scorecard provides a framework which can be utilised to develop a multi-dimensional set of performance measures for strategic control of the business. The Balanced Scorecard as shown in Figure 1 has been developed to reflect important aspects of the low-cost carrier's business model outlined above.

The business process element of the scorecard is the logical starting point since it must reflect the 'do wells' of the business. In this context, no airline can be successful unless it has an excellent safety record and a reputation for punctuality of service. The high utilisation of aircraft of the low-cost carrier makes it vulnerable to delays, since there is inevitably a 'knock-on' effect within a flight timetable. The principal measure here, must therefore be 'adherence to schedule', which will depend on the effectiveness of managing three interconnected areas of activity.

Engineering management involves maintenance and safety work on aircraft between flights and the longer-term maintenance, requiring the aircraft to be withdrawn from service. Selection of an appropriate set of measures in this area

must not lead to any compromise to safety standards or the inappropriate funding of short-term cost savings against long-term lifetime costs of operations.

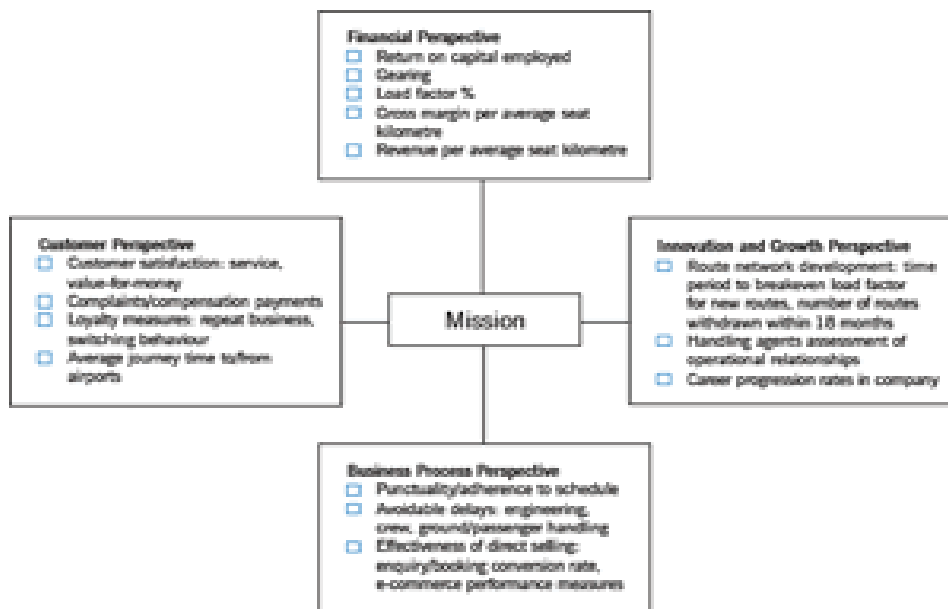


Figure 1: The balanced scorecard

Crew management, both of pilot and cabin staff, has to balance the need to have back-up staff to cover for unplanned absences and problems arising from flight delays. Again, this is a potential pressure point for the low-cost carrier, since staff utilisation is more intense than on schedule airlines. Ground and passenger handling activities, loading and unloading of passengers, luggage, fuel etc involves the co-ordination of different parties working to an agreed timetable. The lower level of passenger service and open seat (as opposed to allocated seat) policy of the low-cost carrier simplifies these relationships and as such work to their advantage.

The three above activities will in combination affect punctuality and the relationship with Air Traffic Control, whose goodwill can often be important in recovering 'lost' landing and take-off slots. The fundamental measure in this area must be percentage of flights on schedule with an analysis of delayed flights by reason -

distinguishing unavoidable and avoidable delays. The latter will indicate the areas where management action needs to be directed to improve performance.

Measures must also be developed for customer-company interaction with regard to both the booking and administrative aspects of travel, since the direct selling strategy is critical to on-going success. The enquiry-to-booking conversion rate would be the principal measure with an analysis of potential problem areas, again attempting to classify avoidable and unavoidable problems. Other conventional measures in an e-commerce world would need to be employed to assess the quality of customer service, eg response times to information requests via the Internet/telephone etc.

The innovation and growth elements must reflect the ability of the business to maintain competitive advantage. Two principal areas of innovation can be identified - route network development and the management of operational-based relationships. The first of these reflects the ongoing understanding of customer demand in terms of new route development. Two measures could be employed:

- time period required to build traffic to breakeven load factor level
- number of routes withdrawn, eg within 18 months.

In evolving a new route structure, important relationships will have to be developed with handling agents, suppliers in destination airports, and time periods to establish effective relationships could be monitored against a standard time period. A major strategic development for low-cost carriers is their ability to establish 'hub-based' businesses abroad (eg in Germany) and to monitor this activity and assess similar initiatives. Other measures would focus on the development of individuals within the company, either by measures of expenditure on training or success in jobs as measured by internal promotion rates. These businesses require flexibility in the individuals they employ and this needs to be measured and managed.

The last two elements - customer and financial perspectives - are dependent on the performance achieved in the business processes, and innovation and growth elements should reflect achievements in the market and the effectiveness of management processes.

The customer perspective measures included customer satisfaction, rating of service/value-for-money, levels of customer complaints/compensation payments

and measure of loyalty in terms of 'repeat business' and 'switching behaviour' between other low cost/schedule carriers. Other measures might assess the convenience of travel as measured by the average miles travelled to UK airport/from overseas airports to destination, a composite measure of total journey time, a key factor in customer satisfaction ratings.

The financial perspective will embrace the high-level performance measures such as return on capital employed (ROCE) and gearing which reflect the financial strength of the company - a key factor in entering long-term contracts for new aeroplanes and for evaluating the terms within leasing agreements. Key operational statistics influencing financial performance should be considered, such as load factors, route flying times, and other revenue/cost measures analysed in terms of ASK statistics, eg cabin crew costs per ASK. Other measures might focus on specific initiatives which might have profit potential, eg the sale of targeted in-flight services beyond those conventionally provided such as catering and duty-free sales. Exceptional items such as fuel charge excesses might need to be monitored, given its potential impact on the profit outcome.

The above review of strategic developments within the European airline market and how the balanced scorecard might be used to monitor performance is essentially 'a rear-view mirror' approach and is limited in this respect. The key to success is future-oriented and while certain elements of the scorecard are fundamental to the industry, the key driver of success is the strategy adopted and the ability to keep ahead of competitors. On this basis, it might be argued that the innovation and growth element need special thought and analysis since the modern world is characterised by persistent change, and successful business models have to be re-formulated in line with these changes. Nonetheless, the importance of performance measurement systems has long been recognised, since individuals know that 'what counts is counted'.

The performance measurement system adopted by an organisation is a very powerful means of not only evaluating an existing strategy, but is also useful for developing the mindsets within an organisation which will allow new strategies to be developed on the basis of a coherent analysis of the existing strategy and company performance.

Activity-based management

Activity-based management (ABM) can be defined as the entire set of actions that can be taken on a better informed basis using ABC information. The aim is to achieve the same level of output with lower costs.

During the 1980s, many businesses started to introduce activity-based costing (ABC) systems. The aim of these was to achieve a more accurate calculation of product costs. However, it soon became apparent that the information that had been produced for activity based costing had much wider use than just calculating the cost per unit of a product or service.

Activity-based management (ABM) can be defined as the entire set of actions that can be taken on a better informed basis using ABC information. The aim is to achieve the same level of output with lower costs.

Stages in ABM

The initial stages in ABM are the same as for ABC, so these should be familiar from earlier studies:

1. Identify the activities that the organisation performs
2. Calculate the cost of each activity
3. Identify the activity cost driver for each activity.

Identifying the activities

Organisations perform hundreds, if not thousands, of different activities. It would not be feasible, or even beneficial, to identify every activity that the organisation performs – so judgment will need to be used to identify the significant activities; perhaps based on the amount of time that is spent performing them or based on the expected cost.

Some organisations may try to define only high-level activities to keep the number of activities defined to less than 30, while other organisations may define much more detailed activity lists. These activities may be summarised in an activity dictionary.

The following list shows examples of some of the activities that may take place in a manufacturing organisation:

- Schedule production jobs
- Set up machines
- Receive materials
- Run machines
- Support existing products
- Introduce new products
- Calculate the cost of the activities

All indirect costs must be apportioned to the particular activities that they relate to using an appropriate basis. Staff may be asked, for example, to estimate how much time they spend on each of the activities above so that factory staff costs can be apportioned to the relevant activities. Other costs such as rent and heating and lighting will also have to be apportioned. This is similar to the principle of allocating and apportioning costs to cost centres in traditional absorption costing.

As far as ABM is concerned, simply having the information about the cost of each activity may be all that is required. In the case of ABC however, it is then necessary to apportion the costs of each activity to the products using the cost driver information.

Identifying the cost driver

The cost driver is the factor that causes the cost of an activity to vary. In traditional costing, it was always assumed that the cost driver was volume of production, measured either in terms of the number of units, or a proxy, such as the number of labour hours or the number of machine hours. In ABM however, it is recognised that the cost of a particular activity may depend on something other than volume

of output. In the case of sales order processing, the cost driver may be the number of orders processed; so whether a sales order contains five line items, or 10 line items, the amount of time to process it will be the same.

The cost drivers for the activities listed above may be as follows:

Activity	Driver
Schedule production jobs	Number of production runs
Set up machines	Number of setups
Receive materials	Number of receipts
Run machines	Machine hours
Support existing products	Number of products
Introduce new products	Number of new products introduced

ABC then apportions the costs of each activity among the different products that use them, based on the use of the drivers by each product.

There are two main types of activity-based management:

1. Operational activity based management (doing things right) – this relates to making the organisation more efficient by reducing the cost of the activities and eliminating those activities that do not add value.
2. Strategic activity based management (doing the right thing) – which essentially involves deciding which products to make, and which customers to sell to, based on the more accurate analysis of product and customer profitability that activity based costing allows.

Operational ABM

One of the greatest advantages of ABM is that costs are categorised by activities rather than by traditional cost categories. A simplified analysis of expenses from a traditional costing system may look something like this:

Cost of sales	X
Staff costs	X
Rent of factory	X
Maintenance	X
Depreciation	X
Total costs	X

ABM analyses costs by activity. For example:

Direct materials costs	X
Direct labour costs	X
Schedule production jobs	X
Set-up machines	X
Receive materials	X
Support existing products	X
Introduce new products	X
Total costs	X

Having costs analysed by activity provides much more relevant information to managers. There may be activities that are being performed that do not add value, so these can be stopped. Management may also identify activities that cost more than expected, and can investigate these. Management might decide for example that the cost of setting up machines is too high. Using their knowledge of the drivers of that activity, management would realise that having longer production runs could reduce the cost of this activity as the number of set ups would be reduced.

Many writers discuss using ABM to eliminate non-value-added activities. Cooper and Kaplan claim that it is not always clear whether an activity is value added or not. It might be argued for example that setting up the machines is a non-value added activity, as customers do not value it. However, without setting up machines, there can be no production. Instead, Kaplan and Cooper suggest discussing how efficient an activity currently is, and therefore how much opportunity there is for improvement.

Use of ABM with other performance improvement strategies

ABM does not have to be used in isolation, and can be used alongside performance management improvement strategies, such as Total Quality Management, Six Sigma and Business Process Reengineering, where the information provided can support the projects.

In Total Quality Management, costs are analysed into costs of conformance (appraisal and prevention costs) and costs of non conformance (internal and external failure costs). The aim of TQM is to reduce the costs of non-conformance. Activity-based management enables organisations to more accurately calculate these quality related costs and to monitor improvements.

Six Sigma, Business Process Improvements and Business Process Reengineering aim to achieve large one off (discontinuous) improvements in particular business processes relating to efficiency and better customer satisfaction. ABM can support these methodologies in several ways:

1. Identifying processes that need improvement and establishing priorities
2. Providing cost justification for proceeding with the project
3. Monitoring the benefits of the projects.

As far as establishing priorities is concerned, ABM enables management to identify which activities or processes it is spending the most on, and where the biggest financial savings can be made. It can also identify activities where management believe big improvements can be made. Typically, these are the processes that are highly fragmented, and involve people from many different departments.

Many business improvement projects may require considerable capital expenditure, and it will be necessary therefore to do a cost benefit analysis to establish whether it is worthwhile going ahead. ABM can provide more accurate information about the potential savings from a particular project, therefore leading to a more accurate assessment.

After completion of a business process improvement project, many businesses do not measure the benefits achieved by the project, and in some cases fail to take full advantage of them. For example, the project may have reduced the amount of time spent on dealing with customer complaints, but have the excess staff members whose time has now been freed up been re-deployed in other departments?

ABM models also provide information about cost incurred on the various activities, so it is easier to monitor how much the costs of an activity have been cut by a particular project.

Example

A case described by Kaplan and Cooper related to a producer of technical manuals for the computer industry. The company had run out of storage space in their main factory in South Street, due to a large amount of slow moving inventory for their biggest customer, IBM. So additional storage space was rented in Elmore Street,

several kilometres away from South Street. After production, the manuals for all other customers were transported to Elmore Street for storage. They would then be returned to South Street for despatch to the customer when required. This was often only two or three weeks later.

The management knew that this movement of finished goods to and from Elmore Street was inefficient. However, since the company used a traditional cost accounting system, the only visible cost relating to this was the cost of transport – this was \$200,000 per year. A solution to redesign the storage process in the South Street factory for the fast moving goods, and to move the slow moving inventory to Elmore Street (or destroy it entirely) was estimated to cost \$600,000. It did not seem worth investing in this, given that the annual saving would be only \$200,000.

Activity based management was then introduced, and this identified that fact that the actual costs of operating the inefficient system were much higher than expected. The annual savings of the proposed solution analysed by activity were:

	\$
Reduced rental expense	128,000
Reduced transport costs	271,000
Reduced costs of moving WIP within factory	38,000
Reduced costs of moving finished goods within factory	91,000
Reduced costs of finding materials	88,000
Equipment savings	27,000
Reduced cost of managing WIP	44,000
Reduced cost of managing finished goods	68,000
Eliminated use of outside warehouses	53,000
Total annual savings	808,000

This activity based information clearly gave management a much more accurate idea of the savings that could be made by going ahead with the proposed solution, and since the required investment was \$600,000 it was clearly worthwhile.

Strategic ABM

The first application of strategic ABM is to help decide which products or services to make. The use of ABC enables the cost per unit of a product or service to be measured accurately and therefore the profit per unit can be predicted. Many organisations find that when they rank their products according to total profit, it is

typical that 20% of their products generate 300% of the company's profits.[1] This means that between them, the remaining 80% of products lose 200% of the company's profits. The loss making products are normally those that are produced in low volumes, or require a high level of customisation.

While it may be tempting to suggest that all such loss making products should be stopped, there are two possible dangers to such a simplistic decision. First, if 80% of the products were stopped, demand for the remaining 20% might fall, as many customers prefer to buy all their requirements from one supplier. A second danger is that even if the business were to stop producing the loss making products, the costs associated with them would not all be saved.

A more realistic approach that can be used is to adjust the price of the loss-making products, or to employ tools such as target costing to reduce the cost.

A second application of ABM is customer profitability analysis where overheads are allocated to customers using activity based management processes to obtain a more accurate analysis of the profit or loss generated by each customer. In traditional costing it is assumed that if a customer generates positive contribution, then servicing that customer must increase the profits of the company. This ignores the fact that many 'fixed' overhead costs are customer specific – such as the time spent by customer service departments.

Using ABM, overhead costs are also apportioned to customers using appropriate cost drivers, giving a more accurate picture of how profitable each customer is. Such exercises have produced surprising results for many businesses, where the 'best' customers have often turned out to generate losses when ABM is employed.

Example

In Hometown, there are several providers of electricity, and domestic consumers can easily switch from one provider to another.

One of the providers of electricity is First Electric. The company recently had an aggressive advertising campaign and increased its customer base from 30,000 users to 40,000. Management was surprised to discover that this led to a fall in profits.

The company introduced customer profitability analysis, using activity-based principles. The analysis identified the following activities, along with their cost per unit of driver.

Activity	Driver	Cost per unit of driver
Meter reading	Number of visits	\$20
Customer service	Number of calls	\$30
Invoicing	Number of invoices	\$10
Customer complaints	Number of complaints	\$25

The meter reading took place every three months, after which an invoice was issued.

For an 'easy' customer, the overhead cost per quarter was \$30, the cost of reading the metre, and issuing the invoice. More difficult customers could cost much more. Many customers were out when the metre reader came, so a second visit was necessary. Sometimes the customer was not home second time either, so was requested to read their own metre and then call the customer service centre.

Using this information, First Electric was able to analyse accurately the profit per customer. The company was surprised to learn that it made a loss on 20% of its customers and only broke even on a further 30%.

In order to remedy the situation, the company made a number of changes. First, it reduced the number of meter readings to once per year, and issued invoices based on estimated consumption for the other quarters of the year. It introduced a website where customers could enter their own meter readings if they were not home at the date of the reading, thus reducing the amount of time used by the customer service department. These actions are examples of operational activity-based costing as they relate to reducing the cost of existing activities.

The company also made attempts to stop supplying loss making customers by increasing prices above those of competitors, encouraging loss making customers to switch to other providers, while offering big discounts to profitable customers, encouraging them to remain loyal. This is an example of strategic activity-based costing, as it focuses on which customers the company should supply to.

Evaluation of ABM

The benefits of ABM (and ABC) are greatest in organisations that have high indirect costs. A major reason for the increase in the use of ABC in the last 30 years has been the fact that as manufacturing processes have become more IT based and sophisticated, overhead costs have increased, while direct costs, particularly labour, have fallen.

ABC is most useful in organisations with a wider range of products, as it is these organisations that will have the most difficulty in allocating overhead costs among different products.

ABM can be criticised for being too inwardly focused. It aims to increase profits by reducing the cost of the activities that it already performs. It does not consider external factors, such as changes in consumer demand for its product.

Users of ABM and ABC often assume that all overhead costs are variable. This is not the case, and some overhead costs will be fixed, so will not be saved if activities are reduced.

ABM is also complex and is expensive to implement. For small businesses, or businesses with narrow product ranges, the benefits of implementing ABM may not justify the costs.

Question

Note – this question is an abridged version of a question that appeared in the June 2013 Paper P5 exam.

Navier Aerials Co (Navier) manufactures satellite dishes for receiving satellite television signals. Navier supplies the major satellite TV companies who install standard satellite dishes for their customers. The company also manufactures and installs a small number of specialised satellite dishes to individuals or businesses with specific needs resulting from poor reception in their locations.

The CEO wants to initiate a programme of cost reduction at Navier. His plan is to use activity-based management (ABM) to identify non-value adding activities. The first department to be analysed is the customer care department, as management believe that the costs of this department are too high. The costs for the most recent year from the existing accounting system are shown in Table 1.

Table 1: Existing cost data

	\$000
Computer time	165
Telephone	79
Stationary and sundries	27

\$000

Depreciation and equipment

36

707

The cost accountant has gathered information for the customer care department in Table 2 from interviews with the finance and customer care staff. She has used this information to correctly calculate the total costs of each activity.

Table 2: Activity-based data

Activities of department	Staff time	Total cost % (\$)	Comments
Handling enquiries and preparing quotes for potential orders	40%	282,800	relates to 35,000 enquiries/orders
Receiving actual orders	10%	70,700	relates to 16,000 orders

Activities of department	Staff time	Total cost % (\$)	Comments
Customer credit checks	10%	70,700	done once an order is received
Supervision of orders through manufacturing to delivery	15%	106,050	
Complaints handling	25%	176,750	relates to 3,200 complaints

707,000

The CEO wants you to consider the implications for management of the customer care process of the costs of each activity in that department. The CEO is especially interested in how this information may impact on the identification of non-valued added activities and quality management at Navier.

Required:

Assess how the information on each activity can be used and improved upon at Navier in assisting cost reduction and quality management in the customer care department. (12 marks)

Solution

The information in Table 2 shows that the main cost activities of the CC department are pre-sale preparation (handling enquiries and quotes) and post-sale complaints handling. Together, these activities consume 65% of the resources of the customer care department.

The pre-sale work is essential for the organisation and the department converts 46% (16,000/35,000) of enquiries to orders. It would be beneficial to try to benchmark this ratio to competitor performance although obtaining comparable data will be difficult, due to its commercially sensitive nature.

However, the complaints handling aspect is one, which would be identified as non-value; adding in an activity-based management analysis. Non-value adding activities are those that do not increase the worth of the product to the customer; common examples are inspection time and idle time in manufacturing. It is usually not possible to eliminate these activities but it is often possible to minimise them. Complaints handling is not value adding as it results from failure to meet the service standards expected (and so is already included in the price paid).

Complaints handling links directly to issues of quality management at Navier as improved quality of products should reduce these costs. These costs are significant at Navier as complaint numbers are 20% (3,200/16,000) of orders. Complaints may arise in many ways and these causes need to be identified. As far as the operation of the CC department is concerned, it may cause complaints through poor work at the quotation stage where the job is improperly understood or incorrectly specified to the manufacturing or installation teams. This leads to non-conformance costs as products do not meet expected standards and, in this case, complaints imply that these are external failure costs as they have been identified by customers

Quality of the end product could also be affected by the supervision activity and in order to ensure that this is functioning well, the CC department will need to have the authority to intervene with the work of other departments in order to correct

errors – this could be a key area for prevention of faults and so might become a core quality activity (an inspection and prevention cost).

The other activities in the department are administrative and the measures of their quality will be in the financial information systems. Order processing quality would be checked by invoice disputes and credit note issuance. Credit check effectiveness would be measured by bad debt levels.

Demystifying value-based management

This article aims to demystify the topic of value-based management by looking into its background, key ideas, problems, and steps for implementation. Finally, this article will give advice on how to tackle VBM requirements.

Being able to evaluate and improve a company's performance using new performance management systems is an important capability that you should develop during your APM studies and is also an often-examined topic. Value-based management (or VBM) is one such system in the syllabus which often creates trouble for APM candidates.

This article aims to demystify the topic of VBM by looking into its background, key ideas, problems, and steps for implementation. Finally, this article will give advice on how to tackle VBM requirements.

Problems of profit-based performance measurement

If we go back in time to the 1970s and earlier, companies usually measured performance with profit-based metrics, such as Earnings per Share ('earnings' is a

synonym for profit), Return on Capital Employed (ROCE), or Net Profit Margin. The source of information for these metrics was the company's financial statements. These metrics are referred to as 'traditional performance metrics' in your APM syllabus.

Then, in the 1980s, leaders in business strategy and performance management began to challenge this approach. While recognising that increasing shareholder wealth is the ultimate goal of a company, a paradox was observed: a company's profits could be increasing, while at the same time, total shareholder return could be decreasing. They concluded that the link between the objectives of 'maximising profit' and 'maximising shareholder value' is actually tenuous. Other problems with profit-based measures were also highlighted at this time:

- Profit-based metrics ignore the required return of the company's capital providers.
- Profit-based metrics can give a distorted view of performance: accounting standards and policies mean significant non-cash expenses, like provisions, can negatively impact a company's reported profit but don't decrease cash.
- Profit-based metrics are often based on annual results, so managers may be inclined to focus on increasing annual profit while ignoring long-term company growth. For example, a manager who is not on track to make their profit target might cut back on R&D expenditure or marketing, which will likely harm the long-term profits and competitive position of the company.

It was in this period that alternative approaches to performance management were developed (which you will be familiar with as many are covered in APM), ideas such as the Balanced Scorecard, Total Quality Management, and Value-Based Management, the subject of this article.

Example of poor decision-making using profit-based measures

To illustrate the problem described above, imagine we have a fictitious, listed company Omega Co. Omega Co has numerous divisions, including Alpha and Beta, which are treated by management as autonomous investment centres. Omega's weighted average cost of capital is 13%.

Division Alpha

Division Alpha is an underperforming division in a declining market—a ‘Dog’ according to the BCG Matrix model. The manager of Alpha is assessed on ROCE, which is currently 5%. She has the option to invest shareholder funds in a project that will improve her division’s ROCE to 7%. She accepts the project.

Division Beta

Division Beta is the leader in its fastest-growing market. This is a ‘Star,’ according to the BCG model. The manager of Division Beta is currently achieving a ROCE of 21%. She has the opportunity to invest in a new project. However, when the profits and investment of this new project are added to her divisional ROCE, she calculated that it would fall to 19%. Hence, she rejects this investment.

The problem

Both managers made decisions based on accounting profit measures rather than value-based measures. If a manager uses ROCE to make decisions, they are ignoring cash flows, the impact of tax, and the effect their actions have on the value of the company. Division Alpha’s project, while delivering increased profits to XYZ Co, most likely did not exceed the company’s cost of capital. Division Beta’s potential project might have exceeded the cost of capital, however, she rejected it.

This problem is also known as ‘goal incongruence,’ which you first encountered on your Performance Management studies. How could we know if the two divisions are growing or eroding shareholder wealth? Is there a better way? Yes, adopt the principles of Value-Based Management (VBM).

Introducing VBM

As you learned in *Financial Management*, it is a company’s discounted future cashflows that determine its value. And, value is created when the cash flows returned from invested capital exceed the expected returns of the company’s capital providers, measured by the weighted average cost of capital. This is the idea of ‘value’ in VBM, and the VBM approach puts maximising shareholder value (as opposed to maximising profit) as the high-level objective of a company.

In order to achieve this, the company's strategy, objectives, and processes should be aligned with the generation of shareholder wealth.

To measure performance under VBM, a single, over-arching organisational performance metric is established, such as Economic Value Added (EVA). Then, 'value drivers' are identified: these are activities linked to shareholder value which managers in the company can influence. This system of value drivers cascades throughout all levels of the company, linking to objectives for managers and staff. VBM is a hierarchical system that connects all levels of a company to shareholder value, not just a framework for board-level evaluation. Under an effective VBM system, individual employee objectives should be connected with the high-level company objective of increasing shareholder value. This is the core idea behind VBM.

It is important to emphasise that this system of value drivers is matched to the specific activities that management can control at each level of the company. Value drivers often cascade in a 'tree' diagram and cover both financial and non-financial performance areas of performance.

For example, employee satisfaction and employee training are value drivers that have a direct impact on customer satisfaction. Customer satisfaction, in turn, directly impacts customer retention. Improved customer retention will then (combined with revenue per customer) positively affect revenue, which will directly impact operating profit. These value drivers move up from operational to strategic level and cover financial and non-financial areas of operation.

VBM vs. EVA: they are not the same thing

Make sure you understand the difference between VBM and EVA: VBM is an approach to performance management that improves shareholder value, while EVA is one performance metric that measures shareholder value. While EVA is an often-used metric and covered by the APM syllabus, there are others as well, for example, Net Present Value, Market Value Added and Shareholder Value Analysis (the last two won't be specifically examined in APM). In other words, EVA is a high-level performance metric appropriate to use under the VBM approach.

Implementing VBM

VBM can be implemented using a four-step approach:

Step 1: Strategy development

At the corporate level, a strategy is developed with the high-level objective of maximising shareholder value. This strategy can span operations, financial management, and buying and selling of business units.

Value drivers are then created for business units and all levels of the company. For example, a telecom company could have a business unit objective, 'reduce call centre costs.' Value drivers linked to this could be 'personnel costs' and 'premises costs,' which cascade down the organisational pyramid to operational drivers such as 'average time per call' (for personnel costs) and 'equipment maintenance costs' (for facilities costs). Similar value drivers would be defined for all business units and at all organisation levels.

Step 2: performance targets are created

After value drivers are defined, they should be translated into specific targets. Following on from the example above, a target for 'personnel costs' could be 'personnel cost reduction of 18% over three years.' For 'average time per call,' a target could be, 'maintain six minutes per call' for the current year. Note that VBM promotes linking short term targets to long-term ones, and all the targets should be connected to say the EVA metric at the top of the organisational pyramid.

Step 3: Operational plans

Next, the performance targets defined above should be assigned to and 'owned' by specific employees. For example, the business unit manager might be responsible for reducing personnel costs, and a customer service team leader might be responsible for maintaining six minutes per call. Specific operational plans are then defined that will help employees take actions that will help them achieve their individual targets.

Step 4: Performance measurement

As with all modern performance management systems, VBM promotes the creation of key performance indicators for all members of staff, and a shift will be required from financial metrics to the inclusion of management-driven, non-financial metrics (yes, this idea overlaps with the Balanced Scorecard). Under VBM, 'economic profit' will be a short-term financial measure used to measure performance over a single year, but other metrics should be tailored to specific business units and the

activities of individual managers. Depending on the value driver being measured, the metric may be non-financial in nature (for example, customer satisfaction level), and focused on the long-term, rather than short-term (for example, customer lifetime value).

VBM overlaps with HR Management Issues (also in your APM syllabus). Successful VBM implementation will require linking management remuneration to key value drivers and objectives, ideas covered by the Building Block Model.

Spreadsheet modelling

Spreadsheet modelling is a critical tool for the management accountant in VBM as there will be many forecast variables involved in calculating EVA (or other value-based metrics), such as growth in revenue, forecast capital expenditure and depreciation, corporate tax rate, interest rate on issued debt, etc. With a spreadsheet it will be possible to conduct scenario analysis and see how different economic assumptions impact different value drivers, and in turn, impact the value of the company.

Also, a spreadsheet will help the management accountant combine performance metrics from many business units and management processes into a unified financial model and this can drive a dashboard to monitor performance. For example, a dashboard could be designed to present operational-level metrics such as receivables and payables timing, percentage of billable hours to total hours, or percentage of capacity utilised. Managers at different levels of the company can use this information for improved decision making and performance management.

Potential Problems of VBM

- For a VBM initiative to be successful, it may involve culture shift. The new objectives, performance metrics, and reward schemes associated with VBM may be a big change for staff. All managers and employees will need to understand how their individual role adds value.
- Management information systems will need to be updated to take account of new, non-financial information that will need to be captured. This has the potential to be a big, expensive project.
- 'Value Veneering' as opposed to value-based management. A thought leader on VBM, Timothy Koller, observed that a company may go to great efforts calculating

cash flow forecasts, business unit valuations, and cost of capital (for example), but then fail to involve decision makers at group or business level in any new management processes, thus failing to use VBM as a true management tool.

Exam technique

Now that you understand the concepts of VBM, you need to be able to apply these ideas to your upcoming APM exam, and this topic often causes trouble for APM candidates. One examiner's report said the problem for most candidates was a lack of knowledge about the subject. Next, many candidates talked about VBM in general terms without showing an understanding of it in the context of the scenario.

If VBM comes up on your exam, you might be asked to 'evaluate whether the VBM approach is an appropriate approach.' To avoid the problems mentioned above, ensure your answer is linked to evidence from the scenario. Without doing this, you will certainly not gain passing marks. Next, if you are 'evaluating' or 'assessing,' make sure you are stating whether VBM will help or hurt the company for specific reasons. To generate ideas that are linked to the particular company given, you can ask yourself these questions:

- **Is there any indication that shareholder value is dropping?** If the scenario mentions that total shareholder return or the company's share price is dropping, or that 'shareholders are unhappy with their returns,' then VBM might help turn the situation around as VBM will put the focus on shareholder value.
- **Does the scenario mention the company's current primary performance metric?** If the scenario states something similar to, 'The company currently measures performance with ROCE,' then you know shareholder value is not aligned with the main company objective. The company is using a profit-based, rather than a value-based, high-level metric.
- **Does the scenario mention the company's business unit objectives?** If the scenario states that business unit managers are given net profit margin (or another profit-based metric) as their primary objective, we might see a follow-on problem: managers will be focused on generating short-term profit rather than long-term value creation. There may be examples of short-termism, or dysfunctional decisions being made that you can reference in your answer.

Another requirement you might be asked is, 'what changes to the business will be required to adopt VBM?' Again, to gain passing marks, your ideas need to be linked to the scenario. Here are some ideas you could develop (of course, related to the scenario):

- **The company will need to change its performance metrics.** Suggest EVA as a new high-level metric and state why it measures value while other metrics do not.
- **The company will need to create a framework of value drivers.** Give an example or two of value drivers that could be linked to the company in question.
- **The company will need to assign new targets and KPIs to managers and staff.** Suggest a new target and KPI, linked to the value drivers you suggested above. This may be a challenging change initiative for the company to move to a new system of objectives.
- **The company will need new information.** If the company is currently using profit-based metrics, its information systems may be primarily based on financial data. To implement VBM, the company will need new management information systems that provide timely, accurate, and reliable information, derived from both financial and non-financial sources. If there is no information provided about this in the scenario, simply state this and develop the ideas above as recommendations.

This article has examined the topic of VBM and its links with other syllabus areas. With a practical approach that answers the question asked, further question practice, and an answer this is linked to the scenario, you should be able to successfully tackle any VBM requirement on your upcoming exam.

To see how VBM has been examined in the past, please see [Question 2 of the March 2020 exam](#).

Written by a member of the APM examining team

Complex business structures

This article focuses on complex business structures, where a core enterprise needs to manage the performance not only of its own activities, but also those of its partners to some extent.

Businesses increasingly rely on relationships with external partners to perform critical business processes. Relationships such as outsourcing and collaboration allow business processes to be performed better or more cost effectively, or without the need for investment in expensive production capacity. Various terms have been used to describe the complex relationships that have developed, such as virtual organisations, hollow organisation and network organisations.

In *Virtual Organisations and Beyond* (1), Hedberg, Dahlgren, Hansson and Olve describe how the Swedish clothes retailer GANT operates. The centre of operations is a Swedish company, Pyramid Sportswear AB, which has eight employees. Pyramid Sportswear owns the rights to use the brand name, selects the designers, performs quality control of production, arranges advertising, and organises the shipping of clothes from the factories to the retailers. Design and production of the clothes are outsourced, and the clothes are sold through independent retailers. To the customer it appears that there is one organisation, the GANT Company, which performs all these activities but in reality no such organisation exists. This group of independent companies, working together, coordinated by Pyramid Sportswear is described as an 'imaginary organisation' by Hedberg *et al* although the term 'hollow organisation' has been used by others to describe similar arrangements. Pyramid Sportswear is the core of this imaginary organisation, and it coordinates the other organisations; the partners.

A virtual organisation is one that has little or no physical premises, but where employees and managers work remotely (typically from home) and are connected using IT, such as emails, video conferencing, extranet and intranets. The organisation appears to the outside world to be just like any traditional style organisation. Customers and suppliers are linked using IT systems which adds to the impression that they are all part of the organisation. The classic example is Amazon, the online retailer. Most orders placed on Amazon's web site are forwarded to suppliers, who then send the goods directly to the customer.

Collaboration is also an important element in many business chains. Organisations such as Apple rely on a network of independent programmers who develop apps

for their products. While these programmers work independently, they rely on Apple sharing technical information with them about its operating systems, and through Apple's developer conference, they become part of the Apple family.

For the rest of this article, all these different arrangements will be referred to as complex business structures. They include a core enterprise (such as Pyramid Sportswear) that coordinates the activities of the partners in the structure.

Performance Management

In complex business structures the core enterprise needs to manage the performance not only of its own activities, but also those of the partners to some extent. The obvious problem is that the core enterprise does not usually own the partners, so has no legal right to try to manage them. Performance management issues must therefore be agreed with each partner as part of the terms of business.

Typically a contract or service level agreement will specify what activities are expected of each partner, what the minimum standards are in terms of quality, and the price that will be paid. These agreements may also describe reporting requirements, whereby partners are required to report their own performance using agreed metrics, such as % of late deliveries, and number of customer complaints. There may also be fines for repeated failure to achieve some of the standards.

Planning

In traditional organisations, planning and control is based on the budget. The process of preparing the budget requires the different parts of the organisation to coordinate their activities for the following year, and this requires some central coordination. Budgets also aim to ensure that costs of production are controlled. At the end of each accounting period, actual results are compared with budgets and action taken to remedy any significant variances.

In a complex business structure, the core organisation does not need to have a detailed analysis of costs incurred by the business partners. From a financial point of view, the core is only interested the prices that partners will charge, and these will already have been agreed in the service level agreement. The core does need to

be sure that suppliers will have the capacity to meet its demand on time, even though it may not be possible to specify how much that demand will be at the start of the year. Some type of planning will therefore be required to ensure that all parts of the structure have the flexibility and capacity to meet the potential demand from the core organisation.

Control

The core is mainly interested in non-financial aspects of the performance of the partners. Quality of goods or services are obvious areas. Other aspects may include delivery times, quality of customer service and ethical behaviour. Several large multinational companies have had their reputations damaged by the behaviour of partners in third world countries who employ child labour for example, or operate sweat shop style operations where employees are paid subsistence wages, and made to work long hours. Poor ethical behaviour of such partners can harm the reputation of the whole structure.

Expected standards must be specified in service level agreements. If a partner is required to fulfil sales orders to customers for example, there may be requirements about the minimum period within which such orders must be completed. The service level agreement may also require compliance with a corporate code of ethics. Partners will be expected to provide performance reports showing appropriate measures of performance and must allow inspections and audits to be performed by the core organisation.

Monitoring the workforce

Where the structure makes use of freelance workers and employees who work from home, traditional methods of control over the work force become less useful. It is not possible to clock employees in each morning when they work from home, for example, and they cannot be watched to ensure that they are working diligently. One solution is to simply pay by results. Remuneration may be based on quantitative measures of the output such as number of customer queries dealt with. Trust is likely to be a key factor in any such relationship, and the use of cultural controls, which involves employing people who are self-motivated.

Information technology can also be used to keep tabs on employees. System logs can record what time employees log onto and off the system, although there is of course no guarantee that they are being productive all of the time they are logged in.

Performance management problems

While performance measures and expected targets will be specified in the service level agreements, there can still be disagreements when things go wrong. Disagreements can arise about the value of metrics calculated. In the exam question Callisto Retail (June 2012 – see 'Related links'), there was disagreement about the amount of days inventory held by one of the wholesalers, and this required detailed reconciliation to be performed. Disagreement may also arise over who is to blame when things go wrong. If customers are not happy about the service they receive, there could be a number of partners who are potentially to blame.

Confidentiality of information becomes a risk, due to the fact that the core organisation is sharing key information with its partners. This may include commercially sensitive information such as production methods, or names and addresses of customers. Procedures need to be in place to ensure that such information is secure. This would include requirements relating to the security surrounding the information systems.

Motivation can also be an issue. Where all business processes are carried out in house, it can be easier to motivate employees using reward systems. Where the processes are carried out by an outside partner, it may not be so easy to motivate them. It is essential therefore that all partners share the same objectives and understand how they contribute to the success of the whole organisation. In some relationships, there is an element of profit share or bonus paid to the partners to motivate them to perform well.

Role of IT

Information systems often play a crucial role in complex business structures. The core organisation may invest in the development of an information system that it requires all partners to use. This can mitigate many of the challenges relating to

performance management discussed above. Its role in monitoring the work of employees has already been noted above. Having one system used by all partners means that everyone is using the same data. There should be less difficulty collecting information about the performance of partners since the information will all be stored on one system. The core party has greater control over the security of data, and communication between the parties will be much more fluid allowing greater coordination.

Conclusion

The greater use of business partners to perform crucial business processes may lead to lower costs and greater specialisation. However, the reliance on external partners can lead to additional challenges for performance management. These must be considered in drafting of contracts with the partners. The use of shared IT systems can also assist in many of the challenges.

Nick Ryan is lead tutor for performance management subjects.

[Improving your Advanced Performance Management answers – part 1](#)

[Improving your Advanced Performance Management answers – part 2](#)

This two-part article aims to give clarity on the level of response that is required in a Advanced Performance Management answer. It will address a specific past exam question that caused considerable difficulty in the March 2021 session. This part

will present and discuss two possible poor solutions to this question. This two-part article aims to give clarity on the level of response that is required in a APM answer. It will address a specific past exam question that caused considerable difficulty in the March 2021 session. This part will present and discuss two possible poor solutions to this question.

Reading through the answer and the marker's comments should help candidates to avoid basic mistakes and gain a better understanding of the breadth and depth of solution that a marker is expecting. Comments are made in [] after each paragraph, where appropriate.

Before reading this article, it is essential to have read the scenario and requirement for Question 1 part (b)(i) of the March 2021 APM exam and it will be helpful to keep these to hand. The requirement is repeated here for clarity.

Requirement:

Write a report to the chief executive officer (CEO) to respond to his instructions for work on the following areas:

- (b) the performance report at Fiag focused on
- (ii) whether the report addresses the company's objectives and the report's presentation

(14 marks)

Example solution 1: An assessment of the performance of Fiag

A solution focused on an assessment of performance has not been reproduced here, since it is not actually an answer to the question – being, as the title states – an assessment of the performance, not of the report. However, an explanation of why this is the case may help to clarify your understanding of the requirement. There are also some examples of the same kind of mistaken thinking in example solution 2.

This is a common mistake in the APM examination in many sessions and so, it is worth noting some of the ways in which a candidate could have realised that 'an assessment of the performance' was not what was required.

1. An evaluation of the 'report' not the 'performance' is requested in the question.
2. This type of question has appeared in many other past exams. (And will continue to do so in the future).
3. This issue of interpretation of the requirement was commented on in the examiner's report to these previous exams.

The most plausible explanations for this error are either a lack of preparation (practising past exams, reading examiner's reports and articles) and/or entering the examination room with an expectation of the questions in the exam – ie that it would begin with a performance evaluation, which was then followed regardless of the question asked. **It is wise to remember that proper preparation and then careful reading of the question are pre-requisites for success in the exam.**

The remainder of this article will look at a detailed commentary on a weak solution in order to give advice about how it could be improved. This solution represents a single answer of roughly the length often seen in the actual examination, but it is made up of a series of common mistakes. It is also written in a specific order and whilst this may be a good approach to formatting an answer, even the order here is a common mistake as will be seen.

A good way to approach studying this solution is to read it as if you are the marker and see if you can spot the mistake. Then when you do see something wrong try to think about how you would rewrite that paragraph in order to improve it. The marker's comments are at the end of each paragraph.

Example solution 2: A weak answer on evaluation of the current performance report

Fiag operates in a declining market that will not see much growth. Bicycles are becoming less relevant in today's car-based societies. People are also less active and less fit so they will be less willing to buy bicycles as they require physical effort to use.

[Comment: These remarks seem a little odd. In many markets bicycle sales, (whilst volatile as mentioned in the scenario) are not in permanent decline and there is no sign of this here, after all we only have two years-worth of data to go on. Sustainability issues in many countries where cars can be afforded are actually moving populations back to cycling. Also, the new Zoam product and cycles like it are designed for the less fit to enjoy cycling, which could further increase or stabilise sales. There is no clear data to support this, and it is an odd assertion to begin with].

The current performance report is very informative containing a mix of financial and non-financial information. This will help both financial managers and other managers to understand Fiag's performance.

[Comment: For a marker reading such a comment it shows that the scenario has not been read carefully. The report is exclusively financial. This mistake may arise from assuming that the commentary is effectively non-financial as it's written or that second appendix, which is for a separate part of the question, is part of the report].

Fiag has improved its revenue by 200% (per the commentary given). This will have a positive impact on their profit. It does not appear that this is reflected in this report, so perhaps there may be an error in the report or in the commentary. This will be very confusing for the managers reading this.

[Comment: Although the commentary talks about a 200% increase this is just for new and redesigned bikes. Total revenue for Fiag is actually reducing. Notwithstanding this misinterpretation of the data, revenue growth seems confused with profit growth here, the sales do not translate directly to profit. This point also suggests an error in the report – if the writer had stopped to think more carefully about this remark, they may have realised that the 'error' was theirs in confusing the commentary point with total revenue].

The report compares this year with last year, which is a good comparison as it gives the company an indication of how it has performed compared to what it did before.

[Comment: This could be more effectively explained by saying: 'The report compares year on year results, which is a good comparison as it gives the

company an indication of how it has improved or worsened during the year.’ This is better as it begins to show more detail in the purpose of including last year’s information, not just ‘compared’ but ‘improved or worsened’.]

The report does not show any segmental data for the revenue, which would be helpful to show the revenue from the new Zoam product separately in particular. Knowing which models are selling well can help management to take strategic decisions. If they could see what products were popular, they could use this to help the business. If Fiag has lots of products this could be a difficult exercise.

[Comment: Segmenting the revenue would indeed help to make more sense of the numbers. It would show the change in new and redesigned bike revenue at least. However, the comment as it stands is too vague and has not shown why this extra data would be useful, which is a crucial point, along with how this will link to the objectives of the organisation. It also does not effectively explain why this would help to make decisions and how it would ‘help the business’. The final sentence shows that the scenario has not been read carefully as it clearly states that Fiag only makes eight types of bicycle.]

The report does not break down the cost of sales by categories or product either, so we cannot clearly see where the cost is being spent. ABC will be useful to split the costs by bicycle type. This type of costing identifies the drivers of cost and the cost pools attached to them. It attaches costs to specific activities which can then be charged to the bicycle types to get a more realistic costing and to enable pricing and profit per model to be reviewed. With this extra data the products’ profits could be calculated. This may then allow Fiag to change their process to save costs and increase profits.

[Comment: This is common mistake when using models/techniques in the APM exam, trying to explain how the model/technique works, wasting time on definitions and theory rather than just using it, and showing how it will be useful. This point does try to finish with the reason for using ABC, but the comment is too vague, and not linked to the objectives of Fiag].

The report shows that Fiag has just about maintained its gross profit, this must be due to a stable market and shows good performance. There is only a 7% difference here which is good.

[Comment: The objective of Fiag is to give sustainable growth in returns and although gross profit is not the final amount available to shareholders, if it reduces there is unlikely to be growth at the profit after tax level. The market comment is also incorrect as the case clearly states that the market is becoming more volatile. Also, we cannot tell if this performance is good or not, as we have no other comparator, and remember that the question is not asking about how the company is performing].

Administrative expenses have gone down, which is good. However, it should display the administrative expenses split into categories as this will add value to the report. The managers need to see where the money is being spent.

[Comment: No justification is offered for the additional cost of preparing these metrics, nor consideration of the impact of further confusing a purely financial report with more financial metrics. Given that these types of expenses are often very fixed in nature, a splitting out of the detail may not help at all and we have no comparators to confirm whether this is a 'good' performance or not. Again, this is looking at the performance of Fiag and not the report].

The commentary mentions that the operating margin has only worsened by a small amount – 1.8%. This small reduction compared to the 7% at the gross profit level means that the intervening costs have been controlled well. This will ensure that the shareholders do achieve their returns.

[Comment: This point is trying to address the objective of shareholder returns, but it is very confused. The 1.8% change is incorrect – it is the number of percentage points change but not the percentage change in the margin $((6.6-4.8)/6.6 = 27.2\%)$. As well as this error the 7% at gross profit level is the margin itself but here it is compared with the incorrect change in margin].

The report only shows one industry ratio to assist with benchmarking of operating margin. We do not know if any other aspects of performance are any good compared to competitors.

[Comment: Whilst benchmarking is indeed useful there is no detail given here as to what it would be useful to add and why this will be helpful for Fiag to

know. Simply stating it will help us to see if we are 'good' compared to competitors is too vague, what would Fiag then use that knowledge to do? How does this link to the objectives]?

There is a good performance in the distribution expenses, they have gone down year on year. The same is true for selling and marketing expenses. Fiag must be controlling these well.

[Comment: Having started to stray into looking at the performance of Fiag this next point continues along the same, incorrect, theme].

Overall profit after tax shows a great performance for Fiag. They have improved this number by 86%, this is very good. The shareholders will be very happy with this number.

[Comment: Yet another point here looking at the performance itself and not the report].

The commentary is very useful as it can explain the numbers in the report for any less financially aware managers reading it. This is a good thing to have in any performance report.

[Comment: As a general point it is indeed true that commentary can be useful and particularly helpful to non-financial managers].

The notes make the nature of the exceptional costs clear so that there is no confusion when reading the report. This makes it easier to analyse the financial data to see if the company is reaching its objectives.

[Comment: Another general point here and an attempt to link to Fiag's objectives but it is a little weak].

The report is very numbers based and contains a lot of financial information. This would not be good for non-financial user to read. However, the numbers have at least been stated as millions to avoid there being too much detail to review. There are only a few comments and notes.

[Comment: It would have been helpful to give examples of broad improvements necessary here. This comment is also rather confusing given the earlier insistence that the report included a good spread of financial and non-financial data and the points about the commentary and notes].

Also, it only contains two years' worth of information. It does not show the budget data, so we do not know if the performance is as expected or not.

[Comment: There are two points here. The first relating to the year-on-year data – it is useful to have this for comparison, but it would usually need more years to discern a trend for Fiag's results to identify if they are meeting their objectives. The second point relates to the budget data, again it can be helpful to have budget and variance data, but the comment does not give a clear indication for the reason with regard to objectives although it does show that the writer understands some of the reasons for including the budget].

Fiag's mission statement is to maximise shareholders' wealth, but the report does not give any indicators on how or even whether this is happening. It should show EPS ratios or information on how it is targeting to improve their wealth.

[Comment: This is right on the mark but sadly not given the priority it deserves – ie it should be at the beginning of the answer which should then cover the objectives in turn. If the answer had started with this comment, it may have prompted the writer to include many more helpful comments as the detail of the report was discussed].

Fiag also mentions quality in its objectives but there are no measures that could be helpful to measure this in the report. Internal measures of wastage and reworks and external measures such as customer satisfaction will be needed for this.

[Comment: This is another very good link to the objectives and as the above point it is heading in the right direction. It does however fall short of explaining why the measures would be helpful to look at this aspect, the point is not developed well].

Summary:

This answer tries hard but consistently fails to make its points relevant and justified in assessing the performance **report** for Fiag using the information in the scenario.

It shows how not to answer this question. Like the first answer that we did not reprint here, it strays into reporting on the performance of Fiag. There is some attempt at structure here – following the headings in the report, but there is little thought of how the points should be organised and prioritised with regard to the objectives.

Before reading the improved solutions (the next article), it would be an excellent exercise for you to now write your own solution. This should only take about 20–25 minutes as you have done the preparation!

Written by members of the APM examining team

This two-part article aims to give clarity on the level of response that is required in an APM answer. It will address a specific past exam question that caused considerable difficulty in the March 2021 session. The article follows on from the first part (see 'Related links'), which gave examples of weak answers, and this one will discuss two possible pass standard solutions to this question.

Reading through the answer and the marker's comments should help candidates to avoid basic mistakes and gain a better understanding of the breadth and depth of solution that a marker is expecting. Comments are made in [] after each paragraph, where appropriate.

Before reading this article, it is essential to have read the scenario and requirement for Question 1, part (b) (i) of the March 2021 APM exam and it will be helpful to keep these to hand. The requirement is repeated here for clarity.

Requirement:

Write a report to the chief executive officer (CEO) to respond to his instructions for work on the following areas:

(b) the performance report at Fiag focussed on
(i) whether the report addresses the company's objectives and the report's presentation

(14 marks)

The first example here (numbered 3 to be consistent with the earlier article) is based on several, very good solutions seen. The spelling and grammar have been slightly tidied up but not perfected so that this solution is understandable but not overly polished. This solution's length reflects real exam efforts.

Example solution 3: An excellent, passing solution

The current performance report has the following merits to it:

It represents the results for the last two years, allowing for historic benchmarking. This allows Fiag to see, overall if they have been improving or worsening.

[Comment: A good general presentation point to begin with and the appropriate use of the jargon term 'historic benchmarking'].

The report includes one industry average, thus allowing for some external benchmarking and preventing the company from having a purely internal focus and putting the company's performance into perspective. However, this could be improved with more external measures for other categories in the report.

[Comment: The key issue here is that the presence of only one industry average is not particularly helpful for perspective, so is a valid point].

The format of the report is a standard profit and loss format and should be easy to read for anyone used to dealing with financial reports to understand and be able to use to make business decisions.

[Comment: As the board of Fiag will probably be used to doing so this is another useful but minor point in the report's favour].

A short commentary is included which can help explain some of the underlying trends and reasons for Fiag's performance as shown in the report.

[Comment: Indeed, commentaries can be useful in providing reasons for performance and trends. Although this commentary also has some negatives associated with it in that is short and not particularly helpful, containing an inaccurate calculation as we will see later].

However, there are some drawbacks with the report:

The report is obviously made up of purely financial information. It's difficult (almost impossible) to understand for non-financial people and members of the board. This is helpful information for the financial managers, but it will prove of little use for the top level of the company.

[Comment: This point is a little confused. It actually appears to be making two points. First, that there is the lack of non-financial data and secondly the use of excessive financial jargon. It might also be considered insulting to the board to imply they cannot read a what is essentially a basic income statement. It would be improved by a specific example of how the report goes wrong or how to improve the report – for example, which key numbers should be highlighted].

The report consists only of financial information, lacking information on some non-financial aspects which are very important for Fiag's business, such as quality of the bicycles, customer base and customer experience (they talk about the joy of cycling and a broad customer base in the objectives).

[Comment: This may not be perfectly put but is an excellent point as it is justified by using the objectives of the company and better than the one above which was trying to make some of the same points].

Some vital financial information is missing as well. Fiag is a venture capital backed company stating sustainable growth in returns to shareholders as its primary objective – but there are no measures of shareholders' wealth on the report. It could be useful to include such traditional measures as total shareholders return (TSR), price to earnings (P/E), earnings and dividend yields and such.

[Comment: Again, this is well justified by reference to the main objective. A more logical approach would have been to put this point ahead of the previous one, signifying its priority as reviewing the report's ability to address the first objective. It is also developed by giving examples of what measures could be appropriate].

External data to allow for further benchmarking would be useful as mentioned in the first part of this report. Currently Fiag only have an industry average for operating margin. Other averages or direct competitor information would help benchmarking further.

[Comment: This point is a little vague – what would Fiag be benchmarking against the competition specifically? It needs to be linked to the objectives again but does make a valid general point about the need for benchmarks].

As we know, Fiag has a new type of bicycle that it has developed and some of its other bikes have been redesigned. The report should split out the revenues (and profits, if possible, using ABC) for the different types of bikes sold. This segmental analysis would allow Fiag to see if any 'Dog' products should be discontinued and allow focus on manufacturing the products that are best at creating shareholder wealth – the 'Stars' in the product portfolio.

[Comment: Here is a good illustration of how to use the models that the APM syllabus contains in a suitable context. It is a common mistake here to realise the BCG matrix may help but then to wander away into a lengthy (and unnecessary) definition and description of the BCG matrix. The solution has used the jargon correctly in context and demonstrated this in the specific advice given. A very good approach].

It also would assist managerial decision making and appraisal if this year's budget figures appeared on the report allowing for a comparison of the actual results against expectations.

[Comment: Again, a short but valid point and note that this solution does not just say include budget comparatives, it states why].

The report does not include any data relating to quality of the bicycles. There is no internal quality data available, such as reject rates or rework. There is also no direct external quality data, such as customer returns or warranty claims.

[Comment: This is a vast improvement on the earlier comment about the need for data for benchmarking. Here the exact data required and the reasons for it (linked to the objectives) are stated].

With regard to a broad customer base the report again provides nothing to help Fiag identify whether they are managing to reach many types of customer or not. The commentary says that the revenue for the new and redesigned models grew but it is not clear if this relates to returning customers, the current customer type, or new groups of customers entirely.

[Comment: This point further develops the need for benchmarks for the other objectives. It makes it clear that the company cannot effectively monitor achievement without data].

The commentary is very brief and there is no data in the report that can be used to back-up the first comment about the increase in revenues for new and redesigned bicycles such as a segmental analysis of the bicycle types. The PBT can easily be seen to have improved from the report itself, the commentary here adds nothing. The final comment is factually incorrect. It states a small difference in operating margin – this difference is not 1.8% but 1.8 percentage points the true percentage difference $((6.6-4.8)/6.6)$ is 27.7%.

[Comment: This final comment deals with the final part of the report, the commentary and it's inadequacies. It also points out that it is misleading in that the percentage change in margin is calculated incorrectly – this form of calculation error is often performed by candidates themselves in this exam. There are several points worthy of credit in this paragraph].

Summary:

Overall, the answer has a good logical structure – merits then drawbacks which is what is expected when the verb 'evaluate' is used. Within the lists of points, there is some effort to prioritise, but this could be improved – see the third drawback, it should have been moved up and appeared earlier given the priority of that objective.

More and different points could be made, but in a time-limited examination this is an excellent effort. It may be worth noting that this answer contains c.600 words while the poor answer example for the same question (in the earlier article) had c.800 words and would have scored less than half as many marks. Quality not quantity is what markers, and your future employers seek.

Example solution 4: The model solution

A detailed commentary on this solution is provided at the end.

Current performance report

The current report has a number of strengths and weaknesses. These will be discussed according to whether the report:

- addresses the overall objectives of Fiag
- is well presented
- contains appropriate information for monitoring the business performance.

The current mission of the company can be broken down into three parts:

- to give shareholders sustainable growth in returns
- by developing and manufacturing quality bicycles
- to bring the joy of cycling to a broad customer base.

The report does not directly measure shareholder value which could be done through considering net present value or economic value added (EVA™) and dividends. The current report uses period profits as its main measure of performance. This can suffer from being short term unlike the shareholder value measures mentioned.

The report does compare year on year performance which gives an indication of what direction the company's fortunes are going in and is helpful in controlling the organisation.

There is an indirect measure of the customer value being offered by the company through the operating margin which, when compared to the industry average, gives

a partial measure of value but without data on the price/volume mix compared to competitors, it is difficult to be conclusive about this. Revenue changes compared to the overall industry would aid in giving an impression of the attractiveness of Fiag's offering to the customer. However, with no budget information given it is difficult to see if the company is performing even as it expected on an internal level.

Measuring the appeal of the products to the broad range of customers will be difficult and involves subjective non-financial measurements. Customer loyalty and price elasticity of demand will give some indication of the appeal of the new and redeveloped products and the older versions. It will be difficult without directly surveying customers to identify exactly why customers choose Fiag bicycles over the competition.

The report does not split out the types of bicycle to allow further analysis of what it and is not selling well. This limits its appeal as a strategic decision-making tool. As already mentioned, the reporting of performance year on year is a helpful control tool. However, as the various types of cycles will have differing margins and growth rates it would be advisable to provide more detail here.

Selling and marketing, which is a significant cost, is not attributed to individual product or ranges and it would be expected that the Zoam product would account for a large proportion of this charge, hence it would be a good idea to see this split out as well as the revenue, as mentioned above.

Administration expenses have improved slightly, and the commentary makes it clear that this includes the government grant for Zoam. Even after removing this grant the expenses have reduced but no reason is provided which given the usually fixed nature of these costs would be useful.

In terms of presentation, the data is clear, and, in a form, which would be easily recognisable to those used to reading accounts. The short narrative commentary highlights some of the key features in the report but is rather limited in contents and usefulness given the lack of underlying segmental analysis and also the incorrect percentage change in operating profit. It should be 27.3% $((6.6-4.8)/6.6)$ as well as it not really supporting the objectives clearly.

To summarise, additional information which could be supplied in the report also includes:

- budget information to demonstrate whether the performance is on the expected trajectory
- greater detail by product to aid the managers with product decisions
- competitor information relating to performance in the three areas of Fiat's mission (shareholder value, product quality, broad customer appeal)

[Overall commentary:

As with all model solutions, this is longer than a marker would expect to see produced in the time limits of the exam. This model solution has more than 14 marks within it (probably about 20 marks).

However, this is the top of the standard expected in terms of the *depth* of points made – not beyond that standard. It would be wise to study how each point is supported by evidence or argument from the scenario or else is developed. The answer tries to avoid making unsupported judgements. As an example, it continuously ensures that it does not only say 'How' but 'Why'.

Another feature of the model solution is its logical structure. The model solution begins with the most important point of view: the board's perspective. It lays out the strategy and then assesses whether the report is measuring the achievement of the strategy. Then, it goes deeper by considering the supporting objectives. Finally, it finishes with probably, the least important points about general presentation and provides a short summary.

Having read this article, prepare (or if already done)/review your own solution to this question so that you can see where improvements can be made.]

Written by members of the APM examining team

Changes to Advanced Performance Management question requirements

From September 2019 onwards the format of the question requirements in Section A of the Advanced Performance Management exam changed to an 'embedded' approach. From September 2022 all requirements in both Sections A and B will be embedded.

From September 2019 onwards the format of the question requirements in Section A of the Advanced Performance Management (APM) exam changed to an 'embedded' approach. From September 2022 all requirements in both Sections A and B will be embedded.

Throughout this brief article, examples from the 2022 APM specimen exam will be used to demonstrate what this will look like in the real exam and give advice on how to use the embedded requirements in the scenario to produce answers.

This article won't be covering the professional skills in any way, so although they will appear in the requirements they will not be discussed further here. ([Read more about APM and professional skills](#))

Figure 1 – Example from Section A

It is now the 1 September 20X5.

Write a report to the CEO of the Department for Internal Affairs to respond to his instructions for work on the following areas:

(i) the critical success factors and the key performance indicators for Deeland Police;

(16 marks)

(ii) an evaluation of the value for money service provided;

(14 marks)

(iii) the use of league tables.

(10 marks)

Professional marks will be awarded for the demonstration of skill in communication, analysis and evaluation, scepticism, and commercial acumen in your answer.

(10 marks)

(50 marks)

As can be seen in Figure 1, candidates will be required to produce a report for the board or chief executive officer (CEO) of the company in the question, but it will direct candidates to respond to instructions for work on a number of specific areas. In this illustration the areas of work are the three question parts (denoted by roman numerals), which have a corresponding number of marks allocated to them.

In order to determine what the instructions are for each of these areas, candidates will need to engage with the question scenario. Each question part will relate to one or more exhibits in the question scenario. Often the name/heading of the exhibit will make it clear which part it is to be used for. Where further exhibits may need to be referenced this will be made clear.

For example, Exhibit 2 in the question is titled CSFs and KPIs which clearly relates to question part (i).

Question part (i) asks for a response to the CEO's instruction for work on 'the critical success factors and key performance indicators for Deeland Police'. So, what are the embedded instructions?

In order to address the requirements in full and effectively, candidates will need to read and understand the question scenario. There will not be enough in the requirement alone to enable a full answer to be developed and the nature of the APM exam is that answers must be in the context given. This means engaging with the relevant exhibits.

Figure 2

Exhibit 2 – CSFs and KPIs

In a recent meeting with the CEO, the Minister indicated that she felt that the four key areas were too vague and in order to better focus actions, the Minister's adviser has suggested the following critical success factors (CSFs):

1. Greater protection and more support for those at risk of harm
2. Be better at catching criminals
3. Reducing the causes of crime by increased involvement with local communities
4. Create a task force to develop skills in detection and prosecution of virtual crime

Initially, the CEO did not see why the four key areas originally given could not be used as CSFs. **He wants you to provide justifications in the light of the Minister's concerns for the changes which the adviser has made to each of these. Then, using the above CSFs, he wants you to provide justified recommendations of up to two key performance indicators (KPIs) per CSF in order to measure performance.**

In order to help you with the KPIs, the CEO has provided you with a table of data (Appendix 1) which has been used in the past when considering DP's performance. However, you are allowed to suggest new data which would help in measuring

performance. The CEO has made it clear that at this stage, no calculations are required.

The vital information has been bolded in Figure 2 and when identifying these embedded requirements, it is important to not how many activities there are being asked for. In this example, there are two aspects to the work:

- Justify why the CSFs have been changed
- For each CSF, recommend up to two justified KPIs (Appendix 1 in Exhibit 5 can also be used to help with this part).

Figure 3 – Example from Section B

It is now 1 September 20X5.

Respond to the director's request for work on the following areas:

(a) the implementation of Step 2 of VBM

(15 marks)

(b) measurement of value.

(5 marks)

Professional marks will be awarded for the demonstration of skill in analysis and evaluation and commercial acumen in your answer.

(5 marks)

(25 marks)

As can be seen in Figure 3, in Section B there will still be a need for candidates to produce work that will be required at a high-level – ie for the board, chief executive

officer (CEO) or a director of the company/organisation in the question. Like in Section A, it will direct candidates to respond to instructions for work on a number of specific areas. In this example there are two parts to the work required and each will have a corresponding exhibit(s) which contains the relevant information.

Figure 4

Exhibit 3 – Measuring value

The directors are unsure of a suitable financial performance indicator for them to use to measure whether Totaig is creating value. As an illustration, **they have asked you to evaluate, by calculating economic value added (EVA™), whether Totaig has generated value for the year to 30 June 20X5. You should use the financial information given in Appendix 2.**

Once more the embedded requirement has been bolded in Figure 4. It is asking for a calculation of EVA™ to be performed and clearly directs the candidate to Appendix 2 for the financial data to be used.

What to do now

Practise using the question requirements and question scenario in this way to become familiar with the use of embedded requirements. Ensure that all activities being asked for, by either the board or CEO, are broken down and highlighted. This will ensure that all aspects of the instructions are being addressed by candidates in their report and will maximise the opportunity to score marks.

There are many examples of this style in past Section A questions from September 2019 onwards. Refer to the APM Specimen exam and two additional sample exams on ACCA's Practice Platform for examples of this style in Section B questions.

Read the article '[Reading the question requirements for APM](#)' for further valuable advice on this essential area.

Advanced Performance Management examiner approach

Advice on how to prepare for the exam, and the best ways to achieve success.

Relevant to candidates sitting Advanced Performance Management (APM) from September 2022

Advanced Performance Management (APM) is one of the four Strategic Professional Options examinations in the ACCA Qualification. This article begins by considering the syllabus and overall aims of the exam, how it links to other exams and the format of the exam. It will then summarise advice about how to approach the exam using suitable example questions from recent exams to illustrate points.

Syllabus

There are six syllabus areas:

- **Strategic planning and control**
The syllabus introduces candidates to the strategic role of management accounting as a discipline for planning and controlling performance so that strategic objectives can be set, monitored, and controlled. Candidates will be expected to use strategic planning and control models to plan and monitor organisational performance. This emphasises the need to take a holistic view of the factors, both internal and external, affecting the business and to consider them when giving strategic advice on performance management and measurement solutions. Good candidates at APM often distinguish themselves by being able to synthesise disparate detailed points into an overall, strategic approach for an organisation.
- **Performance management information systems and developments in technology**
APM requires candidates to identify and evaluate the design features of effective performance management information systems. This does not mean having detailed technical knowledge of hardware and software but instead be conversant with the broad hardware and software trends and issues and how these interact with the provision of performance information throughout the organisation. It is the effect of these technologies on the performance management decision-making processes and subsequent reporting of performance which is most significant.
- **Strategic performance measurement**
Application of appropriate strategic performance measurement techniques in evaluating and improving organisational performance will be required. This

capability requires the application of the performance measurement techniques of APM and its assumed knowledge in specific scenarios. These scenarios can range from private sector companies, public sector organisations, not-for-profit organisations, multi-national businesses, and regulated industries.

- **Performance evaluation**
The syllabus then moves to the scope and application of high-level performance measurement techniques in a variety of contexts, including complex business structures. Having covered the strategic aspects of performance management and operational systems for the measurement and control of performance, APM focuses on advice to senior management or independent clients on how to evaluate and control the performance of an entity.
- **Professional skills**
The professional skills section of the syllabus links to all others and provides a range of professional skills expected of a professional accountant.
- **Employability and technology skills**
The syllabus concludes with outcomes relating to the demonstration of appropriate digital and employability skills in preparing for and taking the APM examination. This includes being able to access and open exhibits, requirements and response options from different sources and being able to use the relevant functionality and technology to prepare and present response options in a professional manner. These skills are specifically developed by practising and preparing for the APM exam, using the learning support content for computer-based exams available via the practice platform and the ACCA website, and will need to be demonstrated during the live exam.

The syllabus comes with a *Study Guide* of more detailed guidance about the specific topics to be examined. The syllabus undergoes an annual review so it important to pay attention to any changes.

Links to other exams

Performance management systems are the systems in an organisation by which the performance of an organisation is measured, controlled and improved. The thrust of the APM exam is that move towards the strategic level of considering different performance measurement techniques and management systems. APM builds on knowledge gained at other levels; especially from PM, Performance

Management and MA, Management Accounting. Areas covered in the SBL, Strategic Business Leader, are also useful for APM and vice versa. PM tests the candidate's ability in application and analysis of core management accounting techniques and APM develops key aspects introduced at the PM level with a greater focus on the synthesis and evaluation of the key topics and techniques. It will also introduce more specialised techniques and current issues in performance management. Therefore, candidates should not expect to be retested in a PM style on topics but need to be aware that all of PM knowledge is assumed to be known and will now be used in a more critical capacity.

Exam format

The exam is a three-hour 15-minute test. There are two sections in the exam:

Section A (a single compulsory question)

Section A of the exam will always be a 50-mark case study based on an organisation in a particular business context. The 50 marks will comprise of 40 technical marks and 10 professional skills marks. All the professional skills will be examined in Section A.

It is likely to include the organisation's mission statement and strategic objectives and candidates will be expected to be able to assess the methods by which the organisation is controlling, managing, and measuring performance in order to achieve its objectives. This assessment could include an evaluation of the organisation's performance report, its information systems, new strategies or projects and its performance management and measurement systems. Candidates should understand that they will be expected to undertake calculations, draw comparison against relevant information where appropriate and be prepared to offer alternative recommendations as needed.

Management accountants are required to look across a range of issues which will affect organisational performance, the achievement of objectives and impact on operations and so candidates should expect to see Section A of the exam focus on a range of issues from across syllabus sections A, B and C. These will vary depending on the business context the case study in Section A is based on.

Section A questions will ask candidates to produce a response in a specific format, for example a report to the Board of Directors.

Section B (two compulsory questions)

Candidates will be required to answer a further two 25-mark questions in Section B of the exam, which will normally comprise of scenario-based questions. The 25 marks will comprise of 20 technical marks and 5 professional skills marks. Section B questions will examine a combination of professional skills appropriate to the question. Each question will examine a minimum of two professional skills from Analysis and Evaluation, Scepticism and Commercial Acumen.

One of the Section B questions will come mainly from syllabus section D; however, the other Section B question can come from any other syllabus section.

Section B questions will also require candidates to address a range of issues influencing performance of organisations in specific business situations.

Professional skills

From September 2022, marks will be awarded in APM for demonstration of the skills of communication, analysis and evaluation, scepticism, and commercial acumen. In terms of earning these professional skills marks, the examining team will be looking for the skill to be evident in respect of the technical points you make. It is important, therefore, that candidates understand what these professional skills are, and details can be found in the APM Syllabus and Study Guide.

What is important to remember is that professional skills marks are earned by providing comprehensive and relevant responses to the technical requirements.

Embedded requirements

APM has used embedded requirements in Section A questions since September 2019. From September 2022, all questions in the APM will use embedded requirements.

Use of dates

All dates in the APM exam will be in the format 20XX – for example, 20X5. As this will make the dates for each exam session generic, the same dates will apply in each exam irrespective of the exam session.

Time management

Candidates should allocate time based on the technical marks available, as the

professional skills marks should not be thought of as separate requirements and should be addressed throughout the entire answer.

Approaching the APM exam

The best approach to the exam can be summarised as:

- cover the whole syllabus
- be prepared to apply all your knowledge to a business scenario
- read and answer the question asked
- create information from data
- add value to the organisation which is being advised

Cover the whole syllabus

Remember that, broadly, the exam tests the capabilities which are required of a candidate. The exam aims to address issues at the strategic, tactical, and operational levels and often requires a candidate to understand the connections between these levels. For example, the Section A question in the specimen (Deeland Police) asks about critical success factors, recommending key performance indicators, assessing performance in terms of value for money and considering the introduction of league tables. Critical success factors are necessary for an organisation to achieve its mission and key performance indicators are how that achievement is measured.

A common type of question which arises is how does the choice of performance measures impact on the strategic, tactical, and operational performance of the organisation? A phrase that rings true in many situations is Drucker's dictum 'What gets measured gets done'. This phrase succinctly points to the impact that the choice of performance metrics has on the management activity of the organisation.

Questions in APM will also expect candidates to evaluate performance management methods, models, systems, and processes. It is important to remember that any evaluation needs to be coherently applied to the context which the organisation is in. Changing performance management in an organisation will

have an impact on achievement of objectives, costs, reporting, information systems, processes, people and culture.

Finally, in thinking about syllabus issues remember that APM builds on PM knowledge applying it in more complex scenarios so candidates should ensure that this PM knowledge is available in the exam.

Apply your knowledge to the question scenario

The exam tests a candidate's ability to assess different approaches to performance management from a variety of perspectives. This will entail the candidate knowing what the approaches are and more importantly being able to compare one with another in the context of a scenario – for example, profit and value approaches, financial and non-financial perspectives, short-term and long-term issues.

A good candidate will be able to tailor the approaches suitable to the organisation described in the scenario and justify this advice using the evidence given in the scenario.

The scenario describes the organisation, its objectives and its business environment. A good candidate will show how they have taken in this information and then applied it to the performance management of that organisation. For example, when assessing different performance management approaches, a useful question to ask is 'Does this meet the objectives/needs of the organisation?' so obviously, the candidate must have identified these from the scenario.

Candidates must make sure that they can:

- assess the current situation of the organisation (for example, its existing performance management systems) and then
- consider how to apply a new approach to performance management (for example, value-based or based on one of the many models mentioned in the syllabus such as the performance pyramid or the building block model), and
- assess whether this new approach will be an improvement (for example, by helping to meet the corporate objectives).

Lists of rote-learned advantages and disadvantages for different approaches will not produce a complete answer as a candidate will be expected to tailor this knowledge to the situation given in the question. Also, simply writing the appropriate jargon words or phrases associated with a model or method will not score heavily. It is essential that candidates demonstrate that they know how to apply these appropriately to the scenario.

Answer the question asked

The embedded requirements get a great deal of attention from the examining team. Candidates are given credit where their answer is technically correct and relevant to the question asked. There has been a tendency by candidates to write good answers to questions that they wish had been asked by the examining team rather than the one actually set in the exam. This latter approach scores little if no credit. There is a longer article entitled 'Reading the Question Requirements of APM' (see 'Related links') that illustrates the common misinterpretations seen in previous sessions. In addition, there is a two-part article entitled 'Improving Your APM Answers' that is very useful reading (see 'Related links').

Create information from data

As the business environment has been profoundly affected by the increased use of technology, there is less need at a strategic level to manually perform calculations. This is already tested heavily in earlier exams; therefore, there has been a reduction in the volume of computational work required for this exam compared to the lower levels. Occasionally, longer computations may appear but these will be used as a way of allowing the student to absorb the data in a question and become comfortable with the scenario. Large repetitious calculations are avoided but it should be noted that some repetition is inevitable as, for example, a trend can only be identified with at least two, or more realistically three data points.

Computational work in APM focuses more on the interpretation and further analysis of data provided in the question. Candidates have to demonstrate the ability to add value to their advice by taking information already produced and identifying the important features. At Strategic Professional, comments should be helpfully quantified where possible and the commercial implications discussed.

Candidates should be constantly on the lookout for ways to make their numbers more understandable, for example, by comparing them to increased activity of the business or to competitor performance.

A valuable management accountant will create information from the detailed data given in a question. It is often best to begin by considering the 'big picture' (what is the overall objective); next, break down the data into smaller but meaningful (and manageable) chunks; finally, discuss the individual lines of the data table and even then, a candidate should focus on the data that explains the overall picture of changes.

It is important to realise that, at the APM level, it is not enough to throw down all the ratios and measures that can be imagined. In doing this, the candidate is probably going to overload the report reader with unnecessary data. It is essential that candidates try to be selective in their choice of what to calculate. This is an important testing area in the exam as it shows that the candidate has appreciated the strategic goals or key drivers of performance and can focus on them. Note specifically that in handling data heavy questions, the level required for APM is for answers to go beyond repeating, in sentence form, the data given in (say) a table in that question.

Candidates will be expected to analyse not merely calculate numerical data given from a scenario.

Add value to the organisation

A candidate would be advised to consider if the answer they have produced would help the organisation to answer the question requirement.

Remember, try to add value with your answers by way of comments relevant to the issue at hand.

Overall

Applying correct methods and knowledge to differing and complex scenarios, adopting an integrative and holistic approach, demonstrating comprehensive

professional skills, and adding value in the recommendations and advice offered, are the factors which will lead to success in the APM exam.

Written by a member of the APM examining team