سفر کیفیت

FIT SIGMA

One main factor is the lack of solid measures. All companies have one key measure; the return on assets, or the 'bottom line'. However, the bottom line is a historical measurement – no matter how good the accounting system, by the time the bottom line is known it is too late to influence the result. The bottom line is in itself a measure of the result, and for many, such as bankers, investors and the share market, it is the result. Thus most organizations considering a new management technique or quality initiative, such as balanced score cards, business process re-engineering, benchmarking, just-in-time systems or what ever else is the flavour of the month, are in the main looking to save costs so as to improve the bottom line. Lip service is given to customer service (as espoused in the mission statement), but the reality is to get the costs down and the bottom line up. The measures must be truly balanced and underpinned by a formal process of periodic assessment and senior management review.

Lean Sigma

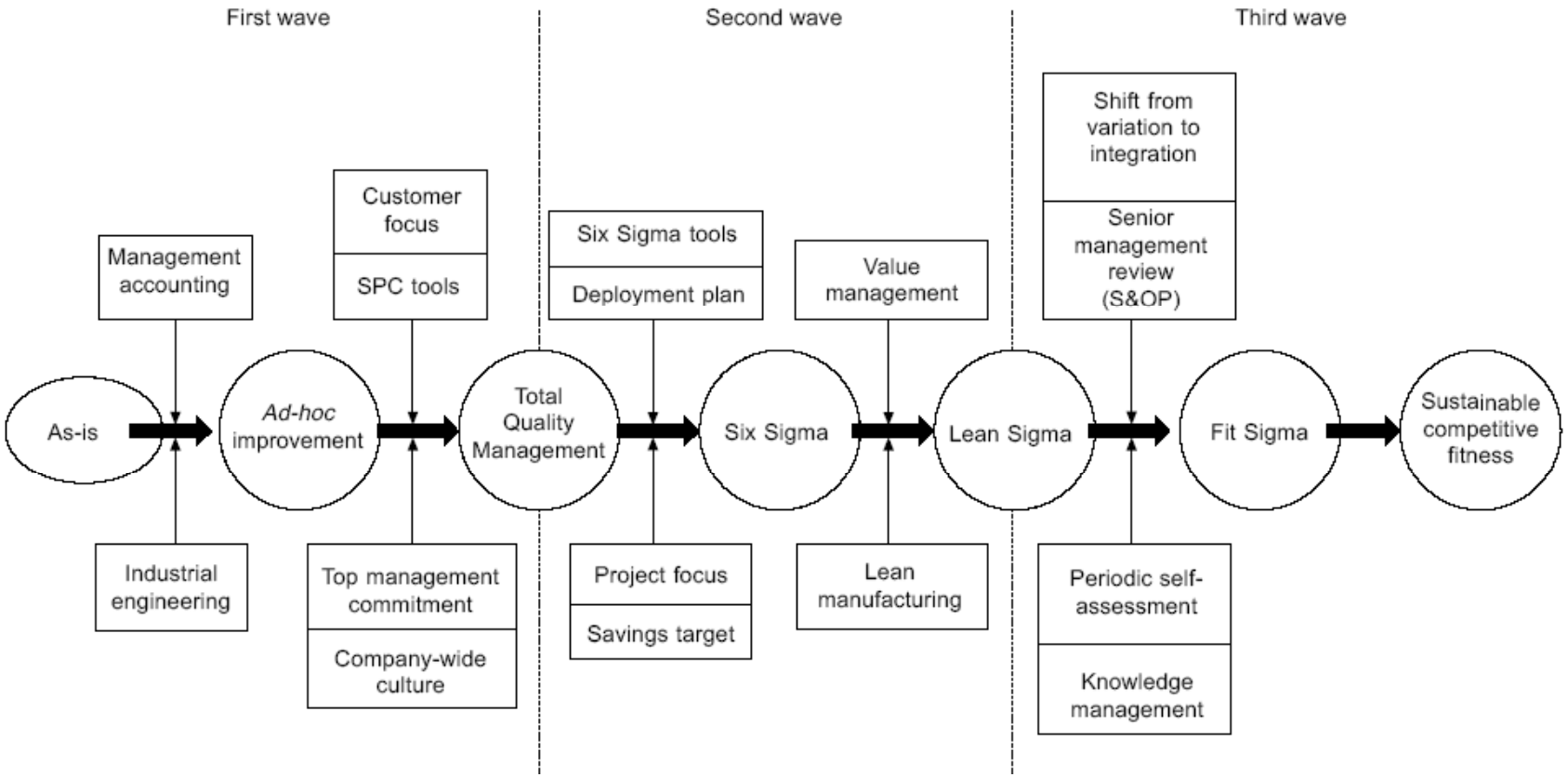
Basically, if accuracy in the order of 3.4 defects per million opportunities is added to the key ingredient of quality, and this is implemented across the business with an intensive education and training programme, we have Six Sigma. We will now look at lean enterprise, which is in fact an updated version of industrial engineering. With lean enterprise the focus is on delivered value as seen by the customer. The aim is to eliminate all non-value-adding activities (wasted effort, wasted materials) for each product and process along the value chain. The value chain begins with the supplier and the supplier's supplier, and flows through the transformation process to the organization's direct customer, and finally to the customer's customer. The value chain relies on two-way communication from the end user back to the original supplier.

Incremental is not enough

What frightens people is the target of Six Sigma – 3.4 defects per million opportunities is almost perfection, and seems impossible or even unnecessary. Instead, some management hide behind the concept of continuous improvement. However, almost all organizations today are striving to make continuous gradual or incremental improvements, and these companies obviously include your competitors! Incremental today is not enough; it is too slow, and only keeps pace with mediocrity. What do you do if your main competitor announces that it has reduced expenses by 10 per cent, it will deliver a markedly improved product in half the time and increase the level of service, and will not increase the price? Erwin and Douglas (2000) cite Craig Erwin of Motorola:

From TQM to FIT Sigma

بهره وري هوشمندانه كار كردن است



Lean production aims for elimination of the seven *mudas* (non-value-adding activities):

1. Excess production (no stockpiling of finished goods)
2. Waiting (no buffer stocks between processes, no idle time)
3. Conveyance (movement is reduced to a minimum)
4. Motion (elimination of unnecessary motion, adoption of ergonomic principles)
5. Process (Deming claimed that 90 per cent of waste is due to inefficient processes)
6. Inventory (materials should arrive when required, go straight into production, and flow like water through the system to the end user)
7. Defects (the aim being zero defects).

FIT SIGMA adds the following features to Six and Lean Sigma:

- A formal senior management review at regular intervals, similar to the sales and operational planning process
- Periodic self-assessment with a structured checklist, which is recognized by a certificate or award, similar to the European Foundation of Quality Management or Baldridge process
- A continuous learning and management programme
- A whole systems approach across the entire organization.

FIT Sigma model

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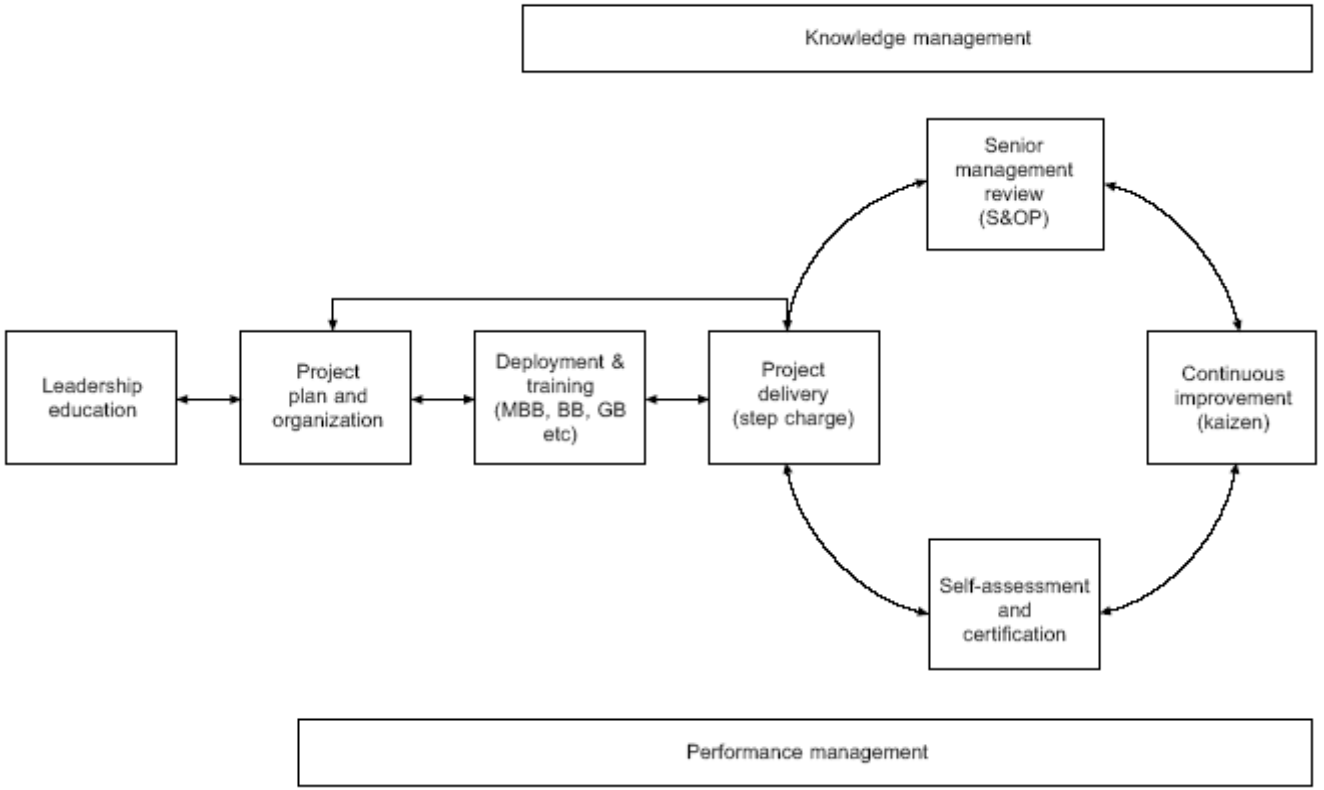

The new wave: quality beyond Sigma

FIT SIGMA is the new wave of Sigma. Lean Sigma provides agility and efficiency; FIT SIGMA also ensures sustainability. We call this maintaining fitness. FIT SIGMA also considers what is really required for a specific organization or operation. We will show that is not necessary for every operation to achieve the virtual perfection level of 3.4 errors per million opportunities – FIT SIGMA is what is fit for the operation. Not all organizations need the intensive and expensive 'all or nothing' investment required by the Six Sigma deployment plan.

World class

The term world class is generally attributed to Hayes and Wheelwright (1984), who related best practice to German and Japanese firms competing in export markets. Schonberger (1986) used the term 'best practice' to describe manufacturers making rapid and continuous improvement. World class in the nineties was extended to include lean production (see Womack et al., 1990),

Fry and co-workers (1994) and Harrison (1998) say best practice refers to any organization that performs as well as or better than the competition in quality, timeliness, flexibility and innovation. Knuckey and co-workers (1999, p. 23) explain that:

... the logic behind best practice is simple: because operational outcomes are a key contributor to competitiveness and business performance, and because best practice should improve operational outcomes, by implication good practice should lead to increased competitiveness. Best practice should lead to world class service.

Why best practice and world class is essential

There is no doubt that people today are more travelled, better educated and consequently more discerning than ever before. Customers know what is on offer elsewhere, they have experienced it and their expectations have been raised by advertising and marketing. Likewise, shareholders and other financial stakeholders can be excused for wondering why the rapid technological advances of the last decade have not resulted in increased performance and higher returns on investment. At the same time, the well-publicized and promised benefits of technology have led customers to expect – even demand – improved products and service at less cost. Quality service, reliable products, value for money and accountability are now taken for granted. Competitors are global, standards are world class, and organizations that fail to meet world-class performance will soon be found out.

Deming 14 Points

بهره وري هوشمندانه كار كردن است

1. Create consistency of purpose toward improvement of product and service.
2. Adopt the new philosophy (management has to learn its responsibilities and to take leadership. It is difficult for management to accept that 90 per cent of problems lie with management and the process).
3. Cease dependence on inspection to achieve quality (supervision and supervisors' wages do not add value, they are an extra cost; far better if staff take responsibility and supervise themselves. Deming also added that if quality is built into the design or process, then inspection will not be necessary).
4. End the practice of awarding business on the basis of the price tag (the cheaper the price, the higher the number of failures. Move to dedicated suppliers, and value reliability, delivery on time and quality).

Deming 14 Points

بهره وري هوشمندانه كار كردن است

5. Improve constantly and forever the system of production and service (this is an extension of the Japanese philosophy of kaizen, whereby not a day should go by without some incremental improvement within the organization).
6. Institute training on the job (become a learning organization with a willingness to share knowledge).
7. Institute leadership (everyone at all levels, especially supervisors, should be team leaders and not disciplinarians. Everyone should be encouraged to develop self-leadership. Quality is too important to be left to management).

Deming 14 Points

بهره وري هوشمندانه كار كردن است

8. Drive out fear (encourage people to admit mistakes; the aim is to fix not to punish. However it is expected that people won't go on making the same mistakes!)
9. Break down barriers between departments (eliminate suspicion between departments. There needs to be clear objectives, with everyone striving to work for the common good).
10. Eliminate slogans, exhortations and targets for the workforce (there is no use asking for zero defects if the process or the product design is not perfect; 10 per cent across-the-board cost reduction demands are poor for morale if they are not possible).

Deming 14 Points

بهره وري هوشمندانه كار كردن است

11. Eliminate work standards – quotas – on the factory floor (e.g. 100 pieces per hour with a bonus for a 110 will result in 110 pieces, but not necessarily in quality products. The focus will be on output numbers rather than quality. If the worker is encouraged to consider quality, 95 high-quality pieces per hour will be worth more than 110 if 15 (of the 110) are subsequently rejected or returned by the customer).
12. (a) Remove barriers that rob the worker of the right to pride of workmanship (give them the right tools, right materials, right processes and comfortable working conditions; treat them with respect).
    (b) Remove barriers that rob people in management and in engineering of their right to pride in craftsmanship (this includes appraisal systems that reward on bottom-line results and keeping expense budgets down, and ignore customer satisfaction. If cost is the only driver, then training, maintenance and customer service etc. will suffer).
13. Institute a programme of education and self-improvement (encourage staff to seek higher educational qualifications; become a knowledge-based organization).
14. Put everybody in the company to work to accomplish the transformation (change of culture is difficult to achieve. Dr Deming saw that everyone has to be involved in transforming the culture of an organization).

Juran

بهره وري هوشمندانه كار كردن است

Deming was not the only guru of quality used by the Japanese. Dr Joseph M. Juran was also associated with Japan's emergence as the benchmark for quality of products. Juran was, like Deming, an American statistician, and there are similarities between his work and that of Deming. Above all, both men highlight managerial responsibility for quality. Arguably Juran was the first guru to emphasize that quality is achieved by communication. The Juran trilogy for quality is planning, control and improvement (Juran, 1989). His approach includes an annual plan for quality improvement and cost reduction, and continuous education on quality. Juran's foundations are still valid, and are embedded within Six Sigma and Lean Sigma and our FIT SIGMA philosophies.

Feigenbaum

بهره وري هوشمندانه كار كردن است

Feigenbaum is recognized for his work in raising quality awareness in the USA. He was General Electric's worldwide chief of manufacturing operations for a decade until the late 1960s. The term Total Quality Management originated from his book Total Quality Control, first published in 1961 (Feigenbaum, 1983). Feigenbaum states that Total Quality Control has an organization-wide impact, which involves managerial and technical implementation of customer-orientated quality activities as a prime responsibility of general management and of the main-line operations of marketing, engineering, production, industrial relations, finance and service as well as of the quality-control function itself. He adds that a quality system is the agreed company-wide operating work structure, documented in integrated technical and managerial procedures, for guiding the coordinated actions of the people, the machines, and company-wide communication in the most practical ways, with the focus on customer quality satisfaction.

Crosby

بهره وري هوشمندانه كار كردن است

P.B. Crosby, a guru of the late 1970s, was the populist who 'sold' the concept of total quality management and 'zero defects' to the USA. Although the zero defects concept sounds very much like Six Sigma, in fact Crosby takes a very much softer approach than does Deming, Juran, Feigenbaum or Six Sigma. His concept of zero defects is based on the assumption that it is always cheaper to do things right the first time, and quality is conformance to requirements. Note the wording 'conformance to requirements' – thus any product that conforms to requirements, even where requirements are specified at less than perfection, is deemed to be defect free.

Crosby developed the concept of non-conformance when recording the cost of quality. Non-conformance includes the costs of waste and scrap, down time due to poor maintenance, putting things right, product recall, replacement

Of the Japanese approaches to quality, the Taguchi methods have been the most widely adopted in America and Europe. Taguchi, an electrical engineer, used an experimental technique to assess the impact of many parameters on a single output. His method was developed during his work rebuilding the Japanese telephone system in the 1970s. His approach to quality control is focused on 'off line' or loss of function (derived from telephone system failures).

The Taguchi approach is to:

- Determine the existing quality level measured in the incidence of down time, which he called ‘off line’
- Improve the quality level by parameter and tolerance design
- Monitor the quality level by using statistical process control to show upper and lower level variances.

Taguchi approach

بهره وري هوشمندانه كار كردن است

1. System design – this is the development of the basic system, which involves experimentation with materials and the testing of feasibility with prototypes. Obviously, technical/scientific knowledge is a requisite.
2. Parameter design – this begins with establishing the optimum levels for control factors so that the product or process is least sensitive to the effect of changes of conditions (i.e. the system is robust). This stage includes experimentation, with the emphasis on using low-cost materials and processes.
3. Tolerance design – this includes setting numerical values (factors) for upper service levels and lower acceptable service levels, and reconciling the choice of factors in product design. In turn, this includes comparison of costs by experimenting with low-cost materials and consideration of more expensive materials to reduce the tolerance gap. Design includes process design and product design; process design includes choosing the upper and lower parameters of service, and product design includes reconciling the choice of materials against the desired service level parameters.

Basu & Wright

بهره وري هوشمندانه كار كردن است

Basu and Wright (1998) identify a hierarchy of quality management that has four levels: inspection, control, assurance and Total Quality Management (TQM).

Quality inspection and quality control rely on supervision to make sure that no mistakes are made. The most basic approach to quality is inspection, detection and correction of errors. The next level, quality control, is to inspect, correct, investigate and find the causes of problems and take actions to prevent errors re-occurring. Both methods rely on supervision and inspection. The third level, quality assurance, includes the setting of standards with documentation and also the documentation of the method of checking against the specified standards. Quality assurance generally also includes third-party approval from a recognized authority, such as found with the ISO 9000 series.

Basu & Wright

بهره وري هوشمندانه كار كردن است

Generally it is the lower-paid members (shop assistants, sales representatives, telephone operators, van drivers, accounts clerks) of the organization who will be physically interfacing with the customers or providing the service, and it is their attitude and level of helpfulness that will determine the overall perception of quality by the customer. These workers have a huge part to play in how the customer perceives an organization. It is on the lower levels, then, that an organization must rely for the continuing daily level of quality.

Once the culture of quality has become ingrained, quality will be driven from the bottom up – whether by the factory worker or the sales assistant – rather than achieved by direction or control from the top.

USA & Europe

oakland

بهره وري هوشمندانه كار كردن است

In the UK, Professor Oakland is recognized as the leading light of Total Quality Management. His particular brand of TQM is essentially pragmatic, and includes a whole systems approach without relying on either quantitative or qualitative measures. It has been suggested that he leans towards qualitative aspects, i.e. the issues of culture, communication and teamwork. Some might refer to these as the 'softer issues', as it is difficult to quantify in 'hard' statistical terms a level of culture or teamwork. Like many writers, Oakland stresses the importance of these issues and offers a culture change cycle based on psychometrics such as MBTI and FIROB (Oakland, 2000).

oakland

بهره وري هوشمندانه كار كردن است

1. Make a long-term commitment
2. Change the culture to ‘right first time’
3. Train the people to understand the customer–supplier relationship
4. Buy products and service on total cost (like Deming, Oakland is saying that the purchase price is not the final cost; total cost includes performance, running costs and repairs and maintenance costs)
5. Recognize that systems improvements must be managed
6. Adopt modern methods of supervision and training, and eliminate fear (the supervisor has to move from a strict disciplinarian role somewhat towards a mentoring role – guiding and supporting, not kicking butt and taking names)

oakland

بهره وري هوشمندانه كار كردن است

7. Eliminate barriers, manage processes, improve communication and teamwork (encourage cross-functional department support, not defensive silo mentalities)
8. Eliminate arbitrary goals and standards based only on numbers, eliminate barriers to pride of work, use correct methods to get the facts and do not accept fiction or hearsay.
9. Constantly educate and train and use in-house experts where possible (bearing in mind that Oakland himself heads a consulting group)
10. Utilize a systematic approach to TQM implementation.

oakland

بهره وري هوشمندانه كار كردن است

Referring back to Deming's fourteen points, it can be seen that Oakland's ten points reinforce rather than significantly add to TQM. Oakland has, however, applied a set of implementation tools known as Quality Function Deployment (QFD) to create a 'Goal Deployment' approach to aligning TQM with the business strategy.

carlzon

بهره وري هوشمندانه كار كردن است

Sometimes, just a change in attitude and the recognition of key problem areas can be sufficient to make a big difference. For example, when Jan Carlzon took over Scandinavian Airlines (SAS) the airline was about to lose $US20 million. He found that SAS was a very efficient organization – it knew its business of transporting goods and people by air, and did this with clinical efficiency. It had sufficient resources and well-trained staff, and 10 million passengers were carried each year. Carlzon then established that for each passenger there were five occasions when the passenger came into contact with front-line employees, and that this contact lasted on average for 15 seconds. He called these contact times 'moments of truth' when he said (Carlzon, 1989):

ISO9000

بهره وري هوشمندانه كار كردن است

Total Quality Management means more than just the basics as outlined in ISO 9000; indeed, ISO 9000 could be seen as running contrary to the philosophy of TQM. As Allan J. Sayle (1991) pointed out:

It is important to recognize the limitations of the ISO 9000 series. They are not and do not profess to be a panacea for the business's ills. Many companies have misguidedly expected that by adopting an ISO 9000 standard they will achieve success comparable to that of the over-publicized Japanese. One must not forget that the ISO 9000 standards did not exist when the Japanese quality performance improved so spectacularly: many Japanese firms did not need such written standards, and probably still don't.

Expectation

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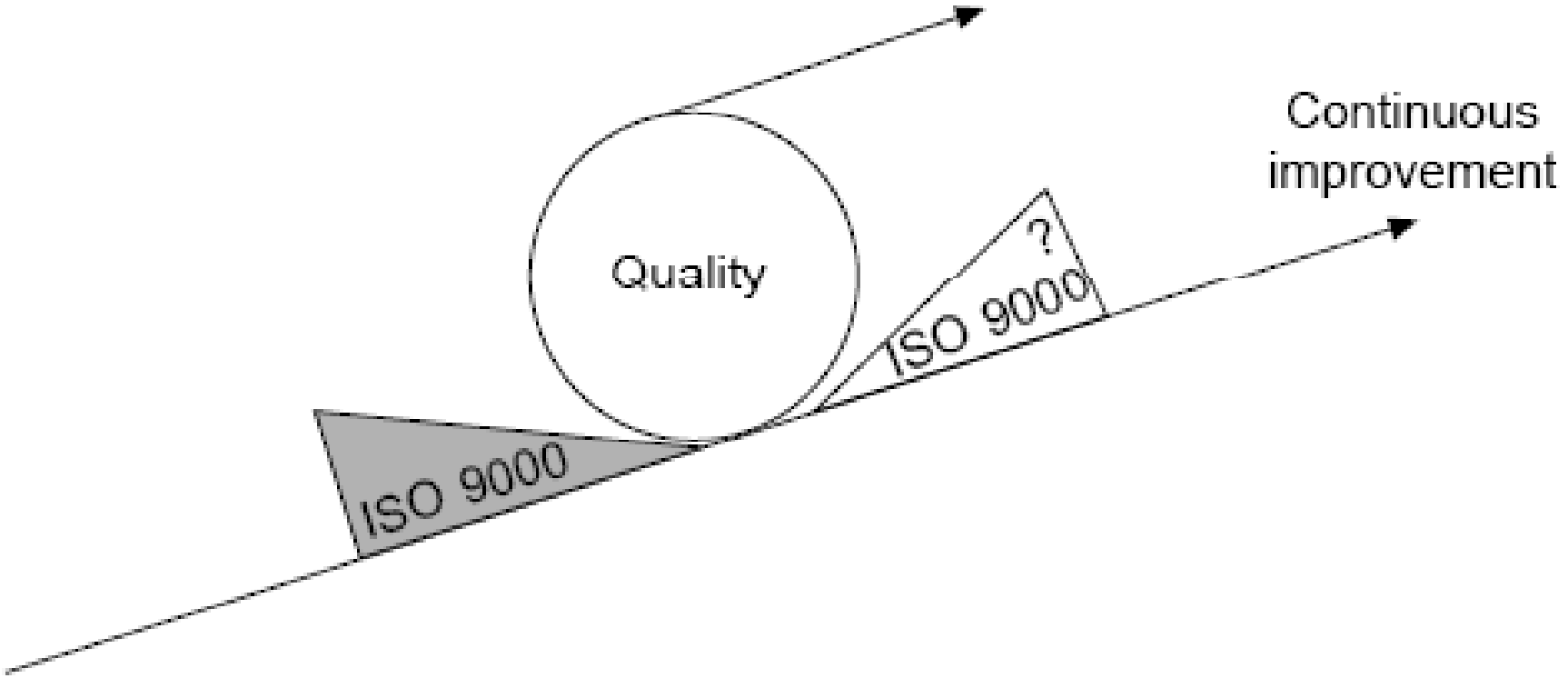

ISO series

بهره وري هوشمندانه كار كردن است

- ISO 9000 mainly deals with how to choose other ISO series standards for inclusion in a contract between a customer and a supplier.
- ISO 9001 should be chosen if there is design work or changes to designs involved, and/or if after-sales service is required.
- ISO 9002 should be chosen if there is no design work involved and/or no after-sales service in the contract. Some people think that ISO 9002 is easier to achieve and that therefore that ISO 9002 is a lesser 'qualification' to 9001. This is not so. If there is no design work involved or after-sales service required, then ISO 9002 is appropriate and it is no less onerous than 9001.
- ISO 9003 only requires one final check, and thus is not a good way of reducing costs of mistakes and of instilling a quality culture into the organization. Of course, ISO 9003 can be amended to include corrective action taken during the process and so on. If such amendments are made, then ISO 9002 may be more appropriate.

ISO series

بهره وري هوشمندانه كار كردن است

- ISO 9004 extensively uses the word ‘should’. This means that an organization is not required actually to do anything included in the standard, and thus ISO 9004 can only be regarded as an advisory introduction paper to quality management. It is not so much that what ISO 9004 covers is wrong; it is the lack of compulsion that makes ISO 9004 of little value for contract purposes. If a customer were to use ISO 9004 in a contract document, then ‘should’ ought to be replaced with ‘shall’ throughout.
- The 14000 series concerns environmental (green) issues. Achievement of the standards is said to lead to business benefit through process performance improvement, cost reduction, reduced pollution, legislative compliance, and an improved public image. All very good – but if an organization has a social conscience and is environmentally aware, why would it need ISO accreditation?!

Kaizen

بهره وري هوشمندانه كار كردن است

The Japanese have a word for continuous improvement: kaizen. The word is derived from a philosophy of gradual day-by-day betterment of life and spiritual enlightenment. Kaizen has been adopted by Japanese business to denote gradual unending improvement for the organization. The philosophy is the doing of little things better to achieve a long-term objective. Kaizen is 'the single most important concept in Japanese management – the key to Japanese competitive success' (Imai, 1986).

Quality circles

بهره وري هوشمندانه كار كردن است

In the 1960s Juran said (Juran, 1988):

> *The quality-circle movement is a tremendous one which no other country seems to be able to imitate. Through the development of this movement, Japan will be swept to world leadership in quality.*

Certainly Japan did make a rapid advance in quality standards from the 1960s onwards, and quality circles were part of this advance. However, quality circles were only one part of the Japanese quality revolution.

Success factors

بهره وري هوشمندانه كار كردن است

Quality circles have been tried in the USA and Europe, often with poor results. From our combined first-hand experience of quality circles in Australasia, the UK and Europe, South America, Africa, Asia and India, we believe that quality circles will work if the following rules are applied:

1. The circle should consist only of volunteers
2. The members of the circle should all be from different functional areas
3. The problem to be studied should be chosen by the team, and not imposed by management. Problems looked at by the circle may not always be directly related to quality or, initially, be seen as important by management.

Success factors

بهره وري هوشمندانه كار كردن است

4. Management must wholeheartedly support the circle, even where initially decisions and recommendations made by the circle are of an apparently trivial nature or could cost the company money (such as a recommendation for monogrammed overalls).
5. The members of the circle will need to be trained in working as a team (group dynamics), problem-solving techniques, and in how to present reports. The basic method study approach of asking why (what, where, when, who, and how) is a standard quality circle approach to problem solving, and members need to be taught how to apply this structured approach to solving problems.
6. The leader of the circle and the internal management of the circle should be decided by the members.
7. Management should provide a middle manager as mentor to the circle. The mentor's role is to assist when requested and generally to provide support. The mentor does not manage the circle.

Quality project teams

بهره وري هوشمندانه كار كردن است

A problem experienced in the UK was the blurring of quality circles and quality project teams. The project team approach is top down – that is, management selects a hard quality problem and designates staff to be members of the team. The top-down, conscription approach might appear to be more focused than the quality circle approach, but the fundamental benefits of a voluntary team approach are lost. With the pure bottom-up quality circle approach, the members are volunteers and the circles consist of people who work well together and who want to contribute to the success of the organization.

Journey to Fit sigma

بهره وري هوشمندانه كار كردن است

All of the foregoing methods are compatible with FIT SIGMA. Some of them, such as ISO 9000/14000, are not necessary, but if they exist in an organization then they are not wasted and provide a good foundation to move up to FIT SIGMA. FIT SIGMA is both a philosophy and an improvement process. The underlying philosophy is that of a total business-focused approach underpinned by continuous reviews and a knowledge-based culture to sustain a high level of performance. In order to implement the FIT SIGMA philosophy, a systematic process is recommended. This process is not a set of new or unknown tools; in fact these tools and this culture have been proven to yield excellent results in earlier waves of quality management. The differentiation of FIT SIGMA is the process of combining and retaining successes. Its strength is that it is not a rigid programme in search of problems, but an adaptable solution fit for any specific organization.