

Benchmarking Organisational Capability using The 20 Keys

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Abstract

Organisations have over the years implemented many improvement initiatives, many of which were applied individually with no real, lasting improvement. Approaches such as quality control, team activities, setup reduction and many more seldom changed the fundamental constitution or capability of an organisation. Leading companies in the world have come to realise that an integrated approach is required which focuses on improving more than one factor at the same time - by recognising the importance of synergy between different improvement efforts and the need for commitment at all levels of the company to achieve total system-wide improvement.

The 20 Keys approach offers a way to look at the strength of organisations and to systemically improve it, one step at a time by focusing on 20 different but interrelated aspects. One feature of the approach is the benchmarking system which forms the main focus of this paper. The benchmarking system is introduced as an important part of the 20 Keys philosophy in measuring organisational strength. Benchmarking results from selected South African companies are provided, as well as one company's results achieved through the adoption of the 20 Keys philosophy.

1. Introduction

This paper introduces the 20 Keys as a benchmarking tool and describes some of the findings recorded using the 20 Keys in determining organisational capability in selected South African companies.

The paper is structured as follows :

- An overview perspective of benchmarking is provided
- The 20 Keys is introduced as a systemic approach to the improvement of organisational capability
- The 20 Keys benchmarking process is described as well as some of its limitations and some suggestions are made to overcome these
- A look at organisational capability in selected South African companies

2. Benchmarking - Some definitions

Benchmarking is defined as the continuous process of measuring one's products, services and practices against the toughest competitors or those companies recognised as industry leaders. It also includes the search for the best industry practices that will lead to superior performance [Gregoire and Delaney, p7].

The process of benchmarking often involves the following steps:

1. Knowledge of one's own operations (i.e. understanding one's strengths and weaknesses)
2. Gaining knowledge of the external market by researching other companies. In this regard, it is important to know what companies in other industries are doing - some useful ideas and techniques may be adopted.
3. Establishing performance targets based on the knowledge gained.
4. Directing one's efforts on the established best operating characteristics [Adam and VandeWater, p24].

Benchmarking is thus a tool to identify, establish and achieve standards of excellence; standards based on the realities of the market place. Benchmarking therefore forces an external focus to becoming competitive and often this will

provide “breakthrough” thinking that will lead to non-linear improvements in performance [Landry, p54].

3. The 20 Keys as a systemic approach to the improvement of organisational capability

The 20 Keys to Workplace Improvement was developed over a dozen years ago by Prof. Iwao Kobayashi¹. The approach has been implemented in several hundred Japanese companies and eventually spread to the West via South Africa².

Prof. Kobayashi states that “Managers need to determine to what degree their companies can rapidly respond to change, and to regard such responsiveness as a standard for evaluating corporate strength. To have such a standard, they must have specific means of evaluation and specific items that can be improved. Managers cannot make their companies stronger unless they know how to improve items that assessment shows require improvement.”

Therefore, a systemic approach [Baysal, p12] to Workplace Management is required to :

- identify the underlying causes of problematic behaviours in today's organisation/manufacturing environment by ensuring a holistic understanding of the operating system.
- develop and evaluate concrete steps in bringing sustainable improvements to actual problematic situations.

The 20 Keys system provides such a systemic approach by bringing together (and evaluating) the world's workplace improvement methods into one package and integrating these separate methods into a closely interrelated whole with synergistic effects.

The 20 Keys system defines 20 characteristics companies require to stay flexible and adaptive. A five-point scale is assigned to each category, using level one (1 point) for the most primitive and level five (5 points) for the world's most efficient.

¹ Iwao Kobayashi is the President of the PPORF (Practical Program of Renewal in Factories) Institute in Japan and has published two books listed in the references.

² Organisation Development International (Johannesburg, South Africa) obtained the rights to the 20 Keys and has been responsible for its translation and adaptation for the West.

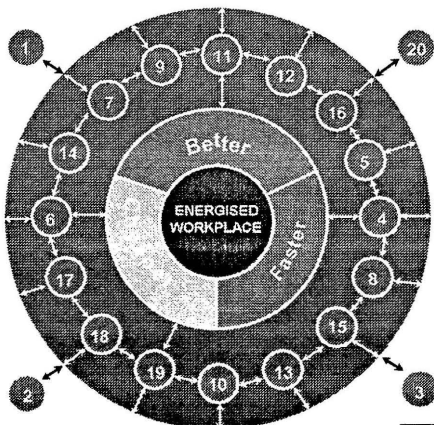
Many companies have made considerable efforts in certain of these categories, however, no company is yet known to have achieved a perfect score in all the categories. Organisations which start on a workplace improvement drive usually find that they score between 25 and 35 points, out of a possible 100. [This has proved to be true even for well-known Japanese companies who have for years implemented TQM, TPM, QC circles, or other improvement initiatives] Experience has shown that it is possible to improve by about 20 points over a three year period resulting in :

- significant productivity gains (usually doubling output per man hour)
- significant quality improvements (two to tenfold)
- reduced cycle times
- improved safety and morale

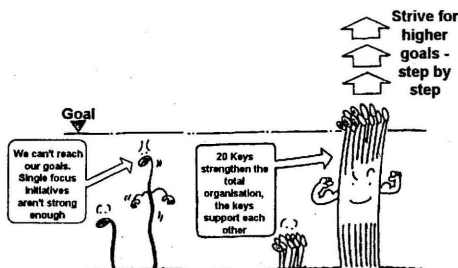
Prof. Kobayashi displays the 20 Keys in a *20 Keys Relations Diagram* (shown below), which highlights the four pillar keys on the outside, as well as the significant position of each Key in relation to other Keys around Quality, Speed and Cost objectives. The primary feature of the system is a scoring system for evaluating organisational strength known as the *20 Keys five-point evaluation system* mentioned above.

20 KEYS TO WORKPLACE IMPROVEMENT

- Key 1: Cleaning & Organising
- Key 2: Rationalising the System / Goal Alignment
- Key 3: Small Group Activities
- Key 4: Reducing Work-in-Process
- Key 5: Quick Changeover Technology
- Key 6: Kaizen of Operations
- Key 7: Zero Monitor Manufacturing
- Key 8: Coupled Manufacturing
- Key 9: Maintaining Machines & Equipment
- Key 10: Time Control & Commitment
- Key 11: Quality Assurance
- Key 12: Developing Your Suppliers
- Key 13: Eliminating Waste
- Key 14: Empowering Employees to Make Improvements
- Key 15: Skill Versatility and Cross Training
- Key 16: Production Scheduling
- Key 17: Efficiency Control
- Key 18: Using Information Systems
- Key 19: Conserving Energy & Materials
- Key 20: Using Technology for Strategic Advantage



The systemic nature of the 20 Keys is emphasised by Kobayashi using his analogy of bean sprouts growing towards their full potential.



Single Focused Initiatives [Kobayashi, p3]

Kobayashi states that single bean sprouts grow towards their goals, but if they are not supported by growth in other areas of business, they are not strong and collapse at the first sign of “turbulence”. As an example, if “inventory reduction” is considered as a single-focused initiative, management may decide to hold less stock and reduce batch sizes. If this is done without supplier involvement, addressing setup times, looking at coupling issues, or scheduling implications, etc., the company may not achieve the intended benefits. In some cases, performance may even deteriorate. The 20 Keys allows the company to evaluate its progress in each of the Keys which support such an initiative in the most appropriate (evolutionary) way. When a multi-factor or coherent package of change is implemented, the fundamental constitution of the company is strengthened and company goals are achieved under most conditions.

4. The 20 Keys benchmarking process

The level of understanding required for each Key varies to some extent, therefore, to illustrate the benchmarking process, the most readily understandable Key has been chosen, namely Key 1 - Cleaning and Organising.

Key 1 contains the elements of the well-known Japanese 5S approach, as well as simple ergonomic tools such as the Australian Modular Arrangement of

Predetermined Time Standards (MODAPTS) to illustrate what is meant by "making work easier". Key 1 deviates from common "housekeeping" approaches which are normally top-down driven - instead, employees are motivated to performing Cleaning and Organising tasks, due to a common awareness and understanding created that work is made easier through its implementation. The 20 Keys starts and ends with Key 1 since it is one of the foundations for success in all other 19 Keys. Furthermore, it is the easiest Key to understand and relate to, and is therefore useful in introducing the 5-point scale used in all the other Keys.

The benchmarking feature of the 20 Keys is an important part of the improvement process and in this regard Kobayashi states :

"When all employees are aware of a company's position in relation to world best practices, a true feeling of competition is developed on every level, and everyone becomes aligned in their efforts to improve."

However, it is the philosophical systemic approach to improvement which is the most important feature of the 20 Keys and this paper only focuses on one element of the process, namely the benchmarking approach.

The approach is one of self-benchmarking where a facilitator plays a crucial role in describing the characteristics of each level and obtaining consensus with regard to an overall score.

To obtain an initial score, all levels in a company should participate in one of two ways:

1. Separate benchmarking sessions are held with different levels within the organisation (e.g. Top Management, middle management, front-line management (supervisors), front-line employees) The scores are then aggregated by group to obtain an overall organisation score.
2. A single benchmarking session is held with representatives from each section and each level of the organisation. (This is usually effective, but in some companies distortions appear due to subordinates fearing that their honesty in the presence of superiors may not be appreciated.)

Companies who have travelled some distance along the road of implementing the 20 Keys, and who have undergone the necessary training, will use the check-sheets provided for each Key when benchmarking their company on a regular basis. However, another strength of the 20 Keys approach is that each of the five levels (for each Key) is represented by a picture or vision of a status the organisation could find itself in. This visual illustration combined with the facilitator's guidance in pointing out characteristics for each level, makes it easy for individuals to make a judgement call for their environment. To facilitate the scoring process, individuals may only choose between 5 levels and in-between scores (0.5). (Note that the final aggregated score will contain fractions) Therefore, if it is believed that an environment or workplace is somewhat better than the worst level (one), but not quite the standard of a level 2, then 1.5 points is judged.

The following example³ shows a level 1 and a level 2 company for Key 1 - Cleaning and Organising. The facilitator would typically point out the following characteristics of a level one manufacturing company (as can also be done with service or indirect environments):

Level 1 Characteristics
1. The workplace environment is dirty and "litter" has neither been defined in its various forms, nor has it been quantified.
2. Employees have as yet not developed a common understanding of <i>what makes work easy</i> and <i>what makes work difficult</i> .
3. The storage of items (tools, jigs, manuals, equipment, etc.) <u>directly</u> on the floor is common in the workplace.
4. Notices are either outdated, worn, cluttered or dirty; making it unlikely to notice newer notices or signs.
5. Cleaning equipment is not readily available or easily accessible.
6. Waste bins, ashtrays or other disposal bins (for specific waste such as paper or glass) tend to overflow or there is a lack of discipline in storage whereby foreign objects (not meant for these bins) are often placed in these.
7. Items (tools, jigs, manuals, equipment, etc.) have not yet been identified for removal, disposal, nearby storage, etc. depending on their usage (never, seldom, intermittent, often).

Actions required to progress to level 2

Actions which are required to move to a level 2 are also described in order to help with the benchmarking process. These are normally summarised as "addressing floor surfaces" and typically include the following actions :

- All floors must be cleared of unnecessary items.

³ Courtesy Organisation Development International (Johannesburg, South Africa)

- Nothing should be placed directly on the floor.
- The workplace is examined to eliminate all waste and non-essential tools and material. As much as possible should be disposed - items with no clearly foreseeable use should be removed from the workplace.
- Recognise employees who are putting an extra effort in the Cleaning & Organising process.

Level 2 Characteristics

1. There are no unneeded items lying around - There are no cigarette butts, pieces of scrap paper, tools, files, machines and parts that are not used for months or years.
2. Cleaning equipment is stored neatly / brooms are hung properly - Cleaning tools are stored near the shop floor. Brooms are hung properly so that the edges don't touch the floor and they are easily retrieved.
3. No garbage, dirt, or oil on the floor. No trash in floor wells - The floor is clean from iron scraps, water and oil, so that the operators do not have to step in the dirty areas. There is no danger of slipping.
4. No outdated, torn, or soiled announcements are displayed on notice boards - Papers are straight and neat. There are no corners or tape marks left from old notices.
5. Nothing obstructing access to fire extinguishers and water hoses. Nothing is in front of emergency exits or corridors. Fire extinguishers can be seen from 20 m away. No foreign objects in electrical switchboards, ashtrays or garbage cans. Location and use of switches and circuit breakers are clearly posted. Zebra marks are painted on safety risk areas.
6. Work-in-process and tools are not placed directly on the floor. Operators do not have to bend over to load up materials on carts to go to the next operation. Large materials are placed on pallets.

Level 3 Characteristics focus on the ownership accepted by employees, constructive competitions between groups and links to other Keys also become more evident (for example, an environment with high work-in-process will hamper Cleaning & Organising efforts). Level 4 Characteristics focus more on detail such as the state of work-benches and cupboards (for example, identification and labelling within these). Also, issues relating to frequency of auditing (checking) are highlighted, since a move towards a level 5 will imply total employee commitment and self-discipline in adhering to Cleaning & Organising standards. A level 5 environment will also focus on ensuring that everything is made "visual".

Limitations and Benefits of the benchmarking process

As the 20 Keys is adopted around the world, many practitioners, researchers and academics will provide further input and/or criticisms in order to gain a better

understanding of this important management tool. At this stage, the following problems appear to be of most concern:

- **The role of the facilitator**

When benchmarking an organisation for the first time, the facilitator's role is critical in explaining and describing the characteristics of each level for every key and in facilitating the process at arriving at a consensus score. Companies who merely use the 20 Keys as a benchmarking tool will be dependent on the ability of the facilitator. In contrast however, companies who implement the full 20 Keys programme are less reliant on a competent facilitator since their knowledge and understanding of the benchmarking system is implicitly achieved in the systematic (continuous improvement) implementation process.

- **Some relative measures**

Some of the criteria described in certain keys are not consistent with the "characteristics" theme for each level. For example, a criterion for a Level 3 company in Key 11- Quality Assurance System, is that "*the defect rate has been reduced by at least half*". Naturally, this criterion appears to be relative to your starting base and can result in unnecessary debate where companies have not implemented the philosophy and understood its significance. Perhaps, some additional clarity is required for these criteria.

- **Ensuring objectivity of participants**

There are occasions where even the best of facilitators is unable to obtain an acceptable self-evaluation for a given group. Although this is rare, one such case is known to the author (see comments described in part 5 below). This problem can easily be identified by the systemic nature of the 20 Keys illustrated in the bean sprout analogy. (Note that the facilitator should also insist on "evidence" for characteristics suggested by the participants).

Correlation between each Key as an indicator of an objective benchmark

The bean sprout analogy described above, suggests a high correlation between all of the Keys. Therefore, if a low score is achieved in a particular Key, it is unlikely

that much higher scores will be achieved in other Keys. For example, if a score of 1.5 is recorded for Key 1 - Cleaning and Organising, it will be unlikely that the company has a rating of say 3.0 for Key 9 - Maintaining Machines & Equipment. A level 1.5 company in Key 1, has not achieved an environment where employees have taken responsibility for their workplace and machines by painting and cleaning their equipment. This also influences many of the criteria which assist with the maintenance process in Key 9 dealing with ownership and responsibility of equipment. [Note that poor cleaning is considered one of the three evils of equipment abuse and that the cleaning process often acts as an inherent audit of equipment status]. Conversely, if high scores are recorded for certain Keys, this will imply high scores in other Keys. The following example illustrates this point. If Key 5 - Quick Changeover Technology has a score of say 3.0, then this will imply that Key 1 - Cleaning and Organising is also close to 3.0, since performing quick changeovers relies on :

- the proper and organised storage of change parts (or kits),
- the organising of tools,
- the understanding of ergonomic issues,
- and other preparation activities necessary for effective changeovers.

As a rule-of-thumb, the standard deviation for the 20 Keys score can be used in determining whether the benchmarking process has achieved an acceptable score for the "bean sprout effect"⁴. Note however that consistent high scores for each of the Keys may well indicate a consistent evaluation in terms of the "bean sprout effect", but these may nevertheless be overstated.

Rule-of-thumb			
Tool	Good	Acceptable	Poor
Standard Deviation	< 0.30	0.30 to 0.50	> 0.50

In order to assist with the benchmarking process, a correlation test could be devised, but it should be noted that Prof. Kobayashi does not focus on the statistical validity of the process, since his focus is on self-benchmarking for the sake of continuous improvement. The benchmarking system helps companies to decide *where they are, where they would like to be and the detailed steps of how to get there.*

⁴ As a company achieves higher scores for each of the 20 Keys, the criteria required focus more heavily on achieving the "bean sprout effect" and thus the correlation between each of the Keys is more evident.

Some Benefits

The following benefits of the benchmarking system were deemed worthy of note :

- Although the 20 Keys embraces world-class philosophies and criteria within a pre-defined framework, previous improvement initiatives undertaken by a company can be evaluated in terms of their effectiveness in having strengthened the company's constitution. For example, if a company has implemented a performance management system which cascades the strategic goals of the Managing Director through to all levels with associated performance measures, the effectiveness of this initiative would be evaluated in terms of its contribution to the advancement of Key 2 - Rationalising the System / Goal Alignment.
- The benchmarking system is not industry-specific; it also takes into account particular industry advances and areas where an industry is behind other industries. This latter point is useful in generating improvement ideas. Furthermore, the breadth of the 20 Keys allows for the system to recognise areas where progress has been made.
- The benchmarking system is easily understandable. Although some of the Quality Assurance and Industrial Engineering concepts may only be readily understandable at management level, the detailed improvement steps allows the shop-floor to progress towards an understanding in an evolutionary way.

5. A look at organisational capability in selected South African companies⁵

Just over half of the companies who were benchmarked are currently implementing the 20 Keys programme and many are either about to initiate the programme or are considering its implementation. Only a handful of companies exposed to the approach through benchmarking have opted to pursue their own initiatives. The overall findings are summarised below with the number of plants/factories/sites indicated. In contrast to these findings, a number of Japanese companies have achieved a score of 65 (for which a bronze prize is awarded), whilst a handful have achieved a score of 75 (for which a silver prize is awarded). Only one Japanese company is close to achieving a gold award, requiring a score of over 85.⁶

⁵ The results from various benchmarking sessions are considered confidential and therefore only industry categories are used in the findings below

⁶ Prof. Kobayashi personally conducts the benchmarking session for these awards.

Industry	Score	Standard Deviation
Beer and Beverage (1)	36.80	0.52
Chemical / Fuel / Paper (2)	34.10	0.63
Steel Construction (3)	32.10	0.39
Leather /Tanneries / Shoes (4)	31.55	0.36
Mining (8)	34.21	0.49
Retail (2)	37.95	0.42
Packaging Suppliers (37)	32.10	0.45
Service / Insurance / Indirect (admin) (2)	38.60	0.18
Steel/ Foundries (8)	32.91	0.36
Transport/Shipping (1)	34.80	0.35
Wine Industry (1)	30.20	0.33
General Manufacturing (4)	34.44	0.36
Average	34.15	0.40

The most significant 20 Keys benchmarking exercise undertaken is one by the Supplier Development Team of The South Africa Breweries - Beer Division⁷ (SAB) who were introduced to the 20 Keys by the author in 1994/1995. SAB decided to use the 20 Keys as a replacement to their previous Quality Audit performed at all their packaging suppliers. The 20 Keys benchmarking system was perceived as more objective and would change a supplier's paradigm on World Class Manufacturing standards. That is, the previous Quality Audit had reached a stage where suppliers were scoring in excess of 80 % and further improvements were perceived by suppliers to be limited. A new paradigm was needed and the low scores obtained highlighted the stringent nature of the 20 Keys system. SAB was also keen to use the system as one of its criteria for determining supplier awards. Since then, SAB has conducted two rounds of benchmarking evaluations for all its primary packaging suppliers. The two evaluations were conducted one to two years apart, with the latter round being completed in March 1997. Not all suppliers benchmarked during round 1 were benchmarked during round 2 - these were companies who ceased to be suppliers for various reasons. The diagrams below summarise the results as follows:

- Figure 1 summarises the benchmarking of 37 plants in round 1 as compared to the summary of a subset of 22 of these plants benchmarked in round 2.
- Figure 2 is perhaps a more meaningful summary as this only shows the 22 plants benchmarked during *both* rounds.
- Figure 3 shows the results of the plant with the highest score during both rounds.

⁷ The benchmarking sessions were principally facilitated and co-ordinated by Mr Chris B. Swart of SAB

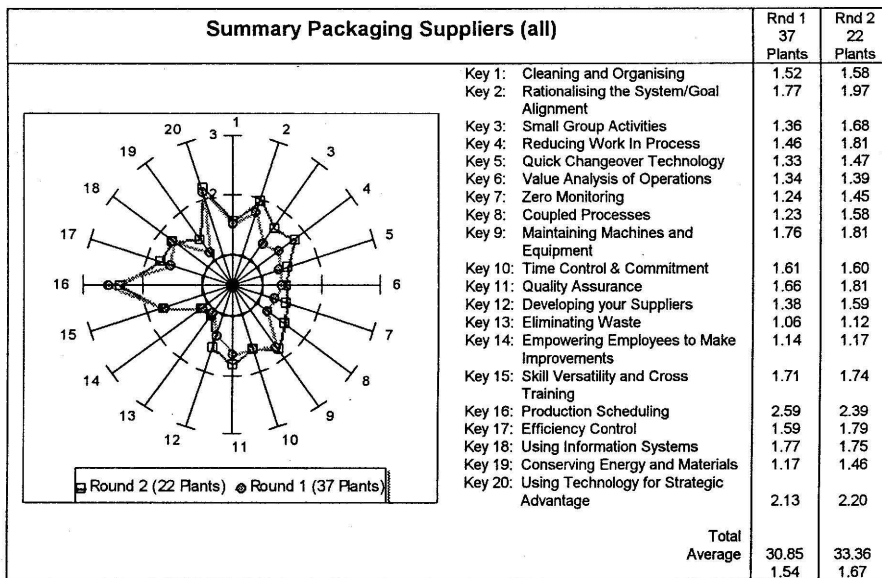


Figure 1

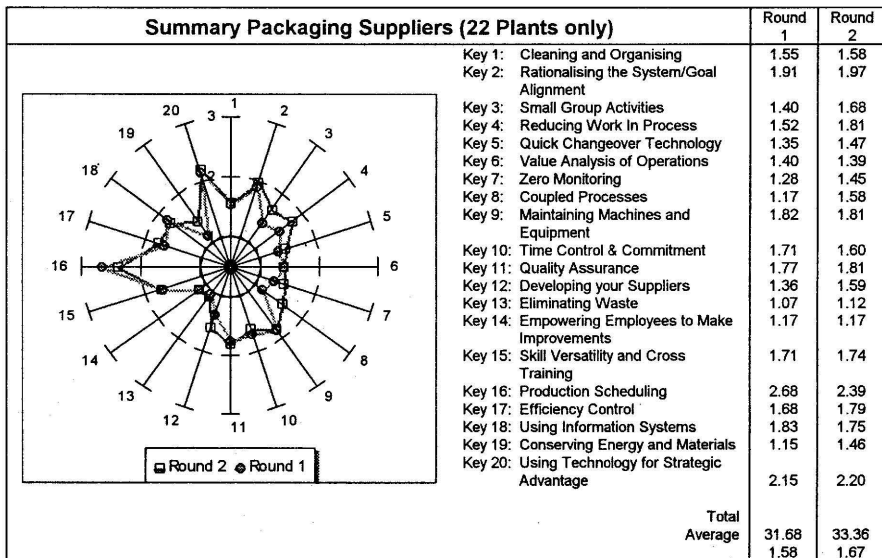


Figure 2

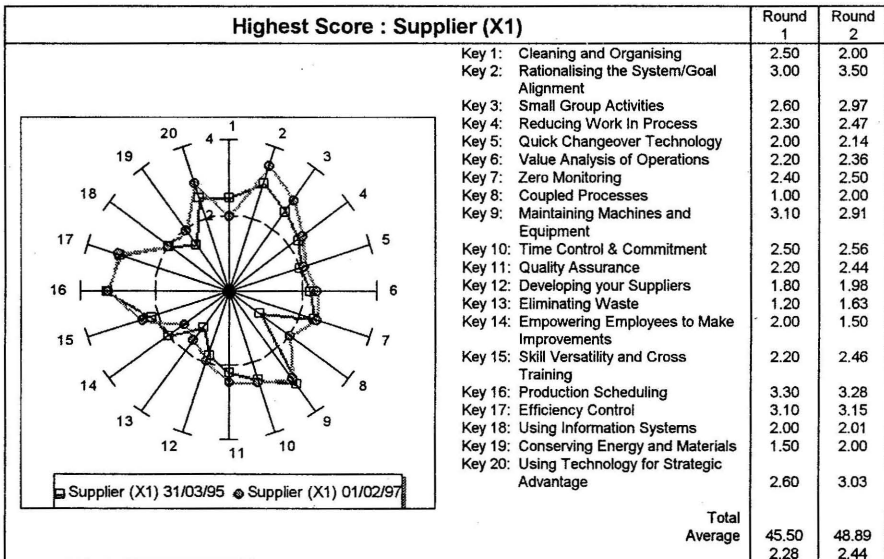


Figure 3

The following comments [Swart] apply to the table above:

- Many supplier plants benchmarked themselves lower during the 2nd round, due to improved learning and understanding of the 20 Keys - there had been a realisation that the benchmarking scores had been somewhat optimistic during their first exposure to the system. The bean sprout effect seems also to be more pronounced during the second benchmarking session, where the standard deviation for the 20 Keys score has reduced in most cases.
- One or two companies attempted to overstate their scores - these disappointing individuals not only did their companies a disservice by being dishonest, but also did some damage to an important supplier partnering relationship which relies on their trust and honesty. Experienced facilitators can easily determine overstated scores by asking for evidence to substantiate these. (see also the comments relating to the correlation error).

- A few companies had worked hard at improving their organisational strength and the results were evident. One division of a company is shown in Figure 4 below followed by a summary of benefits obtained.

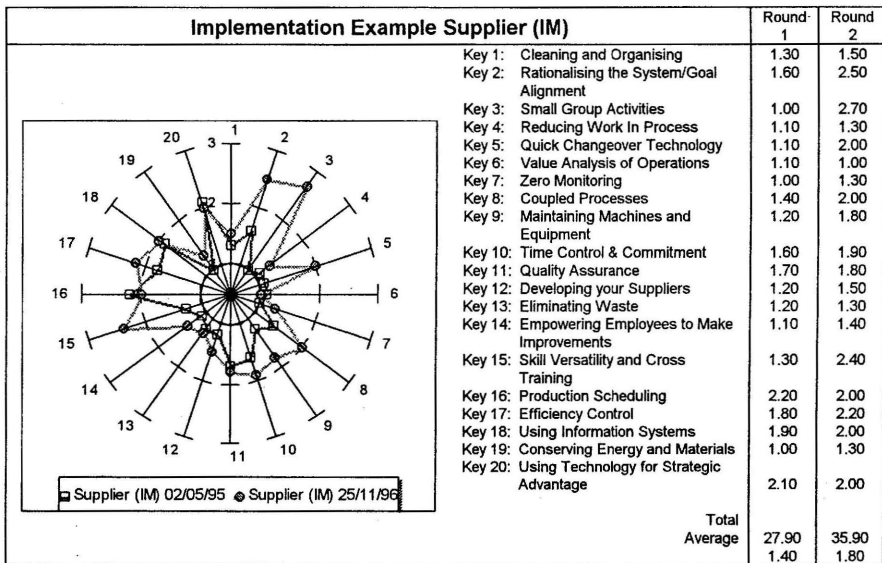


Figure 4

Example : Supplier IM (Div 3)

• Initial Score (May 1995)	27.90
• Last Score (Nov 1996)	35.90

Benefits Obtained

- Housekeeping improved by 18 % as rated on a risk management score by the company's insurer.
- Management of shop-floor teams by supervisors improved.
- Suggestions for improvement from employees increased.
- Throughput increased by 75 %.
- Customer complaints reduced.
- Customer claims reduced by 60 %.
- Budgeted financial targets met for the first time.
- Three external company awards received for excellence.

Conclusions

The 20 Keys is an important benchmarking and improvement approach. This systemic, integrated and synergistic philosophical approach should not mislead audiences to believing that it is merely a framework which integrates known world-class practices or that it merely states the obvious of "good management practices". Furthermore, the two books written by Iwao Kobayashi provide some information about the benchmarking criteria and the approach required, however, the philosophy requires knowledge of its true potential. The power of the 20 Keys lies in its adoption as a fundamental way of managing the workplace and is only truly understood through dedicated and committed application.

With regard to the benchmarking element of the approach, it provides employees with a tool to visualise improvement steps in a simple, logical and concrete manner. For management, it can provide a measure of the overall strength of the organisation's constitution or capability. Although there are certain limitations to the benchmarking approach with respect to rigour, the 20 Keys nevertheless has proved to be an important tool as an indicator of organisational strength.

The benchmarking results from selected South African companies show that there is a considerable road ahead for these companies wishing to achieve World Class status. However, the few companies who have experimented with the approach have shown significant benefits in the limited time the approach was adopted.

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