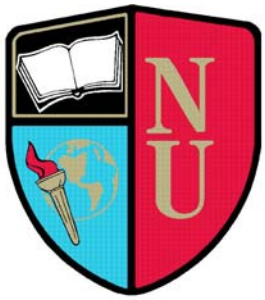

NEWPORT UNIVERSITY

MASTER OF BUSINESS ADMINISTRATION

Measuring Training

A Search of Methods for Measuring Training Efficiency and Effectiveness

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At the time I started my MBA I was involved, or better committed, in the TQM project of the Belgian Air Force. As the first one to walk path of a MBA-TQM and as, people expected, a specialist on the matter, I decided to go to the bottom of every topic. Of course this took a lot of time. Once used to go to the bottom of things, the habit dies hard. So I not only spent a lot studying and writing about qualitymanagement, but on all the performance requirements. Meanwhile I picked up this thesis, a few assigments for teaching, started and ended a one year course in the Military, and got my instructor title in diving. And do not forget, I'm married with 3 children …

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1. Introduction

"An education is what you have left when you can no longer recall most of the facts."
Jim McAbee

1.1. Problem Setting

Training is an important issue, but hard to study. Most training is informal in character and hard to measure. Its effects on productivity are also difficult to quantify. Studies and their outcomes on training are (were) unreliable because the large number of unobservables means that any given phenomena had many alternative explanations (Garen, 1987).

While cumulative reviews of the training literature by Burke and Day (Burke et al., 1986) and others provide suggestive evidence about which training methods are more effective, the generalizations that can confidently be drawn from this literature are few. Any one issue is addressed by only a few studies, sample sizes are small (most studies compare treatment groups that contain fewer than 40 people), criterions are often of doubtful relevance to establishment profitability and designs are often flawed (random assignment is often absent). The great variability across studies in the estimates of the magnitude of training effects is further evidence of our ignorance. When one considers that in the US probably more than $20 billion dollars is spent annually on the formal training of managers and supervisors, it is quite remarkable that Burke and Day were able to find only 70 studies (with a cumulative sample size of only 7178 individuals) that met their acceptance criteria. Clearly, a great deal more systematic field research is required (Bishop, 1991).

It is most certain that all companies and government institutions, the Armed Forces are no exception, train their people for a number of reasons. While the investment in training may be known, the outcome of the effort is a lesser certitude. One of the elements that creates this haze is the lack of valuable and standardized measurement methods.

Only recently industries, institutions and governments, inspired by the TQM movement, are researching this problem in an effort to guide their training policies.

Although no miracle solutions to the complex problem of measuring training exist, this thesis is an attempt to catalogue the possible methods and tries to give an answer to the question "How to measure training effectiveness, efficiency and quality?"

1.2. Objectives

The objectives of the present thesis are:

- Fuel the discussions about measuring training;
- Inventorize most of the measurement methods;
- Apply the philosophy and principles of TQM to the subject of measuring training;
- Propose a possible best solution to the variety of applied measurements.

1.3. Study Object

The research object of the present thesis is the measurement of training in its broadest sense. This way this thesis goes further than the thesis "Quality Assessment in Education and its Applicability for Belgian Navy Instruction" by Ph. C. Menu (Menu, 1999). The methods are catalogued according the following points of view:

- The participant as the product;
- The training as the product;
- The training as a process;
- The training as a system.

In the final chapter a completely different approach to training is investigated. This approach is compared with the 'traditional' philosophies and used to define new methods for measuring training.

As a term of reference, basics about training and measuring will be reviewed in the first chapters of this study.

1.4. Background of the Problem

The stimulus for this research finds its origine in a climate of downsizing, significant restructuring, demanding operational deployments and the like, with which nearly all Armed Forces of the Western World are confronted. This implies that most military organizations are forced to implement significant changes, which effect training. The speed of changes and the focus on cost reductions challenges the old way of training and urges for the use of effective and efficient training methods. To detect those superior methods a good measurement system is a conditio sin qua non.

In the light of the TQM movement, the Belgian Air Force started an education effort. As a member of the Quality Support Team, I was in charge of the follow up of this training effort. Simple questions like "what is the beneficial effect on the outcome if we prolong the training sessions with 1 day" were very hard to answer. Following the principle of "measuring", I encountered the different methods of measuring training. Like the Knights of the Round Table, I didn't find the solution. After years of study I came to the conclusion that it is already available in the just application of the already existing measurements. This thesis may be viewed as the path I walked in search of the Holy Grail of measuring training.

1.5. Expectations for the Measurements

The following assumptions and limitations direct this thesis:

Necessity

The use of a training measurement system is a necessary condition to answer the questions relative to the effectiveness, efficiency and quality of training in the industry, government and Armed Forces. The measurement must support the decision making process for the individual participants, organizations and training institutions.

Parallelism

The use of a training measurement system has to coincide with and be a part of a global strategy aimed at improving the organization's management practices and work methods.

Pragmatic Usability

The methods must be useable by the industry and are not specially designed for large-scale scientific surveys.

Continuous Evolution

The methods must support a continuous management of the training aspect of an organization. It must be possible to integrate them in the feedback loop of good management.

1.6. Methodology

Although this thesis treats the problem of measuring, there are almost no experimental-empirical data available because some variables characterizing this subject are difficult to quantify. At first the aim was to find an universal measurement applicable to all kinds of training, but after a while this changed into a qualitative or descriptive approach. The purpose is to inventory and to assess the methods against criteria, because developing a good training measurement boils down to knowing exactly the purpose of it.

As such, the present study's objective is not to test the measurements against the expactations that were stated earlier, but to start from those expectations and to study the available measurements against a few criteria. This descriptive analysis, however, does not attempt to be an exclusively literature study, there is enough room for creativity and new ideas.

1.7. Sources

To support this thesis a wide variety of sources was used:

- Books and working papers on the object;
- World wide web sites with information of the object or of firm promoting their training courses by offering a measurement system as a option;
- Discussions and e-mail exchanges with Training Officers of industry;
- Personal experiences with training, as a trainer and as a participant, and with measurement systems.

1.8. Definitions

It is an absolute necessity to clearly define the key terms and concepts that are used in this study. Failure to do so, would only lead to confusion and misunderstandings. The lack of some elementary scrutiny, observed with some authors, will not simplify this mission.

The definitions of the terms used in the present thesis are provided in the glossary. Also provided, is a list with abbreviations used in training.

Remarks

Throughout this thesis, all individuals are being referred to in the masculine form (he, him, etc.) in stead of using "he/her", this to ease reading. However, it is obvious that no discrimination is intended, and that the reader is urged to consider each "he", "him", etc. as replaceable by 'she", "her", etc.

In the same spirit of readability the words “company”, “industry”, “firm”, etc. may be replaced by “military”, “organization”, etc.

2. Training

"The teachers are everywhere; what is needed is a learner."
Wandell Berry

Faced with a choice between changing one's mind and proving that there is no need to do so, almost everybody will get busy on the proof."
John Kenneth Galbraith

"Total Quality Control starts and ends with education"
Dr. Ishikawa

2.1. Introduction

Training is clearly big business. Exhibit 2.1 shows that U.S. organizations with more than 100 employees spent a total of $45 billion in 1992, an increase of 12 percent over 1988 levels. Notice that 71 percent went to paying training staff salaries, with the rest for materials, outside services, conferences, and facility overhead. In France, training expenses averaged 3 percent of the total wage bill in 1990, with firms employing more than 2,000 people spending 5 percent. Japan is estimated to spend 6 percent of payroll on training. Yet, this is only the tip of the iceberg. Motorola estimates that staff time off the job is equal to formal training expenditures, so that would bring the total U.S. cost to $90 billion. Many workers get their training through informal on-the-job activities, or through partnerships with outside universities or local schools; this also involves resource costs (Milkovich et al., 1994).

Following the advice from the Red Queen in Lewis Carrolls 'Alice in Wonderland' we will 'start at the beginning and finish with the end.' So, before digging into measuring training this chapter explains the whys and the whats of training.

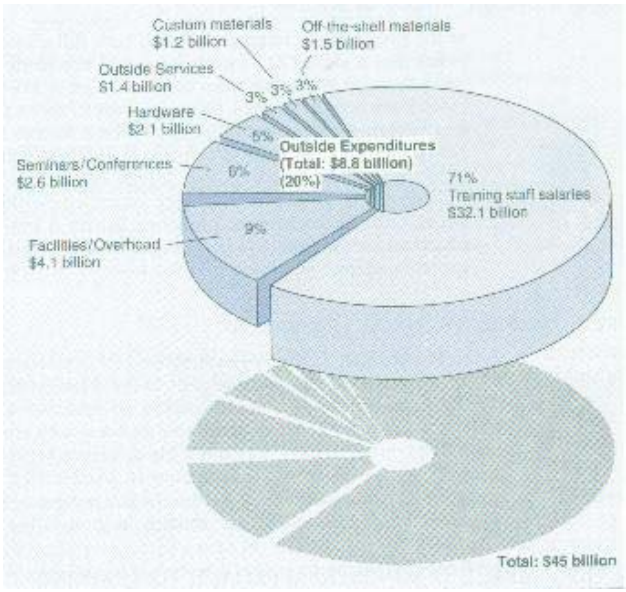


Exhibit 2.1: Expenses for Training in the USA (1992) (Milkovich et al., 1994).

2.2. What is Training?

Training is a systematic process to foster the acquisition of skills, rules, concepts, or attitudes that result in an improved match between employee characteristics and employment requirements (Milkovich et al., 1994).

Although good training may differs in type, see Exhibit 2.2, it always starts with a goal and the purpose of training is for the participants to learn something. Learning is a good name for this concept and can be split up into three sub-areas of learning: knowledge, skills, and attitudes. Knowledge, the cognitive element, is the realization that can be expressed or put into action. Skill, the locomotive element, is a behavioral ability. Attitude, the affective element, is to be prepared and willing to act in a certain way (Barkler et. al., 1996).

Some authors make a distinction between orientation, training and development as the processes that attempt to provide an employee with information, skills, and an understanding of the organization and its goals. Orientation involves starting the employee in the right direction (establish effective work relationship). Training is designed to improve skills needed today or very soon, and development refers to improving skills over the long term (maintain effective work relationship). In practice, these apparently clear distinctions become blurred, since the three types of activities are components of an (ideally) integrated system (Randall et al., 1996.). In this thesis these processes are treated as (a) training (system), even though it encompasses all three components.

The great bulk of skill development results from learning by doing and informal training. Formal and informal training together account for only about 30 percent of the growth of a worker's productivity during the first two years on a job (Bishop, 1991). Learning by doing accounts for the rest. For new hires, nine-tenths of the time they spend in training is spent watching others do the job or being shown it by coworkers and supervisors. Only one-tenth involves participation in formal training programs. Although this thesis is concentrated around formal training, the majority of the discussed topics may be applied on informal and other training.

2.3. What to Train?

Now that it is clear what training really is, one can be curious about the object of training. In a workplace there are five basic competencies needed (Labor, 1991.):

1. Resources:
   Identifies, organizes, plans, and allocates resources (time, money, material and facilities, human resources).
   - *Time* - selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules
   - *Money* - uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
   - *Material and facilities* - acquires, stores, allocates, and uses materials or space efficiently
   - *Human resources* - assesses skills and distributes work accordingly, evaluates performance and provides feedback

2. Interpersonal:
   These are the skills to interact with one's peers.
   - Works with others.
   - Participates as member of a team.
   - Contributes to group effort.
   - Teaches others new skills.
   - Serves clients/customers - works to satisfy customers' expectations.
   - Exercises leadership -communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
   - Negotiates - works toward agreements involving exchange of resources, resolves divergent interests.
   - Works with diversity - works well with men and women from diverse backgrounds.

3. Information:
   Information becomes a vital resource in a company. The handling of information is therefore a needed skill.
   - Acquires and uses information
   - Acquires and evaluates information
   - Organizes and maintains information

- Interprets and communicates information
- Uses computers to process information

4. Systems:
   The new economy demands a system approach to organizations.
   - Understands complex interrelationships
   - Understands systems - knows how social, organizational and technological systems work and operates effectively with them.
   - Monitors and corrects performance - distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions.
   - Improves or designs systems - suggests modifications to existing systems and develops new or alternative systems to improve performance.

5. Technology:
   The fast, successive waves demand a high awareness of these (r)evolutions.
   - Works with a variety of technologies.
   - Selects technology - chooses procedures, tools, or equipment including computers and related technologies.
   - Applies technology to task - understands overall intent and proper procedures for setup and operation of equipment.
   - Maintains and troubleshoots equipment - prevents, identifies, or solves problems with equipment, including computers and other technologies.

Exhibit 2.2 demonstrates that the training of these 5 competencies is a reality and that training by 'in-house' staff is the preferred way to do it. Although this may be the cheapest way to train its employees, without a good follow-up by valid measurements the benefits of this kind of training may disappear when the training gets off track.

Type of Training	Total	By In-House Staff	By Outside Consultants or Suppliers	By Both In-House Staff and Outside Consultants or Suppliers
New-employee orientation	85	75	1	9
Leadership	75	17	14	44
Performance appraisals	74	50	4	19
Interpersonal skills	70	18	10	41
Train-the-trainer	70	18	21	30
Team building	69	19	10	40
listening skills	69	24	11	33
Personal computer applications	68	21	8	38
Hiring and selection process	67	33	10	23
Time management	67	20	16	31
Problem solving	65	21	9	35
Decision making	64	20	11	33
New-equipment operation	63	31	4	29
Conducting meetings	63	26	9	28
Word processing	63	23	11	28
Delegation skills	63	19	14	30
Sexual harassment	62	28	9	25
Managing change	62	17	13	32
Safety	62	25	3	34
Product knowledge	61	42	3	17
Quality improvement	60	17	6	37
Public speaking and presentation	59	16	15	29
Stress management	59	16	14	29
Goal setting	59	22	7	29
Data processing and MIS	58	14	18	26
Computer programming	57	10	24	22
Diversity	56	18	12	26
Motivation	55	16	8	32
Writing skills	54	14	13	26
Negotiating skills	53	13	15	24
Planning	50	17	6	28
Strategic planning	48	15	9	24
Marketing	45	9	13	23
Creativity	44	14	10	20
Finance	44	10	15	19
Substance abuse	43	11	14	19
Smoking cessation	41	12	17	12
Ethics	39	16	10	13
Outplacement and retirement planning	38	16	11	11
Purchasing	35	14	9	13
Reading skills	31	8	14	10
Reengineering	28	6	7	15
Foreign language	23	3	13	7
Other (topics not listed)	3	0.7	0.8	1

Percentage of Organizations with One Hundred or More Employees That Provide This Training

Note: The figures in this table are based on 1, 119 responses. SOURCE: Adapted from " 1994 Industry Report," Training (October 1994): 49. Used by permission.

Exhibit 2.2: Specific Types of Training (Randall et al., 1996).

2.4. Why Train?

Before going into the possible reasons why a company starts training its employees, it is interesting to know the invalid reasons to train. The knowledge of the wrong reasons is important, because measuring a training that was initiated for the wrong reasons will only reinforce this non-quality.

2.4.1. The Wrong Reasons to Train

The most common reasons that are bad motivators for the implementation for a training system are:

"We always have"

Someone (who isn't very well informed) says, "We always train people. It is just part of the job. We always have.... I guess we always will." Unfortunately this is true in many cases, but it isn't a very good reason for training. People don't always train the right things; people don't always train at the right time; people don't always train the right people. But it does look as if they are always training somebody to do something.

Let's look at what happens if training is just because "we always have." This probably means people are still teaching the same subject, in the same way. But very few jobs remain the same year in and year out. The job changes because equipment and methods change. The people change for better or worse for many reasons. Hiring policies change, so the company may be getting people who are more or less skilled than before, more or less capable than before, more or less intelligent than before. If training hasn't changed, it probably isn't meeting the needs as well, even though at one time the training was doing a nearly perfect job. Since the job changes and the people change, just training because "we always have" isn't good enough.

"The employees expect it"

Why? Why do they expect to be trained regardless of the circumstances? They probably don't all expect this, but there must be a reason why some of them expect this kind of thing. They may think, like some supervisors, "we have always had training, so I guess we will always have it." There is the possibility that they look forward to training because it is time off their regular jobs. No production is required. Someone else "catches" the line or fills in, so they are justifiably excused from doing their work. Neither of these is a very good reason for expecting training, and the results obtained from such training aren't likely to be very satisfactory. After all, people who are "going along for the ride" can't be expected to settle down and learn new things for their job.

Other reasons

There are other reasons given for training that aren't any more valid than the ones mentioned so far. "We train because the money is in the budget," or "... because time is allowed in the work schedule," and ", have to report a certain amount of training on the monthly report." Of course, these reasons aren't always mentioned in so many words, but actions speak much louder than words. This kind of attitude can be recognized by such things as scheduling

training for the last "few" minutes of the day, or at other times when the employees aren't in the proper frame of mind. (For instance, right before lunch they worry more about whether they will get off in time for lunch than they do about learning whatever we are trying to teach.)

Timing and attitude have much to do with the end result of the training effort and should be taken into account every time training is done. Sometimes there is even the situation where a certain amount of training has to be reported, and the person filling out the report feels inclined to exaggerate the actual time since not enough was done. Whether or not the person has really exaggerated isn't the point here. What does matter is that there ought to be a good reason for training and certainly a strong commitment by everyone (especially the one doing the training) as to the place and value of training.

"*It is as unfair to employees to falsify training records as it is to train them under such conditions that little or no learning can take place, and then to hold them accountable for results based on their knowledge of what was supposed to have been learned* (Braodwell, 1995)."

2.4.2. The Right Reasons to Train

There are perhaps other reasons given for training that aren't good enough to justify the time, effort, and money, but let's look at some reasons why we should train. There are good reasons, and they should be taken into consideration each time training is done.

2.4.2.1. Change in Job or Material

One of the obvious reasons for training is that the employees can't do something that the job requires should be done. There is some skill they have yet to perfect or acquire, or some knowledge they are lacking that keeps them from doing a completely satisfactory job. If they are to be evaluated on using this skill or having this knowledge, and if they are thought to be capable of learning what is required, then this is reason enough for training. Such a condition does more than merely justify the training. It makes training a necessity.

For example, if an employee has been working on a certain type of machine and is then moved to another machine that is similar, except that certain parts of the operation are slightly different, then the company must assume the responsibility for seeing that the employee is trained to use this new machine properly. The fact that the employee could operate the last machine satisfactorily gives reason to believe that he has the ability to handle this one if given the chance to learn about its operation. For this reason the company should schedule the training, be sure that the conditions are right for most learning to take place, and then do the necessary instructing.

The same things could be said, of course, if the employee stayed in the same place and the machine was changed. A newer or slightly different model is installed and the employee is expected to continue to produce satisfactorily. Again, one must assume that the employee can do the job with the different machine, but only if proper training is provided. The tendency of some "old-timers" who feel that the best way to learn is to "throw them in over their heads-they'll learn to swim quickly enough!" is not the right state of mind. This may have been the way they learned, but it is by far the costliest and

often the most inefficient training method in the long run. The scrap pile is full of waste from people "learning to swim" on the job without proper guidance.

2.4.2.2. Bad Performance and Quality

An equally good reason for training is that an employee is doing something wrong. Regardless of a worker's length of service, previous experience, or prior training, training should be considered if the job is being done incorrectly. The lack of training may not be the real problem. There may be an attitude problem or poor morale or personality conflicts or many other things. The reason for the incorrect job should be determined before a training program is started, but once it is decided that the employee really can't do the job right because he doesn't know how, then there should be training. Such training is not only justified but is a necessity.

When a certain employee is not doing the work satisfactorily, the company should look at the employee's training record to see if he was ever trained on this particular operation before. An investigation should also reveal if the job has changed since the employee was trained. If the job has changed, the reasons for the errors are obvious. But suppose the job is the same and the employee has been trained to do the job as it now is supposed to be done. How can errors creep in? There are several points to consider in answering this question.

Maybe the errors haven't just "crept" in. Maybe they have been there for a long time. Maybe they were there under another supervisor who couldn't or wouldn't recognize them. Maybe the employee couldn't do the job right even after the training because the training wasn't good enough, hence not effective, … [1]

All of this points out the need for good measurement techniques for our training programs, and frequent evaluations of the job performances of people. It isn't enough just to know that an employee is doing the job wrong; the company needs to know how long the employee has been doing it wrong, what steps have been taken to correct the errors, and what measurement was taken of the effectiveness of the training given to the employee. Then start the training, but not until then (Braodwell, 1995).

2.4.2.3. Retraining

Another very good reason for training is that a job is being phased out, but it is desirable to keep the employee. In this case, retraining is necessary. Ideally, some job could be found that would use skills similar to those required for the job. Then the training task will be much simpler.

It isn't enough to say, "We'll put Charlie on the form press. He's a sharp fellow and should be able to pick that up pretty quickly." Then after putting him there, we say to Charlie, "If you have any problems, let us know." The company has created the problem

[1] Companies tend to state in training records that an employee has had training in such and such a course, but fail to state the caliber of teaching that was done. In other words, all the accountability is placed on the employee, and none on the person doing the instructing. N top of that we may not forget a third major party namely : management.

by moving Charlie; it should take the necessary steps to solve it without waiting for Charlie to make mistakes and even get a reputation as an unsatisfactory employee. Put simply, this is another perfectly good reason for training (Braodwell, 1995).

2.4.2.4. The Gain in Productivity

Analyzing the productivity effects of training is substantial. Rates of return on the investment appear to be high both for the firm and the worker. The hours devoted to informal training have just as large an effect on productivity growth as hours devoted to formal training. Time devoted to training has a positive effect on wage growth, but these effects are substantially smaller than the productivity effects of training, suggesting that the labor market views many of the skills developed as effectively specific to the firm. Hours devoted to formal training have larger effects on wage growth than hours devoted to informal training, suggesting that formal training is more visible to other employers and/or generates skills that are more useful at other firms (Bishop, 1994).

After reviewing studies of the effect of OJT on organizational productivity, Kochan and Osterman (1991) concluded that:

"These studies provide consistent and convincing evidence that (1) education and training are associated with significant productivity increases when their impact is examined in a production function context; and (2) training and associated flexible human resource systems are associated with higher levels of productivity and quality in matched comparisons (pp. 16-17)."

Government statistical agencies have only recently begun asking questions about it and there is, at present, no standardization of data collection procedures across countries. But according the Belgian government, the Belgian labor market is characterized by the outstanding quality of the workforce. It is a common knowledge that productivity in Belgium is one of the highest in the world (Exhibit 2.3).

This high productivity can partly be explained by the high education and training standards in Belgium. Schooling is compulsory in Belgium between the ages of 6 and 18. However, it is possible from the age of 15 to combine attendance at school with part-time work. Furthermore, people who are already working have the option of additional training.

Industrial apprenticeship contracts enable young people between the ages of 16 and 18 to learn an occupation practiced by salaried workers with the exception of domestic workers. This is done by alternating work and studies: practical training in an occupation organized within the enterprise at the same time as theoretical training in a school or training center.

Vocational training covers all measures and schemes aimed at providing the vocational skills necessary to obtain employment. It is organized by the regional employment offices (Economic Affairs, 1998).

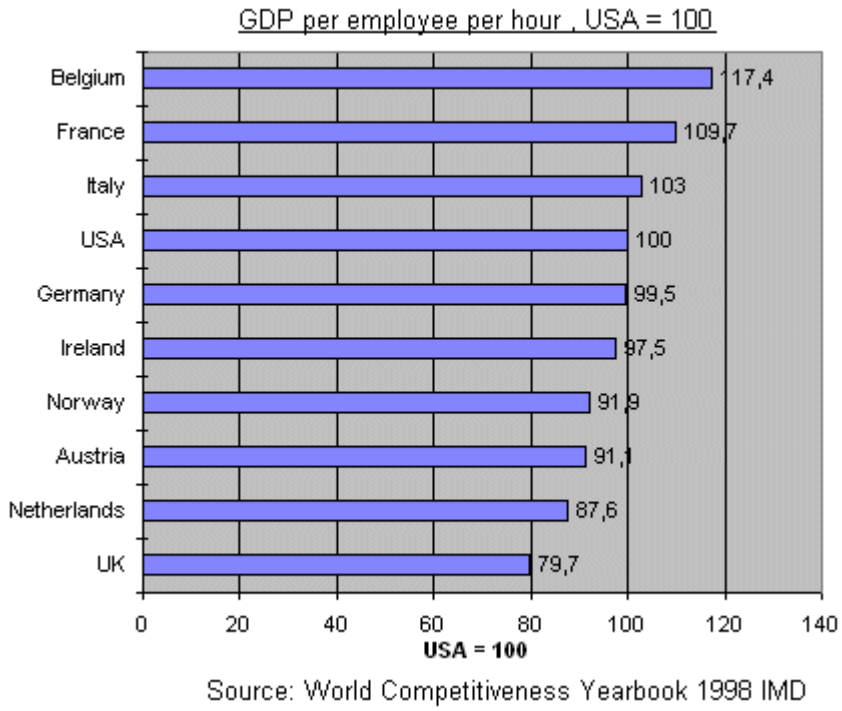


Exhibit 2.3: Labor Productivity (Economic Affairs, 1998).

2.4.2.5. The Evolution in Information Technology

The most recent evolution in business technology, which has a tremendous impact on how business is done, is the evolution in information technology. In the 1970s this kind of technology was known by the name Data Processing. This technology was designed to support the way things were done by providing a library with mostly financial data.

In the 1980s data processing changed to Information Systems and became the way to do business. The technology was no longer hidden in some kind of dark room but became an every day tool to work with. Employee and customer came in contact and used the technology in their day-to-day life.

One step further in the 1990s with Information Technology we change our way of doing business. The implementation of Information Technology has a high impact on business as we know it.

Nowadays we are moving towards Knowledge Technology. By adding a layer of intelligence to filter appropriate information and to deliver it when needed, Knowledge Information increases the value of the existing information. The change this kind of technology will cause is yet unknown.

Companies that want to survive the competition must invest in their human resources to apply this technology and to implement competence management. The investment is mostly training in the new technologies and in new ways to learn and train.

Modernization and training appear to be complementary, i.e. training is often critical to the implementation of new technology or a reorganization and, therefore, companies that are modernizing are more likely to be investing heavily in training. However, this does not imply that modernization is the only occasion where training is worthwhile. Taken altogether the economic literature on the effects of training suggests that, as long as the company is initiating and paying for training, one can be pretty confident that most of these investments are profitable both for the worker and the firm (John Bishop, 1994).

2.4.2.6. Service Management

The most efficient way to overcome the difficulty of supervising and correcting the providing of services and to reduce the person to person variation is to invest in initial training and continuous retraining. Service firms spend a much greater part of their budget on training than product firms do. These high financial efforts are not only caused by the increased need but also by the nature of the training. It is harder to work on the affective or emotional side of the person than it is on the cognitive or rational.

2.4.2.7. The Marketing Aspect of a Quality Certification

One of the reasons for a company to certify its organization is the marketing value of the certificate of conformity. The most known certification system is the ISO (see also Annexe D). Because competent people, this may be achieved by training, on the right place are a condition for quality, ISO demands a good approach of training. Personnel who are assigned responsibilities defined in the quality management system shall be competent on the basis of applicable education, training and experience. To assure this, an organization shall:

- Identify competency needs for personnel performing activities affecting quality;
- Provide training to satisfy these needs;
- Evaluate the effectiveness of the training provided;
- Ensure that its employees are aware of the relevance and the importance of their activities and how they contribute to the achievement of the quality objectives;
- Maintain appropriate records of education, experience, training and qualifications (ISO 9001:2000.).

So, even when a company is only interested in the marketing value of quality, it will be obliged to set up a good, basic training system if it wants a certificate of conformity.

2.4.2.8. The Introduction of TQM

Total Quality Management (TQM) is an enhancement to the traditional way of doing business (see also Annexe D and Annexe E). It is a proven philosophy to guarantee survival in a world-class competition. Only by changing the actions of management will the culture and actions of an entire organization be transformed. TQM is for most part common sense. Analyzing the three letters of the acronym, we have

Total – Made up of the whole
Quality – Degree of excellence a product or service provides.
Management – Act, art, or manner of handling, controlling, directing, etc.
Therefore, TQM is the art of managing the whole to achieve excellence.

TQM is defined as both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. It is the application of quantitative methods and human resources to improve all processes within an organization and exceed customer needs now and in the future. TQM integrates fundamental management techniques, existing improvement effort, and technical tools under a disciplined approach (Besterfield et al., 1995.).

Increasingly, organizations in Europe accept that Total Quality Management is a way of managing activities to gain efficiency, effectiveness and competitive advantage thereby ensuring longer term success - meeting the needs of their customers, employees, financial and other stakeholders and the community at large. The implementation of Total Quality Management programs can achieve significant benefits such as increased efficiency, reduced costs and greater satisfaction, all leading to better business results (EFQM, 2000).

Companies committed to TQM invest heavily in training, particularly as empowered employees require new knowledge and skills. Organizational performance is maximized when it is based on the management and sharing of knowledge within a culture of continuous learning, innovation and improvement. Besides the professional knowledge, employees must understand their role in the company, the basics of Quality Leadership, basic improvement tools, ... to improve their work. This kind of knowledge can not be learned by reading textbooks, it must be practiced. Like managers, employees must fully absorb the philosophy and act accordingly. This can only be achieved by extensive training and education.

A joint study conducted by Developmental Dimensions International and the Quality and Productivity Management Association revealed that training is the most important factor in a successful implementation of TQM. The research confirmed what most organizations already realize: training is an integral and essential part of the TQM initiative (Brown et al., 1994).

The leaders in quality (Deming, Juran, and Crosby) actively promoted quality training and education. Two of Deming's 14 Points, for example, are devoted to these issues. The approaches of quality leaders are not based on sophisticated statistics or new technologies. Rather, they are focused on the philosophical importance of quality and simple tools and techniques that are easily applied and understood. Once the basics are in place, more advanced statistical methods can be taught and applied (Evans et al., 1996).

Where it comes right down to it, all of this could be condensed to the simple fact that companies train because there is a deficiency, or an expected deficiency. Thinking in terms of past, actual or future deficiencies makes it more likely to come up with good training and to train for the right reasons. If a manager looks at his employees and asks the simple question, "What is it they can't do?" the picture gets a lot clearer. He doesn't go off on the tangent of training because they always have, or because the employees expect it, or the money is in the budget, or any of the wrong reasons discussed so far. It'll help him, too, when he thinks about job analysis (Exhibit 2.3). It all comes together in simple formula:

Job Requirement - Employee Skill = Deficiency

Let's look at this formula for a little while. Many times a manager says that a person needs training because the job isn't getting done. As simple as that sounds, that may not be a deficiency. What does he mean by "not getting the job done"? Does he means that the job isn't getting done as well as the last employee on the job did it? Or as well as he did it when he was on the job? Or as well as someone up the line would like to have it done, without really knowing what's involved in getting the job done? Setting job standards is an important part of the manager's job, and one that must come before training. There is an old Hindu saying to the effect that "if you don't know where you're going, any road will get you there" (Braodwell, 1995).

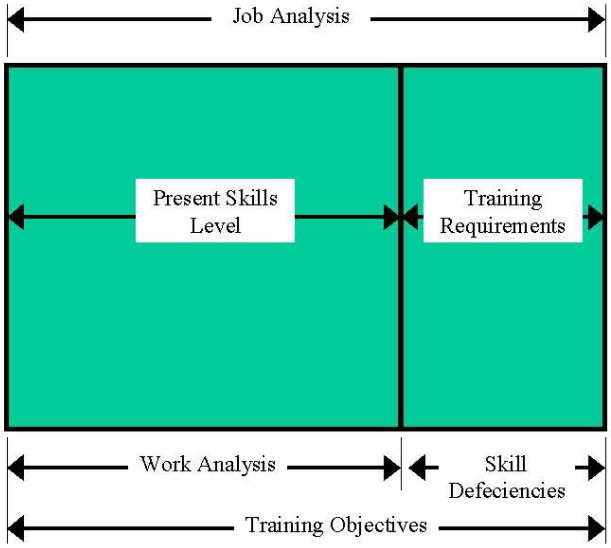


Exhibit 2.4: Job Analysis (Randall et al., 1996).

2.4.2.9. Legal Issues

In some countries the government has realized the importance of training as a vector for boosting the economy. These governments are issuing laws to promote companies to better train their employees. This is the last good reason to train people.

The French Mandate to Spend on Training

Legislated mandates to spend on formal training are a central component of the French system of continuing training. Beginning in 1972, every French employer with 10 or more employees was obligated to spend 0.8 percent of its wage bill on continuing education and training of its employees or pay a tax equal to the difference between its obligated and actual training expenditure. The mandated training tax for continuing training has since been raised many times and is now 1.4 percent. In addition, every

employer regardless of size is required to spend 0.5 percent of its wage bill on apprenticeship training or pay a tax equal to the difference between its obligated and actual training expenditure (Berton et al., 1991).

Firms are required to develop a training plan and present it to the firm's labor management committee (these committees were already required by French industrial relations legislation). This committee's role is advisory only, however. Management generally decides which skills are to be taught, who is to be trained, and when. Other times employees take the initiative. The government is not involved in these decisions and bureaucracy has been kept to a minimum. The auditing of company reports of training expenditure requires a staff of only 120 controllers for the entire nation.

The Australian Training Levy

In 1990 Australia initiated a mandate to spend on training quite similar to the French program and consequently subject to the same technical criticisms. Firms with payrolls of more the $200,000 were required to spend 1 percent of their wage bill on structured training programs or pay a tax of an equivalent amount. To be considered "structured," programs had to: (a)"[be] designed or approved in advance by a person who is appropriately qualified or experienced to design a program of the relevant type, (b) skills to be acquired...and means of imparting them ... [must be] clearly identified before the program begins ... [and] expected program outcomes are clearly formulated (Labor, 1991a.)." The tax rate was raised to 1.5 percent in 1992.

2.5. Who gets Formal Training?

Holding other worker characteristics constant, the likelihood and amount of formal training in a given year is higher for workers:

Job Characteristics

- in high value added jobs where the individual has great responsibility;
- in cognitively complex jobs (e.g. professional, technical and managerial jobs);
- in sales jobs for complicated, changing and customized products;
- who use expensive machinery on their job;
- in regular non-temporary jobs;
- in full time jobs (Bishop, 1991; Barron et al., 1993). In a multivariate model explaining variations in training intensity across jobs in the same broad occupational group, a 10 percent increase in hours worked per week is associated with a 7 percent increase in training time;
- in jobs where the skills learned are not useful at many other firms in the community (Bishop, 1991). This suggests that training intensity rises when firms have monopsonistic power in the local labor market.

Firm Characteristics

- at larger establishments (Bishop, 1991);
- at large unionized manufacturing establishments. Managers of large unionized establishments reported spending $1121 per worker (42.5 hours per year) on the training of bargaining unit employees or about 4.5 percent of annual earnings (Katz et al., 1993);
- at firms which have multiple establishments (Bishop, 1991; Barron et al., 1993);
- at companies employing flexible or high performance production systems (Katz et al., 1993);
- in industries or firms experiencing rapid technological progress and rapid output growth (Lillard et al., 1986);
- in industries which have established industry standardized and certified training;
- at firms that have long probationary periods for new hires (Bishop, 1991);
- at firms where firing an employee is reported to be difficult once the probationary period is over (Bishop, 1991);
- in industries with low unemployment rates (Bartel et al., 1993). Training appears to increase when demand for an industry's product is strong and capacity utilization is high.

Worker Characteristics

- with many years of education; in particular workers who have completed high school or college;
- with vocational training that is relevant to their current job (Bishop, 1991).

2.6. The Learning Curve

Talking about training means having an idea of how people learn. The evolution in time of a learned skill is visualized by the learning curve.

The Simplified Learning Curve has the shape given in Exhibit 2.5. The first half (1) shows that in the beginning a student learns very fast but as the training continues his brain becomes saturated. The effort to learn the same surplus of skills increases as the amount of mastered skills grows. Once the training ends the student starts to forget, the second part of the curve (2). The actual shape of the curve depends on the student, the time of the training, the kind of training, the teacher, ... An educational system that does not take in account this simple fact of life is doomed to fail or at least to be very ineffective.

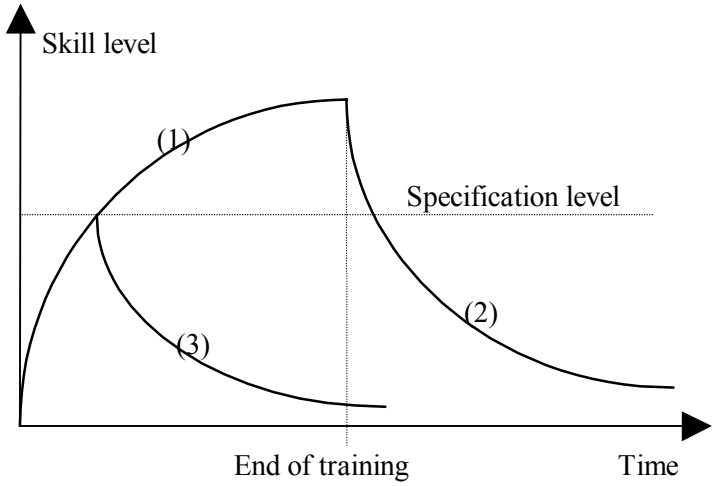


Exhibit 2.5: The Simplified Learning Curve.

A lot of traditional training starts as a remedy to a surfaced problem. 'If the operators lack the skill to operate properly let's give them an hour or so training' is a very common but too hastly start for a training program. This managerial statement contains the first disapproval of the learning curve, the use of time as a reference to the amount of learned skills. The freed time for training is fixed and there is no relation to the desired level. The 'feeling guilty situation' and not the analysis of the deficiency is the basis of this fixed time approach. Something bad happened and management wants to do something to give their conscience some rest. A training package for everyone is ideal for this purpose and a limitation on the hours will keep the costs low. So the available hours will be in relation to the amount of guilt and not to the necessary skill level.

In other situations than the feeling guilty, the planning is not better. Seeing training as a cost driver, management wants to minimize the cost for a certain level. Training is given till the student reaches the specified level, see curve (3). This is decided by the results of a test. Unfortunately this is a test under ideal, controlled circumstances, after a period of intense learning, under pressure, in a classroom environment, ... Elements that are not present in the day-to-day life. So what is the relation of the results to the real performance. If a student passes a test with 80 % what will he do in reality when there is no teacher around? What about the faulty 20 %?

Good training programs go above the specified level, see curve (2). They want to reach a level of perfection in the ideal environment, so to assure an outstanding performance in real life. Due to the learning curve this strive to perfection will increase the training cost, but because training is a defect prevention tool the investment will pay back.

Even if training goes beyond the specified skill level, most of the programs do not succeed. Once a course ends, a student starts to forget. When nothing happens in the end only a fraction of the

content will remain as knowledge or skill. To sustain a certain level a person needs a number of recapitulative training sessions. Without it the student is doomed to forget. An initial training not followed by additional reminders acts just as traditional management think about it: a cost driver. Every initial training needs follow-on sessions to be successful.

While the development of training is done with the learning curve in mind, training itself influences the curve. Marcie Tyre's (Tyre, 1990) examination of several plants in a single multi-national corporation found that the American plants took longer to start up and had flatter learning curves than plants in Italy and Germany. She attributed this in part to less development and cross-training of workers.

2.7. The Future

Computers and telecommunications change our view on classrooms. There is no need to assemble all the participants on the same spot. A trainer can give a course in a virtual classroom.

With CAT (Computer Aided Training), ICW (Interactive Courseware) and IMI (Interactive Multimedia Instruction) it is even not necessary to assemble the participants at the same time. An individual simply installs a CD-ROM in the computer and starts the course at his own speed and ability. The CD has almost all the knowledge of a collective of trainers. This knowledge may be stored as simple data, but also as audio, video, simulations, ... Employees can train whenever they see it appropriate.

These techniques are powerful aids for cognitive training, but fails for affective oriented development courses like teamskills and communication courses. IT increases the need for this kind of employee development with a human touch.

2.8. Conclusion

Training provides and/or enhances the knowledge and skills employees need to do their jobs effectively and efficiently. Studies showed evidence that there is a correlation between training and productivity, in other words training pays. Training may include all kind of skills. The planning must consider the place, participants, … To have good training it is important to start the effort for the good reasons.

Before studying the measuring training it is imperative to have some knowledge about the measurement system itself.

3. Measuring

"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write."
H. G. Wells

"In God we trust. Everybody else bring data."
Quality Control Engineer

3.1. Introduction

Training must serve a higher purpose. The finality of training is not training but a change in the work place. To evaluate the training system there must be a way to measure its outcome. This thesis will not discuss what can be done with the results, that is statistical analysis, SPC, etc. but more what can be used as a good measurement. Therefore this chapter only explains 'what is measuring?', 'why do it?', and a few basic definitions.

3.2. What is Measuring?

Controlling an organization entails monitoring, evaluating, and improving various activities that take place within an organization.

Control is a major part of every manager's job. Control consists essentially of making something happen the way it was planned to happen and that it attain the desired results. Effective control requires that managers have a clear understanding of the intended results of a particular action. Only then can they ascertain whether the anticipated results are occurring and make any necessary changes to ensure that the desired results do occur. Managers control to ensure that plans become reality, so they need a clear understanding of what reality is planned.

In practice, managers actually control by following a three-step procedure: measuring performance, comparing measured performance to standards, and taking corrective action to ensure that planned events actually materialize. So measuring is an essential part of a manager's work. Let's see what measuring really means:

'to measure' is to find the size, extent, volume, degree, etc. of something of somebody (Hornby, 1985)

In his trilogy about quality (□), Juran tells us that effective control can only be the result of the feedback loop. Measuring is an essential part of the feedback loop (Exhibit 3.1). This feedback

loop starts with the designation of an object that must be controlled. The desired state of the object is then expressed in a value of a certain characteristic. To measure, that is to determine the value, this characteristic, a sensor is devised. The sensor gives the 'actual' value of object, which is compared by the referee with the desired value (standard). The difference between the two must trigger the actions of the actors (effectors). Although the idea is to influence the performance of the process to achieve the desired state of the object, an alternative action is to adapt the standard.

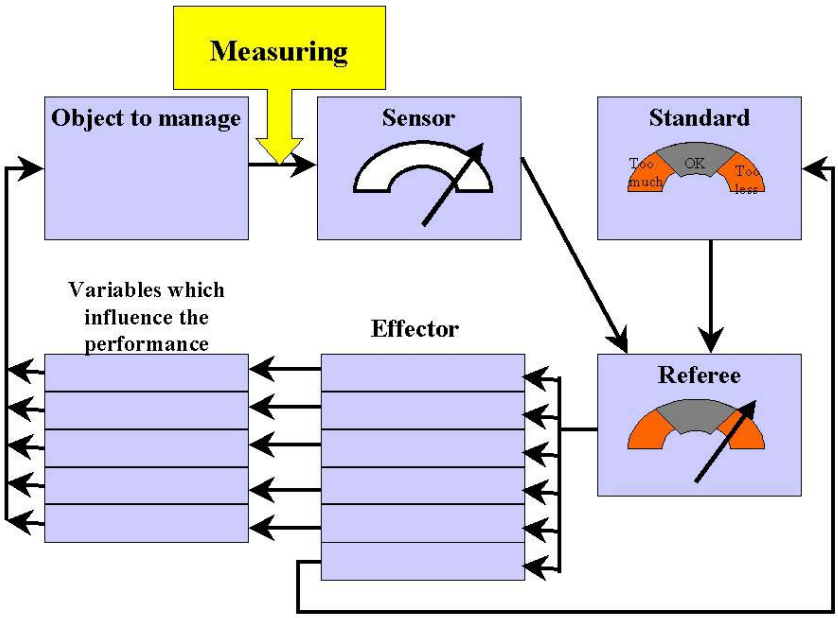


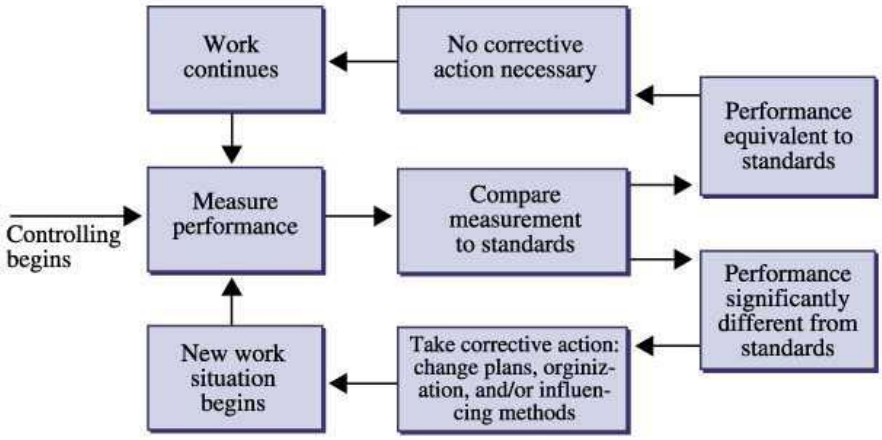
Exhibit 3.1: The Feed Back Loop (Juran, 1995).

These steps are broad recommendations for overall organizational control, but more specific types of organizational control like as production, inventory, strategic and quality control are based on these same three steps but tailored to the demands of the specific type of control.

Exhibit 3.2 shows a general model of how these broad steps of the control process relate to one another. This model implies that when performance measurements differ significantly from standard or planned outcomes; managers take corrective action to ensure that expected outcomes actually occur. On the other hand, when performance does measure up to standard or planned outcomes, no corrective action is necessary and work continues without interference.

The feedback loop clearly demonstrates that measuring is not the final goal, it must support the decision making process. Nevertheless one may still observe measuring and record keeping without a feedback loop. As Lt. Gen. Collins observed: "one hardy perennial is the maintenance of individual training records. My viewpoint has not changed on that since I was a company commander. It has been my experience that individual training records at company level are mere

eyewash and are seldom, if ever, up to date. If kept up to date, the system requires the full time effort of at least one member of the unit, who is therefore not available for training. I believe that individual training records should be kept only at the level of the first commander or supervisor in the chain of command responsible for the individual. This method distributes the workload and allows each non-commissioned officer to spend only a few minutes a day on the training status of his or her troops. An important bonus is that when the immediate leader keeps the record it reinforces the leader's position in the chain of command. This is one small but important way to build up the pride and prestige of commanders who carry a heavy, and too often unrecognized, load" (Collins, 1998.).



SOURCE: Samuel C. Certo, MODERN MANAGEMENT: Diversity, Quality, Ethics, and the Global Environment, 6 e., © 1994,

Exhibit 3.2: The Control Process.

3.3. Why Measuring?

Although the feedback loop sufficiently explains the reason for measuring, there are some recent stimuli that enforce the need for measuring.

3.3.1. The Integration of Measuring in the ISO 9001:2000

Principle 7 of the new ISO 9000:2000 talks about the 'factual approach to decision making', meaning that "effective decisions are based on the analysis of data and information".
Applying the principle of factual approach to decision making leads to the following actions:

- taking measurements and collecting data and information relevant to the objective,
- ensuring the data and information are sufficiently accurate, reliable and accessible,
- analyzing the data and information using valid methods,

- understanding the value of appropriate statistical techniques, and
- making decisions and taking action based on the results of logical analysis balance with experience and intuition.

Beneficial applications of this principle include:

- for policy and strategy formulation, strategies based on relevant data and information are more realistic and more likely to be achieved;
- for goal and target setting, using relevant comparative data and information to set realistic and challenging goals and targets;
- for operational management, data and information are the basis for understanding both process and system performance to guide improvements and prevent future problems;
- for human resource management, analyzing data and information from sources such as people surveys, suggestions and focus groups to guide the formulation of human resource policies (ISO 9000:2000.).

3.3.2. The Implementation of TQM

For example, in the TQM model of the Belgian Air Force measurement finds its place as one of the four pillars (see Exhibit 3.3).

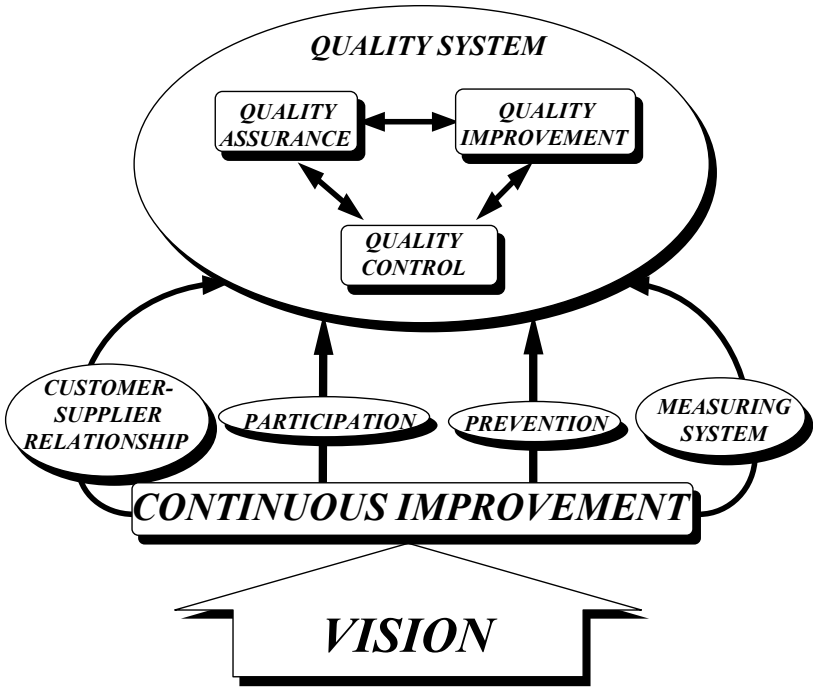


Exhibit 3.3: The BAF TQM Model.

In this model[2] and in other comparable TQM models (see Annexe E) measurement has an important role. This means that the implementation of TQM in an organization increases the interest and focus in measuring.

3.4. Efficiency and Effectiveness (quality)

Measurements are not always used as raw data; sometimes they are transformed in ratios. These ratios make comparisons easier. The two mostly used ratios are efficiency and effectiveness (Exhibit 3.4).

Efficiency: relationship between the result achieved and the resources used (ISO 9000:2000)

Effectiveness: measure of the extent to which planned activities are realized and planned results achieved (ISO 9000:2000)

Note that for ISO effectiveness is not only the degree in which the desired output is reached but also the degree in which the planning is followed. The idea behind this is that a lagging behind or being ahead of schedule means a waste of resources and thus a decrease in quality. For most cases effectiveness is just the comparison between the desired and the achieved output.

Output / **Input**	**Calculated Output (Oc)** (planned, standard, budget)	**Actual Output (Oa)**	*Eo = Oa / Oc (Effectiveness)*
Calculated Input (Ic) (planned, standard, budget)	*Ec = Oc / Ic (Calculated Efficiency)*	*Est = Oa / Ic (Standard Efficiency)*	
Actual Input (Ia)	*?*	*Ea = Oa / Ia (Actual Efficiency)*	
U = Ia / Ic (Degree of Use)			

Exhibit 3.4: Efficiency and Effectiveness.

[2] From January 2002 due to the plan to evolve towards an integrated staff, the Belgian Air Force changed its name to Belgian Air Component. Untill a new 'integrated' model is accepted, this model stays the basis for the TQM program.

3.5. Validity

The purpose of training is to influence the future performance of the trainee. To measure the effectiveness and efficiency of the training means sometimes predicting his future comportment. Based on applicant characteristics that can be observed after training, organizations try to predict how trainees will behave or perform if they are on the workfloor. Validity is how well this measurement predicts the future. The only way to know for sure which training is the best would be to try them all, let some employees be trained, then put them on the floor and then look at their performance. Unfortunately, this approach is seldom practical, due to high costs, limited equipment availability, risks of damage or accidents, ...

During the measurement, trainees give some signals, like their knowledge, their performance, their attitudes, their behavior, … The signals are called the predictors, and the desired information elements are called the criteria. Evidence regarding how well predictors actually work is called validity information.

Validity is the degree to which predictions from measurements are supported by evidence. Validation is the process of gathering information about predictor validity. Reliability is the accuracy and consistency with which selection information reflects an individual's characteristics. High reliability in both predictors and criteria is necessary, but not sufficient to have high validity.

Validation simply asks, "are the trainee characteristics (such as knowledge, skills, abilities, or experience) that we measure now, related to their behavior after they are on the floor again?"

Sometimes a validity coefficient can be calculated for any set of paired scores and reflects the degree of relationship in that particular sample of scores. It is represented by the symbol r, and the values for r can range from -1.0 (indicating that scores fall perfectly on a line sloping downward from left to right), to 0.0 (indicating that scores fall in a circle or have no linear relationship), to 1.0 (indicating that scores fall perfectly on a line sloping upward from left to right) (Milkovich et al., 1994).

3.6. Conclusion

Measuring is only a part of a feed back loop and is not a goal on its own. The outcome must be used to control a chosen object. In recent years, under the influence of the new ISO 9000 and the popularity of TQM, companies increase their interest in management based on facts and figures, thus measuring.

Training is only one component of the development process that includes all of the experiences that enhance and build employees' employment-relate characteristics. Many have argued that focusing on the immense training expense obscures the fact that most government and business

training is administrative mayhem, rarely focused on clear objectives or integrated with other HR activities. Training programs too frequently see the light because a few people decide a particular program is needed, or that the latest training fad can be sold to management. They find the money to get it started and measure success by how many people enroll. Seldom is effectiveness ever measured. The programs often remain in the company course catalog long after anyone can remember why they occurred or whether they work.

In contrast, the best companies integrate training within a systematic set HR activities, including external and internal staffing, rewards, and job. Federal Express spends 3 percent of its total expenses, or $225 million a year on training. It also uses a pay-for-knowledge system to reward employees for what they learn, bi-annual tests of job knowledge (with results tied to pay increases), and a precise service quality indicator that scores problems such as wrong delivery (5 points) and missed pick up (10 points), to correlate knowledge with results. Training is a vital competitive weapon for organizations and even nations, as well as an investment that must prove its worth. Therefore measuring the efficiency and effectiveness with valid measurement methods are essential to use training as a strategic weapon.

4. Measuring training

Somebody has to do something. It's just incredibly pathetic it has to be us."
Jerry Garcia of the Grateful Dead

"Insanity: Doing the same thing the same way and expecting different results."

4.1. Introduction

It would be rather ridiculous to ask, "Is it really necessary to train people how to do their jobs?" No one would dare say no. It would be equally foolish to ask, "Is some training better than other training?" Here again, everyone would immediately answer in the affirmative. But suppose we were to ask the question: "How do you tell the difference between good and bad training?" Even though it is apparent that some of our training produces better results than other training, we aren't always able to tell exactly what makes the difference. Obviously, when we have an employee who is responsible for certain work, and we expect that work to be done properly, we want to have only the good kind of training, rather than the bad. But we must find out what makes the difference (Braodwell, 1995) and to find this out; we must measure.

4.2. Why Measuring Training?

The motivations to measure in general, that is the introduction of TQM, ISO certification, the feed back loop, … are also those to measure training in particular. This is not only true for companies but also for schools and universities which are training industries. This movement is extra motivated by the industrial push to incorporate TQM in the curricula and their interest in national education. On top of that there are a few extra reasons why measuring training is extra important for companies.

Motorola calculates that every $1 spent on training delivers $30 in productivity gains within three years; between 1987 and 1993, the company cut costs by $3.3 billion as workers were trained to simplify processes and reduce waste. Sales per employee doubled and profits increased 47 percent (2). Perhaps a good stock-picking strategy is to invest in companies that train the best? (Milkovich et al., 1994). But then again, how to measure this?

4.2.1. Industrial Urge to Include TQM in Education

A consortium of businesses, including Procter & Gamble, American Express, General Motors, IBM, Milliken, Motorola, 3M, and Xerox, has explored ways in which universities can be persuaded to incorporate TQM into curricula in business and engineering. The following list

of businesses and educational institutions is only a small sample of partnership arrangements for sharing experiences and TQM training that have developed:

- IBM, MIT, and Rochester Institute of Technology;
- Milliken, Georgia Tech, and N.C. State a Motorola and Purdue;
- P&G, University of Wisconsin-Madison, and Tuskeegee Institute;
- Xerox and Carnegie Mellon.

In addition, to encourage development of comprehensive approaches to TQM in colleges of business and engineering, IBM has given $1 million grants to each of eight universities. Part of IBM's motivation lies in their expectation of a return on their investment, that is, in the quality of graduates from these and other programs. These efforts demonstrate that businesses are serious about improving the quality of both content and delivery of instruction at colleges and universities through use of TQM methods (Evans et al., 1996). These efforts also stimulate the schools, colleges and universities to measure their effectiveness and efficiency in training and education.

4.2.2. Training is Context Specific

Training has high average rates of return for both the firm and the worker. High levels of training are associated with high levels of organizational productivity (see paragraph 2.4.2.4). To successfully raise productivity, training must, however, be customized and adapted to the needs of the specific work place. There are no standardized training packages that can enhance organizational productivity at all or even a large number of work places. While the typical training program yields very substantial benefits, some fail. Training is a risky investment. Very little rigorous research comparing different methods of training or comparing payoffs to training of different types has been conducted.

If training is to remain effective, what is taught, who is to learn it and how it is to be delivered must be decided locally (by the employer and her employees), not by government or trade associations. But little is known about which types of training are most effective (Bishop, 1994), so any company that wants to train its employees has a hard time to choose the right kind of training. Without good measurements a good choice is harder or even impossible.

4.2.3. Legal Issues

To defend against charges of discrimination, companies can show that the training programs were conceived and administered without bias. This will be exceedingly difficult to do unless companies have the foresight to document their training practices. Thus, they should follow these guidelines:

- Register affirmative action training and apprenticeship programs;
- Keep a record of all employees who wish to enroll in the training program;
- Document all management decisions and actions that relate to the administration of training policies;
- Monitor each trainees' progress and provide progress evaluations (that is measuring);
- Continue to evaluate the results even after completion of training (that is measuring too).

4.2.4. The Role of the Supervisor

Supervisors, managers, and executives, as well as their employees can be sued for violations of fair and equal employment laws.

The best protection against liability for personnel-related actions is better training for managers and supervisors as to the consequences of their actions. Employers should encourage and train supervisors and managers to:

- Document personnel issues such as performance and conduct, at the time the performance or conduct becomes a problem;
- Assess objectively employee performance and conduct (measuring);
- Review carefully communications concerning or directed to employees.

4.2.5. Bussiness-Education Partnerships

Management and leaders in business have raised concerns about the quality of education in the United States. In 1992, Fortune magazine surveyed the amount of business contribution and support to all levels of education. Of the 342 Fortune Industrial 500 and Service 500 firms that responded, 84 percent indicated their top management was "very involved" or "fairly involved" in education. Sixty-five percent of respondents reported that their companies made donations to elementary school-related projects, 75 percent donated to high school related efforts, and 87 percent donated to colleges and universities.

In May 1991, a consortium of professional associations, business associations, individual businesses, and universities incorporated as a nonprofit membership group called the National Education Quality Initiative (NEQI). Its purpose is far-reaching, based on its mission statement:

It is the purpose of the National Education Quality Initiative to foster three objectives by all practical means so that all residents of this nation will become wholy knowledgeable about quality:

- To obtain the inclusion of appropriate portions of the quality sciences and associated arts into every course anyone takes from preschool through graduate school and in continuing education.
- To obtain the incorporation of the quality sciences and associated arts into all aspects of the administration and operation of all schools in the country.
- To improve the quality of the content and delivery of all material to students in the entire educational process.

Perhaps the largest single private grant of $500 million for school improvement was announced in December 1993, donated by media giant and philanthropist Walter Annenburg. With such efforts underway, substantial improvements can now be made in the K-12 educational system, although they will not be rapid or easy (Evans et al., 1996).

To keep receiving these funds the schools and universities implement TQM and try with facts and figures that their education is good. However, note that most applications of TQM in higher education have focused on the administrative side, not in teaching or research.

4.2.6. Balanced Score Card

Strategic control is not just about monitoring how well an organization and its members are achieving current goals or about how well the firm is utilizing its existing resources. It is also about keeping employees motivated, focused on the important problems confronting an organization now and in the future, and working together to find solutions that can help an organization perform better over time.

According to Kaplan and Norton other than the financial side should be monitored (measure the result of past decisions). There must be a focus on the ability to build competitive advantages: efficiency, quality, innovation and responsiveness to customers and these should also be measured (measure future performance). They propose to use a Balanced Score Card (Exhibit 4.1) as the cockpit of the strategic implementation.

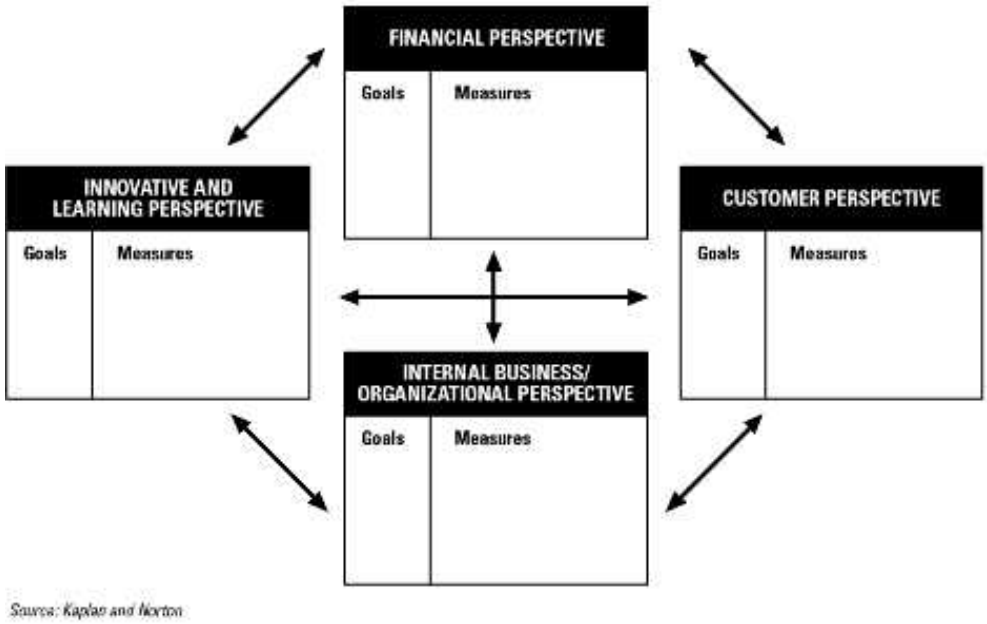


Exhibit 4.1: The Balanced Score Card.

Under impulse of Dr. Kaplan, the BSC gains worldwide interest as the latest management tool and thus a stimulation to measure training effectiveness and efficiency as part of the innovative and learning perspective block.

4.3. Different Points of View

Like we already stipulated, measuring is done with a purpose. Someone, or some team, must own the purpose. To achieve his purpose that person will decide on the method of measuring and the interpretation of the results. Therefore it is good to know this person and his point of view.

4.3.1. The Participant

The first one who comes up when talking about training is the participant. He is the key to success in training and thus a much-used sensor in feed back loops. But he is not only important as an element in the loop, but he is also interested in the results of the measurements. He wants to know if his investments in time and attention will pay off. His interests may not be in line with his company's interests and may even be found in his private life. If he sees indications in the past, present and future that his interest will not be satisfied, his attention will lessen and the effectiveness and efficiency of the training is lost. These indications can be:

- Past experiences with training;
- The image of the training organization;
- Comments of his peers on the session;
- Comportment of the trainer;
- Estimation of the competence of the trainer;
- The training environment;
- The expected use of the content;
- Etc.

It is important to assure that the participant stays interested and motivated. This can be done by showing favorable data in his area of interest, whatever that may be.

Sometimes a whole team is trained. The team will react on a similar way as the individual, but when a team's interest decreases, a whole class may be lost, while one lost individual does not necessarily means a wasted session.

4.3.2. The Company

While participants mostly use informal measurement systems, at company level more formal methods will be used. Although there is lots of data available, the use of less formal measurements is still important. The effectiveness of a training is often estimated by the niceties, the look of the brochure, … and less than thought on hard (to get) data.

In the company there are different groups with different views on training. We have the manager of the participant, the purchase officer and the HR manager.

The *manager* (and thus the work environment) is interested in the added value of the training. He wants a change in the competence or the comportment of the trainee after the session. His desire is to increase the productivity because the investment of money and time in training must pay off. Therefore he will concentrate on the outcome or output of the training. Looking

at different training courses he will ask the question "which one will maximize the productivity?" and choose the most effective one.

The *purchase officer* must manage the training budget. His interest is in the cost or input of the training. In his choice between different training courses he will, in an effort to optimize the use of the training budget, go for the low cost.

The *HR manager* (or training manager) wants a global view of the in- and output. He is not directly interested in the individual participant, but in the company's personnel as a whole. But he will not only look at the in- and output, but at the 'how it is done'. The training methods must be compatible with the company's philosophy. Before all, he will choose the most efficient training.

4.3.3. The Training Organization

The former parties are in fact the customers of the training. In the effort to satisfy these customers, a training organization must control its processes. It is interested in satisfying the needs of all its customers at low cost.

Although it may sound wise to subscribe for the low cost, but effective training, sometimes this logic is not followed. Some MBA studies only flourish because they are expensive and not because they are superior. It seems that in some rare cases the high price symbolize the high, even unproven, quality of the institute.

4.3.4. The Government

As one of the biggest 'companies' that invest in training and education, the government starts to show interest in the pay-off of these country-wide funding. It sees that training is a weapon in the international economical battle. More and more funding becomes dependable on global results. Training with high penetration, grade of participation and success raise the interest of the government (see Exhibit 2.3).

4.4. Training Tourism

Sometimes training is regarded as a reward. The course is sometimes supplemented with extras like a good meal, a nice hotel on some exotic location, … This kind of training gives the wrong signal 'training is for fun' (training must be fun, but it must remain working). There is no use in measuring (perhaps with the exception of the effect on motivation) these kinds of training, because the participant is not there to train, but for fun. If the company wants to reward the employee then it can give him the meals and the 5 star hotel, but do not send him on a so-called training session. Training is to learn something and it is hard-work!

4.5. Conclusion

We know now why we need to measure training and who is interested in the data. We are ready to explore the different methods of measuring training. The different methods are divided following a stepping-up categorization (Exhibit 4.2). Every step to the following category means an increased difficulty in the application of the method and awareness of the training process. It is also the line of evolution most people follow when trying to quantify training.

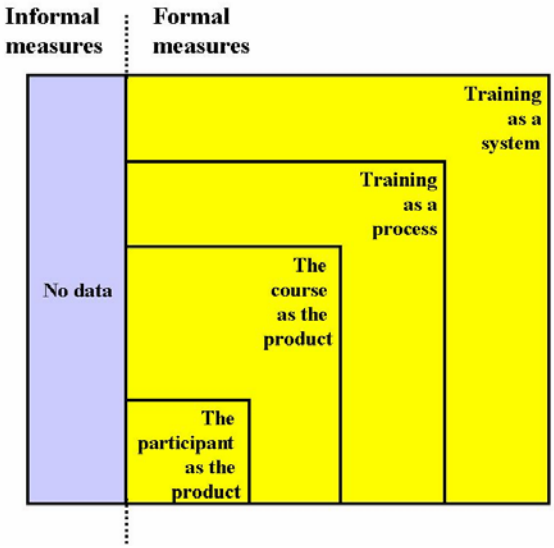


Exhibit 4.2: The Evolutive Categories of Measuring Training.

5. The Informal Measurements

"To forget one's purpose is the most common form of stupidity."
Fredrick W. Nietzsche

5.1. Introduction

Perhaps the most used methods to measure training are not the most sane ones. Whatever theoretical or formal method supports the decision making process, there will be some informal observations influencing that same process. The acknowledgement of these ever-present informal methods[3] is important to appreciate their impact on training.

5.2. Basic Assumptions

Even when we have hard data on the training organization we consider to work with, we will still seek confirmation on a more emotional level. As rational as we may want to act, we'll still be driven by emotions and appearance. So in deciding which teaching organization to choose, members of a company will be influenced by informal measurements. The importance of the measurements will be the greater, the less formal ones are established.

Although most of the areas of informal measurements fall under the responsibility of the marketing department of the training organization, every department has its role to play.

5.3. Examples of the Informality

If we find find figures that demonstrates that p.ex. the courses are of high quality, we will expect that this corresponds with the findings of others, the image of the organization, the idea we receive from publicity and our own experience. A discrepancy between what we measure and what we see, or feel may influence the decision making process.

[3] The use of the word 'method' may be giving it some scientific ring, but this is not intentional.

5.3.1. Mouth to Mouth

Before selecting an organization as a partner, the one that must give advice or make the decision will try to contact somebody who has some 'knowledge' of or 'experience'[4] with the training organization. This sharing of experience may be purely luck or sollicitated for. The credibility of the passed-on information is in relation with the appreciation of the source.

This is why it is important to isolate these solicitated sources or opinion leaders, someone that is regarded as a trusted 'specialist' on the matter, and to try to influence them positively. This way the organization may pass-on the good news with little effort.

5.3.2. Image

A nice building, a nice brochure with beautiful photographs, an illustrated map with a good looking and well prepared course in it, new and modern looking classrooms, … all these things will help to create a certain look or image. If the image our organization radiates corresponds with what companies are looking for, then there is a big chance we will be the preferred partner in training.

A strange thing in training is the training fee. There is an economical law that says that the demand decreases with increasing price. But for some high value added training sessions, i.e. MBA, Quality oriented courses, etc., the fee is interpreted as a reference for the quality of the training (Merlino, 2002). If a organization would find a way to reduce the training fee of a MBA to the amount of less then say € 2,500, it will have a hard time selling it. The logic behind this is that a MBA or similar course for so less a fee can impossible be of a high standard.

5.3.3. Publicity

Publicity has a lot in common with 'image'. Not only does it serve to recruit potential customers, it also plays a role in the creation of the organization's image. If we look for a partner to give quality training, that partner must make publicity that radiates quality. A sloppy looking ad will not do a good job.

Good and ample publicity will also give the message that the organization is doing well and thus that other companies are satified with the received training. How else can one make good money to invest in such a publicity campaign?

The last advantage of a good, personal publicity is that it decreases the need to look for information. Why look for another organization to give a training on a subject, if we know that our trusted organization has it in his portfolio?

[4] This knowledge or experience may be real or hear-say.

5.3.4. Experience

Perhaps the strongest informal measurement is our own experience. Armed with this first hand information we can battle all the messages from facts and figures. Experience by one in the decision loop may strongly influence the final outcome. Only the hard lesson that our experience may be a single, isolated case can reduce this to its normal proportions.

5.4. The 7 Characteristics for Comparing the Models

To enable us to compare the different models of measuring we will examen every type of measurements in the light of 7 characteristics. Before doing so for the first time, it is wise to explain the meaning of every one of them even if some are quite obvious:

1. Simplicity
   This characteristic tells us something about the ease to set up the measurement.

2. Speed
   Speed, the time to set up and to make the measurement operational, is in most cases in close relationship with simplicity. Speed sometimes slows down because the data is available at very short notice and does not need a lenghty collection effort. Complex models not only need time to prepare the indicators, but also time to acquire the necessary expertise and experience. Both slow down the speed towards an operational indicator.

3. Time Lag
   Time lag is the period between the moment of training and the availability of the the corresponding value of the chosen measurement. Complexity, the amount of required data, the kind of data, … influence this period. The shorter the time lag, the better the reaction time in improving training. A short reaction time makes it possible to quickly correct any mistake, but holds the risk of micromanagement and overreaction.

4. Relation with the Cause (diagnostics)
   This is the relation between the value of the measurement and the cause. A direct link between these two creates the possibility to shorten the reaction time, because there is no time wasted to determine the cause and its corresponding solution.

5. Depth
   Although depth and cause-finding are closely related, there is a difference. Depth means the possibility to measure different aspects of training and thus directly determines the ‘span of control’ and the level of detail.

6. Intern – Extern
   This tells us how the model can be used; to look at the external training organization or at

the internal department of our company. Sometimes it is quite impossible to collect the confidential data or sometimes the result is simply of no use for own improvement purposes.

7. Group – Individual
   Are the measurements meant to make conclusions on a group or an individual level?

5.5. The Value of the Informal Measurement

5.5.1. Simplicity

Although we may not like the informal measurements they have an influence on the final decision and may be of great value when lacking the means and time to set up more formal ones. These measurement lack every sign of complexity. They are speedy to set up and represent an almost instantanuous appreciation. But don't be bewildered, they have some great disadvantages.

5.5.2. Speed

The previous paragraph demonstrated not only the simplicity of the measurement, but also the speed of setting them up because the data is also available at very short notice.

5.5.3. Time Lag

No time lag. It is even possible to get a measurement before we start a training.

5.5.4. Relation with the Cause (diagnostics)

Besides having almost no inherent objectivity, they are mainly based on a subjective observation, there is no identifiable relation between the outcome and the cause. These measurements are an attempt to appreciate the whole on very little information.

5.5.5. Depth

There is really no depth in this kind of measurements.

5.5.6. Intern – Extern

It is mostly a measurement used by the companies that look at a training organization. Nevertheless, the organization itself may try to quantify this in order to try to positively influence it (remember they are a part of the decision process). To do this, additional

investigations will be needed to find the causes, or it may think that a good informal score means that it is giving excellent training.

5.5.7. Group - Individual

The measurements may be both a group as weel as an individual view.

5.6. Conclusion

In our search to emotionally validate the objectively obtained figures or just because we lack those figures, we will try to find information on an informal basis by collecting the findings of others, by interpreting the image of the organization, by appreciating the publicity and our own experience. This information will be used, willingly or not, to influence the decision making process.

Knowing that these ever-present informal methods play a role in the decision of selecting a training organization, we are now ready to explore the more formal measurements.

6. Measurements Based on the Input Model

"I would not give a fig for the simplicity on this side of complexity, but I would give my life for the simplicity on the other side of complexity."
Oliver Wendell Holmes

6.1. Introduction

Soon after someone received the responsibility of training, he will set up a kind of measurement. His first attempt will almost for sure be based on the input model. He will be in charge of a training budget and in the aim to control the expenses he will measure these. Quickly thereafter he will calculate the training expenses per employee, the number of training days per employee, … These ratios are very basic and the result of a fairly basic logic. On top, they are often directly available and easy-to-understand, hence their widespread use.

6.2. Basic Assumptions

It may be surprising to start the assesment of formal methods for measuring the outcome of training with the measurement of the input. How strange it may look, the basic need for using this kind of measurement stays the evaluation of the outcome. There are two assumptions that relate the input with the outcome:

- The more input we have, the more outcome there will be;
- If we have a lot of input, then there must be some good outcome.

There are clearly a quantity and a quality aspect on these assumptions. The first supposes there is a correlation between the input and the outcome. In the beginning, it is saying 'well, we are doing something' later on it is telling 'we are doing a lot', without ever asking 'how are we doing'. The second one expresses a concern about 'how are we doing'. It is a reasoning similar to hunting in the woods with a riot gun. Eventually we will hit the rabbit.

6.3. How to Measure Input?

Most, even very big, companies started with this model. Janssen Pharmaceutica's[5] major indicator of their training program is still the number of training initiatives. The 43,000

[5] A leading Belgian company based in Beerse and a member of the international Johnson and Johnson Group.

initiatives per year are the basis for determining the budget (van de Ven, 1999). Other indicators like:

- the number of sessions,
- the number of trainers involved or hired,
- the amount of training hours given,
- the percentage of the budget spent on training, etc.

have the same input inspiration.

One popular story, although used in another context, demonstrates the appeal of this kind of measuring is about Thomas Watson, an early leader at IBM, involves a manager who made a mistake that cost the company $ 2 million. When the manager came to tender his resignation, Watson said, "Why should I let you resign? I just spent $ 2 million dollars educating you." So, is it because the ironically called education costed $ 2 million, that is was of high quality?

The input point of view is also applicable in the training organization. Just think about counting the number of trainees entering the courses, the number of companies[6] sending their employees, the amount of training given, …

When only looking at the quantitative aspect, we could consider the bean counting attitude towards means as an extention of the same input model. That way we can add the number of trainers, the number of classrooms, … on the same list.

6.4. The Value of the Input Model

6.4.1. Simplicity and Speed

The biggest advantages of measurements based on the input model are their simplicity and their set-up speed. In most cases these measurements are not more than some simple manipulations of already existing data. There is 'no' need for extra work in establishing a measurement system.

6.4.2. Time Lag

It gives the information before the training started. There is no relationship between the time of training and the availibility of the measurement.

[6] When the names of the individual companies are used they are called: references. It just tells us who started the courses, but does not give a clue about their appreciation. It is a demanding job to try to find this out.

6.4.3. Relation with the Cause (diagnostics)

The lack of a relation between the result of the measurement and the outcome of the training makes it a useless diagnostic tool. There is nor depth, nor possibility for cause determination. The information is available, but cannot be used for improving the training or the decision making process.

6.4.4. Depth

This model does not even scratch the surface. It looks at training on a very distant level.

6.4.5. Intern - Extern

The model is fairly flexible because it can be used internally (from the point of a company looking at his training efforts) and externally (i.e. at the training organization).

6.4.6. Group - Individual

Again everything is possible. We can design the tests on a individual or group level, even combinations are possible. It is just a question of what we want to achieve by measuring training.

6.5. Conclusion

The simpliest way to start establishing formal measurements is following the input model. This results in some fast available, easy-to-understand figures. Unfortunately this simplicity degrades its usefulness because these measurements give us no idea of the achieved outcome. So they are only useful for calculating the efficiency, but give no data on the effectiveness of the training program. An overstretched thrust in their result may lead to wrong conclusions.

There is another, emminent danger in using this kind of measurement. The ease of achieving it and the fact that once established there is a measurement may slow down or even stop further effort to improve the measurement. From now on, every step further and deeper demands extra effort. As a result some, if not most, companies stick with this ‘simple’ model and never leave the embryonal phase of measuring training.

7. The Participant (and his actions) as the Product

"Creative minds have always been known to survive any kind of bad training."
Anna Freud

7.1. Introduction

Training programs that address specific well-defined problems and whose outcomes are tracked can demonstrate that "Training doesn't cost - it pays!" However, programs whose purposes are not well defined and whose performance is not tracked, may be threatened by the axe. Making a case for training often means being able to quantify results.

A study of hot-roll steel facilities by Ichniowski, Shaw and Prennushi (Ichniowski et al., 1993) found that plants using high performance work systems had less down time and produced higher quality output. Higher levels of training were one of the components of the high performance work systems that generated these positive outcomes.

It is much easier to define the results of good training than to define the action of good training. As, after training, the employee can do what he couldn't do before the training, and if the training did not take too long nor cost too much, we conclude that the training was "good." On the other hand, if, when the training is over, the employee still cannot do the job for which she was trained then the training may have been "bad ". We say because 'the training may have been all right, but other conditions, such as location, attitude of the employee, time of day, or the employee's lack of ability, may have made the training fail.' While the person doing the training [may have] a responsibility for these things, too, the actual instruction may have been good (Braodwell, 1995).

7.2. Assumptions

The basic idea behind the 'the partcipant as a product' model is that good training is a training which produces employees (the participants) who show the desired result. This gives the chance to explore the second most simple method of measuring training.

7.3. About Objectives

When speaking of the desired result, this means that the aim of a training is to make measurable improvement in a targeted area. Therefore when we start our training, we need to have some target to shoot at, some aim in mind to tell us if we have been successful. We will call this our objective. We are going to set up some specific rules to prepare the objectives and to determine

when they have been met. The single most important measurement of whether training is going to be successful is the ability to properly state objectives.

A good quantitative and/or qualitative objective is SMART (Specific, Measurable, Acceptable, Realistic and Timely):

- Specific: it is not a general statement, but specific for the situation;
- Measurable (or observable): to know if the objective is reached or not, we must be able to objectively decide. This can only be done with data and thus the objective must be measureable. This means that when we make a commitment to employees that says they will be able to do something when the training is over, it should be something that we can measure and watch being done;
- Acceptable: if the objective is not accepted as a goal, there will be no effort to reach it;
- Realistic (or doable, or accomplishable): overstreched goals work demotivating. The objective must be challenging but attainable. It shouldn't be something that we hope someday the employee will be able to do but only with a lot of practice. It should be something we can accomplish during the training;
- Timely: it must be limited by a deadline. An objective for the end of days makes no sense and will never be attained.

Why are objectives so important? After all, isn't an objective just the "purpose of the course," which is very general? No, that is what must be avoided at all times. The objectives must be specific because the entire training program, from beginning to end, will revolve around the objectives. Put simply, the objectives should be so specific that they tell us in plain terms exactly what the person will be able to do at the end of the training. This is not as easy as it may sound.

Organizational needs analysis should translate the organization's objectives into an accurate estimate of the demand of human resources. Efficiency indexes, including cost of labor, quantity of output (productivity), quality of output, waste, and equipment use and repairs can provide useful information. The organization can determine standards for these indexes and then analyse them to evaluate the general effectiveness of training programs.

Even if they are in the same industry, two companies with different business strategies may adopt very different training systems. Increasingly, companies are recognizing that by establishing a new strategy and a new set of objectives they create an immediate need for a major training and development initiative.

Organizations should conduct demographic studies to determine the training objectives of specific populations of workers. More generally, research indicates that different groups have different training needs. Demographic needs can also be used to assess whether all employees are given equal access to growth experiences and developmental challenges, which are known to be useful on-the-job methods for promoting skill development.

Only when we write the items to be learned down so that we can specifically point to them one at a time (and step by step) are we able to prepare a training program that will accomplish our purpose of training. The objectives should be stated in this manner (Braodwell, 1995).

7.4. Methods for Measuring

Objectives are measurable, so there must be methods to quantify the output of a training session.

One of the simpliest ways to measure the output of a training program is counting the trainees[7]. The bigger this number, the greater the output. This kind of data does not consider the qualitative results of the output. It does not care if the training objective is attained. In this category we also find the number of the number of teams trained, the number of specialists, …

As a quality control measure and/or a stimulation to train and be trained, firms could be required to give certificates describing the skills taught and competencies achieved to trainees at the completion of training. These certificates would make the individual more marketable at other firms and strengthen worker incentives to engage in training. Public companies would be expected to describe their investments in formal training in their annual report. In order to avoid a conflict of interest in the allocation of training investments, tax offsets would not be available for training received by the owner and top managers (Evans, 1996). Then the number of certificates, although they have a qualitative aspect, would be a good example of a simple output based measurement.

So, although these measurements are straightforward, conclusions based on this kind of quantitative data are of the same, small value as the input model. By using a few basic principles and reducing the complexity of training measurement, there is a simple and more relevant qualitative approach. The proposed framework (by Dale Smalley, Director of Creative Infowork) involves a series of 6 steps.

Step one: take a measurement before a training event.

This pre-test is seldomly done and may be more common in the process approach.

Testing participants' skill levels prior to a training event, especially those of mature-age staff, always brings out a wide range of responses. These can include dreaded memories of school days, feelings of self-doubt, lack of confidence and low self-image. Often people act out these responses through difficult and unco-operative behaviour. In dealing with participants' responses shows that they feel less anxious if testing is self-administered and self-assessed. They are even

[7] The difference with the input model is just the point of view.

more co-operative if the testing process is promoted as a means of assessing the training method and not the student.

The advantage of this pre-test is not only that is serves as a baseline for validating the post-test results but also as a tool to finetune the course itself. In some cases it may even stimulate the participant and thus increase his motivation and the end result itself. If the pre-test questions can be aligned to specific modules within a self-run training course, then the results of the pre-test questions can be used to build a personal course module map for each student. Repetition and time-wasting are avoided because students only do the modules deemed necessary by their initial skill levels.

Step two: perform the training event (attend a course, read a book, watch a video, …).

Step three: take a measurement after the training event (the post-test).

The pre and post-tests are simply collections of questions designed to identify skill levels. They should be an appropriate mixture of multiple-choice and essay-answer-type questions. The style and content of the questions should ideally be crafted by curriculum designers of the training event.

Post-test questions can either be the same as the pre-test questions to give a true A/B comparison, or more detailed to assess skills at a deeper level. Self-assessed post tests also offer the ability for students to print out course completion certificates, optionally based on pass marks.

Step four: compare the before and after measurements to detect a change.

Step five: store the results for longer-term statistical analysis.

Long-term collection of pre and post-test results provides the basis for some revealing statistical analysis. Comparisons of pre and post-test scores over a range of course delivery modes can reveal the effectiveness over different audiences and different subjects.

Long-term analysis of scores reveals some unexpected outcomes. A question that is consistently failed by students can either indicate a poorly worded or ambiguous question, or a course module that does not clearly communicate the required skill or knowledge. Experience indicates that both situations can occur.

For example, analysis of CBT course scores at a large manufacturer revealed that CBT is a more effective way of delivering the training of detailed procedures than of facilitation skills. This may appear to be common sense, but it is helpful to have the hard data to prove it.

Step six: integrate results with existing human resource systems.

7.5. Techniques for Performing the Tests

The use of the above mentioned method reduces the measuring of a training to a simple or double test. So it comes down to finding the right kind of testing technique.

7.5.1. The Knowledge Test

If we think about our days at school, we can simple image a variety of test or examens. The purpose of these tests were more to stimulate and test us as a student as opposed to verifying the quality of the course. Both goals may go hand in hand, but here we concentrate on measuring the quality of the course.

The knowledge test is the kind we know best from our days at school. It may vary from a simple list of open questions to a complicated multiple choice test with degrees of certainty. Although these test are well-know and frequently used, the amount of books and documentation shows they are a complicated tool.

The biggest disadvantage is that they pretend to only test knowledge. They do not measure either the ability or the will to do something useful with this knowledge. A good result on a questionnaire about welding, does not guarantee that the candidate is able and willing to do a good welding job. Neither does a bad result the opposite. Of course, a good result gives more confidence and, if he is willing, the possibility of a job well done will improve. But, without guarantee!

7.5.2. Interviews

Giving away a bit of objectivity, it may be possible to sense the will to perform by taking an interview. It gives the interviewer a good feeling about the assimilation of the knowledge, the possibilities and the will to use it. Studies in performing interviews as a selection tool show that unstructured interviews can produce validity as high as 0.30, while structured interviews validity in the 0.60s or higher can be reached (Milkovich, 1994). There is no counterindication that the same results can be achieved with interviews as post training tests.

The relatively high cost (think of the interviewer and participant time, the development and processing costs of a new interview, etc.) may be the downside of this tool. Subjectivity can be kept minimal by structuring and interviewer training, but this again increases the costs.

7.5.3. Ability Tests

Instead of testing the knowledge, why not test the ability to do something? By giving a predefined work to perform, we can evaluate if the candidate is able to do what he is trained for. This kind of ability testing gives a validity, again in the selection process, generally greater than 0.40, and can range as high as 0.80.

While the cost of developing a new test can be very high, the use of this kind of test is relatively inexpensive to administer. Additional modest costs involved in processing and interpreting scores.

7.5.4. Simulations

We can present the student a few simulated situation and observe or ask how he would react. We can evaluate his reaction to a certain standard and even score it on a scale. This test is very useful because we can create a similar situation for every student at the time and place we want. Bringing in some hired help can improve the sense of reality of the situation.

Nevertheless most students will react differently because they 'know' it is a simulation. The validity of the simulation greatly depends on the perceived reality of the situation.

7.5.5. On the Floor Test, Work Samples

To eliminate the programmed reaction due to the 'feel' for the simulation, it is possible to bring the candidate in his real work enviroment and to test him there. While he still knows he is being tested, all the elements in his enviroment say he is doing his 'normal' job. The tendancy to act outside the normal will be minimal.

By observing the actions, the examiner will be able to tell if the candidate has assimilated the training and has the possibility and will to act accordingly. By scrutenized observation one can even watch the impact and the reactions of the people around him on his newly achieved abilities.

7.5.6. Appraisals

Every company has some appraisal system. It may be a good idea to use the results of this system as a tool for measuring training. If a low figure on some criteria is not the condition to get a training, then we may consider these evaluations as unbiased pre-tests. Possibly, an extra appraisal interview after the training may serve as the post-test. This time it will be influenced by the training because the interviewee and the interviewer will look for results of the training. The appraisal system may be of a normal top-down or of a 360 approach, as long as it measures the areas of the considered training.

Performance appraisal interviews that involve feeding back evaluation information can be effective if the evaluation information is meaningful, clear, and helpful. Selecting the best evaluation approach for the employees and managers to use and evaluating its usefulness for evaluating training is an important HRM decision. Properly performed, performance evaluation can contribute to organizational and training objectives and employee development and satisfaction.

7.5.7. Behavioral Audits

This kind of test we go into the field and observe the reactions of the trainees after a predefined incident. With this kind of test we can see if the participant uses courseware in real

situations. This kind of behavioral audits excells simulations because the person tested is not aware of the test. Above that, he performs the test in a known and familiar envirronment. In the KBC-Telecenter, the call center of a Belgian Bank, the people are monitored during call handling in order to define necessary training and to verify training effectiveness (Verbiest, 1999). There are a number of ways this test can be implemented, following examples give we a good idea of the possibilities.

First, consider the use of telephone surveys performed by the training department. These surveys can be used with the actual trainees, their peers, their subordinates and their superiors. There are certain skills that can easily be tested in this format. These skills include knowledge of the company's mission statement, corporate policies and procedures and technology usage.

A variation is the so called mistery shopper. A hired actor walks in the company and acts like a 'pre-defined' customer, supplier, … The reactions are observed and reported by the actor.

7.5.8. Translating Training Output into Financial (and other) Outcomes

Every training function must compete for allocations of limited funds. To do this successfully the training department must be able to prove its need for funding by demonstrating both efficiency and effectiveness. What kind of evaluation will yield the kind of information board members and managers need to determine the effectiveness and efficiency of a training department? Inevitably, decision makers do not ask, "Do we train well?" but rather, "Is our training worth it?" To get to the unqualified "Yes!", trainers must provide evaluation measures that relate performance data (effectiveness) to financial data (efficiency).

How can trainers do this? A look at some typical organization-wide goals produces a clue. Just as most passengers do not ride transit for its own sake, but rather as a means to an end (that is, as a way to get from point A to point B), so training is not (or at least should not be) an end itself, but rather a means to something else. Figure out how a training program impacts the efficiency or effectiveness of that "something else" and we are on our way to finding a measurement that relates performance data to financial data. The best demonstration of training's organizational effectiveness comes from evidence that training actually helped achieve an organization-wide objective and that it did this at a cost that was less than some other approach or no approach. To prove training's positive impact, we first establish a baseline measurement. Then identify the target skills needed to change that measurement. Then train. Then measure after training and compare.

This, for example, is what SEPTAs Callowhill District Training Team did in the Spring of 1995 when they created an operator training program to reduce accidents on specific routes. When the cost of the training program is related to the cost savings produced by lowering accident rates, the goal of proving training's effectiveness is achieved.

Most training, however, is not evaluated this way. Selling training to management requires a focus on outcomes within a context of the whole organization.

The first step towards developing measurements of training effectiveness is to be clear about what the training program is trying to accomplish. Training should be developed in response to a problem that has reached an unacceptable level. And this problem needs to be defined in a way that can be measured. An intuitive sense that a certain training course would be "nice" to do or that workers need to know more about something, will not produce a measurable

outcome. So, it is important to try to focus on defining specific problems, and on asking why a solution to this problem would be important to the organization? Are certain worker skills needed to bring about this solution? Can training develop these skills? For example, there is an operations problem of too many backing-up accidents. Asking why the organization needs to solve this problem might produce an explanation that the accidents are generating excessive repair costs and downtime. Asking why is training needed might produce the answer, "To reduce these accidents." Now defining the measurement of effectiveness for this kind of training is easy: measure backing-up accidents and seek reductions. This performance improvement can be related to financial data by asking which costs more - the accidents or the training it takes to reduce them? By how much? This evaluation process produces information that will interest management.

Not all training benefits, of course, can be measured in euros, just as not all decisions by a board are driven by the bottom-line. Nevertheless, the principle still applies. It is important to understand when developing measurements of effectiveness what objectives - stated or unstated - motivate decisionmakers in the organization. Accidents, for example, may be a problem for one agency, not because of cost, but because of public relations. Accidents are tracked in the press and board members see them as negatively impacting a campaign to get riders to view transit as a safer way to go, or management is in the middle of negotiating a new policy agreement with an insurer and needs to demonstrate that the agency really puts its money where its mouth is regarding safety.

In the maintenance department, trainers might demonstrate effectiveness by relating training to Mean Time Between Failures (MTBF), a measurement that reflects the average number of hours between breakdowns. This may be done for a component or for whole vehicles. Not all systems collect this data, so it is important that trainers understand how the maintenance department as a whole tracks its performance - miles between roadcalls, miles per gallon of fuel, even hours of downtime for a revenue generating vehicle. Find out what kind of data a particular department does collect, and why. Then, if training can impact these measurements positively, the training department can produce strong arguments for maintaining the training budget in times of reduced allocations.

At the Metropolitan Atlanta Regional Transit Authority (MARTA), for example, 50 percent of non- scheduled bus maintenance work orders are for electrical problems. Reducing this percentage would create greater fleet availability, meaning more revenue generating vehicles in service or retirement of less efficient vehicles, as well as greater mechanic availability. To address this, MARTA has initiated a series of six courses to produce about 15 electrical specialists with the ability to diagnose electrical systems quickly, a process that currently takes up to three days to accomplish. If this crew of specialists produces fewer vehicles out of service for non-scheduled electrical problems, then the training is demonstrably more effective.

7.5.9. Measuring the Return On Investment (ROI)

By calculating every possible effect of the training on cost reduction and supposing that the difference before and after is due to the training sessions, we can calculate a ROI. An example of this simplified system is given by Exhibit 7.1.

Objective: _____

_____

Audience: _____

Returns measured over: _____ One year _____ Other _____

_____

PART 1: Calculating the Revenue Produced by Training

Option A—Itemized Analysis

Increased sales:	_____	Additional sales per employee
	× _____	Revenue (or margin) per sale
	× _____	Number of employees
	= _____	Revenue produced by training
Higher productivity:	_____	Percent increase in productivity
	× _____	Cost per employee (salary plus benefits plus overhead)
	× _____	Number of employees
	= _____	Revenue produced by training
Reduced errors:	_____	Average cost per error
	× _____	Number of errors avoided per employee
	× _____	Number of employees
	= _____	Revenue produced by training
Client retention:	_____	Average revenue per client
	× _____	Number of clients retained
	= _____	Revenue produced by training
Employee retention:	_____	Average cost of a new employee (training plus lost productivity)
	× _____	Number of employees retained
	= _____	Revenue produced by training
Other:	_____	_____
Total revenue produced by training:		$ _____

Option B—Summary Analysis

_____	−	_____	=	_____
Revenue After Training		Revenue Without Training		Revenue Produced by Training

PART 2: Calculating the Return

_____	−	_____	=	_____
Revenue Produced by Training		Cost of Training		Total Return on Training Investment

Source: James Hassett, "Simplifying ROI."

Exhibit 7.1: Calculating the ROI of a Training.

7.5.10. Measuring Training by Comparing Its Outcome with Other Options

A somewhat different approach to measuring training focuses on relative paybacks from various kinds of investment, for example comparing investments in human resources (training) with investments in new equipment (capital expenses) in terms of some measurement of value to the organization. Although an investment decision is rarely an either/or decision, the results of a recently completed study by the University of Pennsylvania's National Center on the

Educational Quality of the Workforce (EQW) for the US Bureau of the Census provide food for thought as well as grist for the mill.

While it seems easy to measure the economic impact of an investment in capital stock or new technology, what is the rate of return for an investment in worker education and training? Is there a productivity advantage for organizations that either seek to employ better educated workers or that spend the effort (and expense) to educate current employees? The EQW sought answers to these questions by trying to document the relative contributions of workforce educational level and increases in capital stock to overall organizational productivity. Their recently completed survey of 3000 US manufacturing and service organizations employing 20 or more workers revealed educational level to be the more important contributor. According to the EQW report, a 10 percent increase in the book value of capital stock improves a company's overall productivity by, on average, 3.4 percent. By comparison a 10 percent increase in the educational level of workers in a company (roughly equivalent to one more year of school) is associated with an average 8.6 percent increase in output. For the non-manufacturing sector, the effect of educational improvement climbs to 11 percent on average, nearly three times the boost observed for capital investments.

Measuring the effectiveness of training in terms of productivity improvement is not yet common practised, but it can provide a powerful tool for trainers. The problem with it is that is does not only measure the training itself, but everthing that interacts with the trainee too. Just think about the motivation of the trainee, his manager, the interaction with his physical envirroment, … However, developing the habit of looking for quantifiable, referential ways to evaluate training programs will, in the long run, help ensure not only the budgetary health of the training program but also encourage its continuous improvement (Van Doren, 1995a and Van Doren, 1995b).

7.6. The Value of the Output Model

7.6.1. Simplicity

The output model is a fairly straithforward and simple model. A limited number of steps (5 to 6) make it possible to measure the output of the training and thus its efficiency and effectiveness. Although designing the tests may range from simple to complex, the model has a wide range of applications.

7.6.2. Speed

The time needed to set up this kind of measurement is fairly short. Not only because its simplicity, but also because there is a wide application. Whatever training we are given, there will be something that or someone who can give we a great deal of information about the test, or even large, useful parts of the test itself. So when in-depth interviews or complex simulations are not necessary, we may develop the test in parallel with the course. Sometimes, we may even prefer to first develop the test and build the training around it.

7.6.3. Time Lag

The time lag is the weakest point of this model. Because the participants are tested at the end of the training, this model gives no clue on the preparation phase and during the sessions. This disadvantage grows with the duration of the training. For the trainer, nor the trainees there just no time to correct. The only things left to do are:

- to debrief the trainee and hope he will learn from his 'mistakes';
- to do the whole training over again;
- to improve the training for the next session.

Of course it is possible to divide the training into modules and to do the testing at the end of each module. But, then the above is true about each separate module. Performing more test should theoretical make it possible to correct while training, but this will slow down the speed and increase the cost. The difficulty is finding the right balance between testing and correcting.

Testing at the beginning of the session (cfr. Step 1: the pre-test) does not create the ability to correct the training, it only gives us the opportunity to adapt once to the entry level of the participants.

When the desired effect of the training is a change in habits, and this takes time, then the output model loses its appeal. As an Air Force instructor in TQM tools I compared the results of a post-test directly after the 3 days session and 6 months later. The results of the after session tests showed the participants where willing and able to use the method and the tools offered during training, the tests 6 months later told that they had lost interest and ability. I came to the conclusion that the late test did not measure the TQM sessions, but the 'un-training' in the organization. Because 6 months of 'un-training' had a greater effect than the 3 day session, the results where equal or sometimes worser than the post-tests.

7.6.4. Relation with the Cause (diagnostics)

Measuring at the end of the line gives no hint on the cause, it only tells what went wrong. To find the hows and whys other tools and more time is needed.

7.6.5. Depth

There is the possibilty to test in different levels of understanding or ability, but the test themselves only scratch the surface.

7.6.6. Intern - Extern

The training organization and the company may use the output model because the test are performed on the borderline between the training and the work envirroment.

7.6.7. Group - Individual

Again everything is possible. We can design the tests on a individual or group level, and even combinations are possible. It is just a question of what we want to achieve by training.

7.7. Conclusions

Multi-variance analyses (see Exhibit 7.2) of the effects of training on rates of improvement in productivity of new hires (Bishop, 1991) have found that:

- Hours devoted to each type of training had very similar effects on productivity growth during the first year or so on the job. This implies that lower cost forms of training, informal training by coworkers and training by watching others do the job, had higher benefit cost ratios than informal training by management and formal training.
- The productivity growth effects of formal training were bigger at large establishments.
- When training was reported to be highly general, training had a larger effect on wage growth than when training was reported to be specific. Nevertheless, training that was reported to be entirely general had much larger effects on productivity growth than wage growth implying that the labor market treats this training as if it were at least partly specific to the firm .

This finding suggests that, while most formal training programs achieve their objectives of significantly improving job knowledge and job performance, a significant minority do not (Burke et al., 1986).

Although of great value the output model gives no clue about why these minority does not improve job knowledge and job performance, nor does it gives opportunities to improve the quality of training.

	Sales	**Profes sional**	**Mana geral**	**Not Retail Sales**	**Retail Clerical**	**Blue Collar**	**Service**
Hours Spent in Training in First 3 Months							
Watching others do the job	60.0	65.0	82.8	39.2	50.4	48.1	32.7
Formal training programs	9.1	12.1	23.9	8.2	13.5	9.1	5.7
Informal training by management	76.6	80.4	71.8	48.5	54.6	49.3	35.1
Informal training by co-workers	31.8	23.0	33.9	23.9	26.2	26.8	16.7
Investment in Training Time	293	295	350	185	235	200	130
Weeks to become fully trained if no previous experience	11.1	13.4	9.2	6.5	6.7	9.0	3.4
Increase in Reported Productivity (%)							
Between first 2 wks. & next 10 wks.	28%	32%	50%	30%	40%	32%	28%
Between first 3 mo. & end of year 2	38%	33%	56%	25%	32%	23%	17%
Increase in Real Wage in First 2 Yrs. (%)	5.0%	7.7%	22.6%	9.7%	11.5%	11.5%	3.7%
Number of cases	95	112	76	203	429	649	334

NOTE: Tabulation of the EOPP Employer Survey. The sample is limited to jobs for which all the necessary questions on wage rates, training time, and productivity were answered.

Exhibit 7.2: Training and Productivity Growth of Typical New Employees by Occupation (Burke et al., 1986).

8. The Course as the Product (or Service)

"School does not make us anything. Life makes us what we are."
Kol Ballon in Tom Clancy's Op-Centre 'Games of State'

8.1. Introduction

The approach of the student as the product of training does not help much when designing a new course. For this we need to look at the course itself in stead on the effect on students. This is the more true when we consider short courses because the training itself has only a supporting impact on the behavior of the participant. His stay in his work enviroment is much more determining than the few hours in the classroom.

We cannot pick a course and look at it. If we want to design or improve a training we have to consider it as a service rendered to our customer. And this service, as services in general, has some special charateristics compared to 'normal' products. A good understanding of these differences is important to find good measurements.

8.2. Assumptions

The basic idea behind the 'the training as a service' model is that good training is a training that satifies the customer. Measuring the quality of the training then comes down to comparing the customers' desires with their appreciation and may be translated in a rate of satisfaction.

8.3. Service and Training

Before discussing the problems facing training we must understand the difference between a product and service.

A service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. As shown in Exhibit 8.1, there are four major characteristics differentiating a service from a product: intangibility, inseparability, variability and perishability (Kotler, 1994).

Services are (essentially) **intangible**. They are an experience. Where most products can be examined before purchase, services lack this physical property. A service never "exist." This creates an uncertainty for a possible customer. The perceived risk by customers is higher. Customers are less easily convinced of reliability than with a tangible product. To set his mind at

rest he starts looking for indirect signs of service quality. One of the elements that forms the basis for his judgment is the people working for the firm. If these employees do not reflect the qualities of the service the customer will buy elsewhere. So, the trainers must look professional and knowledgeable.

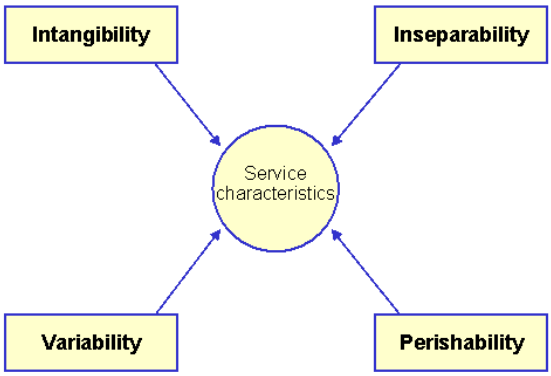


Exhibit 8.1: The Four Major Characteristics of a Service (Kotler, 1994).

Like in most services, trainings are produced by an employee, that is the trainer, and frequently in the presence of the customer, the trainee. The trainer as a production staff is the customer contact, they are **inseparable**. There is an influence of both, which makes the customer-supplier relationship highly important. This demands specialized interpersonal skills.

There is a higher influence of the competence of the employee on the quality of the service. This person to person **variation** of the outcome makes that customers prefer some employees. Not only the person causes variation but also the place and moment. Quality is variable - and customers tend to use Price as an indicator of quality.

Unlike products, services **cannot be stored** for times of high demand. To handle fluctuating demands employees most be flexible in time, place and function.

The difference between a product and a service may be quiet clear in theory, but in practical life this is seldom the case. It is more a spectre in all the possible degrees from a pure product to a pure service (Exhibit 8.2).

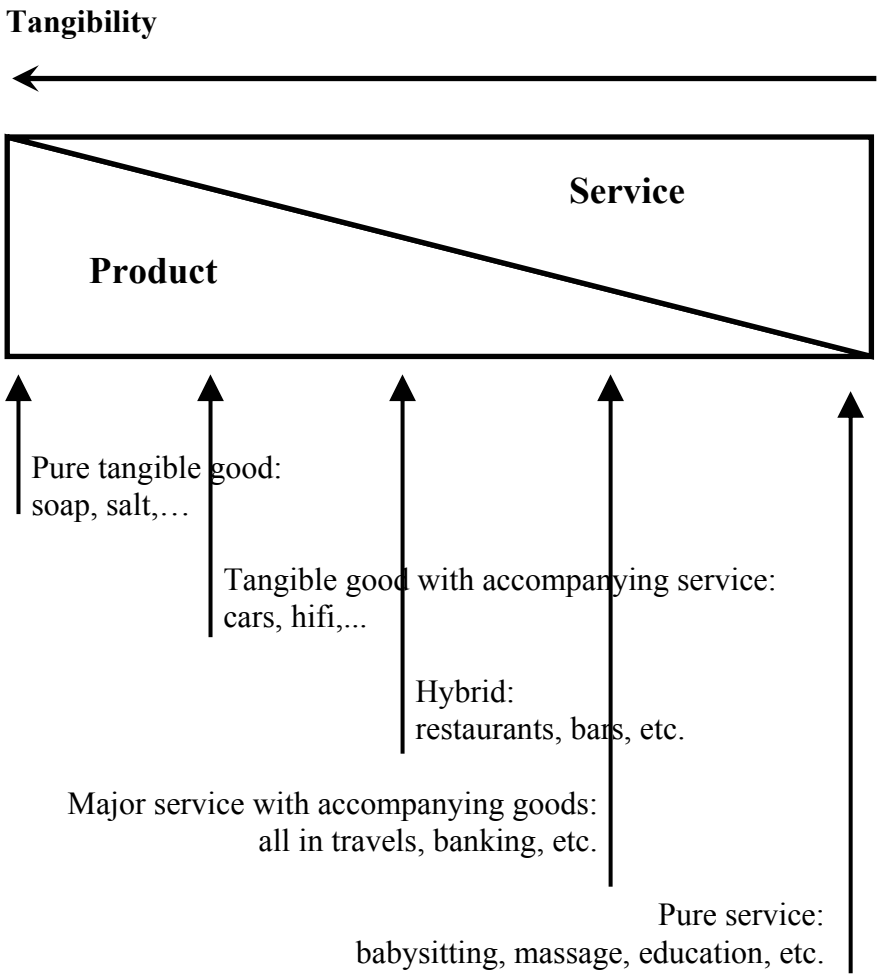


Exhibit 8.2: The Range from Product to Service.

8.3.1. Attacking Intangibility

A training is intangible, so the organization finds a way to 'materialize' the training or concept for the customer. This materialization must overcome the lack of a physical product and must be a tangible representation like handouts, a textbook, a certificate, …

Because of the lack of personal appreciation by the consumer, the training organization must give the trainee something to grasp the concepts mentally. The use of visual symbols in the advertising may be a good tool to be better understood by the customers.

Another way to tackle this feature of services is to focus on the service provider that is more tangible than the service. The advertising a good education may be done by showing the

infrastructure of the school, an interview of a professor, … The look at the provider will give the consumer an idea of the quality of the service. The service being offered is made more tangible by showing the provider (see also 5.3.2).

8.3.2. Attacking Perishability

Services need providers and providers must be ready anytime because service cannot be stored or taken in inventory. A not used provider like a waiting trainer means lost revenue. A waiting provider means that the 'production capacity' excesses the demand and this due to an inaccurate forecast. Only a steady and foreseeable demand can be fully covered by an organization without any excess of staff. The best way to avoid service excess is in increasing the flexibility of the providers and to increase the predictability of the demand.

8.3.3. Attacking Inseparability

A training is consumed the same time as it is produced (new technologies like CAT is changing this). Simultaneous production and consumption means that services must be directly delivered to the customer and that a quality check is almost impossible. The quality of the service depends heavily on the provider.

Not only quality depends on the provider but also the impression the consumer gets before (and even during) buying. Attention must be paid that the 'production' area reflects the image the consumers must have. An university must look like one. The fact that the 'production facility' must be in the neighborhood of the consumer and cannot be centralized makes this hard to do and to control.

8.3.4. Attacking Variability

Most training providers are people, thus the quality varies from provider to another, and from one moment to another. The difficulty of standardization means that a customer is never sure to be satisfied even when he was it the first time.

Due do this variability a potential buyer face great uncertainty and he will try to reduce that risk. This customer will very likely seek a friend's advice for selecting the right service, like asking one's opinion before seeing a movie. This means that the organization's marketing department must stress on word-of-mouth publicity.

Providing warranties may reduce the risk of the potential buyer. This can be by giving the customer the possibilty to leave before a certain hours at no charge if he is not satisfied by the training.

Marketing must also take care of the loyal consumers. It must provide the organization with a good relationship with its customers so that this relation can resist the attacks of the competition and occasional low performance so they come back to buy again and again. An important tool for this is an well-organized complaints office or call center.

8.4. The Customer of a Training

The customer plays an all-important role in the evaluation of a service. Identifying the customer makes it possible to focus on the key person. For a process/service output there exist four types of customers:

- the owner of the company;
- the purchaser;
- the user and;
- the trainee.

Although the trainee is the real end customer, it is quite possible the other three types have more influence in the purchase of the training. A good course tries to meet the needs of all types.

Like with every typology, in real life there is a coexistence of the types. This is the more true the smaller the company. In a large company the three types may be found in their different departments: the owner in the direction board, the purchaser in the purchase office and the user and the trainee on the workfloor.

8.4.1. The Owner

He is the person that pays for it (or represent those people), so his main interest is the cost of the training. The costs themselves are important but the most important is the return on investment ratio. The owner is prepared to pay for something as long as he is convinced of the possible profit. Because the major part of the profit is determined by the small number of high budget investments, it is not uncommon that the owner only is personally interested in those purchases.

8.4.2. The Purchaser

The main tool of a purchaser is his budget. To control this budget, meaning to use it 100% with a maximum return, is his goal. To do so he must get the lowest price possible. As a consequence his main interest is the price of the product. In most cases this results in the purchase of the the lowest price training.

Because even the training with the lowest price must be the desired one, he is interested that it meets the specifications. This conformity to specs is of the marginal type, meaning the moment the specs are met everything is OK. His own contractual specifications have a greater impact on the decision than the contant specs.

8.4.3. The User

As the final user of the trainees he is not interested in the concerns of the other two types. He is the guy that will work with the trainees (see previous chapter) and his needs are totally different from the owner's and the purchaser's. Because he does not have the money, his impact on the purchase decision is minimal, that is in a traditional big company.

His concerns are :

- a on time delivery (ideally Just In Time learning). He needs the training on time to do the job;
- the training most be suited for use, even if that means not conform to specifications.
- because he takes pride in his craftship, he expects that the training is state of the art. He does not like to train with oldfashion looking material.

8.4.4. Integration

Because the owner is the most powerful customer he will have the final decision, surely in big investments programs, in a traditionally led company. Meanwhile the guy that has to work with the product has almost no impact on the decision. True he may give his input in the form of specifications, but as a customer he does not desire variation between two limits. He has needs and to transform them into specifications is hard to do.

8.5. Methods of Measuring

8.5.1. Evaluation Forms

The simpliest form to measure the satifaction of a customer is to let him fill out a evaluation form. It is common to find trainers asking program participants to provide an evaluation, for example, by rating a training experience to a particular job (Will we use this training on our job?) or participant's own learning objectives (How well did this training meet our expectations?) on a scale from "poor" to "excellent." While this strategy provides useful internal feedback to the training department regarding how to improve its presentations, it rarely contributes to the kind of information a manager asks for when deciding how to allocate funds within an organization. Even trainers consistently rated "excellent" by their customers can lose funding unless their "excellence" is shown to contribute to the achievement of organization-wide objectives.

Another question is the value of these seminar evaluation forms. In the Kirkpatrick model, the seminar evaluation plays a simple but crucial first step. Seminar evaluations are designed to measure whether the seminar participants liked the training program. This is important, because the Kirkpatrick model is a cumulative model (see paragraph 11.3.1); each step of the model builds on the prior step.

In other words, if step one does not make sense, there is probably no reason to move on to step two. In our case, if the seminar participants do not like the training program, the likelihood of the participants employing the tools and techniques presented is greatly diminished.

Conversely, if they did like the training, they are more likely to be supportive of the ideas presented and consequently use them in the field.

8.5.2. Importance-Performance Analysis

A simply evaluation form treats every question as equal. The importance-performance analysis tries to concentrate on the important issues. Like most services, training can be usefuly rated according to its customer importance and company performance. Comparing the two gives four sectors:

- Sector 1 "Desinvestment" : although the customer is more then satified with the performance he attaches almost no importance to it. The sector shows that a minor service element is being performed in an excellent manner, a case of possible overkill. The organization may consider to desinvest the effort if there is any.
- Sector 2 " No action": although the customer may find this element important, he is overly satified with the performance. The sector shows minor service elements that are being delivered in a mediocre way but do not need any attention, since they are not very important. These are strong elements of the organization and do not need extra care.
- Sector 3 "Action": the customer find this element important, but he is not overly satified with the performance. Further investigation is necessary and action must be taken.
- Sector 4 "Urgent action": the customer find this element very important, but he is not satified with the performance. The sector shows important service elements that are not being performed at the desired levels. Further investigation is necessary and action must be taken. This is urgent because he may start complaining.

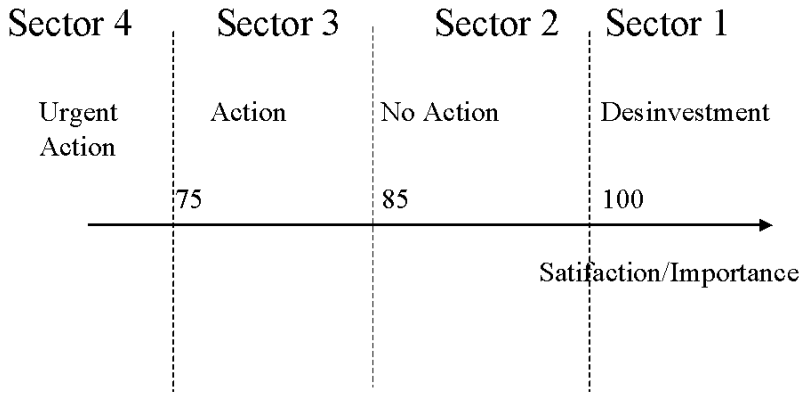


Exhibit 8.3: Sectors in Importance-Performance Analysis.

Sometimes Exhibit 8.3 is presented as a circle divided into four quadrants. A step further is adding an axis with the number of people that find the element very important (Exhibit 8.4). By doing this it is possible to make a distinction between general group actions (zones 1 and 2) and specific type of customers actions (zones 3 and 4). Measuring training elements according to their importance and performance tells us where to focus our efforts.

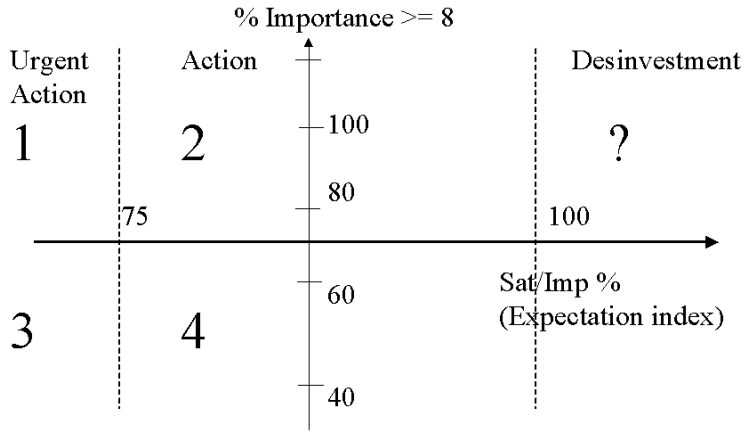


Exhibit 8.4: Further Importance-Performance Analysis.

8.5.3. The SERVQUAL Model

One of the major ways to differentiate a training organization is to deliver consistently higher-quality service than competitors. The key is to meet or exceed the target customers' service-quality expectations. Their expectations are formed by their past experiences, word of mouth, and service-firm advertising. The customers choose providers on this basis and, after receiving the training, they compare the perceived service with the expected service. If the perceived service falls below the expected service, customers lose interest in the provider. If the perceived service meets or exceeds their expectations, they are apt to use the provider again.

According to Kotler (Kotler, 1994) Parasuraman, Zeithaml, and Berry formulated a service-quality model that highlights the main requirements for delivering the expected service quality. The model, shown in Exhibit 8.5, identifies five gaps that cause unsuccessful service delivery. They are described in the following paragraphs.

1. Cap Between Consumer Expectation and Management Perception:
   Management does not always perceive correctly what customers want. Managers may think that trainees want better textbooks, but trainees may be more concerned with trainer's knowledge.

2. Cap Between Management Perception and Service-Quality Specification:
   Management might correctly perceive the customers' wants but not set a specified performance standard. Managers may tell the trainers to give good training without specifying it quantitatively.

3. Cap Between Service-Quality Specifications and Service Delivery:
   The trainers might be poorly trained or overworked and incapable or unwilling to meet the standard. Or they may be held to conflicting standards, such as taking time to listen to trainees and seeing the contenu.

4. Cap Between Service Delivery and External Communications:
   Costumer expectations are affected by statements made by company representatives and ads. If an organization brochure shows a beautiful classroom but the trainee arrives and finds the room to be cheap and tacky looking, then the external communications have distorted the customer's expectations.

5. Cap Between Perceived Service and Expected Service:
   This gap occurs when the consumer measures the company's performance in a different way and misperceives the service quality. The manager may keep visiting the classroom to show interest, but the patient may interpret this as an indication that the trainer is no good.

The same researchers found that there are five determinants of service quality. These are presented in the order of their importance as rated by customers (an allocation of 100 points):`

- Reliability: The ability to perform promised service dependably and accurately. (32)
- Responsiveness: The willingness to help customers and to provide prompt service. (22)
- Assurance: The knowledge and courtesy of employees and their ability to convey trust and confidence. (19)
- Empathy: The provision of caring, individualized attention to customers. (16)
- Tangibles: The appearance of physical facilities, equipment, personnel, and communication materials. (11)

Various studies show that excellently managed service companies share a number of common practices (Kotler, 1994).

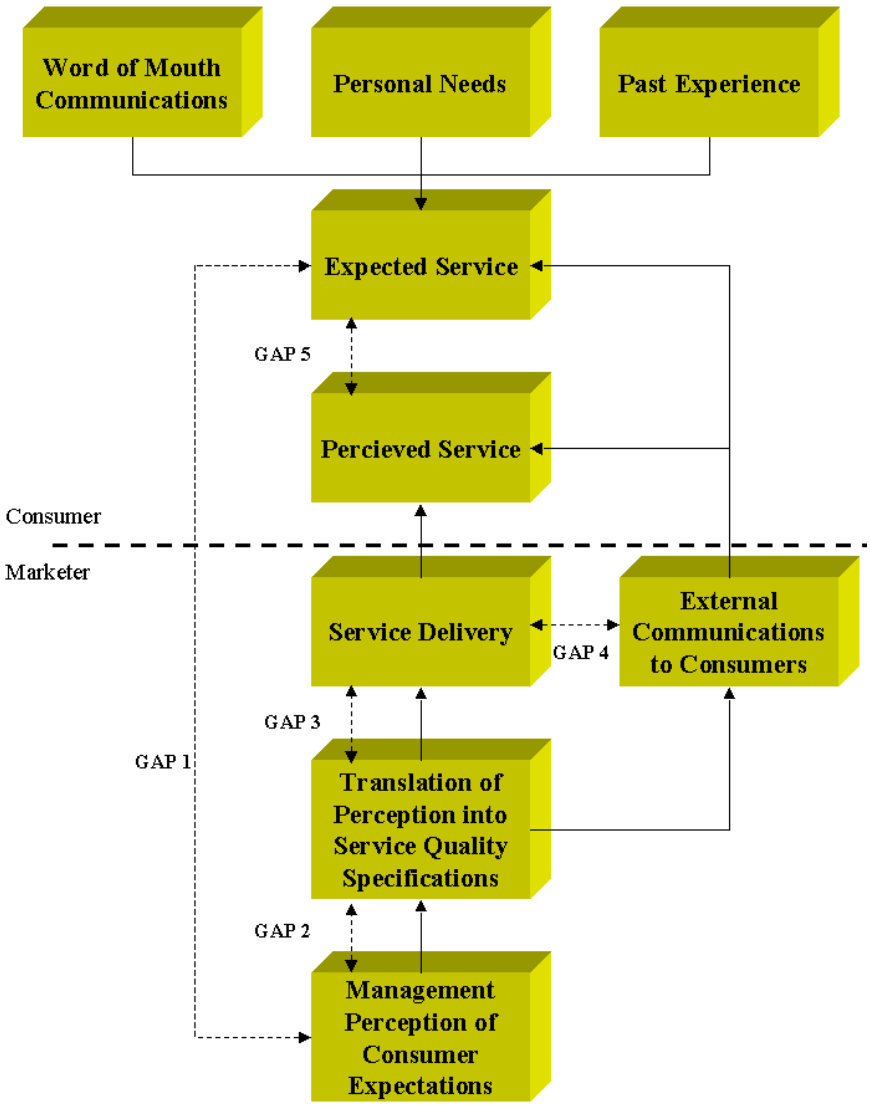


Exhibit 8.5: The SERVQUAL Model (Kotler, 1994).

8.6. The Value of the Service Model

8.6.1. Simplicity

With increasing analytic depth and understanding of the customer's wishes the method's complexity becomes bigger. On top of that the difficulty of interpreting the results and acting accordingly keep up the pace. Seldom the data is readily available and so it demands extra effort and budget to collect it.

The inherent danger of losing one's purpose by letting the voice of the customer (mis)guiding the training effort can only be countered by a strong preparation and a good mission orientation.

8.6.2. Speed

The acquisition of the peticuliar knowledge and the necessity to (re)design and adapt the measurements to our organizational needs results in a time lapse between concept and first useable data. But even after the tools are tailored to our wishes there still the time needed to transform the raw data into useful information. Only powerfull hardware, special software and experience can reduce this treatment delay.

8.6.3. Time Lag

Once the measurement is designed and tested the results may be very fast available. It is just a matter of a speedy reading of the raw data, the use of adapted software and an experienced person ready to interpret the analysis.

8.6.4. Relation with the Cause (diagnostics)

The questions itself may prone to the possible causes of certain dissatisfactions. They are very useful to find the negative elements, but are fairly useless or at least harder to use for positive elements. A customer has more eye on what is going wrong, and he may overstress this element, then on what is going fine.

Remember that the answers, even expressed as figures, stay opinions of people on a certain subject and may not be used as hard data.

8.6.5. Depth

Theoretical it is possible to ask the trainee any kind of question to find the cause of his disatisfaction. When using evaluation forms or interviews there are practical limitations:

- The number of question one can honestly and concentrated answer is limited;
- The questions may be differently understood;
- Detailed questions may influence the responses.

Once the trainee has filled out the form, it is hard to call him back for further clarification. This means we have to wait till next session to go deeper.

8.6.6. Intern - Extern

Although designed for extrenal use, the service model rests very flexible and easily adaptable to internal use.

8.6.7. Group - Individual

The idea is to treat the information on a group level. Because the collection of data starts at a individual level this entry can give data on individuals. Nevertheless, caution may be at its place. The knowledge that the data is analysed at individual level may decrease the honesty of the answers. If the organization has this intention it is wise to inform the trainees of the why's.

8.7. Conclusion

Since we cannot pick a course and look at it. The measuring of training needs a different approach as fabricating a product. The solution to design or improve a training is to consider it as a service rendered to our customer. A good understanding of the differences between product and servivce opens possibilities to measures new elements of training.

Measuring the quality of the training becomes a comparing of the customers' desires with their appreciation. This helps us to design and 'produce' training sessions that satify our customer and by doing so we underline the basic idea behind the 'the training as a service' model.

9. The Training as a Process

"If the process is right, the results will take care of themselves!"
Osada

9.1. Introduction

So we see that in trying to find out what good training and bad training are we must look, among many other things, at the results of the training and the conditions under which the training took place. Of course, it would, be easy to say that good training is simply the kind of training that produces the results we want. But this wouldn't help us much if we were trying to learn how to train others, or if we want to start a new training. What we need to do, then, is to examine some methods and see how they work. Further, we need to use our own imagination and see whether there are better ways of doing what we are trying to do. After all, if we know the job well enough to train others, we ought to be very well suited to figuring out ways to improve the training method.

9.2. Assumptions

If we control the training process and this process is well designed, then the result will be a quality course and a quality training. The purpose it to control every critical part of the process and so to guarantee and control the result before the end it is too late.

9.3. What is a Process?

A process is a set of interrelated or interacting activities, which uses resources to transform inputs into outputs.

NOTE 1: Inputs to a process are typically outputs of other processes.

NOTE 2: Processes in an organization typically are planned and carried out under controlled conditions to add value (ISO 9000:2000).

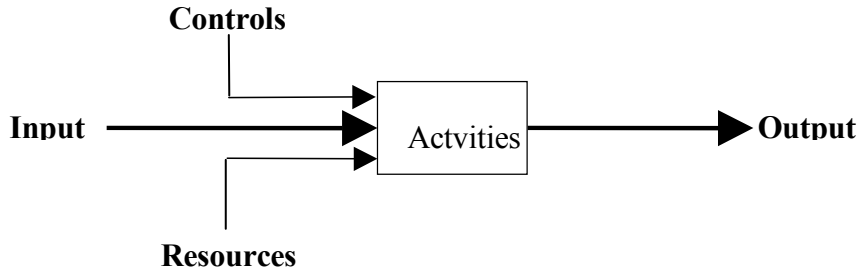


Exhibit 9.1: Schematics of a Process.

The set of interrelated or interacting activities may be a set of processes themselves. Thus, a macro-process consists of many micro-processes. These so-called micro-processes can be smaller macro-processes including other micro-processes. These can be in return yet smaller macro-processes. For an enterprise the breakdown starts at the top with a few, according to the EFQM six to twelve, core processes. These processes are split into a few micro-processes. These then are split into smaller processes, and so on.

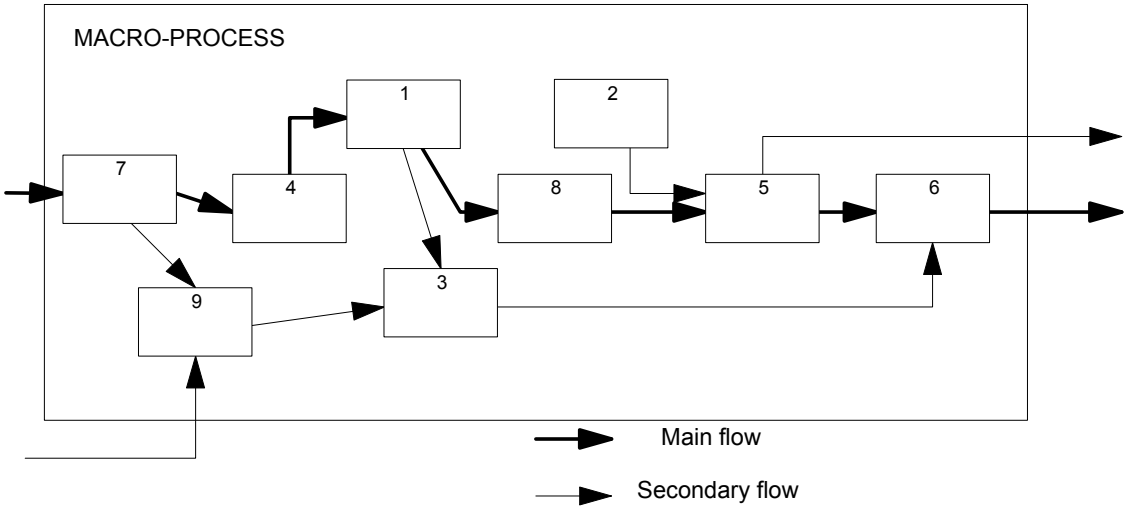


Figure 1.2 : A Macro-Process split up into Micro-Processes.

9.3.1. Different Kinds of Outputs

Products and services can be classified in macro and micro-process outputs. The outputs of the macro-process around which a company is build, the key or core processes, are commonly called the key products. These products are the reason why customers come to the company.

If we descend to the level of micro-processes, there we also find outputs. These products (in the meaning of real products and services) do not serve the external customer but the internal one. These products form the basis from which the next micro-process can produce a product conform to the external customers needs.

So, the same way we talk about macro and micro-processes, we can talk about macro and micro-output, whereas the macro-output serves the external customer and the micro-output serves the internal one. Of course a micro-output can become a marco-output the same way it happens with a process.

9.3.2. Other Classifications

Besides a classification according to the division in macro and micro-processes there exist other possibilities, but one method of classification does not rule out an other

In every company there exist a few processes that form the reason for doing business. These processes are called the key or core processes. The outputs of those processes are in the same way called the key products. They are the products that make the most money for the firm. In terms of a pareto analysis, they are 'the essential few'.

The other products, 'the useful many', form the secondary output. They are the results of the secondary processes. Although they have their importance they are not essential for the firm to survive.

To make the production of these products possible there is a need for support. This is the reason for the existence of support processes. The outputs of these processes are support products.

As the micro processes can become macro processes when one changes his point of view, so a support output can become a key product p.ex. In the Air Force a well-maintained aircraft is a support product for fulfilling a mission, but for the Logistic branch the same aircraft is a key product!

A last form of classifying an output is product (in the strict sense of the word) and a service. This classification is important because the treatment (measuring, investigation, experimentation, ...) of it differs.

While TQM, and its focus on processe, mainly is an operational management aiming at the efficient use of processes, therea good Marketing Concept must aim at the effective use of the resources. Exhibit 9.2 shows the result of the combination of the two.

		Product	
		Ineffective	Effective (Marketing Concept)
Process	Inefficient	Goes out of business quickly	Survives
	Efficient (TQM)	Dies slowly	Does well Thrives

Exhibit 9.2: TQM and the Marketing Concept.

9.3.3. The Training Process

Although Deming's view of a production system is easily applied to manufacturing organizations it can be applied to service organizations as well. The inputs to the system are students, faculty, support staff, and so on. Outputs include people with new knowledge and abilities and research findings that are useful to organizations (Exhibit 9.3). The customers include the business community, graduate schools, society, students, and families. Processes include teaching, student counseling, and scientific research. Similar to manufacturing systems, educational systems can conduct customer research for evaluation and improvement. For example, by observing students, analyzing test results, and using other sources of student feedback, instructors assess their effectiveness and develop strategies for improving it. Some colleges and universities survey their graduates and their graduates' employers to assess consumer satisfaction with their product. Such feedback helps colleges, departments, and faculty members to redesign curriculum, improve course content, and improve facilitating services such as academic advising. A similar model could be developed for an individual classroom (Who are the customers and suppliers? What are the key-processes? What types of consumer research might be appropriate?).

The definitions of quality that apply to manufactured products apply equally to service products. The very nature of service implies that it must respond to the needs of the customer; that is, the service must "meet or exceed customer expectations." These expectations must be translated into performance standards and specifications similar to standards of conformance that direct manufacturing activities.

The production of services differs from manufacturing in many ways, however, and these differences have important implications for quality management. The most critical differences are described in the previous chapter.

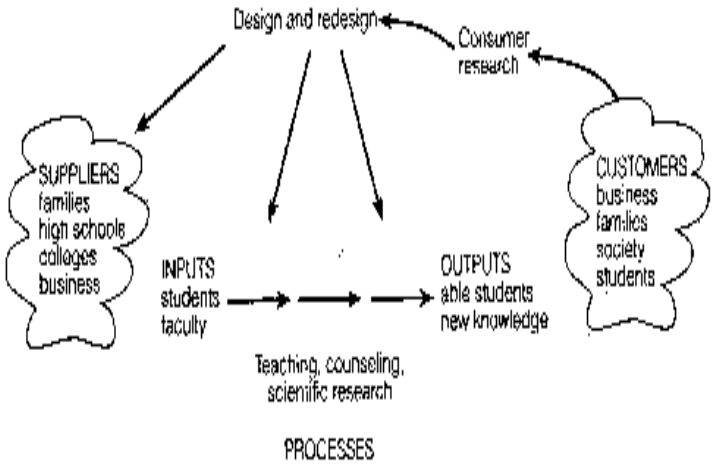


Exhibit 9.3: Deming's View of a Production Process Applied to Training Organizations (Evans et al., 1996).

9.4. Measuring the Process

9.4.1. Input versus Output

On a job and personal related level, we must first analyze the work to know where the employees are now. It doesn't make much sense to start our training unless we know where the employees are when we start to teach them. If they are too far ahead of where we are starting, they will become bored and the training will be wasted. If they are too far behind where we start, we will leave them in the dark, and again the training will be useless. The analysis will tell us exactly where they are so far as job performance is concerned, although it won't tell us how far they will be able to go in what length of time. It will tell us what they are doing right and what they are doing wrong. The job analysis will tell us where we want them to be when the training is over. The difference between the two is what they need to know.

Training is the difference between the expectations (job analysis) and the present skills level (individual skill analysis). Since the objectives will tell us what the trainees will be able to do at the end of the training, they encompass both the present skills and the deficiencies, if we feel we can overcome all of these deficiencies in our training effort.

This type of measuring was already treated as a part of the extended output model, but its place is really justified in the process model. The extra advantage is that by using the concept

of micro processes we can define and measure the skill level at every micro process and compare it with the preplanned expectation. In doing so, we can adjust the next micro-process in order to reach the desired level. At the end we increase our chances to attain the final expectations by continuously adjusting every activity.

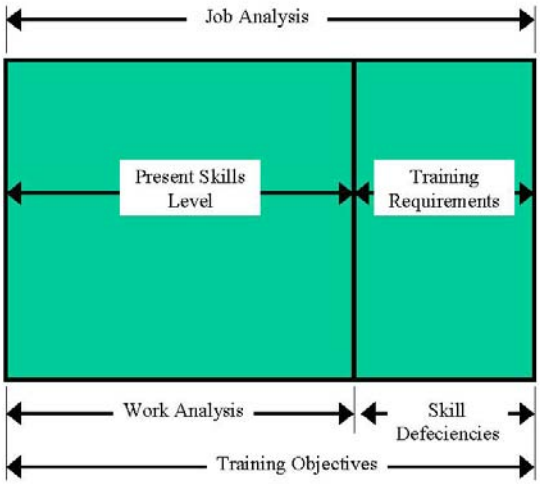


Exhibit 9.4: The Training Program Model (Randall et al., 1996).

9.4.2. Breaking up the Objective

The distinction between macro and micro level outputs may be used as the basis far process improvement method. One of the first steps is to fix the desired improvement of the process by writing down the new performance level of the process, in other words the new standard for the output. This output is measured with a so-called Quality Indicator (QI_i).

After an in depth analysis of the process the difference between the actual and the desired performance is treated as a problem or an effect (ΔQ_i). To bridge this valley between the actual and the desired status we ask the following question: "What are the needed performances of the micro-processes so that we can reach the desired performance of the macro-process?" Every difference between the needed and the actual performance of a macro-process is treated as a cause for the earlier stated problem. These causes and the problem (effect) are visualized with the aid of an Ishikawa diagram and ranked with a Pareto analysis. The performances of the micro-processes are as the macro-process measured on the output. The measurement that serves as an indicator is called the Process Indicator (PI_{ij}).

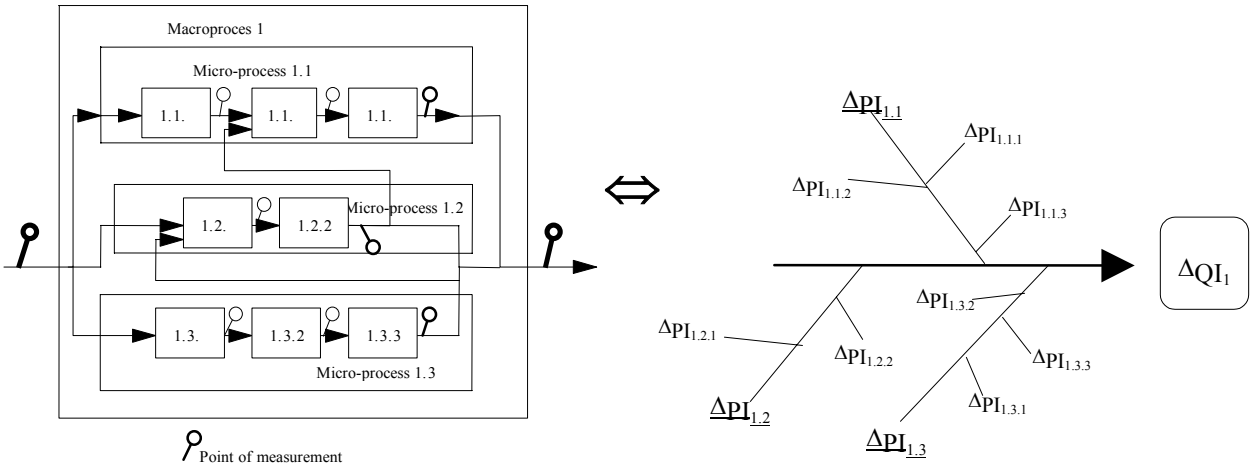


Exhibit 9.5: From a Macro-Micro Division towards a Cause and Effect Diagram.

The purpose is to use the macro objective as a tool to steer the smaller parts of the process. All those bits of training objectives become objectives of every trainer.

9.4.3. Methods and Resources

Besides the comparaitions between input and output; and the possibility to desent with the overall objective to the level of the individual trainer the process model makes throws a light at the method of training and the used resources. Because "a process is a set of interrelated or interacting activities, which uses resources to transform inputs into outputs"; these activities and resources influence the quality of the output. So it is logical to look closer at the activities and resources.

When we use good and proven methods we increase the possibility to produce quality. Not only we must foresee the methods, but we must also assure that the trainer understands and uses them. There will be some sort of system to assure us that the trainers are doing the job we asked them to do.

Talking about trainers doing their job, we must consider the quality of the trainer himself. We must select trainers who are well trained, who have the necessary knowledge, who have the will and ability to give a quality training, …

The trainers being our principal (human) resources, there certainly not the only ones. Good handbooks, slides, black- or whitebords, … are also important. We cannot expect a training to perform at his top when he lacks the necessary equipment. So we must control every aspect of the training session.

The first step to measure the training process is to determine the necessary methods and resources to do the job. After fixing these baselines we can set up the point of measurement by:

- Checklists:
  verifying if the necessary equipment is available. The degree of availability can be a measurement of process quality;
- Auditing:
  a specialized auditor goes around looking and listening to the trainers and trainees. He evaluates his findings against the the baseline he is handling. At the end he makes a report with his conclusions and recommandations.
- Benchmarking:
  comparing the micro-process performances with other similar processes. The correct word is similar processes because it is not necessary to compare with training related processes. The performance of our micro-process of developing and copying a coursebook may be compared with the production of a novel in a professional editor.

9.5. The Value of the Process Model

9.5.1. Simplicity

The problem is to find an equilibrium between enough details and not to many measurements. The final result may look simple, but it is hard work to come up with the right ones. To arrive at this state a very good understanding of the processes and their mutual interactions is necessary.

9.5.2. Speed

The time consuming aspect is the knowledge and understanding of the processes. Once this is acquired the setting up of a set of measurements may be fairly quick. By defining the right indicators it is possible to compress a lot of data in some simple figures.

9.5.3. Time Lag

Depending on the indicator it may give us a final result with some time lag, but it is also possible it gives us ample reaction time. It may be too late to correct the problem of the previous micro-process, but there may be time enough to save the final outcome of the macro-process.

9.5.4. Relation with the Cause (diagnostics)

It is perfectly feasible to set up some indicator that are surveying possible causes and thus that are telling us what cause is or is not the root of the (un)desired outcome. These measurements are powerfull diagnostic tools to focus on the problem and to improve the training.

9.5.5. Depth

Normally there will be 2 kind of indicators: a set for surveying and a set for diagnostics. The first set will be continually updated and watched. They tell in a quick way how the process is performing. The moment they signal something is wrong, the second set is activated. This set hunts for the root cause. Thus, the two combined provide us a superficial watchdog activating an in-depth investigator.

9.5.6. Intern - Extern

The knowledge and understanding of the process is a sin qua non for the use of this model. It is hard to imaging that a training organization gives its customers full access to its training processes. So the model is not suited for extrenal use, although a training organization may use it for its own improvement.

9.5.7. Group - Individual

The aspect of the individual is lost in this model. The focus is on the process and less on the individual that 'flows' through it.

9.6. Conclusions

To look at training with a look of a process specialist creates new possibilities to measure training. The process model that states that training is a set of interrelated or interacting activities gives birth to measurements that may be superficial or in-depth; simple or complex; a basis for corrective or preventive actions; related to result or to cause. It gives us ample opportunities to control the training process, but more important it stimulates us to better understand the process and to figure out ways to improve the training itself.

If we understand and control every critical part of the training process, then the result must be a quality course and quality training.

10. Training as a System

"I would not give a fig for the simplicity on this side of complexity,
but I would give my life for the simplicity on the other side of complexity."
Oliver Wendell Holmes

"The more unstable the system, the more chance matters."
Alvin Toffler in "Power Shift"

10.1. Introduction

Suppose we have a very big training organization with many processes. Although there are only a few core processes, there are still too many to approach each of them as an independend, individual set of interrelated or interacting activities, which uses resources to transform inputs into outputs.

Although different, at closer look we will inevitabily find some common parts in our processes. If we collect all those commonalities, we can construct a system that while it surrounds these core processes it also supports them. So, if we guarantee the quality of this supporting system, we are on the way of producing quality training.

We may even imagine that our system can support the creation of new processes, because we already have big parts of it and we may have a scenario to invent them. Thus, by controlling the system we can control the processes.

10.2. Assumptions

If we control the system, we can control the training processes, as well as the supporting processes. By controlling the processes through the system, the result will be a quality course and aquality training. The purpose it to control the processes through the system and so to guarantee and control the result before the end it is too late.

10.3. What is a System?

A system is a set of interrelated or interacting elements (ISO 9000:2000).

If we compare this definition with the ISO definition of a process (a set of interrelated or interacting activities, which uses resources to transform inputs into outputs), then we almost have similar ones. This may not come as a surprise because the biggest difference between the two is only clear at a pure theoretical level. A system is just the collection of all the processes of an organization.

Because a macro-process is also a collection of (macro-)processes, we may consider a system a (macro-)process, but then all the processes of our organization and not just the core processes with its supporting activities.

10.4. Models for Training Systems and Measurements

The biggest problem to treat a system is to understand the important interactions and links between the individual processes. To visualize and better understand these links, we use models. Different approach and basic assumptions result in different models. Every models has its utility and sometimes they may support one another.

10.4.1. ISO and Measuring Training

The International Organization for Standardization (ISO) is a non-governmental, worldwide federation of national standards bodies from some 130 countries, one from each country (see also 0).

The new edition ISO 9000:2000, a modern framework for quality management and quality assurance, introduces a model (see Exhibit 10.1) for a Quality System that is based on 8 principles:

- Customer-Focused Organisation
- Leadership
- Involvement of People
- Process Approach
- System Approach to Management
- Continual Improvement
- Factual approach to decision making
- Mutually beneficial supplier relationships

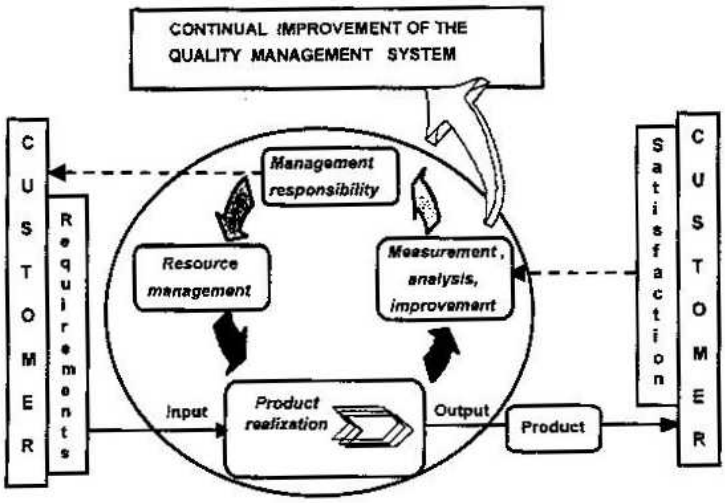


Exhibit 10.1: The Process Approach of an Organization by ISO (ISO 9000:2000).

When training is accepted as a product of a training system build in an organization the application of the ISO requirements may improve the quality of that system. An organization may use these requirements to erect and sustain a quality management system aimed at delivering the service of training.

Once implemented it can ask for a certification according to these requirements and thus saying to the rest of the world that it is organized following these ISO requirements. By showing this certificate of conformity the organization gives the customer a kind of guarantee that the organization delivers a quality service.

Following this philosophy the Antwerp Study Center of the Newport University is awarded with the ISO 9001 (edition 1994) certification.

10.4.2. EFQM

The European Foundation for Quality Management (EFQM), founded in 1988, has more than 600 organisation-members. It's mission is to stimulate and assist organisations to participate in improvement activities leading ultimately to excellence and to support the application of Total Quality Management.

The EFQM Excellence Model is a non-prescriptive framework that recognises there are many approaches to achieving sustainable excellence. There are some Fundamental Concepts which underpin the EFQM Model:

- Results Orientation
- Customer Focus

- Leadership & Constancy of Purpose
- Management by Processes & Facts
- People Development & Involvement
- Continuous Learning, Innovation & Improvement
- Partnership Development
- Public Responsibilitry

The application of these principles results in an Excellence Model[8] (Exhibit 10.2) based on nine criteria and translates the idea that excellent results with respect to Performance, Customers, People and Society are achieved through Partnerships and Resources, and Processes.. The Model recognises there are many approaches to achieving sustainable excellence in all aspects of performance.

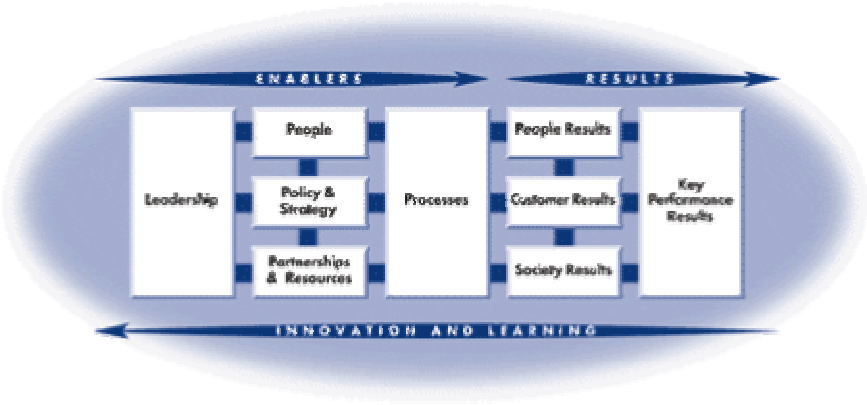


Exhibit 10.2: The EFQM Model (EFQM, 2000).

When using the model within an organisation for Self-Assessment, Assessment, Benchmarking, etc. the Approach, Deployment, Assessment and Review elements of the RADAR logic should be addressed for each Enabler sub-criterion and the Results element should be addressed for each Results sub-criterion.

RADAR consists of four elements:

- Results,
- Approach,
- Deployment,
- Assessment and
- Review

This logic states that an organisation needs to:

- Determine the **R**esults it is aiming for as part of its policy and strategy making process. These results cover the performance of the organisation, both financially and operationally, and the perceptions of its stakeholders.

[8] According to ISO the transition from ISO 9001:2000 to the EFQM model is possible by apllicating the ISO 9004:2000 serie.

- Plan and develop an integrated set of sound **A**pproaches to deliver the required results both now and in the future.
- **D**eploy the approaches in a systematic way to ensure full implementation.
- **A**ssess and **R**eview the approaches followed based on monitoring and analysis of the results achieved and ongoing learning activities. Based on this identify, prioritise, plan and implement improvements where needed.

When applying the RADAR Logic, the following should be addressed:

- **Results**
  This covers what an organisation achieves. In an excellent organisation the results will show positive trends and/or sustained good performance, targets will be appropriate and met or exceeded, performance will compare well with others and will have been caused by the approaches. Additionally, the scope of the results will address the relevant areas. To assist users of the model in assessment and scoring, EFOM has created two support techniques, the Pathfinder card and the RADAR scoring matrix;
- **Approach**
  This covers what an organisation plans to do and the reasons for it. In an excellent organisation the approach will be sound -having a clear rationale, well-defined and developed processes and a clear focus on stakeholder needs, and will be integrated - supporting policy and strategy and linked to other approaches where appropriate.
- **Deployment**
  This covers what an organisation does to deploy the approach. In an excellent organisation the approach will be implemented in relevant areas, in a systematic way.
- **Assessment & Review**
  This covers what an organisation does to assess and review both the approach and the deployment of the approach. In an excellent organisation the approach, and deployment of it, will be subject to regular measurement, learning activities will be undertaken, and the output from both will be used to identify, prioritise, plan and implement improvement.

10.4.3. Derived Models

Although EFQM (like ISO) is a universal model, sometimes people find it useful to develop special training models based on existing ones.

10.4.3.1. The Model for Quality in Classroom

A first example of this tailoring is the Model for Quality in Classroom. This model a process model with strong links to the EFQM Model. It can also be seen as a quality development/securing tool. For the latter purpose it has the dynamics of the PDCA circle and is a never ending quest for quality improvement.

In comparison with the PDCA, planning can be seen as the initiating element. Planning creates the foundation for the teacher and pupils to get the most out of the teaching situation. The main task is to formulate and communicate a clear and accepted goal statement, defining the conditions (e.g. physical) for the teaching, dividing the curriculum

into fitting lessons, co-ordinating the subject with other subjects, and more. Good planning is essential if fundamental improvements are requested.

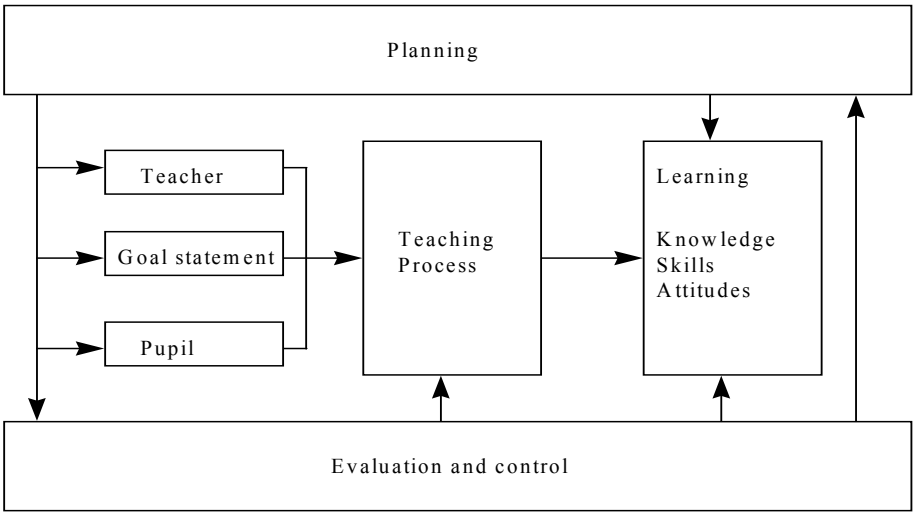


Exhibit 10.3: A Model for Quality in Classroom based on EFQM Model (Barkler et al., 1996).

If the model is read from left to right the centre is a common process model with the teacher, goal statement, and pupils as input to the teaching process with learning as outcome. Since teaching is a very sensitive process and very dependent on the personal involvement of the teacher and the pupils there are no direct arrows from planning to the process. In this concept the way of planning for quality is limited to influencing the input and make demands on the outcome.

During the whole process, evaluation and control must be used. Of course the learning of the pupils are measured at the end for grading the pupils but it is very important to include evaluation earlier in the process and also to widen the scope of control. The control activities can be divided in three areas: process control used during the teaching process for corrective actions, result control used for correction and final grading, and also goal control to continuously secure the relevance of the goal. This explains the three arrows from evaluation and control. The feed back or control data is given into planning and so the circle is completed (Barkler et al., 1996).

In light of the developmental benefits of the approach, the system currently being used in the Department places primacy on the discussion groups, and only makes selected use of questionnaires (Exhibit 10.4). These meetings are the main mechanism for identifying and reporting areas of concern. If more information on these identified areas is needed, a questionnaire is issued. The information gathered from these meetings is circulated to the relevant staff as before, as is any relevant action taken by the staff concerned.

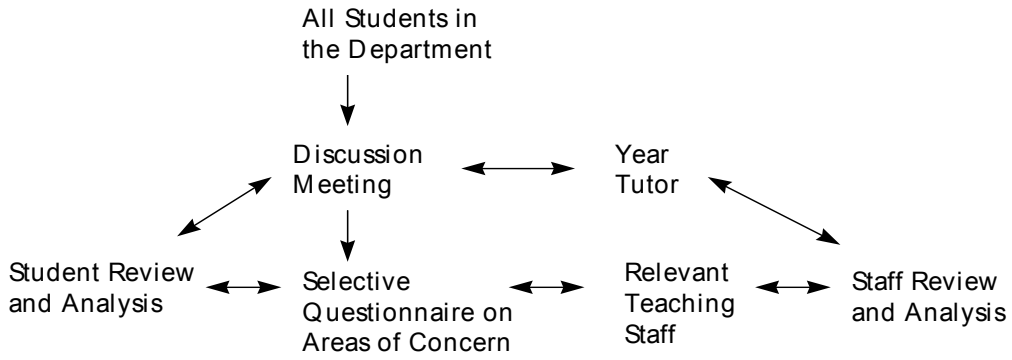


Exhibit 10.4: The 1995 Student-Centred Quality Improvement System (Barkler et al., 1996).

The Department still has a means of eliciting student and staff reaction and views on the modules they undertake, but had shifted the focus from exhaustive use of questionnaires, to more interactive review and analysis:

- between the year tutor and students, and within the group of students themselves (i.e. *inter*-personal).
- within the student (*intra*-personal), where students were to be encouraged to review and analyse their own approaches to learning and use this as a basis for improvement.

Some concern can be expressed over the information `lead time', i.e. the time taken between problem identification, analysis, solution and implementation, as there is only one `sampling point'. In earlier runs of the system, there had been three points where staff and students could elicit feedback on which to base self-reflection and improvement activities. However, this consideration has to be offset against the needs of a system that is more viable (in terms of resource and time) and repeatable (in terms of regular staff/student participation) (Chalkley, 1996).

10.4.3.2. The Tetris and the Proza models (PROSE, 2001)

PROSE c.v.b.a. is a partnership of 8 institutes of higher education in Flanders, Belgium; an organization for management support and an international consulting company. PROSE has developed self-assessment instruments for higher education, secondary education and vocational training. The PROZA instrument (in Dutch) is used in 75% of the Flemish higher education institutes. The instrument is based on the model of the European Foundation of Quality Management, and contains almost 2000 items, covering more than 80 quality criteria over the nine EFQM areas of attention:

- Policy & Strategy
- Leadership
- Personnel management
- Management of means
- Core processes: education, training, research, guidance
- Personnel satisfaction
- Satisfaction of students and clients
- Impact on the society

- Results of the institution or organization

In the PROZA instrument, Policy & strategy is on top, instead of leadership, given the context of education and training institutions in Europe.

The instrument contains more than 80 criteria over the 9 areas of attention. In each criterion 25 specific items are to be checked. The items are grouped in 5 phases of development, according to the level of quality management:

- Bound to persons, quality is variable;
- A start in thinking in terms of processes and systems;
- Professionalism and quality control;
- Continuous innovation, systematic improvement;
- External orientation, acknowledgement of expertise by others.

The checklists are filled out individually by the team members. They gather to agree in consensus on the scores of the items and deduce the level of quality management but also to identify immediately specific goals of improvement that are prioritized and written down in a self-evaluation report. For example, the criterion "Course Units" has items in the 5 different phases such as:

- Do the professors know the function of their course in the curriculum?
- Are the goals of all course units defined?
- Are the goals unambiguous and specific?
- Are goals of improvement defined on a yearly basis for all course units?
- Are there course units that are used also outside the curriculum for which they were developed?

There are several advantages of the PROZA instrument:

- Exhaustive and flexible: separate criteria can be analysed for different units in the organization It is easy to deduce questionnaires;
- Almost 2000 items result in very specific goals of quality improvement based on individual analysis of process-owners and on consultation with others in teams.

10.4.4. Special Training Models

EQUIS, launched in 1997 by the EFMD (European Foundation for Management Development), is an international system of strategic audit and accreditation designed by Europeans for the assessment of institutions in widely different national contexts. The standards are those of effective education for international management and apply to schools in any cultural environment whether in Europe or outside Europe. The EQUIS system is deliberately designed to promote continuous improvement at all levels (EFMD, 1998).

The key features of the EQUIS process and standards can be summarised as follows:

- EQUIS will look at the performance of the institution taken as a whole, including all its programmes;
- EQUIS is an international and intercultural approach to accreditation and;
- the EQUIS criteria reflect some of the major characteristics and dominant values in European management education.

To achieve EQUIS accreditation, Schools must be able to demonstrate that they satisfy quality criteria in three equally important areas:

- High international standards of quality in all of the areas defined in the EQUIS model.
- A significant level of internationalisation as defined within the EQUIS model.
- The needs of the corporate world are well integrated into programmes, activities and processes.

10.4.5. Other Specialized Models

Sometimes professional organizations are aware of the importance of good training and start developing their own models. An example is the Joint Aviation Authorities (JAA)[9]. The JAA, developed since the 1970's, are an associated body of the European Civil Aviation Conference (ECAC) representing the civil aviation regulatory authorities of a number of European States who have agreed to co-operate in developing and implementing common safety regulatory standards and procedures (see Annexe G).

In order to achieve its objectives, the JAA has isued 2 directives trating training and certifying people: the JAR-66 : "Certifying Staff" and the JAR-147 "Approved Maintenance Training".

JAR 66 is a new JAA rule introducing qualification requirements for Certifying Staff, personnel authorised to release an aircraft to service after maintenance work. JAR 66 includes related qualification requirements in term of basic knowledge, maintenance experience, task or type training.

JAR-147 is a requirement for approved maintenance training to satisfy part of the JAR-66 requirements including in particular the conduct of basic and type examinations to be accepted by the JAA-NAA as a basis for issue of the proposed JAR-66 Licence. To be approved in accordance with JAR 147, an organisation has to comply with a series of requirements dealing with facilities, personnel, documentation, records, examinations, quality monitoring, etc. A JAR 147 organisation may be approved to conduct basic training, type training, or both. An organisation approved in accordance with JAR 147 to conduct basic or type training is also entitled to conduct related examinations on behalf of the Authority. This makes the JAR 147 a real training system requirement.

10.5. The Value of the System Model

10.5.1. Simplicity

Using a system model is far from being simple. The application of a model while supporting a better understanding of the interaction of the processes, demands a good knowledge of the system.

[9] The JAA accepts the compliance to ISO 9001 as a partial compliance to their own directives.

10.5.2. Speed

Learning to understand the system and its intractions is a time consuming job.

10.5.3. Time Lag

Depending on the indicator it may give us a final result with some time lag, but it is also possible it gives us amply reaction time. By looking at the creation process, we may foresee problems and solve them even before the training process itself is born. It may be too late to correct the problem of the previous micro-process, but there may be time enough to save the final.

10.5.4. Relation with the Cause (diagnostics)

It is perfectly feasible to set up some indicators that are surveying possible causes and thus that are telling us what cause is or is not the root of the (un)desired outcome. These measurements are powerfull diagnostic tools to focus on the problem and to improve the training.

10.5.5. Depth

Everything is possible from superficial to in-depth indicators. It only depends on the time, energy and need for information. It is also all encompassing.

10.5.6. Intern - Extern

The knowledge and understanding of the system is a sin qua non for the use of this model. This makes the model is impractical for extrenal use.

10.5.7. Group - Individual

The aspect of the individual, and even individual processes, is completely lost in the system approach model. The focus is on the system and its processes; and not at all on the individual that 'flows' through it.

10.6. Conclusions

To treat a training organization as system and thus to understand the important interactions and links between the individual processes, the use of a model is necessary. Different approaches and basic assumptions result in different models. Every models has its utility. The way and the whats to measure greatly depends on the models used. The choice of the right model is important to achieve our goal.

To look at training with a look of a system specialist gives us almost unlimited depth and stretch with combinations of simplicity and complexity. This comes not for free, because it demands great efforts, both in time and money. But the use of the system approach gives us amply opportunities to control all our processes and our training process in peticular, but more important it stimulates us to take the road of continuous improvement of our global system.

If we control our quality system, then our training processes will be under control and will be showing this by producing a quality course and a quality training session.

11. Interludium

"If you must choose between two evils, pick the one you've never tried before."
George Carlin

"When the only tool one has is a hammer, everything begins to look like a nail."
Abraham Maslow

11.1. Partial Summary

There is no step further than the system model, so this is any good a time to look back at the different models. All these models assume that training can indeed be measured and it would be scientifically unjust not to mention a model that does not accept this hypotheses. That is why this chapter is not final, but simple a roundup of the previous ones.

11.2. Basic Assumption

All the so far studied models accept the assumption that training can indeed be measured and each has its own level to do so. To find the right measurement one must only determine the kind of training and its purpose to take the right model.

Put it this way, it is too simple. The lines between the models and certainly between the measurements are not that sharp. Sometimes the difference only depends on the use of the data. The result of a written test may have its use in the output model, but also in the service, the process and the system model. So in stead of independent blocks, the models look more like the Russian dolls. Exhibit 11.1 is a better representation of the relations of the models. As the level increases, expense and scope increase. Not all training programs have enough resources or time span to attempt evaluation at the system levels.

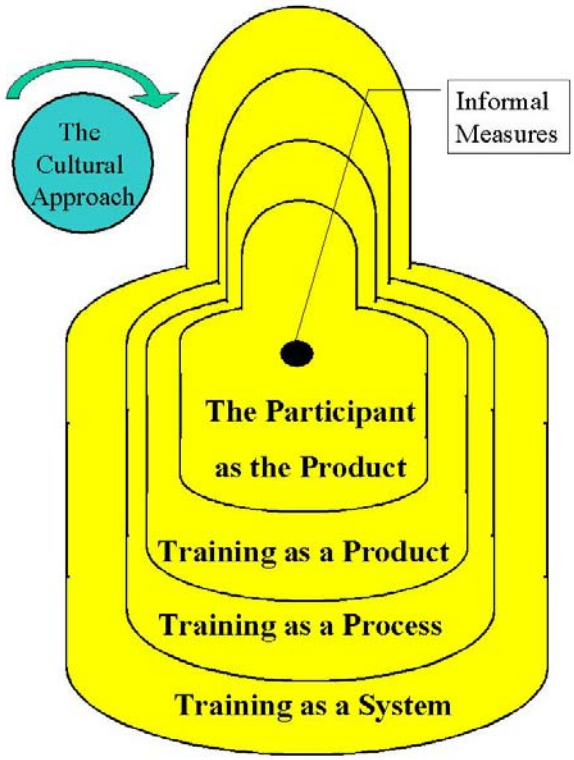


Exhibit 11.1: The Models of Measuring Training.

11.3. Combinations

Seeing the advantages and disadvantages of every model one wonders if it is not possible to combine the models to solidify the good while reducing the bad. Following paragraphs show that people indeed tried to combine to positive sides of different models or of the same model but a different levels.

11.3.1. Kirkpatrick's Four Levels of Evaluation

Trainers widely follow the Kirkpatrick model (although, admittedly, not every organization performs each type of evaluation for every training course). Nearly all organizations perform Level I and II evaluations on most of their courses (Training, 1995). Many organizations perform Level III and IV evaluations on some of their courses. The 1970 framework is followed widely enough that, at conferences and in journals and magazines, that trainers use shorthand in referring to its measurement of reactions ("Level 1"), learning ("Level 2"), behavior ("Level 3"), and organizational effectiveness ("Level 4").

The levels, outlined in more detail below, are the result of Donald Kirkpatrick's work (Carliner, 2001 and Kirkpatrick, 1994). His goal was to create a hierarchical model that would

span many uses, but as Kirkpatrick himself pointed out, no single formula can produce an effectiveness rating. Especially at the higher levels of evaluation, isolating causes of effectiveness is probably not possible.

The Kirkpatrick Model (Bold, 2000) calls for distinct levels of assessment. There are trade-offs and requirements for each level. But, as noted earlier, this Model has become a standard guide for assessment of training programs and this is because the lowest level is almost universally included in training across many fields.

- Level 1: **Reaction**
  Assesses participants' initial reactions to a course. This is the most common form of evaluation (according to the 'Training' magazine annual industry survey, almost 100 percent of all trainers perform "Level 1" evaluation). It usually occurs immediately following the training session.
  A short evaluation form is typically used, often called a "smiley sheet." It may be as short as a few questions; rarely does it run longer than one page.
  Kirkpatrick recommended that the Level 1 evaluation be anonymous and easily tabulated. This is usually accomplished with a rating scale such as "score from 1 to 5, with 1 being lowest satisfaction and 5 being highest satisfaction."
  Kirkpatrick also recommended that Level 1 evaluation invite participants to add their own comments. Such qualitative statements are difficult to analyze, but they can display trends that program directors will find helpful.
  Even though the Level 1 evaluation may not use the word "satisfaction," some program directors complain that at this level the only feedback is "customer satisfaction," and not serious evaluation of the program.
- Level 2: **Learning**
  Assesses the amount of information that participants learned. Measurement can be in the form of tests: a pre-test before the program and a post-test immediately following or at a later date.
  Pencil-and-paper tests are common tools for Level 2 evaluation. Kirkpatrick also recommended observation to measure learning. For example, participants could take part in a role play, demonstration, or simulation. Because a learning measure is typically reported in quantitative terms, the observation would have to include a pre-training simulation as well as a post-training simulation. Thus, the evaluator can look for a difference in performance and (cautiously) conclude that the participant learned the material of the training.
  Level 2 evaluation is enhanced when a control group that has not received the program or training is also tested. The control group would be tested with the same pre-test and post-test as the program group, and at about the same times.
  Because the objectives are the requirements for the course, a Level 2 evaluation assesses conformance to requirements, or quality.
- Level 3: **Behavior or Transfer**
  Assesses the amount of material that participants actually use in everyday work 6 weeks to 6 months (perhaps longer) after taking the course.
  Producing real change in behavior is a challenge. Many programs produce temporary behaviors that end after some days or weeks. Thus, the Level 3 evaluation must be scheduled for a time after the typical relapse to original behavior. A follow-up test or observation may be scheduled three or more months after the end of the program. Practical problems arise with such a schedule. Program participants may not be interested in giving more time to the project. Too, some participants may not be available at all because they have moved.

Even if participants agree to another post-test, the results may not be trustworthy. Most evaluations are essentially self-reports, not observations. This means the participant will be reporting on his or her own behavior and may slant answers to indicate program behaviors or skills that have, in fact, dissipated.
Like the Level II evaluation, Level III assesses the requirements of the course and can be viewed as a follow-on assessment of quality.

- Level 4: **Organizational effectiveness or business results**
  Assesses the financial impact of the training course on the bottom line of the organization 6 months to 2 years after the course (the actual time varies depending on the context of the course).
  Kirkpatrick also called this level the "results level." It is the most challenging, demanding experimental protocol including control groups.
  To measure the impact of a program means that results must be tied to that program. As Kirkpatrick and many others have warned, multiple factors exist in every setting. Claiming that a program is the causal factor of an organization's effectiveness is difficult to prove.
  Despite these difficulties in obtaining a measurement, over 50 percent of organizations perform this type of evaluation on 50 percent of their courses (Training, 1995).
  Level 4 evaluation is assessment of quality. It does so in financial terms, a perspective different than that of the evaluations at Level 2 and Level 3.

11.3.2. 8 Fields Theory

A similar combination it the '8 fields instrument' promoted by the Dutch consultancy firm Kessels & Smit (Kessels et al., 1996). This instrument translates the necessity of an interaction between the training and the organizational objective as a condition to develop a quality training.

The first step or field is the definition of the problem or objective.

To solve this problem or to achieve the objective the work environment must change. The second field describes this change.

To be able to change the environment the participants must alter their behavior or acquire new competencies. Field three formulates the desired competencies the trainees must demonstrate after the training.

The training methods used must enable the trainees to acquire the needed competencies so they can induce the changes in the work environment, which ultimately will lead to the realization of the objective. These training methods are defined ib the forth field.

The way up gives the different levels of evaluating the training. The fifth field evaluates the training process. Are the used methods the right ones to achieve the training goals?

At the end of the training there is an evaluation to verify if the trainees has acquire the aimed for competencies. The sixth field measures the results of the training.

It is not sufficient to acquire the right level of competency, the trainee must also be willing and be able to use it. So the seventh field evaluates the application of the training and its effect on the environment. It measures the functioning of the trainee in the work situation.

The last and eighth field verifies the impact of these changes on ultimate objective.

This instrument is summarized by Exhibit 11.2.

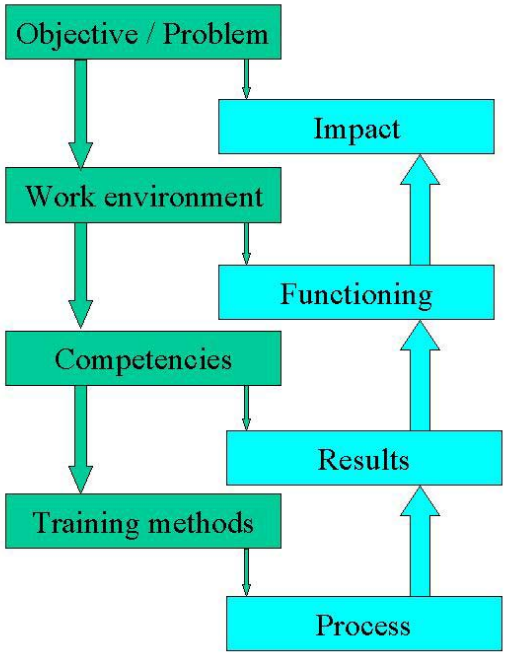


Exhibit 11.2: The 8 Fields Instrument (Kessels et al., 1996).

11.4. Conclusion

The thing that a salesperson must build in his approach is showing that we have a need, then showing that his product will fill this need better than anything else at the price offered. "Would you like to cut costs, save time, win friends, look smart, talk better?" All of these things appeal to needs. Then when the product is introduced, it is a simple matter to show that it matches up with the need. Once it can be shown that the product solves the problem (meets the need), the rest is downhill.

So it is with training. We must find a way to show that the training will fill a need that we have pointed out. Many times we do our training like the inexperienced salesperson, by introducing the product (the new method or correct way) before we have established that there is a need. In essence, we must answer the employee's question, "What's in it for me?" (Broadwell, 1995). When we talk about preparing for training, we look at ways to reach an objective. A measurement that facilitates this relation, helps us to improve our training.

Training is one of the largest initial costs in a total quality initiative, and not surprisingly, one in which many companies are reluctant to invest. Training and education have become an essential responsibility of HRM departments in TQM organizations, particularly as empowered employees require new knowledge and skills. Xerox Business Products and Systems invested more than $125 million in quality training. Even if companies make the investment, they often take great pains to measure the benefits against the costs. Motorola used to do this, but no longer. They know that the benefits of quality-based training outweigh the costs by at least 30 to 1 (Evans et al., 1996). If big companies no longer measure training, what is their assumption to do so?

12. A Cultural[10] Approach

"Most of the truths we know, depends on the point of view."
Obi-Wan Kenobi in 'the Return of the Jedi' (Star Wars)

12.1. Introduction

The great bulk of skill development results from learning by doing and informal training. Formal and informal training together account for only about 30 percent of the growth of a worker's productivity during the first two years on a job (Bishop, 1991). Learning by doing accounts for the rest. For new hires, nine-tenths of the time they spend in training is spent watching others do the job or being shown it by coworkers and supervisors. Only one-tenth involves participation in formal training programs.

Motorola calculates that every $1 it spends on training delivers $30 in productivity gains within three years; between 1987 and 1993, the company cut costs by $3.3 billion as workers were trained to simplify processes and reduce waste. Sales per employee doubled and profits increased 47 percent. Perhaps a good stock-picking strategy is to invest in companies that train the best? (Milkovich et al., 1994).

The answer is almost certainly that training only accounts for a small portion of the overall improvements (the good news is that the measured improvements are usually VERY large). Just how much of the change is attributable to the training itself, or to our contribution, we will never know.

Taken altogether the economic literature on training suggests that, as long as the company is initiating and paying for training, one can be pretty confident that most of these investments are profitable both for the worker and the firm.

Skills and knowledge deteriorate from non-use at least as rapidly as they become obsolescent. In one set of studies, students tested 2 years after taking a course had forgotten 1/3 of the high school chemistry, ½ of the college psychology and zoology and 3/4 of the college botany that had been learned. Reading, writing and arithmetic are used in most occupations and many adult roles and probably do not deteriorate as much after leaving school as the other subjects taught in high school. The payoff to occupation specific education is much more sensitive to placement in a relevant job (and the danger of forgetting skills if a relevant job is not immediately found) than to

[10] At first I called it a philisophical approach because it is a way to look at training, but because the cultural aspect is also important, both names are equally significant.

rates of skill obsolescence. Consequently, when deciding what to study, the probability of using a skill or knowledge base is more important than the rate of obsolescence of that knowledge.

Seeing these figures one can ask oneself what use is it to measure only a small part of the training effort?

Before trying to answer the alternative it may be good to look at what we measure. Sometimes the result of our measurements has nothing to do with the training but everything with the attitude of the trainees.

12.2. Why People Don't Want to Learn

This brings us to another important point: Why is it that sometimes people do not learn? We have seen reasons why people want to learn; now let's look at the other side.

12.2.1. Lack of Motivation

One obvious answer is that they just aren't motivated. They lack interest interest or enthusiasm. If this is the case, then the same things we discussed under reasons for learning – we must find something to motivate them. But good motivation alone isn't a completely satisfactory solution. There are reasons why employees don't have an interest in learning, even after the advantages of learning have been pointed out to them. Sometimes the fault lies with the person doing the instructing rather than with the employee being trained. If supervisors put the training off until the very last part of the day because they aren't interested in it; if they have made it clear to their bosses that they don't really think that training is part of their job; if they enter into the training session with an attitude of "Let's get this over with and get on to something important"; if these statements represent the supervisors' attitude, then it isn't likely that their employees will be jumping with joy about receiving training.

On the other hand, if the person doing the training comes on strong with enthusiasm, such an attitude is probably going to influence the people being trained. If supervisors make it clear that training is part of their job and they want to do just as well at that as at any other part of their job; if they allow proper time for training, and put it on an even plane with production, reporting, etc.; if they go about training in a skillful way; if they make sure that training is done at a time in the workday when it will be the most effective; if they make it clear to their bosses that they expect to be allowed to do the training correctly, even if it means fighting for a little more time and money; if supervisors do all these things, then they can't help but increase the interest and enthusiasm of the employees being trained. In fact, these things are basic requirements for successful training!

Another way supervisors can cause the people being trained to lose their interest and motivation is to do a poor job of training. All of us have experienced times when we were interested in learning something either on the job or in a classroom, only to find that the instructor did such a poor job that our interest turned to boredom or disgust. We finally became interested in only one thing: getting out of the training course. (Of course, a prime purpose of this book is to help people do a better job of training their employees!) Poor

training not only doesn't help employees do their jobs better, but it makes them dislike the idea of recieving any training in the future.

There is not much excuse for consistently poor instruction. There are specific skills that can be learned, practiced, and perfected. Being a good instructor is not something we either have or haven't got. It is somewhat like operating a lathe or a computer or a card punch. Some people have more aptitude for it than others, but most of us can learn the skill if we try. An instructor who has both skill and enthusiasm makes it a lot easier for the employee to learn.

12.2.2. Lack of Background

Another reason why employees don't learn as fast as we would like is that they don't have the necessary background to pick up the training. What we may consider a lack of talent may be only a W of experience. Before we write employees off as incapable of doing their jobs, we should make sure that they have the background to absorb the instruction. How many times have we watched a guided tour through a plant and heard the person in charge say something like, "The residue comes from the acid bath into the oxidation tanks where the discharger controls the injection to prevent a flame-out temperature condition from developing. An improper balance between the anthracene and air will cause the destructive distillation process to produce impurities. Now, are there any questions?" The people in the group, completely unfamiliar with any of the terms being used, stand on one foot, then the other, waiting to move on. Probably the guide understood the process and may have thought the group did too. Even so, the guide did not produce any great amount of interest and certainly not very much learning! The group simply lacked the background to absorb what was said. The truth of the matter is they may not even know enough to ask questions, and to make it worse they may not know that they don't know.

A little reflection may show us that we have done the same thing with our employees. This most often happens when they are new, because there are so many things they don't know, but it also happens when they have been around for a long time. We may be like the tour guide: We understand what we are saying and think our employees do too, but our employees are not really learning. We have to start where they actually are, not where we think they ought to be or where we assume they are. Methods of training will help us not to fall into this trap. What we have to look for is constant feedback to see that the employees are following what we are saying. When the feedback shows that they aren't with us, we change our course of action and try something else. Without the feedback from the employees, we have no chance of knowing how effective we are with our training. The burden is on the person doing the training to see that it is done at the proper level. It should not be left up to the employees to say that the training is over their head. This is sort of like saying to them, "This is where you should be, but if you are stupid, let me know, and I'll try something else."

12.2.3. Rebellion

We have to admit that some people do not learn because of a certain amount of rebellion against authority that exists in all of us. In severe cases it comes out as, "You represent the management."

Along with the idea of rebellion against authority, there is the fear of having to learn something new. The thought of moving to something unfamiliar may also cause employees to

rebel. The excuses they use may not reveal the real reason behind their reluctance to receive the training. "I don't think the company has a right to require me to learn this" may really mean, "I don't know if I can learn this new job. I know how to do what I'm doing now, but I may not be able to handle the new job." If supervisors don't realize that this rebellion is really just a coverup for a fear of change, they may spend a lot of time trying to convince their employees that the company does have the right to train them on something new. The time could be better spent in assuring them that they will be able to handle the job and that the training program will make it possible for them to do the work without any trouble.

12.2.4. Failure to Relate Training to the Job

Any time there is any training, whether it is done in the classroom or on the job, every effort should be made to relate the training to the job as closely as possible. One reason employees don't learn is that they fail to see the relationship between what they are supposed to learn and what they will be doing when the training is over. They rarely are satisfied with a statement like, "You may not see, where this fits in, but take my word for it." Neither will they accept, "Go ahead and learn this because someday you may have to use it on the job." In other words, the employees respond best to the "here and now." They respond the least to what appears to have very little or nothing to do with their job as they see it right now.

But the training should relate directly to the job not only in content; it should look the same way the job looks, feel the same way the regular job feels, smell the same, sound the same, etc. If employees are to use their right hand when operating a machine on the line, then they should operate it with their right hand during the training. If a model or mock-up is made, it should look and respond just like the real thing it represents. If the employees will get grease on their hands on the job, they should get grease on their hands during the training. If the employees will be reaching for letterheads with their left hand when doing production work, the paper should be on their left side while they are learning to do the job. If the employees determine the proper setting of the machine from a worn black book, then they should use that same worn black book when they are training (Braodwell, 1995).

12.3. The approach of Jeff Staes (Staes, 2001)

Jeff Staes (Staes, 1999a) is convinced that the competition among innovators, people who use information to produce new products and services in all areas, will be fierce. The only way to compete with other organizations is to develop unique competencies. This is not simple; competence development really means developing the required expertise and, equally importantly, having the authority to use it. This is an extremely important point which he illustrate with a 4-stroke engine metaphor, 'the engine of innovation'.

All organizations typically go through four stages of learning.

The first stage is that of an unconscious incompetent. The individual (or organization) is unaware of what's going on in the world, and is reasonably content in this state. Eventually (usually when a competitor surfaces), this individual becomes a conscious incompetent.

Having to deal with the threat of competition takes us to the third stage: conscious competent. The individual has adapted, and acquired new knowledge, skills and attitudes and is competent once again.

In the fourth stage, after using these newly acquired skills for a period of time, one becomes an experienced unconscious competent. Only people who have the authorization to do something with their acquired knowledge, skills and attitudes can become unconscious competents. People become unconscious competents when they start using what they have learned.

It is only through new information about products and services that people can develop their knowledge, skills and attitudes. In this new state, they will be well positioned to start using materials to develop new products and services. This circle of innovation is driven by four powers that interact like four cylinders of an engine, the engine of innovation.

If an organizations focuses on one cylinder but do not take into account the other cylinders the engine will not run. All cylinders have to be functioning; if one of the cylinders isn't working, the engine cycle stops.

1. Power of the Market:
   Power = Force X Velocity
   Those organizations that have a significant Power of Market have the means to quickly introduce (velocity) new products and services with great market penetration (force). When the market changes, people who are unconscious competents are caught off guard. Without realizing it, they became unconscious incompetents. It's the market power that fires the first cylinder of the engine of innovation. The market then changes the state of individuals and organizations.

2. Power to See
   If we see the market changing, we have become a conscious incompetent. If we don't see those changes in the marketplace, we remain an unconscious incompetent. Power to see can be impaired by our paradigms; not being able to see changes in the marketplace is a major failing.

3. Learning Power and Learning Tension
   To better illustrate Learning Power, look at Jeff's Law®:
   LP=LT.IF
   It says, Learning Power (LP) = Learning Tension (LT) multiplied by Information Flow (IF)
   Learning Tension is a new mental image. It's a physical tension on our brains. The higher it is, the more we are hungering for information. If we are in the right role, and we have personal goals and the capabilities to reach them, then you'll have a high learning tension and our learning behaviour will be markedly different from that of the average person. People in the right role develop a higher learning tension.
   If two people have the same Learning Tension, do they also have the same Learning Power? Not necessarily. One of them may lack the social skills and emotional intelligence to get the necessary information, for example, a European working in international markets who

doesn't know English. So, when hiring people, an organization must also consider their social skills and emotional intelligence, because their learning power will be much higher. But, only if they are in the right role, have a high learning tension and have a high information flow.

4. Power to Change
   You may be on the right track at this point, but if we have learned it and we just sit there, you'll get run over. Learning Power must be converted to the Power to Change.
   People want to make change. If we don't treat them well, and if they can't make necessary changes, they will leave the organization. Knowledge management is part of the process of treating them well. Competent leaders are good communicators and must able to tell stories to get their message across. The manager who has a vision of the employee's ideal role in an organization is a casting coach: one who directs his people to the right roles.
   The knowledge era organization will recognize these new required attributes and develop the necessary systems to get the high-performance competent employee a new type of manager.

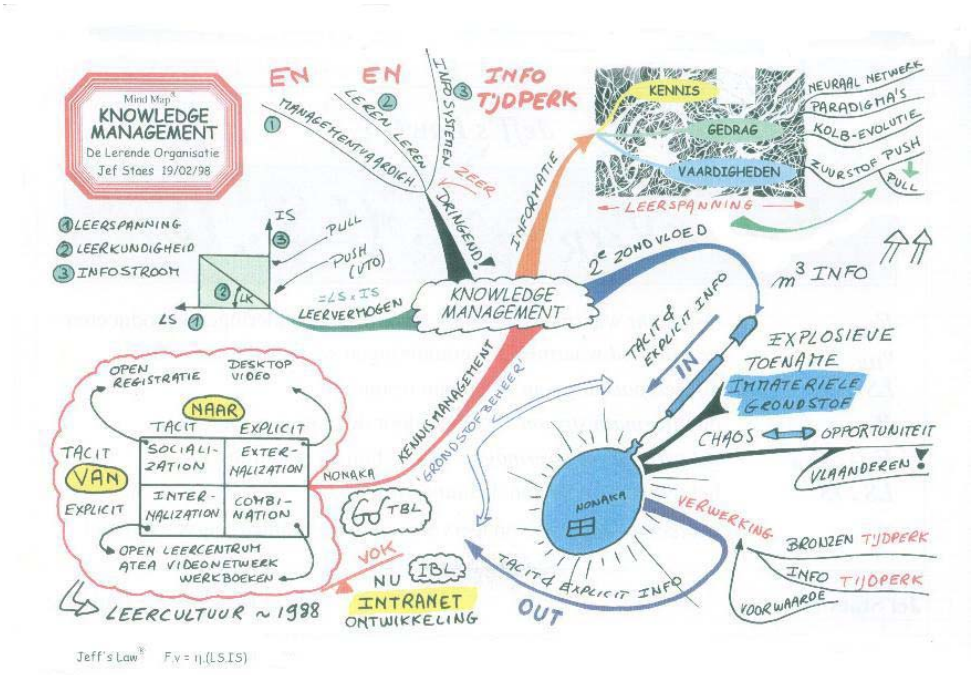


Exhibit 12.1: Dutch Mindmaps Summarizing Jeff's View.

12.4. What about Measuring?

It's important to know how to create learning, even without training. Put people in the wrong role, don't give them any information or resources, and our Learning Power goes down. We

might even give people the right role, and the right information, but if we don't give them the right resources, our Learning Power still goes down.

Most organizations find themselves in a situation of PUSH Learning, which means dealing more with training and education, as opposed to highly evolved learning behaviour. When cultural measurements are conducted in these organizations, we will often get the following conflicting results:
(1) There is not enough information
(2) There is too much information.
This simply means that people have a low learning tension.

In order to achieve a higer tension, we must put people in the right role. Only then can knowledge management start. Only then can creativity and innovation begin, and only then can communities of practice begin to bubble up. We can't change people. But we can create the right environment for increasing the rate of learning. And we can then build a management system that will actively incorporate this high rate of change to all functional areas.

People with a PULL learning behaviour learn at a higher rhythm. They learn in very informal ways and they are constantly looking for irrigation systems, where they can add information and quickly get information out.

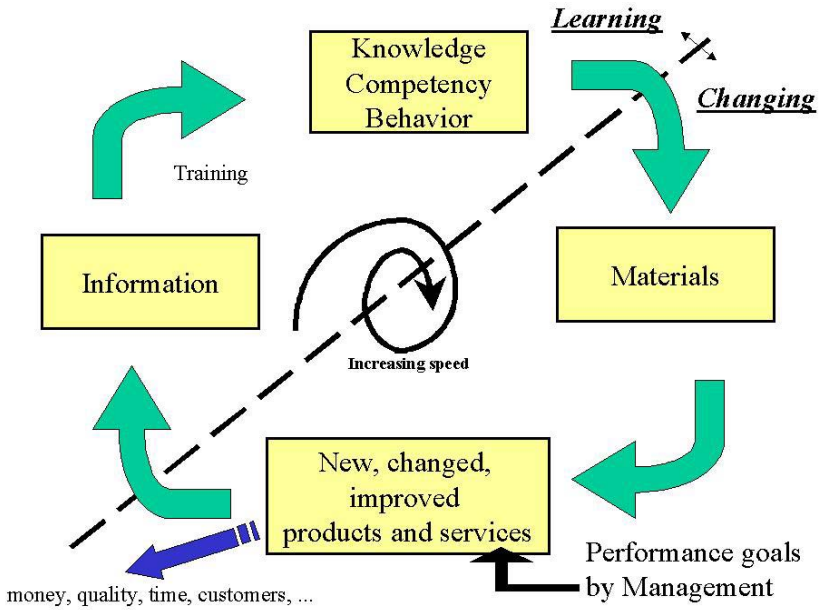


Exhibit 12.2: Training as a Part of the Performance Goals Achievement System (Staes, 1999b).

They are very selective. People with PULL learning behaviour can select the information they want (even if there is too much information offered). If there is insufficient information, they

start looking for it, often by networking. All this means that traditional training systems has to change to this new way of working.

This means that measuring training itself is in a way senseless. Training is just a formal and informal manner to transform information into knowledge and competencies. These must, through change, result in the creation of and effective use of materials. In turn all this is to achieve the performance goals set by management. If the training meets the pedagogical principles then it is better to measure the learning tension and of course the other 'powers'. Ultimately, the only thing worth measuring is the achievement of the performance goals.

12.5. The Value of the Cultural Approach

12.5.1. Simplicity

Taking the basic asumption that training is good as long as the performance goals are met through a high learning tension, there are three possible ways to measure training:

1. a follow up of the goals. This is according to Staes J. the sole sound thing to do (Staes, 1999b);

2. an audit on the application of the pedagogical principles;

3. a cultural measurement concentrated on learning tension.

The three measurements are fairly easy to do. Normally when setting goals manegement also defines the way to measure them. For an experienced auditor there will be no problem to define a audit checklist after benchmarking a quality minded school. The last, the cultural measurement, is already a habit in most organizations through the establishment of 'personnel satisfaction polls'.

12.5.2. Speed

Previous paragraph demonstrated not only the simplicity of the measures, but also the speed of setting them up because they are already available at short notice.

12.5.3. Time Lag

To tranformation from a low to a high learning tension make take a while because it is a change of culture. Even then, a full circle from setting goals through learning and change towards fulfulling them is a long breath. This means that whatever data is collected in relation to training will be quite old and not very useful for corrective actions. The most use for the data is to confirm, or not, the direction taken.

12.5.4. Relation with the Cause (diagnostics)

It is a long stretch beween the data and the cause, this results in the little use as a diagnostic tool.

12.5.5. Depth

With the exeption of the audit, there is barely any depth is the measurements regarding training.

12.5.6. Intern – Extern

Because it is mostly a cultural approach it is of no use for external training organizations.

12.5.7. Group - Individual

Although a cultural measurement can be individually, this is almost never the case. The three methods are focused on groups rather then on individuals.

12.6. Conclusions

After a few years as a trainer I felt that adding days on a training wasn't the right thing to do. It was untill I met Jef Staes that I was able to explain this feeling. If we don't feel that the trainer is responsible for motivating the participants in following the session and in putting it into practice. If we feel that it is management who is responsible for the overall motivation of the participant by creating the right learning tension, we can motivate a person by say 'know you will learn' (Jacobs, 1999), than the only way to measure training is to measure the company culture in relation with formal and informal training and the achievement of the objectives.

If we are, on the contrary, convinced that the trainer has an motivational responsibility, ask yourself for how long will this transfert of motivational power last in an unwilling envirronment. Remember also that training is an important issue, but hard to study. Most training is informal in character and hard to measure. Studies and their outcomes on training are unreliable because the large number of unobservables means that any given phenomena had many alternative explanations (Garen, 1987).

13. Conclusions

"All theories are wrong, but some are useful."
George Box

If we think training is expensive, you're right. Effective training is one of the most expensive change strategies in which we can invest. But training that fails costs even more. There are som simple basics to increase the chances for training success:

- Use relevant examples. One important way to enhance the value of training is to design examples that are relevant to employees in the organization. Ideally, examples should reflect actual situations that employees encounter in their jobs. When this is not possible, examples and exercises should be based on experiences in similar companies.
- Tailor training to the organization. Training should be customized to the organization's needs and accurately reflect its culture. Packaged programs can be tailored to suit our needs, and most training vendors offer this service. Programs also can be customized in-house, by rewriting exercises and examples to more closely reflect the organization. In most cases, it will probably be more cost-efficient to purchase a packaged program than to develop one from scratch.
- Implement training at the top. Training should be delivered top-down, starting with senior executives and cascading down to the lower levels in the organization. Executives should be required to take the full session, rather than an abridged version of the training.
- Follow up with concrete actions. The effectiveness of training is greatly enhanced when it is followed up immediately with specific plans and changes in organizational. For example, an organization might announce that it is embarking on a new comprehensive approach to measure customer satisfaction as part of the quality effort. Also, at each step of the implementation, employees should be kept aware of what is happening (Brown Mark Graham, Hitchcock Darcy E. and Willard Marsha L. "Why TQM Fails and What to Do About It," Irwin Professional Publishing, New York, 1994.).

Accepting the hypothesis that training can be measured there are useful 4 models and each has its own level to do so. To find the right measurement one must only determine the kind of training and its purpose to take the right model out of Exhibit 13.1.

Exhibit 13.1: Comparaison of the Models.

Put it this way, it is too simple. The lines between the models and certainly between the measurements are not that sharp. Sometimes the difference only depends on the use of the data. The result of a written test may have its use in the output model, but also in the service, the process and the system model. So in stead of independent blocks, the models look more like the Russian dolls. Exhibit 13.2 is a better representation of the relations between the models. As the level increases, expense and scope increase. Not all training programs have enough resources or time span to attempt evaluation at the system levels.

Exhibit 13.2: The Models of Measuring Training.

14. Epilogue

'To reach for the skies, one needs a firm grip on the ground'
A slogan of an Aircraft Maintenance firm

It is most certain out of the ordinary to complete a thesis after its defense before a jury. It is not my purpose to comment in full length the feedback of this interesting discussion but only to complete, in the spirit of TQM, the Deming circle. I think this is a good and instructive idea.

Most of the minor remarks about the layout of the thesis are already incorporated in this version and are no more visible. This document is also completed by other complementary information in footnotes and about sources. Due to time limitations the suggestion to better define the source by indicating the page is not incorporated, but will be remembered in the future.

Looking at the objectives, I think this thesis attains the goals set:

- Fuel the discussions about measuring training.
  The discussions held with the jury was a vivid proof, but it will not end with this. I hope the free distribution of this document, while not perfect, will further enhance the discussion;
- Inventorize most of the measurement methods.
  The last chapter may be considered an answer to this;
- Apply the philosophy and principles of TQM to the subject of measuring training.
  May the reader be the judge about that;
- Propose a possible best solution to the variety of applied measurements.
  The proposed grid gives the possibility to better guide the decision making process.

What about possible future efforts on measuring training?
First, the grid may be complemented with other criteria like the possible dangers of a model, or with extra examples, …
Second, a more in-depth study may investigate the validation of the different models in measuring training efficiency or effectiveness.
Third, a better selection tool with an instruction how to use it may be developed from the grid.

It is clear there is still space to explore the subject of measuring training.

Annexe A : What Determines Training Investment by Firms?

In most cases employers will increase their investment in training when:

Marginal Value Product of an Extra Hour of Training

is greater than

The Marginal Cost of Training mulitplied by The Rental Cost of Training

The simlpicity of the formula is decieving because each factor is influenced by a great deal of elements. The knowledge of these elements is important because when not quantified their influence will be based on subjective estimates of their value.

A.1. Factors Influencing the Marginal Value Product of an Extra Hour of Training

A.1.1. Factor that Decrease the Marginal Benefit

- *The time spent in a training activity.*
  There will be diminishing returns to devoting extra time to training. That is the marginal benefit of an extra hour of training is likely to become smaller as time devoted to training increases.

A.1.2. Factors which Increase the Dollar Value of a Skill

- *High value added per worker.*
  The firm's product or service generates high profit margin or is in short supply possibly do to economic boom or the firm's monopoly power or technological lead on rivals.
- *The skill being taught is very scarce.*
  Possibly due to a long training period, high demand for the skill from competing firms and/or an unwillingness (or inability) of other firms, schools and colleges to invest in the training that develops this skill.
- *Innovation.*
  The skill is essential to run a new machine, introduce a new product, or implement a work reorganization at the company. Since the skill is by assumption essential the value of the benefits to training derive from the increased cash flows generated by the innovation. Since there is no way to substitute for the skill, the payoffs to training associated with an innovation are often quite high. They are also likely to be quite uncertain because the success of the innovation is not assured.
- The extent to which the skill will be used.
  This depends on:
  - Is the work site organized such that the skill will be put to use once learned? This is an absolutely critical consideration. Since the employer controls the organization of work, the employer must generally initiate and design the training program even when most of the skills being taught are general. For example, skill with a specific word processing program is useful at many firms, yet the employer must choose

which specific word processing program to standardize on and what features of the package should be taught and in what sequence.
  - How frequently will the skill be used?
  - How many hours a month is the worker likely to be working in the future?

A.1.3. Factors which Influence Learning Efficiency (gain in skill/ hour learning).

- *Quality of the trainers.*
  Their knowledge of the subject and ability to teach it. The motivation of the trainers.
- *Availability of the equipment and materials* necessary to learn the skill.
  Hands on learning is more efficient than theoretical learning. For example, learning a program like Word Perfec necessitates that one have a computer and a copy of the program.
- *The motivation of the trainees to learn the skill.*
  Are they going to be rewarded if they learn the skill well? Is it possible to assess how well they have learned the skill? Is their social support from peers and immediate supervisors for learning the skill?
- The quality of the training protocol.
- *The learning ability of the trainees*.
  This can be predicted by performance in school, by scores on cognitive tests, by past performance on similar tasks and/or by observing people in a situation where they must learn something new.
- *Initial skills and knowledge of trainees*.
  Does the trainee read technical manuals well? Do they have the mathematics background necessary to understand and use statistical process control?

A.2. Factors which Influence the Marginal Costs of an Hour of Training

A.2.1. Opportunity Cost of the Trainer's Time.

This is influenced by:

- Whether the trainer is a supervisor or a coworker.
- Whether the work group members who know the skill are willing to s hare their knowledge. In order for them to be willing to do this, experienced workers must be confident that training a new worker in their unique skill will not lower their chance of being promoted or increase their chance of being laid off.
- Whether a normal work day has free time that can be used for training. An example of work sites where such free time exists is retail stores staffed by both an experienced worker and a trainee which sometimes have only one customer or no customer.
- Whether the company is under heavy pressure to increase output because of high demand and long order backlogs.
- Economies of scale when the training is provided formally in a classroom or when training packages must be devised for specific jobs.

A.2.2. Opportunity Cost of the Trainee's Time.

- Will the trainee learn the skill on his own time at home?
  - Can the Employee Learn the Skill on his Own?

  - Using a self-paced instructional mechanism (eg. tutorials for learning computer programs),
  - By reading a manual or careful description of how to do the task (Kaizen results in the preparation and updating of such manuals),
  - By trial and error (eg. an Icon based computer program is easier to learn than programs which require typing commands.)
- Are trainees willing to learn the skill on their own? This depends on the incentives offered for learning the skill and the norms of the work group.
- Whether the skill can be learned while the worker is producing revenue for the company. Is learning by doing sufficient?
- How low a wage the trainee is willing to accept while learning the skill. This depends on:
  - The worker's alternatives at other firms.
  - The prospect of getting a promotion or wage increase once the training is completed.
  - The likelihood that the training will enable the worker to get a better job at another firm. This depends upon whether the skills learned are useful at other local firms or whether the skills learned are visible to other employers.

A.2.3. Union Support.

In a unionized setting, the cost of training to an employer depends on whether the Union is willing to offer concessions in other areas in order to get a better training program.

A.2.4. Tax Treatment of Investments in Training.

A.2.5. The Probability and Cost of Trainee Errors during Taining.

A.3. Factors which Influence the Firm's Rental Costs of Training

$$\text{Rental Cost of Training} = [r + d + (1\text{-}g)q]$$

- COST OF CAPITAL OR REQUIRED RATE OF RETURN (r) = the firm's real ROR expressed as a monthly rate.
- RATE OF OBSOLESCENCE OF THE SKILL (d) = monthly rate of obsolescence
- RATE OF TURNOVER (q) = monthly separation rate. This averages about 3 to 4 percent per month in the US manufacturing as a whole, about 1% at IBM and only about 0.5 % at large Japanese firms.
- DEGREE OF EFFECTIVE SPECIFICITY OF THE SKILL (1-g) A high degree of specificity tends to lower turnover and this makes a firm more willing to finance it. On the other hand, it reduces the worker's willingness to finance the costs of the training. If a worker is liquidity constrained and unwilling to accept an even lower wage during the training period, it the firms optimal strategy may be to try to transform general training into specific training.

Annexe B : Organizing a Training

The major problems encountered by HRM in establishing a training system are :

- Determining the needs.
- Setting up a training system.
- Developing a program content.
- Choosing a program location.
- Maximizing learning.
- Evaluating the effectiveness of the program.
- Respecting the legal considerations.

The two major questions of organizing a training are: "Who participates ?" and "Who provides?" (Randall et al., 1996).

B.1. Who Participates a Training?

The answer depends in part on the results of the person-needs analysis. It also depends on how many employees are to be trained simultaneously.

When everyone has been targeted as needing training, as is often the case with major change efforts, top managers often participate first, and other employee groups are scheduled in hierarchical sequence. The mix of different levels of managers is also an acceptable solution. When employees who work side by side attend training sessions together, they may find it easier to transfer their learning back to the work site because coworkers can provide feedback and friendly coaching.

B.2. Who Provides?

Depending on where the program is held and what skill or skills are taught, they are different possibilities :

- The supervisor
- A coworker, such as a lead worker or a buddy
- An internal or external subject matter expert
- The employee

B.3. Developing Program

A training program must have content congruent with its learning objectives. Three types of learning objectives that the organization may be concerned about are cognitive knowledge, skill-based outcomes, and affective outcomes.

B.4. Choose a Program Location.

Three types of locations for training activities are on the job, on-site but not on the job, and off-site. Decisions about location may be constrainted by the type of training that is to occur as well as by cost and time considerations.

On the job training occurs when employees learn their jobs under direct supervision and includes job instruction training, apprenticeship training, interships and assistantships, job rotation, and supervisory assistance and mentoring.

On-the-site but not on the job training is appropriate for required after-hours programs and for programs in which contact needs to be maintained with work unit but on the job training would be too distracting or harmful. The different solutions for on-the-site but not on the job training are company schools and executive education programs, programmed instruction, videotapes, videodisks, interactive video training, telecommunication training.

When the consequence of error is high, it is usually more appropriate to conduct training off the job. This method is also appropriate when complex skills need to be mastered or when employees need to focus on specific interpersonal skills that might not be apparent in the normal work environment. The costs of off-the-job training are high. This method includes formal courses, simulation, assessment centers, role-playing and sensitivity training, and wilderness trips (Randall et al., 1996).

B.5. Maximize Learning

Even when the technique is appropriate, learning may not take place if the experience is not structured appropriately.The following principles increase the success of training :

- Setting the stage for learning
    - Provide clear task instructions.
    - Model appropriate behavior.
- Increasing learning during training
    - Provide for active participation
    - Increase self-efficacy.
    - Match training techniques to trainees' self-efficacy.

  - Provide opportunities for enactive mastery.
  - Ensure specific, timely, diagnostic, and practical feedback.
  - Provide opportunities for trainees to practice new behaviors.
- Maintaining performance after training
  - Develop learning points to assist knowledge retention.
  - Set specific goals.
  - Identify appropriate reinforcers.
  - Train significant others in how to reinforce behavior.
  - Teach trainees self-management skills.
  - Following up on training
  - Evaluate effectiveness.
  - Make revisions as needed.

B.6. Evaluate the Effectiveness of the Program.

As is true for all HR management practices used by a company, the value of training activities can be enhanced through continual evaluation and revision. This evaluation is the object of this thesis. By obtaining information of the evaluation, a company can assess the effectiveness of its current practices. Equally important, such data provides useful guidance for improving future approaches to socialization, training, and development.

Annexe C : The Process of Performance Appraisal

C.1. Introduction

Performance appraisal is the process of evaluating the behavior of employees in the work place. Performance appraisal is also called performance review, employee appraisal, performance evaluation, employee evaluation, merit evaluation, and personnel rating. All these terms refer to essentially the same process.

Performance evaluation must provide employees the feedback needed for improvement, without reducing their motivation to do a good job.

A formal performance evaluation system is set up by the organization to regulary and systematically measure and discuss the degree to which employees accomplish their work requirements. In many organizations, two evaluation systems exist side by side; the formal and the informal. Supervisors often think about how well employees are doing; this is the informal system. It is influenced by political and interpersonal processes so that employees who are liked better than others have an edge. On the other hand, a formal performance evaluation is a system set up by the organization to regularly and systematically evaluate employee performance.

C.2. Purposes

Performance evaluations may serve several purposes :

- Development : Evaluations determine the need for more training and measure the results of training programs. They help the supervisor in his role as a coach and counselor.
- Rewards : Evaluations have an important impact on pay raises, bonuses and promotions. They are the basis for equitable monetary packages.
- Motivation : Evaluation programs encourage initiative, responsibility, and performance improvement.
- HR and employment planning : Evaluations provide valuable inputs to skills inventories and HR planning. They help the integration of other HR activities.
- Communication : Evaluations are essential for the ongoing discussion between superior and subordinate about job-related matters.
- Legal compliance : Evaluations serve a legally defensible reason for promotions, transfers, rewards, and discharge decisions.

The importance of performance appraisal can be underlined in four categories :

- Evaluations that emphasize between-person comparisons.

- Development that emphasizes changes within a person over time.
  Systems maintenance.
- Documentation of human resource decisions.
- Increasingly, a fifth category is being added : alignment of appraisal with the needs of the business.

C.3. Objectives

Management should use performance appraisal because they are several important objectives of a performance-appraisal program that cannot be achieved by any other HR program. Performance appraisals are a key element in the use and development of an organization's most vital resource- its employees. Appraisals are used for a wide range of administrative purposes, such as making decisions about pay, promotion, and retention. Effective appraisals can significantly contribute to the satisfaction and motivation of employees - if they are used correctly.

The most common decisions based on evaluative objectives concern compensation, which includes merit increases, employees bonuses, and other increases in pay. Performance appraisal normally has a two-part effect on future pay. In the short run, it may determine merit increases for the following year; in the long run, it may determine which employees are promoted into higherpaying jobs.

Staffing decisions constitute a second evaluative objective of performance appraisals, because the managers and supervisors must make decisions concerning promotions, demotions, transfers, and layoffs. Past performance appraisals normally help to determine which employee is most deserving of a promotion or other desirable job change.

Performance appraisals can be used to evaluate the recruitment, selection, and placement system. The effectiveness of these functions can be partially measured by comparing employees' performance appraisals with their test scores as job applicants. Such analysis not only validates selection techniques but also determine the strengths and weaknesses of the selection process.

The second type of objectives of performance appraisal -developmental objectives- encompasses developping employee skills and motivation and providing performance feedback. Because employee has contributed to the appraisal, the process becomes more time-consuming than when a supervisor simply fills out an appraisal form.

Performance feedback is a primary developmental need, because almost all employees want to know how their supervisors feel about their performances. They want to know whether the results are satisfactory and if they are behaving as expected. As employees pursue their careers, periodically taking stock of how the organization views their performance is important. Their motivation to improve their current performance increases when they receive feedback that specifies goals, which in turn enhances future career moves.

Developmental performance appraisal also involves giving employees direction for future performance. This feedback recognizes strengths and weakenesses in past performances and determines what direction employees should take to improve. Employees want to know specifically how they can improve. Because performance appraisals are designed to cope with the problem of poor employee performance, they should be designed to develop better employees.

The results of appraisal influence decisions about the training and development of employees. Below-average evaluations may signal areas of employee behavior that may be strengthened through on- and off-the-job training. Of course, not all performance deficiencies may be overcome through training and development. Supervisors must distinguish performance problems resulting from lack of a critical skill or ability from those caused by low morale or some form of job dissatisfaction.

C.4. Process

The ability to generate accurate and reliable data for a performance evaluation is enhanced by a systematic process which includes the following steps :

- Establish performance standards.
- Establish policies.
- Gather data on employee performance.
- Raters evaluate their subordinates' performance.
- Discuss the evaluation with the subordinate.
- Make decisions and file the evaluation.

C.4.1. Performance Dimensions and Standards

Step 1 of this process is completed when a organization conducts a job analysis. One of the primary reasons for conducting job analysis is to write job description, and an important part of job description is a clear statement of the performance dimensions and standards expected from incumbents. In addition, the job analysis should have determined how these dimensions and standards are going to be measured.

The dimensions of performance upon which an employee is evaluated are called the criteria of evaluation. An effective criterion should posses the following characteristics :

- Relevance : a measurement of performance must be as logically related to the actual output of an incumbent as possible.
- Sensitivity : any criterion must be able to reflect the difference between high and low performers; high and low performers must receive criterion scores that accurately represent the difference in thier performance.
- Practicality : the criterion must be measurable and data collection cannot be inefficient or too disruptive.

C.4.2. Establish the Policies

For second step of the process, we should answer the following questions : who should assess, when and how often to rate ?

C.4.3. Gather Data on Employees

Gather data on employees is the third step of the process. There are many different ways to evaluate employees. These methods can be divided into two broad categories : methods that evaluate employees individually and methods that depend on multiple-person evaluations (the standards of performance are relative).

The individual evaluation methods are :

- Graphic rating scale is probably the oldest and perhaps the most common one. The number of characteristics rated varies from a fiew to several dozen. The ratings can be in a series of boxes or they can be on a continuous scale (0-9, or so). In this case the scores can be computed. Greater weight may be given to trits that are regarded as more important. To make the scale more effective, statements can be used. Operational and benchmark statements can also be added to describe different levels of performance.
- Forced choice methods were developed because graphic rating scales allowed supervisors to rate everyone high. The rater must choose from a set of descriptive statements about an employee and evaluate how applicable each statement is.
- In the essay evaluation technique, the rater may be asked to describe the strong and weak aspects of the employee's behavior. There are criticism about the accuracy and relevance of essay evaluations but they do offer flexibility.
- Critical incident technique requires raters to maintain a log of behavioral incidents that represent either effective or ineffective performance for each employee being rated. Because these critical incidents might not be directly comparable for different ratees, lists of standardized incidents can be prepared by the HR specialist. These method will help the supervisor to remember the different incidents and will provide valuable logs for performance evaluation interviews.
- Checklists and weghted checklists are sets of objectives or descriptive statements. If the rater believes that the employee possesses a trait listed, the rater check the item; if not, the rater leaves it blank. A rating score from the checklist equals the number of checks. Each check can be weighted.
- Behaviorally anchored rating scales (BARS) approach relies on the use of critical incidents to serve as anchor statements on a scale. A BARS rating usually contains 6 to 10 specifically defined performance dimensions, each with five or six critical incident anchors. The rater would read the anchor and place an X at some point on the scale for the ratee. It is not clear whether a BARS avoids many of the problems encountered with graphic rating scales.
- Behavorial observation scales (BOS) also used the critical incident technique to identify a series of behaviors that covers the domain of the job. The major difference with BARS is that instead of identifying those behaviors exhibited by the ratee during a rating period, the rater indicates on the scale how often the ratee was actually observed engaging in the specific behaviors identified in the BOS. Although this technique seems to be an improvement over more traditional graphic rating scales, it may not be available to organizations with limited resources because the development of a BOS approach needed time and cost.

The multiple-person evaluation methods are :

- Ranking is the simplest form but can be very difficult to do if the supervisor is asked to rank a large number of subordinates.
  Paired comparaison can make the ranking easier and perhaps more reliable.
- Forced distribution is similar to grading on a curve. The rater is asked to rate employees in some fixed distribution of categories, such as 10 percent in low, 20 percent in low average, 40 percent in average, 20 percent in high average and 10 percent in high.
- The following problems can appear during the gathering of data : problems with the standards of evaluation, halo effect, leniency or harshness, central tendency error, recency of events error, contrast effects and personal bias (stereotyping).

C.4.4. Evaluation

During step 4, raters evaluate their subordinates' performance. In order to allocate rewards and provide useful feedback, the scores must be accurate and objective.

C.4.5. Discuss the evaluation

Discuss the evaluation with the subordinate is step 5 of the process. An effective performance evaluation system involves two-way communication

C.4.6. Make Decisions and File the Evaluation

The final step of the evaluation process is to make decisions and file the evaluation.

Annexe D : The International Organization for Standardization (ISO)

D.1. What is ISO?

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies from some 130 countries, one from each country.

ISO is a non-governmental organization established in 1947. The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity.

ISO's work results in international agreements which are published as International Standards (ISO web). Tens of thousands of businesses are implementing ISO 9000 edition 1994 which provides a framework for quality management and quality assurance. The new edition ISO 9000:2000 serie was recently publiced.

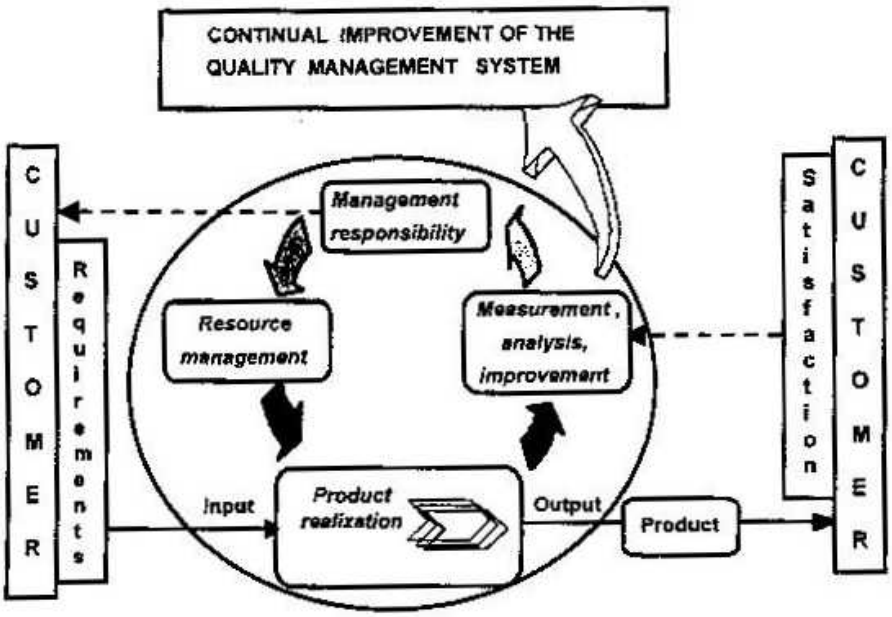
D.2. The Quality Management Principles of ISO

A quality management principle is a comprehensive and fundamental rule or belief, for leading and operating an organisation, aimed at continually improving performance over the long term by focusing on customers while addressing the needs of all other stakeholders (TC 176 web).

- Principle 1 — Customer-Focused Organisation
  Organisations depend on their customers and therefore should understand current and future customer needs, meet customer requirements and strive to exceed customer expectations.
- Principle 2 — Leadership
  Leaders establish unity of purpose and direction of the organisation. They should create and maintain the internal environment in which people can become fully involved in achieving the organisation's objectives.
- Principle 3 — Involvement of People
  People at all levels are the essence of an organisation and their full involvement enables their abilities to be used for the organisation's benefit.
- Principle 4 — Process Approach
  A desired result is achieved more efficiently when related resources and activities are managed as a process.
- Principle 5 — System Approach to Management
  Identifying, understanding and managing a system of interrelated processes for a given objective improves the organisation's effectiveness and efficiency.

- Principle 6 — Continual Improvement
  Continual improvement should be a permanent objective of the organisation.
- Principle 7 — Factual approach to decision making
  Effective decisions are based on the analysis of data and information.
- Principle 8 — Mutually beneficial supplier relationships
  An organisation and its suppliers are interdependent, and a mutually beneficial relationship enhances the ability of both to create value.

These principles are vizualized by the process approach model in Exibit Annexe I and translated in ISO requirements of the ISO 90001:2000.



Exibit Annexe I: The Process Approach of an Organization by ISO (ISO 9000:2000).

Although the ISO requirements may be used for projects and processes, they are ment for a system approach.

Annexe E : The European Foundation of Quality Management (EFQM).

E.1. What is EFQM?

The **E**uropean **F**oundation for **Q**uality **M**anagement (EFQM) was founded in 1988 by the Presidents of 14 major European companies, with the endorsement of the European Commission. The present membership is in excess of 600 organisations ranging from major multinationals and important national companies to research institutes in prominent European universities.

EFQM's mission is:

- to stimulate and assist organisations throughout Europe to participate in improvement activities leading ultimately to excellence in customer satisfaction, employee satisfaction, impact on society and business results; and
- to support the managers of European organisations in accelerating the process of making Total Quality Management a decisive factor for achieving global competitive advantage.

E.2. The EFQM Excellence Model

Regardless of sector, size, structure or maturity, to be successful, organisations need to establish an appropriate management system. The EFQM Excellence Model is a practical tool to help organisations do this by measuring where they are on the path to Excellence; helping them understand the gaps; and then stimulating solutions. The EFQM is committed to researching and updating the Model with the inputs of tested good practices from thousands of organisations both within and outside of Europe. In this way the organization ensures the model remains dynamic and in line with current management thinking.

The EFOM Model is a non-prescriptive framework that recognises there are many approaches to achieving sustainable excellence. Within this non-prescriptive approach there are some Fundamental Concepts which underpin the EFQM Model:

- Results Orientation
  Excellence is dependent upon balancing and satisfying the needs of all relevant stakeholders (this includes the people employed, customers, suppliers and society in general as well as those with financial interests in the organisation).
- Customer Focus
  The customer is the final arbiter of product and service quality and customer loyalty, retention and market share gain are best optimised through a clear focus on the needs of current and potential customers.

- Leadership & Constancy of Purpose
  The behaviour of on organisation's leaders creates a clarity and unity of purpose within the organisation and an environment in which the organisation and its people can excel.

- Management by Processes & Facts
  Organisations perform more effectively when all inter-related activities are understood and systematically managed and decisions concerning current operations and planned. improvements are made using reliable information that includes stakeholder perceptions.

- People Development & Involvement
  The full potential of an organisation's people is best released through shared values and a culture of trust and empowerment, which encourages the involvement of everyone.

- Continuous Learning, Innovation & Improvement
  Organisational performance is maximised when it is based on the management and sharing of knowledge within a culture of continuous learning, innovation and improvement.

- Partnership Development
  An organisation works more effectively when it has mutually beneficial relationships, built on trust, sharing of knowledge and integration, with its Partners.

- Public Responsibilitry
  The long-term interest of the organisation and its people are best served by adopting an ethical approach and exceeding the expectations and regulations of the community at large.

The EFQM Excellence Model is a non-prescriptive framework based on nine criteria. Five of these are 'Enablers' and four are 'Results'. The 'Enabler' criteria cover what an organisation does. The 'Results' criteria cover what an organisation achieves. 'Results' are caused by 'Enablers'.

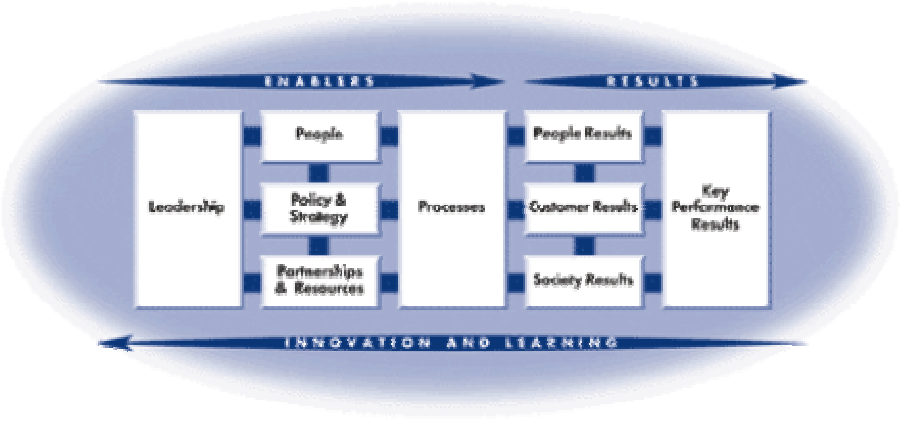
The Model, which recognises there are many approaches to achieving sustainable excellence in all aspects of performance, is based on the premise that:

Excellent results with respect to Performance, Customers, People and Society are achieved through Partnerships and Resources, and Processes.

The EFQM Model is presented in diagrammatic form in Exibit Annexe II.

The arrows emphasise the dynamic nature of the model. They show innovation and learning helping to improve enablers that in turn lead to improved results.

The Model's 9 boxes, shown above, represent the criteria against which to assess an organisation's progress towards excellence. Each of the nine criteria has a definition, which explains the high level meaning of that criterion.



Exibit Annexe II: The EFQM Model (EFQM, 2000).

To develop the high level meaning further each criterion is supported by a number of subcriteria. Sub-criteria pose a number of questions that should be considered in the course of an assessment.

Finally below each sub-criterion are lists of possible areas to address. The areas to address are not mandatory nor are they exhaustive lists but are intended to further exemplify the meaning of the sub-criterion.

When using the model within an organisation, for example for the purposes of Self-Assessment, the Approach, Deployment, Assessment and Review elements of the RADAR logic should be addressed for each Enabler sub-criterion and the Results element should be addressed for each Results sub-criterion.

Annexe F : The European Quality Improvement System (EQUIS).

EQUIS is an international system of strategic audit and accreditation designed by Europeans for the assessment of institutions in widely different national contexts. Although it is inspired by the particular needs of a European situation characterised by extreme cultural diversity within a large civilizational area, EQUIS is not limited to European problems in its scope. The standards are those of effective education for international management and apply to schools in any cultural environment whether in Europe or outside Europe. It was launched in 1997 by the EFMD (European Foundation for Management Development) which has championed the issue of quality in management development for many years and has brought together the key operators in Europe in a common initiative. As Europe's largest network association in the field of management development, with some 400 members from academia, business, public service and consultancy in 40 countries of Europe and the world, EFMD plays a central role in shaping the European approach to management education.

With companies recruiting in Europe and beyond, with students choosing to get their education outside their home countries and with schools building partnerships across borders and continents, there is now a rapidly growing need for more information, for better market transparency. Students and employers often know which institutions in their home country have a reputation for high quality - but they need some guidance as to which institutions meet the highest international standards in the wider European environment.

F.1. The EQUIS Objectives

There are three related objectives that are being pursued through the EQUIS system:

- **To provide market information** to students and employers as to which institutions have achieved a reputation in their own national environment and, in addition, meet international standards for quality providers. In order to support this aim, a European Quality Label will be awarded to schools which meet the EQUIS criteria.
- **To provide an instrument for comparison and permanent benchmarking** Although the system will in no way attempt to impose uniform standards, it will allow schools to position themselves against international standards and will encourage convergence on best practice.
- To promote quality improvement throughout Europe

The EQUIS system is deliberately designed to promote continuous improvement at all levels.

The key features of the EQUIS process and standards can be summarised as follows:

- EQUIS will look at the performance of the institution taken as a whole, including all its programmes;
- EQUIS is an international and intercultural approach to accreditation and;

- the EQUIS criteria reflect some of the major characteristics and dominant values in European management education.

F.2. The EQUIS Quality Standards

To achieve EQUIS accreditation, Schools must be able to demonstrate that they satisfy quality criteria in three equally important areas:

F.2.1. High International Standards of Quality in All of the Areas Defined in the EQUIS Model

Where appropriate, the School should be officially recognized by the public authorities in its national environment and should be regarded as a major quality institution by the marketplace (ie. participants, clients and competitors).

- **Mission**
  The School should have a clearly articulated sense of mission, which is understood and shared throughout the institution and recognized as legitimate, by the marketplace.
- **Governance**
  The School should have an effective and integrated organisation for the management of its activities, with a significant degree of control over its own destiny.
- **Scope**
  The School should have substantial presence in one, and preferably more, of the following areas of educational activity: - First degree programmes - Postgraduate degree programmes (including MBA) - Executive education.
- **Strategy**
  The School should have a defined, credible and coherent strategy, realistically reflecting its resources and constraints.
- **Resources**
  The School should be able to demonstrate financial viability and institutional continuity, with physical resources and facilities to provide a high quality learning environment.
- **Faculty**
  The School should recruit, develop and manage its faculty in accordance with its strategic objectives and have sufficient core faculty to cover the major disciplines and constitute a viable body of distinctive expertise (e.g. minimum of 25 professors).
- **Students**
  The School should recruit and select high quality students in its national/international environment and should be able to demonstrate the quality of placement of its graduates.
- **Student Services**
  The School should provide effective professional student services in such areas as Admissions, International Affairs, Careers, Counselling, etc
- **Personal Development**
  The School should explicitly and effectively support the personal development of its participants beyond the acquisition of knowledge into such areas as managerial skills, values, ethics, leadership, etc.

- **Programmes**
  There should be coherent programme design, staffing, administration and evaluation, incorporating client and student feedback, and rigorous assessment processes for monitoring student progress.
- **Research**
  The School should have a clearly defined research and publication policy, through which faculty are encouraged to develop distinctive areas of expertise.

F.2.2. A Significant Level of Internationalisation as Defined within the EQUIS Model

The School should have a clearly articulated policy for internationalisation to which it is actively committed. The School should demonstrate its commitment to educating students and participants for management in an international environment in the following areas:

Internationalisation of the student body
Evidence of this can include:

- The recruitment of students from other countries.
- The existence of exchange programmes to provide a two-way flow of students.
- A concern for intercultural exchange in the classroom.
- The provision of internships or project work across borders.
- The international placement of graduates.
- The language ability of graduates.

Internationalisation of the faculty
Evidence of this can include:

- The recruitment of non-nationals to the faculty.
- The international experience of faculty.
- The ability of faculty to teach in English.
- The foreign language skills of faculty.
- The involvement of visiting professors.
- The opportunities for faculty to serve as visiting professors abroad.
- The involvement of faculty in international networks.
- Participation in international conferences.
- Research and publication of an international nature.

Internationalisation of programmes
Evidence of this can include:

- Teaching which focuses on the European and global business environments.
- Courses taught in English.
- An international perspective in all the main functional Areas.
- Courses jointly designed and taught with partner institutions abroad.
- Internships and study abroad as an integral part of programmes.
- International learning materials.

F.2.3. The Needs of the Corporate World are Well Integrated into Programmes, Activities and Processes

- The School should have a clearly articulated policy with regard to its relations with the corporate world.

- The School should be able to demonstrate a strong customer orientation, particularly in relations with corporate clients.
- Whenever possible given the statutory constraints under which the School operates, members of the corporate community should participate in its governance.
- The School should manage a portfolio of contacts with the corporate world, a substantial part of which should be with leading companies in its national/international environment.
- The needs of the corporate world should be inherent in programme design.
- The School should monitor the degree of recruiter satisfaction with the quality of its graduates.
- Programmes should incorporate structured opportunities for participants to gain direct experience of the corporate world, through internships, field work, campus visits by company representatives, etc.
- Programme delivery should include input from practitioners.
- Faculty should have business experience and keep abreast of current management best practice.
- Faculty should have opportunities to engage in consultancy (EFMD, 1998).

Annexe G : The Joint Aviation Requirements (JAR).

The Joint Aviation Authorities (JAA) is an associated body of the European Civil Aviation Conference (ECAC) representing the civil aviation regulatory authorities of a number of European States who have agreed to co-operate in developing and implementing common safety regulatory standards and procedures. This co-operation is intended to provide high and consistent standards of safety and a "level playing-field" for competition in Europe. Much emphasis is also placed on harmonising the JAA regulations with those of the USA (JAA, 2000).

Exibit Annexe III: The JAA Logo.

The JAA Membership is based on signing the "JAA Arrangements" document originally signed by the then current Member States in Cyprus in 1990. Based on these Arrangements and related commitments, the JAA's objectives and functions may be summarised as follows:

G.1. Objectives

- **Aviation Safety**
  To ensure, through co-operation amongst Member States, that JAA members achieve a high, consistent level of aviation safety.

- **Transition from JAA to EASA**
  To ensure the highest level of contribution to the European Union for establishing an European Aviation Safety Agency that would absorb all functions and activities of the JAA in a period as short as possible and would ensure the full participation of the JAA non EU Member States.

- **Business Effectiveness**
  To achieve a cost effective safety system so as to contribute to an efficient civil aviation industry.

- **Consolidation of Common Standards**
  To contribute, through the uniform application of common standards and through regular review of existing regulatory situation, to fair and equal competition within Member States.

- **Worldwide Aviation Safety Improvement**
  To co-operate with other regional organisations or national authorities of States who are playing an important role in Civil Aviation, in order to reach at least the JAA safety-level and to foster the world-wide implementation of harmonised safety standards and requirements through the conclusion of international arrangements.

G.2. Functions

- To develop and adopt Joint Aviation Requirements (JARs) in the fields of aircraft design and manufacture, aircraft operations and maintenance, and the licensing of aviation personnel.
- To develop administrative and technical procedures for the implementation of JARs.
- To implement JARs and the related administrative and technical procedures in a co-ordinated and uniform manner.
- To adopt measurements to ensure, whenever possible, that pursuance of the JAA safety objective does not unreasonably distort competition between the aviation industries of Member States or place companies of Member States at a competitive disadvantage with companies of non-Member States.
- To provide the principal centre of professional expertise in Europe on the harmonisation of aviation safety regulation.
- To establish procedures for joint certification of products and services and where it is considered appropriate to perform joint certification.
- To co-operate on the harmonisation of requirements and procedures with other safety regulatory authorities, especially the Federal Aviation Administration (FAA).
- Where feasible, to co-operate with foreign safety regulatory authorities especially FAA, on the certification of products and services.

JAA's work started in 1970 (when it was known as the Joint Airworthiness Authorities). Originally its objectives were only to produce common certification codes for large aeroplanes and for engines. This was to meet the needs of European industry, particularly for products manufactured by international consortia (e.g. Airbus). Since 1987 its work has been extended to operations, maintenance, licensing and certification/design standards for all classes of aircraft. Common procedures and the approval of design, production and maintenance organisations are covered. A single Joint Certification team, working on behalf of all the JAA countries, is used for certification of new aircraft and engines. After the successful completion of the evaluations Type Certificates are issued simultaneously, and on a common basis, by all Member States.

The JAA originated as the Authorities' response to the technical and economic needs of the European Aviation Industry. However, since 1 January 1992 JAA codes, as they are completed,

are referenced in the European Community Regulation on Harmonised Technical Standards and have become law in the EC States.

Industry is fully represented in sectorial teams and working groups, developing requirements and procedures, and in an IPAP (Interested Parties Advisory Panel), where policy issues are debated.

The JAA, as presently established, carries out its tasks of approval, certification and safety monitoring using staff of the national authorities, who also retain the responsibility for the legal findings of granting licences and certificates, etc. The Central JAA is responsible for the process of rulemaking, harmonisation and standardisation, (using specialist staff from the national authorities), the decision-making system, the "infrastructure" and various related tasks.

Membership is open to members of the European Civil Aviation Conference (ECAC), which currently consists of 38 member countries. Membership takes effect when the 1990 "Arrangements" are signed. There are 36 member countries in the JAA today.

G.3. Training and JAR

G.3.1. JAR-66 : "Certifying Staff"

JAR 66 is a new JAA rule introducing qualification requirements for Certifying Staff. Certifying Staff are those personnel authorised to release an aircraft to service after maintenance work in a JAR 145 Approved Maintenance Organisation (AMO). JAR-66 was published on 3 April 1998

JAR 66 introduces four categories of certifying staff, and includes related qualification requirements in term of basic knowledge, maintenance experience, task or type training.

G.3.2. JAR-147 "Approved Maintenance Training"

JAR-147 is a requirement for approved maintenance training to satisfy part of the JAR-66 requirements including in particular the conduct of basic and type examinations to be accepted by the JAA-NAA as a basis for issue of the proposed JAR-66 Licence. JAR-147 was published on 3 April 1998 with mandatory compliance by 1 June 2001 for those organisations that wish to claim reduced time to qualify for JAR-66 licence.

To be approved in accordance with JAR 147, an organisation has to comply with a series of requirements dealing with facilities, personnel, documentation, records, examinations, quality monitoring, etc. A JAR 147 organisation may be approved to conduct basic training, type training, or both. An organisation approved in accordance with JAR 147 to conduct basic or type training is also entitled to conduct related examinations on behalf of the Authority.

Annexe H : Needs, Wants, Drives and Cues.

Marketing Mixes are designed to appeal to the Needs, Wants and Drives of consumers and to provide Cues that trigger action on the part of potential customers.

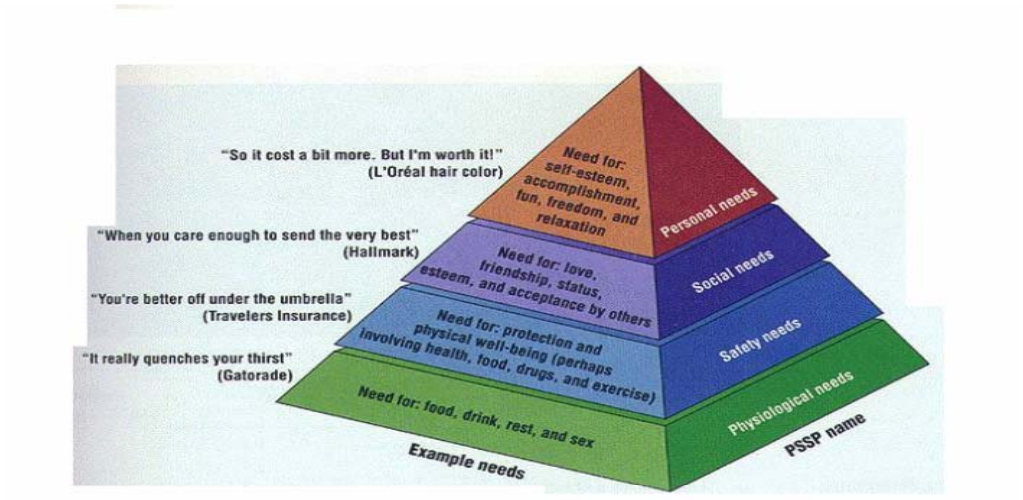
Needs - basic forces that provide motivation for action.

Wants - learned Needs that values socio-cultural and personal preferences.

Drives - internal stimulus for action, often they stem from unsatisfied Needs and Wants.

Cues - products, signs, symbols, and images that trigger Needs, Wants and Drives.

Maslow developed a five level Hierarchy of Needs. He argued that lower level Needs have to be satisfied before a person seeks to satisfy higher level needs. The following graphic compresses the top two Maslow need levels into one.



Annexe I : Glossary

Performance management :
The continuing process that includes a number of basic managerial activities such as directing, encouraging and controlling human resources productivity in an organization.

Performance appraisal :
The process by which organizations evaluate employee job performance.

Suboptimization :
The phenomenon that occurs when each department or work area pursues unique sets of objectives that are in conflict with, or do not support, company-wide objectives. Refers to the "own department comes first" mentality, motivated by a narrow self-interest.

Theory :
Systematically organized knowledge applicable in a relatively wide variety of circumstances, especially a system of assumptions, accepted principles, and rules of procedure devised to analyse, predict or otherwise explain the nature or behaviour of a specified set of phenomena (American Heritage Dictionary). E.g. : one training method might be more effective than another for learning certain skills.

Management-by-Objectives :
A future-oriented performance appraisal which each employee and supervisor jointly establish performance goals, that ideally are mutually agreed upon and objectively measurable.

Validity :
The degree of relationship between a measurement of a trait, behavior or outcome, and a criterion, which is some more objective measurement of the same trait, behavior or outcome (Different types of validity exist : construct, content, ...).

Reliability :
There are different kinds of reliability : e.g. internal consistency (the amount of agreement among assessors) and stability (the degree of similarity between measurements of the same people on the same characteristics obtained with the same method at two points in time).

Affective Domain:
Learning related to the emotions, values, and attitudes.

Cognitive Domain:
Learning related to mental processes such as knowing and understanding.

Locomotive Domain:
Learning related to the locomotive system such as muscles coordination, mastering a drill or movement.

Information Age:
A society where there a greater uncertainties and faster changes, and where communication, flexibility, adaptability and critical thinking are key requirements.

(Organizational) Culture:
The philosophy and values which create common understanding among organisational members concerning the organisation's mission and how its members should behave. On closer analysis, there appear to be ten value-characteristics : individual initiative, risk tolerance, direction, integration, management support, control, identity, reward system, conflict tolerance, communication patterns.

Quality:
Ability of a set of inherent charateristics of a product, system, or process to fulfill requirements of customers and other interested parties (ISO 9000:2000).

System:
Set of interrelated or interacting elements (ISO 9000:2000).

Effectiveness:
Measure of the extent to which plannend activities are realized and planned results achieved (ISO 9000:2000).

Efficiency:
Relationship between the result achieved and the resources used (ISO 9000:2000).

Organization:
Group of people and facilities with an orderly arrangement of responsabilities, authorities and relationships (ISO 9000:2000).

Process:
System of activities which uses resources to transform inputs into outputs (ISO 9000:2000).

Product:
Result of a process (ISO 9000:2000).

Service:
Intangible product that is the result of a least one activity performed at the interface between supplier and customer (ISO 9000:2000).

Total Quality Management:
TQM is defined as both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. It is the application of quantitative methods and human resources to improve all processes within an organization and exceed customer needs now and in the future. TQM integrates fundamental management techniques, existing improvement effeort, and technical tools under a disciplined approach (Besterfield et al., 1995).

Training:
The goal and the purpose of good training training is for the participants to learn something. Learning be split up into three sub-areas of learning: knowledge, skills, and attitudes (Barkler et al., 1996).

Vocational Training:
The promotion and development of abilities useful to the economy over those that are useful to an individual.

Annexe J : Abbreviations

A
ADDIE - Analysis, Design, Development, Implement, Evaluate (SAT or ISD)
ALARA - As Low As Reasonably Achievable
ASTD - American Society for Training and Development
ATS - Advanced Training System
A/V - Audio Visual

B
BEER - Behavior, Effect, Expectation, Results (for feedback for improvement)
BET - Behavior, Effect, Thanks (for positive feedback)
BPR - Business Process Re-engineering
BST - Basic Skills Trainer
BZ - Bravo Zulu (USN signal for 'job well done')

C
CAI - Computer-Aided Instruction
CAUSED - **C**an they do it, do they have a positive **A**ttitude, is it **U**seful to them, are they **S**killed in it, do they have similar **E**xperience, is it **D**ifferent.
CAX - Computer Assisted Exercises
CBI - Computer-Based Instruction
CBT - Computer-Based Training or Competency Based Training
CETA - Cost-Effective Training Analysis
COTS - Commercial Off-The-Shelf
CPI - Continuous Process Improvement

E
EFMD - The European Foundation for Management Development
EFQM - European Foundation for Quality Management
EQUIS - The European Quality Improvement System for School in internatonal management

F
FOJT - Formal On-the-Job Training
FTX - Field Training Exercise

G
GIGO - Garbage In, Garbage Out

H
HR - Human Resources
HRD - Human Resource Development
HRM - Human Resource Management

I
ICW - Interactive Courseware
IFTDO - International Federation of Training and Development Organizations
IMI - Interactive Multimedia Instruction
I/O - Input/Output
IQ - Intelligence Quotient
ISD - Instructional System Development
ISD/SAT - Instructional Systems Development/Systems Approach to Training
ISPI - International Society for Performance Improvement
ISO - International Standardization Organization or simple the Greek word for "equal"
IT - Instructional Technology or Information Technology
ITP - Individual Training Plan
ITS - Integrated Training System or Individual Training Standard
IV&V - Independent Verification and Validation

J
JAA - Joint Aviation Authorities
JAR – Joint Aviation Requirements
JITT - Just-In-Time Training

K
KAS (KSA) - Knowledge, Attitudes, Skills
KISS - Keep It Simple Stupid

L
LG - Lecture Guide
LO - Learning Objective
LTM - Long Term Memory

M
MOP - Measure Of Performance
MPA - Motivation Problem analysis

N
NEQI - National Education Quality Initiative
NLP - Neuro-Linguistic Programming
NSPI - National Society for Performance and Instruction

O
OJT - On-the-Job Training

P
PA - Performance Assessment
PE - Practical Exercise
PFA - Pulled from the Air (as in the most common way of establishing budgets)

Q
QA - Quality Assurance
QC - Quality Control
QI - Quality Improvement
QM - Quality Management

R
R&D - Research and Development
RFT - Ready For Training
RGL - Reading Grade Level

S
SCI - Student Centered Instruction
SDLRS - Self Directed Learning Readiness Scale (developed by Gugliamino)
SKA - Skills, Knowledge, Attitude
SMART - Specific, Measurable, Achievable, Relevant, Time based (objective and goal setting)
SMARTER - Specific, Measurable, Achievable, Relevant, Timely, Exciting, Recorded (see DUMBER)
SPEC - Specification
SQ3R - **S**urvey the material to be learned, develop **Q**uestions about the material, **R**ead the material, **R**ecall the key ideas, **R**eview the material (learning strategy)
SQT - Skills Qualification Test
STD - Standard
STX - Situational Training Exercise

T
T&D - Training and Development
T&E - Training And Evaluation
TADSS - Training Aids, Devices, Simulators, and Simulations
TD - Training Development
TDS - Training Development Study
TDSS - Training Devices, Simulations, and Simulators
TEA - Training Effectiveness Advocate or Training Effectiveness Analysis
TEE - Training Effectiveness Evaluation
TEEP - Training Effectiveness Evaluation Plan
TKT - Threshold Knowledge Test
TLA - Training Level Assignment
TMP - Training Management Plan
TNG - Training
TOIS - Task Oriented Instructional System
TOS - Training Objective Statement
TPR - Trained Personnel Requirement
TQM - Total Quality Management
TQR - Training Quality Report
TR - Training Requirement
TRADE - Training Devices
TTHSS - Touch, Taste, Hear, Sight, Smell (5 Senses)
TWI - Training Within Industry

V
VAK - Visual, Auditory, Kinesthetic
VI - Visual Information
VV&A - Verification, Validation, and Accreditation
VV&C - Verification, Validation and Certification

W
WBI - Web Based Instruction
WBPSS - Web Based Performance Support System
WBS - Work Breakdown Structure
WIIFM - What's In It For Me
WYSBYGI - What You See Before You Get It
WYSIWYG - What You See Is What You Get

Y
YOYO - You're On Your Own

Z
ZD - Zero Defects

Annexe K : Bibliography

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