

# UPDATING THE BOS

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**SUMMARY** Broadly speaking, the aim of computer software is to guide the data which has been fed into the computer, steering it inside the hardware and operating on it in a predetermined way. There also exists a similar situation in an enterprise, be it a company, a school or a bureau of Government. Studying the way things work in a computer gives insights into how they work, or fail to work in a human enterprise. The basic or highest level computer software is referred to as the disc operating system or DOS. We can imagine that the corporate equivalent to a computer's DOS is its culture or brain operating system (BOS) and then use this metaphor to examine how CEOs and companies need to change, if they want to make better use of the corporate equivalents to a computer's application programs.

## **Introduction to the Computer Metaphor**

The tasks made in a company can be compared with the tasks made in a computer. In a computer, when new application programs are run with an older version of DOS, they may operate but with reduced capacity. In some circumstances this incompatible condition may cause the computer to fail. It's not difficult to think of similar conditions occurring in a company when it's trying out new programs and processes without updating the company's culture. We may consider that the corporate equivalent to a computer's DOS is its culture. We can therefore refer to it as the Brain Operating System (BOS).

## **The character of corporate BOS**

Most corporate BOS is not written, existing only in the minds of the management, but it is very important. When a chief executive officer frowns at somebody during a committee meeting, you can be sure that an instruction of the BOS is activating a spate of other instructions at lower levels in the brain application programs of the company.

Which comes first : updating BOS or programs ? Improving the performance of the computer is often achieved through changes of application programs, but the impact of these changes may be limited by the DOS itself. For this reason, computer firms frequently produce new versions of their DOS. Generally, a new application program can work with old editions of the DOS, but with poorer performance than with the latest one.

Sometimes, also when the DOS version is too old, the application program becomes incompatible with the DOS. Sometimes a user keeps an old edition of the

application program and tries to use it with the latest DOS version. In such a case, the performance remains the same, despite an investment made to improve the DOS.

In Western industry, many economic problems arise because companies try to change their brain application programs without changing the BOS. Examples of such application programs have been, for the last ten years : quality circles, just-in-time JIT, SPC, QFD, et cetera. Most of the time, they didn't work properly because the BOS was too old, and the company eventually gave them up without realizing that their problem was not with the application program, but with the fact that their BOS was/is quite obsolete.

## **The Deming BOS**

When Dr. W. Edwards Deming visited Japan during the 1950s, he taught Japanese CEOs a new theory of management, one that represented a tremendous improvement of their BOS. The management theory was based on the theory of variation, a statistical way of thinking that Dr. Walter Shewhart, of the Bell Telephone Laboratories, had invented 25 years earlier. The 22 leaders of the Keidanren, who attended the Deming conference in July 1950, loaded the new BOS into their organizations, a very difficult job, and 25 years later the Western CEOs began to hear of new Japanese methods. They were, in fact, application programs that the Japanese had designed and developed over a long period of time, by themselves, according to their new BOS. But Western CEOs didn't realize that.

The DOS creates in a computer the standard structures and sequences for accomplishing tasks. In this way, it creates an invisible, but exact, map that all other application programs must utilize to carry out their specific tasks. In a computer, when new application programs are run with an older version of DOS, they may operate but with reduced capacity. In some circumstances this incompatible condition may cause the computer to crash (fail). It's not difficult to think of similar conditions occurring in a company when it's trying out new programs and processes without updating the company's BOS. The BOS creates for a company the standard thought and decision making structures and sequences for completing tasks. In this way, it creates an invisible, but exact map that all systems and processes must use to think about and complete specific tasks.

What happens when you try to run two versions of BOS simultaneously ? The extraordinary crusade that Dr. Deming has been leading for decades in the West aims at loading this new BOS version in our organizations. This is the meaning of the 14 Deming points. Unfortunately, many companies have become discouraged after loading the new BOS version, because they tried to let it cohabit with the old one. This produced internal conflicts and the situation became worse than ever in many organizations.

In other cases, companies dropped the old BOS, and were successful in loading the new one, but then they also became discouraged, because they had to update all their application programs, and this required a long time without seeing significant improvement in their system's output. Resistance to change isn't simply psychological. The problem of introducing both the BOS update and the updated application programs is often called resistance to change, but it's not just a psychological problem.

Any genuine system improvement comes only after a thorough study of the system by the people who are trying to improve it. Nobody is too old, nobody is too high in rank to learn the new management theory the theory which is at the

root of the new BOS and to use this theory to study and understand their systems.

Sophisticated and user friendly linkages reduce the causes of resistance. The new application programs, which operate under the latest versions of DOS (Windows), are characterized by the way they link with one another. The newer versions of the DOS are able to deal with problems in a more holistic way. For example many new programs link graphics, text, sound and even animation. Many different input/output functions are required, and the DOS has to be more sophisticated to handle them smoothly.

We can easily understand the difference that DOS design can make when we compare the time it takes for a beginner to become productive, using a Macintosh computer compared to a PC, or the time it takes to transfer graphical information from one application program to another. This has been recognized, and the development of Windows is obviously a step to overcome this difference in operating systems.

So it is that the BOS needs to be able to deal with quality improvements which are cross functional. and which impinge upon many aspects of the enterprise. Deming refers to these new abilities as representing profound knowledge.

The brain operating system (BOS) contends with three sub-systems and requires profound knowledge to do so.

- 1 *The managerial system: Practices, protocols, permissions, procedures and politics.*
- 2 *The social system: Teamwork. cooperation and respect.*
- 3 *Where the work gets done. Where the tools and techniques are applied.*

Think of these as a series of circles. The innermost circle represents the lowest level application programs, such as the tools and techniques of the quality sciences. These tools and techniques must work within a social system, represented by the next circle. These tools and techniques often require cooperation to be effective and are either helped or hindered by the social system. The social system, in turn is imbedded in a managerial system, one designed by the management. All these systems must operate within the BOS.

## **Profound knowledge according to Deming**

Under the heading of profound knowledge, Deming lists the following :

- The theory of variation
- The theory of knowledge
- Human psychology
- Systems theory

The latest versions of the BOS must contend with applications programs for all aspects of profound knowledge and must be able to deal with them simultaneously. Older versions of the BOS are unable to handle this complexity. Older versions of the BOS are usually even unaware of the existence of these three systems and, even if they are pointed out, are unable to organize methods to improve them.

What is profound knowledge ? Deming's profound knowledge list does not

cover all the things a CEO should know ; it simply points to the topics which obviously have been missing in the training and education of Western managers. They are profound in the sense that once a CEO understands and applies profound knowledge, his or her behavior is changed dramatically, and, through leadership and skillful management, the influence of this change is felt throughout the enterprise.

## **Specific things a CEO needs to know**

A CEO should be able to lead and to manage the three systems (the three circles above) and provide leadership to the three systems.

Leadership versus management... Following the thoughts of Dr. Stephen Covey, we differentiate between leading and managing by the following quote from Covey's book, *The 7 Habits of Highly Effective People* :

You can quickly grasp the important difference between the two if you envision a group of producers cutting their way through the jungle with machetes. They're the producers, the problem solvers. They're cutting through the undergrowth, clearing it out.

The managers are behind them, sharpening their machetes, writing policy and procedure manuals, holding muscle development programs, bringing in improved technologies and setting up working schedules and compensation programs for machete wielders.

The leader is the one who climbs the tallest tree, surveys the entire situation, and yells « Wrong jungle ! ».

But how do the busy, efficient producers and managers often respond ? « Shut up ! We're making Progress ».

Everything a CEO undertakes to do involves management and leadership. An act of managing badly is also an example of bad leadership. It is not only the CEO who has to learn many new things. Everyone needs to learn new things. They must also learn how to use their new knowledge. Above all, they need to recognize that they need to learn.

## **The theory of variation and the CEO**

The BOS, in itself, does not require the mathematical theory of statistics, which frightens so many people, but must be able to deal intelligently with variation. (As with statistical programs for computers, the DOS and the hardware have to be able to contend with numbers.) The CEO's BOS should understand how to analyze variation, using very simple methods, and should understand how variation can inrect a system and produce bad effects far from the location where the variations are caused.

The old BOS doesn't differentiate the different types of variation very well, if at all ...

It is crucial to distinguish the variations which are worthy of an investigation because there is probably an assignable cause (a special cause) behind them, from those which are not (common causes). There are four possibilities, as indicated in the 2x2 matrix below.

| CAUSE         | TAKE AN ACTION   | TAKE NO ACTION  |
|---------------|--|---|
| Special Cause | Remove the cause and the system becomes more predictable               | The problem remains and the system remains unpredictable  |
| Common Cause  | Tampering makes the system show greater variation and things get worse | The system remains predictable, but may have such large variation that it is still unsatisfactory |

A new BOS, which can distinguish between the two kinds of causes, and take appropriate action (or inaction) produces, on balance, improved behavior in the organization. The older version of the BOS, on the other hand, consistently makes things worse.

Understand that summary data can be misleading... A basic difference between the job of the CEO and a VP is that the latter prepares reports and the former reads them. Before having this rank, the CEO learned to prepare reports from a set of information, the first source of which is original data, as Shewart said. A report is a summary of data. A great mistake in Western management is the belief that a summary of data is always enough to make a decision. To quote Shewhart directly, "Any mathematical summary can present but a portion of what must be considered as the original data."

When an industry is in its infancy, entrepreneurs know they must go into the field and obtain the data themselves. Later generations of managers, however, seem content to work with ratios, business status reports, et cetera. During the 1970s, top management got essentially all its information from ratios and made decisions thereon.

Missing from these ratios is any sense of the variability in the data which produced them. Since variability decreases the accuracy of any prediction made upon these ratios, the managers who do not understand the elementary theory of variation cannot know what will be the results of the actions they decide to take.

The CEO should possess sufficient conceptual knowledge of variability to ask sensible questions... A CEO needs the ability to ask sensible questions about data, especially the source of the data and how the data were analyzed. Sometimes data are obtained as the result of an experiment. The CEO should understand the concepts behind the design of experiments. Without this understanding, the CEO will simply not know if what is reported is reliable. Data sets are always incomplete. The original data, upon which the charts, ratios, and graphs are based are a sample. How the sample was taken has a great effect upon how the results should be understood.

The world is full of variation, but older versions of the BOS have been educated not to see them. A re-education is necessary for all of us.

The concept of managing by walking around (MBWA) is deceptively simple. Walk around and see for yourself what is happening. The workers know, however,

that if the CEO does not understand variation and the theory of sampling. MBWA can be a menace. Who among us has not suffered from a boss who made a decision based on a sample of one, biased observation?

## **The theory of knowledge and the CEO**

The philosopher Clarence I. Lewis pointed out that knowledge has significance because it affords prediction. In other words, when you seek the causes of a problem, your aim is not to contemplate the past but to become more capable of predicting events in the future.

Knowledge is acquired from data, experience and critical thinking ... A gardening handbook is just a storage of evidence that a gardener may agree with, more or less, in accordance with prior experience, prior knowledge, and a critical mind. It is on the field of experience that the gardener will transform this evidence into knowledge of roses. In the same way each member of an organization must create, in practice, his or her own personal system of knowledge.

For people who do not have a rudimentary grasp of the theory of knowledge, communication becomes futile. The basic problem may be stated this way : When you know something, but you do not know everything, how do you tell someone else neither more nor less than you really know ?

Is acquiring data the same as gaining knowledge ? We should not confuse data with knowledge. Competent scientists do not consider that information is knowledge. For example, when you find data in a report, it is important to stand back and regard the data only as evidence from those who have measured and reported. Your knowledge can increase only through the assimilation of the facts that came from other people, as understood in the light of your personal prior experience.

How do you enable someone else to act upon your (incomplete) knowledge, combine that knowledge with additional information, and reach conclusions with which you will agree ?

Can you load profound knowledge into the BOS as you would a DOS update ? Unfortunately you cannot promote a new version of the BOS in your organization (a company, a hospital, a university) as easily as updating a DOS in a computer. Deming has often said that you cannot install quality control as if it were a new carpet. That is true because knowledge, profound knowledge, is basically a personal possession. The idea that knowledge can go from one person to another the way water is poured from a bottle to a glass, is a great illusion. However, knowledge can be shared. To a very large extent, the progress of science would be impossible without a certain amount of common knowledge.

Relationships based upon win-lose versus win-win logic... Today most business practices are ruled by relationships of power that lead to a win-lose logic and to the progressive destruction of our world. The old BOS can be defined simply as being dominated by win-lose logic.

The transformation that will save the world and our organizations requires a win-win logic. The new BOS, corresponding to this logic, aims at establishing between people a relationship based on knowledge, not power. It is a revolution of thought as important as the birth of scientific thought in Europe that René Descartes promoted three hundred years ago.

The system of profound knowledge should not be compartmentalized, as is so often done with knowledge in academia. It is the ability to use all four aspects of the system of profound knowledge at once that distinguishes the true manager from

the narrow specialist.

## **Eight profound knowledge rules**

Deming has derived eight rules which arise from the theory of profound knowledge

1. Any plan requires prediction.
2. There is no knowledge without theory.
3. There is no prediction without knowledge.
4. Experience teaches nothing unless studied with a theory.
5. An example teaches nothing unless studied with a theory.
6. Operational definitions put communicable meanings into concepts.
7. A single counter example destroys a theory.
8. There is no true value of anything.

To this list of eight, we would add a ninth :

9. Data must be analyzed and organized before the information may be converted to knowledge.

## **Understanding decision analysis**

In addition to the theory of knowledge, the CEO should have at least a rudimentary understanding of decision analysis. A decision should represent the application, of both the theory of knowledge and the theory of decision analysis, in such a way that it enhances the chance of getting the results desired.

While formal decision analysis may not be practical for many of the complex decisions CEOs need to make, an understanding of the theory at a fundamental level is essential if the CEO is to comprehend the connection between what is known and what is wanted.

## **Understanding human psychology and the CEO**

A CEO cannot know too much about the psychology of human beings. Unfortunately, much of what is supposedly known under the old BOS is either false or self-serving. It is all too common to hear managers hold forth on the importance, to them, of having just the right amount of fear in the enterprise. A modern BOS should understand :

- Human motivation
- The different ways people learn under different circumstances
- How the brain works and develops

Each of these three topics requires much study and understanding based upon applying the aforementioned theories of variation and knowledge to the study of human psychology.

Three human requirements for quality work... An easily read and understood book on human motivation has been written by Professor Emeritus Kondo of the University of Kyoto. Like so many helpful books from Japan, it is based almost entirely on original work done in the West (a committee of the Japanese Management Association spent several years reviewing the available literature and theories regarding human motivation and Professor Kondo edited the work).

Here is how Professor Kondo describes the three requirements in the work situation for a worker to produce quality work :

1. There must be an opportunity to make a creative contribution to the improvement of the work processes.
2. There must be an opportunity to move around, the worker must not be chained in place.
3. There must be a social situation which permits people to share the joy of creative contributions.

## **The theory of systems and the CEO**

We cannot improve the BOS unless management views the organizations as a system. The systems over which managers preside are comprised of sets of people, machines, materials, et cetera, that work together for a common purpose.

Deming makes the point that a system is not properly defined unless its aim is defined. Certainly people cannot work together to improve the performance of a system if they do not understand what the system is supposed to do.

## **Our final thought**

From this discussion there emerges the clear conclusion : For a company to become competitive in world markets, it is necessary that the enterprise BOS be the most up-to-date version.

While it may be a useful technique to jump start the conversion by sending the top management to seminars, short courses, executive programs and training sessions in the end the BOS they adopt must have built into it continuous learning.

As Dennett has observed, the purpose of a brain is to answer the question : "What am I to do next ?" The purpose of a brain is to predict the future.

Those who would lead should not adopt the practices of the sea squirt, which Dennett describes in the following way :

The juvenile sea squirt wanders through the sea, looking for a rock or a hunk of coral to cling to and makes its home for life. For this task it has a rudimentary nervous system.

When it finds its spot and takes root it doesn't need its brain any more, so it eats it !

We've met managers like that.

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