'Process and procedure are the last hiding place of people without the wit and wisdom to do their job properly.' David Brent - The Office, BBC Television.

Douglas Cowper extolls the virtues of process management to reduce complexity in business systems and hence provide improvement.

Although at times it may feel like processes constrain what we are doing, the reason we have processes is to enable us to operate within a framework that defines roles and responsibilities, provide us with a focus for our activities, facilitate our ability to manage and control our business and allow us to capture corporate knowledge.

However, processes should not stifle innovation and should allow enough flexibility for people to deploy their intellect. Reinertsen (1997, pp140-143) points out that the creation of processes is never complete with reference to the design process.

The process needs to develop to keep up with changes in the environment (commercial, technological and so on). The continuous development of processes needs to be conducted in a controlled manner and hence we require some form of process management.

Control and management

In order to control and manage our processes to improve them, we need to be able to understand what the process is representing. Essentially processes help us break down some of the complexity in understanding how our organization functions. After all, our organizations are complex systems in their own right.

This approach is not new, Deming (cited by Delavigne and Robertson, 1994, pp47-59) identified in the 1950s that:

Every system has variation and hence the information needed to create optimum systems is unknown and unknowable using scientific method we learn what's unknown but knowable faster by observing the operation of a system, built-in flaws can be detected and isolated complexity can be reduced and entropy lowered by removing the built-in flaws.

As every system has variation it will inherently have built-in flaws which need to be understood and removed. This shift in understanding is represented in the same way as the shift from deterministic Newtonian physics to uncertainty quantum physics.

This laid the foundations of total quality management, which was exploited by post-war Japan at the expense of a large number of western companies.
What is relatively new is the application of a systems engineering approach to business processes in order to remove the three evils of systems (Holt, 2001, pp5-6): complexity, communication and lack of understanding. For example, Cowper and Smith (2002) apply systems engineering principles to projects and project management.

The use of a systems engineering approach includes organizations using modelling tools like the unified modelling language (UML) to gain a ‘deeper understanding of how their business interacts with its environment’ (Eriksson & Penker, 2000).

By developing business process models organizations can increase their understanding of the business and any opportunities that may be presented for improving the business.

It is therefore no strange coincidence that the Software Capability Maturity Model (CMM) developed by Carnegie Mellon University has now been extended to encompass a wide range of business disciplines including systems engineering to form the Capability Maturity Model Integration (CMMI).

The purpose of this model is to establish the process maturity of an organization. This process maturity ranges from an uncontrolled black art to an instituted approach to process improvement and the removal of waste.

At each stage of the model the understanding and control of the process is increased in order to minimize the effects of system variation and reduce complexity.

Some customer organizations, for example the US Department of Defence, require supplier organizations to achieve certain levels of CMMI in order to reduce the risk equipment procurement programmes.

In order to control the process we need to be able to put in place metrics that are well-suited to our control objectives. However, this is often carried out without either understanding the control objectives or the effects the measures will have on the business (system).

We have already established that our business is a complex system and it will react to the measures placed upon it. As scientists and engineers we are well aware of how measurement interferes with the system being measured and we take great care in designing our measurement equipment to minimize the measurement effects.

For example, placing a voltmeter in parallel with a resistor to measure the potential difference across it means that some current passes through the meter. However we make the meter have a significantly higher resistance than the resistor in the circuit to minimize this effect.

Unfortunately, this is not always true of our attempts at business measurement and we have all heard some of the stories of the effects of government measures on the NHS.

One instance I have come across was with a telephone company. One of their
measures, being a communications company, was how quickly their employees answered the phone. Unfortunately for the engineering department their performance was low due to the amount of time the engineers spent in the lab.

To alleviate their poor performance the engineers spend the last half an hour of each day phoning each other up and quickly answering in order to skew the figures. This complete waste of time was due to inappropriate measures being placed upon them.

A word of caution

Despite this article extolling the virtues of process management to reduce complexity in our business systems and hence provide improvement, Delavigne & Robertson (1994, pp102-110) point out that the pressures management face and the constant scrutiny it comes under promotes complexity in our business systems (we are back where we started).

This complexity manifests itself by:

- imposing policy constraints that disrupt flow.
- focusing on goals rather than improvement.
- changing the system without understanding it.
- sub-optimizing the system by making its members compete with one another and not defining the aim of the system.

This management complexity can be avoided if we go back to Deming's profound changes and use processes and process management correctly.

I hope this short article gives you a brief overview of process management and some of the best practices that are drawn from the worlds of total quality management and systems engineering.

Whether you are a user or a manager of processes I hope you appreciate the need for processes and process management and what to do to improve yours.

Dr Doug Cowper is a systems engineering consultant for Sula Systems, a small consultancy firm specializing in systems engineering in the defence and aerospace industries. dcowper@sul.co.uk.

Further reading


This article first appeared in November 2005 ITNOW.