Process Improvement Tools

"Man is a tool using animal…Without tools he is nothing, with tools he is all." - Thomas Carlyle

The tools described here have a wide range and characteristics and have come from many sources. The term tool is used in its widest sense to cover any structure, method, technique, strategy, or even organizational characteristic that can be used to improve software development working practices. They have been selected because they have proved useful, are widely available, and deliver good results for low investments of time and effort.

It is reasonable to ask why specialized tools are needed for software process improvement. It may be thought that the exercise of intelligence, experience, common sense and determination to solve a well described problem or achieve an improvement objective are all that should be needed. For small groups this may well be so, but when attempting to change the expectations and behaviours of larger groups or organizations more than individual knowledge and will is required. An organization can be populated by individuals all familiar with shared ideas of improvement or best practices but unable to make the desired changes until the tools for change are in place.

In practice it is found that many of those working on process improvements, within, and part of complex working environments, without tools are often unclear how improvement objectives can best be achieved. This can manifest itself in an overdependence on process models, overlong planning exercises and a tendency to overproduce documents and process definitions of limited value. This uncertainty can be detected by those expected to benefit from improvements, and will hamper improvement efforts. Where improvement tools are in place:

- Ways of working, of making change, become explicit. When they are implicit the work often does not get done; making them explicit helps in sharing objectives, eliminating ambiguity, and completing the work.

- When ways of working are identified, named, and described as tools they can be taught. Without names and descriptions successful ways of working may not be recognized and are only be available as the experience of experts.

- Tools can be examined, tailored and improved. Experience alone will, over time, be lost.

Many of the procedural, tools, for example PIRs (V – 1), provide structure and guidelines for the performance of tasks which themselves must be performed with a degree of rigour. Both the structure and the rigour are required - and this can be difficult. There is a tendency to let tasks degenerate or simplify, for techniques to revert to undirected activity or conversation. To get the best from these tools groups must be willing to follow each step closely. Without paying attention to tools' processes much of the value can be lost. Initially each step should be followed carefully, and only deviated from as experience using them develops. It is the structure and rigour that delivers the order of magnitude higher performance required for process performance.

This rigour is the necessary complement to the imaginative and constructive thinking that drives process improvement. Constructive chaos, muddle, confusion, dissent, and loss of direction are characteristic of the creative thinking that must be harnessed to reveal solutions and open up opportunities for development. These are the heart of improvement - but little is said about them here. What is described here are the structures and behaviours that can trigger and direct them to best effect; to enable people to become familiar and comfortable with dealing with the new and, with experience, to work with whatever mix of order and disorder produces the best results.

Some tools are elements of organizational infrastructure which may already be in place and can be used for process improvement immediately. However if the infrastructure, for example an organization wide defect tracking system (V – 6), is not in place the cost of putting it in place needs to be considered carefully. The value of such infrastructure is considerable and extends beyond that of process improvement alone, but will require a sizeable investment by the organization and can be beyond the capability of the organization to exploit effectively.

The simplest way to use these tools is to use it as a catalogue and to select tools as required. To do this use the table at the beginning of this book that lists the tools and the circumstance where they should be introduced to an organization undertaking change, when to use them once they have been introduced, and when they are of limited value.

Three tool categories have been created. They are:

- Tools for visibility
- Tools for change
- Infrastructure tools

And an additional 'catch all' category for tools that do not fall into any of the three main categories. In practice of course the categories are not clearly delimited. Because the tools are concerned with the changing of the expectations and behaviours of software developers and managers there is some overlap of the categories. Never-the-less the categorization helps understanding and selection of the tools and also indicates areas where additional tools are required.