

# TickIT International

Well, here we are, 2010 already – as the TickIT International team could not afford to send you each a new year card we would like to use these pages to thank you for your continued support and to wish all our readers a very happy and prosperous New Year

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First, we have the progress statement from Derek Irving on the development of the **TickIT<sup>plus</sup>** scheme and forecasting future events leading to its introduction.

As we are all 'working from home' as the UK suffers its worst period of cold weather since the 1960s it is an ideal time to think about how your organization's systems are arranged ... and if you haven't yet adopted the 'process' view you might want to start thinking about it!

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So we are focussing on process in this edition; first we have an article from Arthur Hill who explores some of the really practical steps that can/should be taken when you start the construction process. I hope you will find this very useful as you prepare for **TickIT<sup>plus</sup>**.

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Secondly, supporting Arthur's paper, I came across some work done by Dr Mahmood Niazi at Keele University. He examined a number of process implementations and distilled out the top seven barriers to success, so this is an ideal complement to our second article.

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Finally, in our last edition we had a major article on Software Asset Management from Steve Klos. We thought it would be helpful if we clearly stated the structure of the various standards making up the family and their current status and management.



Mike Forrester



IT 1Q10

# TickIT International

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This publication is a means of communication with all TickIT-registered organizations and TickIT-minded individuals throughout the world. It also acts as an information exchange and sounding-board for anyone committed to IT quality.

The editorial team always welcomes input and comment.

As editor I will invite comment and debate on specific issues within each edition so as to develop thinking and promote excellence within our industry.

To make comment or provide input please to e-mail the team.

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# TickIT<sup>plus</sup> – the future of TickIT: Project Progress, January 2010

This is the quarterly status report on the development of the **TickIT<sup>plus</sup>** scheme, which will completely change the way that IT is covered under ISO 9001-accredited certification. As previously described, both **TickIT<sup>plus</sup>** and the existing TickIT scheme are run by the Joint TickIT Industry Steering Committee (JTISC) with administration from BSI. JTISC is formed of several major IT suppliers, users and industry bodies. **TickIT<sup>plus</sup>** is a part UK Government funded extension of the original scheme, aimed at improvement and wider use, and which will add capability assessment and an extended standards scope as well as broadening auditing skills and training. More details and information on how to contribute comments can be found at our new website – see below for details.

## Overall Progress and Development

A number of detailed specification documents still need to be finalized before the considerable task of generating the publicly available scheme documentation gets fully under way. This task is now almost complete, with the principle documents undergoing final review and with these due for submission to the accreditation authority in late January 2010.

Two pilot training courses at the Foundation Level have now been delivered, and so a number of existing TickIT Auditors are nominally qualified to operate as Foundation Level **TickIT<sup>plus</sup>** Assessors. GASQ, which is an internationally recognized accreditation authority for software and IT, will be handling both examination and assessor registration administration, together with the accreditation of training course providers.

The first of the scheme documentation – ‘Delivering Quality in IT’ is now available on the **TickIT<sup>plus</sup>** website. This website will eventually be moved to a more permanent and proactively managed home, but for the moment remains under temporary hosting.

## Scheme Launch

As the scheme is now being developed almost entirely by voluntary contributions from committee members and others, this has had an inevitable consequence on production of material and delivery schedules. The proper infrastructure still needs to be set up and the overall task of drafting, editing and publishing the large documentation set needed, plus the BPL model, is taking longer than originally anticipated. As a consequence of this, it has been decided to delay the overall launch schedule by six months and thus the following provisional milestones are the latest estimates. For more accurate timescales the **TickIT<sup>plus</sup>** website should be consulted. Whilst it is regretted that we have had to impose these delays, the JTISC committee feels there is no alternative under the current support arrangements and given the amount of work still required. This has also been done to ensure that, when the scheme is fully launched, all the necessary material and infrastructure arrangements considered essential to ensure the success of **TickIT<sup>plus</sup>** are in place. Therefore the overall schedule plan is now as follows:

- Oct 2009 – Commencement of pilot training and first provisional assessor registrations
- June 2010 – Availability of general initial public courses, registration and administration services
- July 2010 – First formal release of BPL process set and core scheme documentation
- Dec 2010 – Target date for initial Foundation grade accreditation
- March 2011 – Target date for start of migration period for current TickIT-registered organizations and auditors
- June 2011 – Target date for Bronze and Silver grade accreditations
- Dec 2011 – Target date for Gold and Platinum grade accreditations.

It is stressed, however, that these are provisional dates only and may change. Other aspects of the scheme, such as the full documentation set and BPL, will be released at times consistent with this overall schedule. The initial accreditation in December 2010 will likely be for ISO 9001 only, without the planned additional Requirements Standards – essentially ISO/IEC 20000 and ISO/IEC 27001 – which are planned in the second accreditation phase.

## Pilot Assessments

A recent pilot assessment was conducted between a major IT company and its Certification Body. This was performed at the Bronze Level and was considered a success, with important feedback being obtained. More pilots are planned.

## Summary

As always, comments and suggestions are always welcome, either via our website at [www.tickitplus.org](http://www.tickitplus.org) or direct to me on [dkirving@iec.org](mailto:dkirving@iec.org).

Derek Irving,  
TickIT<sup>plus</sup> Development Project Manager



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# “Let’s Get Serious About Business Processes and Implementing Real Improvement”

by Arthur Hill

## Summary

*A look at what you need to do to really define and implement business processes, thereby laying the foundations for real business improvement, rather than just doing a paper exercise. For those people who are planning to implement the forthcoming new **TickITplus** standard<sup>1</sup>, this will help with understanding the Process Reference Model (PRM)<sup>2</sup> and the Base Processes Library (BPL)<sup>3</sup> concepts.*

At the risk of preaching to the converted or teaching grandmother to suck eggs, this article has been written with the aim of helping the overworked business improvement professional to get to grips with the practicalities of defining and improving company business processes. You will need to conduct this exercise, or something similar, if you plan to move your organization on to using the forthcoming **TickITplus** standard. The benefits to the organization can be very significant both in terms of providing tools to streamline the business and improving productivity, thereby directly contributing to improved profitability.

It has to be said that to do this exercise properly is a non-trivial task, but it isn’t rocket science either. When starting, it is important not to get sucked into defining the fine details of the organizational processes too quickly, or to be daunted with the magnitude of the task at hand. You can work on developing specific business process definitions one by one, or area by area, you don’t have to do it all in a big bang; the main thing is to adopt a systematic method and have an idea of the overall architecture that you are seeking to achieve. The good news is that you probably have a lot of the information that you will need already to hand.

It may surprise you to find that, **at a high level**, all businesses operate basically the same business processes. “Ah, but my business is different” I hear you say; hopefully I can demonstrate that this is only partially true. More good news is that if all businesses can be described in the same way using a common framework, then there is a single common template that we can all adopt which will give us the common starting point to create our own business process model and definitions. Remember that the uniqueness and true competitive advantage of a business come from how well the business processes have been designed and implemented, not from having completely different business processes from everyone else.

If you have tried to do this activity from first principles, then there are many starting points and many ways to start. It takes a long time to convince yourself that the model you have eventually created adequately covers the business. The advantages of starting from an existing template are that somebody has done the basic thinking for you, and there is a reasonable chance that the model has been validated for completeness. Another positive point is that you are not the first one trying to crack the problem. Additionally, if you adopt a standard framework, then you can potentially benchmark your performance against others, adopt common metrics and gain from existing best practices. This is one of the underlying benefits of the Business Process Library (BPL) approach being adopted by **TickIT<sup>plus</sup>**.

So, let's get down to practicalities. There is an excellent generic business process framework which has been published on the web by Price Waterhouse Coopers – Global Best Practices at <http://globalbestpractices.pwc.com/Home/ProcessFrameworks.aspx?FW=Process+classification+framework>. This framework was co-developed in 1992 by Global Best Practices and the other founding members of the American Productivity and Quality Center's (APQC) International Benchmarking Clearinghouse <http://www.apqc.org/portal/apqc/site>. PWC are quite happy to sell you services centered on the framework, but you can get a lot of value out of just using the basic framework.

It contains 13 business processes that apply to almost any business. The first seven are Operating Processes that companies follow to develop and move products to the market. The last six processes are Management and Support Processes that make it possible for the company to operate effectively.

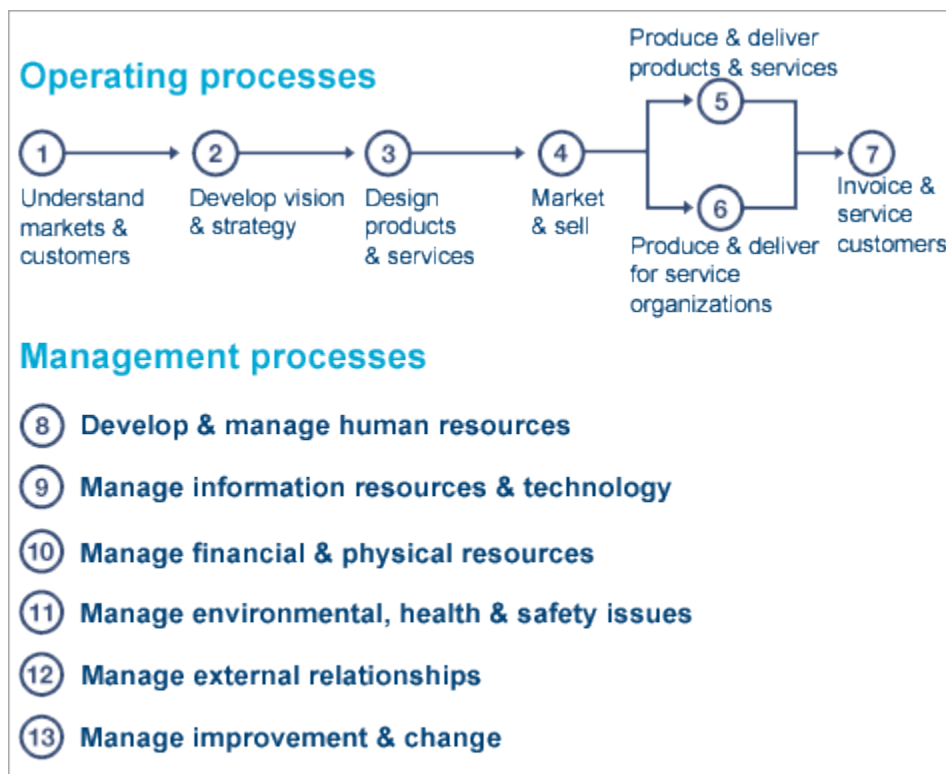


Figure 1: Generic Process Model (Copyright © 2010 PriceWaterhouseCoopers)

This framework gives you a generic model that can accommodate all aspects of any business. It gives you the basic generic building blocks, but without some of the underlying detail. “Ah yes, but all this is too generic to be helpful” I hear you say; well it is, but the first step in the method. For each process, we need to define a number of sub-processes, and within each sub-process we need to define specific activities. PWC have already done this within their generic framework.

When we were working on **TickIT<sup>plus</sup>**, we were more focused on the ISO 9001 and IT-related aspects of the business; hence when developing the library of business processes (the BPL) we did not cover everything possible in every business. The BPL currently gives you more detailed business processes aligned around the aspects of Quality Management and System and Software processes. It is intended that the BPL will be further developed to add in processes necessary for conformance to other standards such as ISO 20000 and ISO 27001, but we are not there yet. Realising that the scope of **TickIT<sup>plus</sup>** will often be less than the scope of the total business, it will be necessary to construct an amalgam of the APQC-PWC generic framework processes and sub-processes and those contained in the **TickIT<sup>plus</sup>** BPL in order to completely describe the business.

You can download the full set of PWC short definitions using their generic framework from the PWC website. Just to give you an idea of what you end up with, here is the full set of short definitions of **Process 1 – Understand Markets and Customers**.

## 1.0 UNDERSTAND MARKETS AND CUSTOMERS

The process of analyzing market and customer information to create and maintain a competitive business position.

### 1.1 Determine customer needs and wants

The process of identifying customer segments, critical incidents of customer contact, and customer needs in order to meet customer demands.

#### 1.1.1 Capture and assess customer feedback

The process of eliciting, analyzing, and applying direct and indirect customer feedback to improve operational performance.

#### 1.1.2 Predict customer purchasing behavior

The process of examining attitudinal and behavioral customer data to predict and influence customer buying patterns.

### 1.2 Measure customer satisfaction

The process of tracking customer satisfaction through indirect and direct customer feedback and sharing it companywide to develop a culture focused on satisfying customers.

#### 1.2.1 Monitor satisfaction with products and services

The process of soliciting customer input throughout all stages of the product life cycle to ensure ongoing satisfaction as well as identify ideas for new or improved products and services.

#### 1.2.2 Monitor satisfaction with problem resolution

The process of determining whether customers receive timely and thorough support to resolve problems with the company or its offerings.

#### 1.2.3 Monitor satisfaction with communication

The process of determining whether customers receive timely and thorough information about products and services through preferred channels of communication.

### 1.3 Monitor changes in market or customer expectations

The process of monitoring the external environment to keep pace with customers' changing expectations as well as competitive offerings.

#### 1.3.1 Determine deficiency of products and services

The process of identifying necessary product and service improvements by examining transaction data, transaction data, and competitor information.

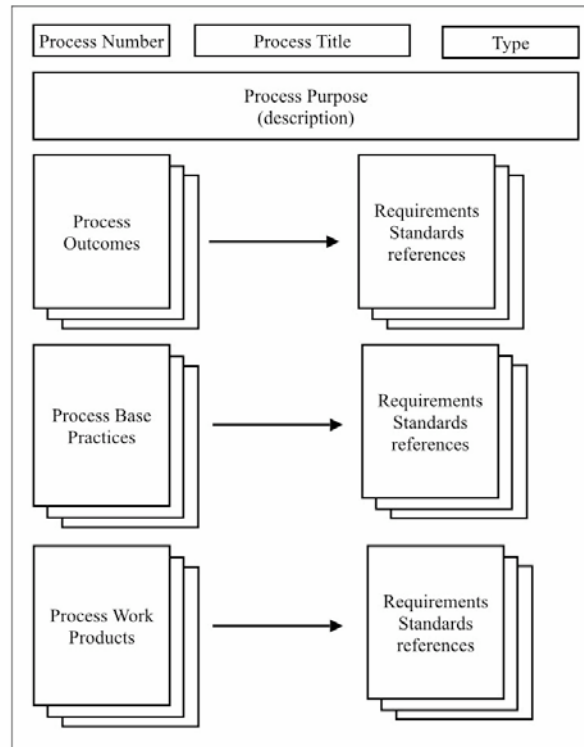
#### 1.3.2 Identify innovations that meet customer needs and wants

The process of analyzing customer information to gather insight into new or enhanced products that would meet evolving needs and wants.

#### 1.3.3 Monitor competitive offerings

The process of tracking competitive offerings and their market share to identify product and service strategies that meet customer demands.

It will rapidly dawn on you that there is a lot to define. You need to go down a level to encapsulate the key differentiators between your business and everyone else. You only need key differentiators in one or two areas to be very successful. It therefore follows that a lot of your business processes can be the same as everyone else. In the areas where your organizational scope is relevant to **TickIT<sup>plus</sup>**, then you need to use the BPL to define your processes. For an overview of the BPL go to <http://www.tickitplus.org/downloads.asp> where you can download a guide.



**Figure 2 – BPL Processes Structure**

Within the BPL, each process has a Process Number, a Process Title, a Process Type, Process Base Practices, Process Work Products and Process Outcomes. All these requirements are directly traceable back to the requirements standards.

Thinking longer term, the other thing to consider is the matter of metrics. I know this can be unwelcome news, but if you are serious about continual business improvement, then you *have* to embed metrics into all your key business processes. If you think about it, metrics really isn't such an alien concept. I bet your company has lots of financial metrics; turnover, profitability, return on capital employed, and the like. You just need to take this concept and apply it to the performance of individual business processes.

I have found it helpful to develop a standard way of describing business processes. A process has to have a purpose. It has inputs and it has outputs. Both the inputs and the outputs can be tangible or intangible. For example, an input might be a hard copy customer order – on a form or just a telephone call. An output could be a printed report or an update to an internal computer database, or an instruction or a decision. A Process should have a Performance Standard, that is, something defined to tell the operator whether the process is meeting requirements or not. As processes mature, then organizations develop metrics to help them to measure how well the performance standard is being met. Processes need Process Definitions to define the sequence of activities needed to complete the process. Processes also may need equipment/facilities/software in order to be conducted. The Process Operators will need knowledge or training in order to be able to conduct the process competently. This block of things should be defined for each key process. The BPL will help you in the **TickIT<sup>plus</sup>** areas.

You may have an existing Quality Management System which will give you a lot of the information you need. ISO 9001 has required organizations to produce “a description of the interaction between the processes of the Quality Management System” since the 2000 version. However, many organizations have not fully converted these to a business process orientated view, and have tried to equate *procedures* to *processes*. Most of the time, this approach is doomed to failure. The reasons are that processes frequently cross organizational boundaries, whereas procedures often document local departmental activities. Processes are concerned with transforming inputs into useful outputs, whereas procedures tend to tell people how to carry out an activity.

So what about improvement? There are two basic ways of improving a process. Probably the best is to streamline a process by redesigning it to have fewer steps, or achieve the output in a shorter time or with fewer resources. The second way is to remove causes of defects so that the process doesn't generate so much waste in the first place. There a number of well known methods for improving processes. The classic Deming “Plan, Do, Check, Act” cycle <http://www.asq.org/learn-about-quality/project-planning-tools/overview/pdca-cycle.html> is always appropriate.

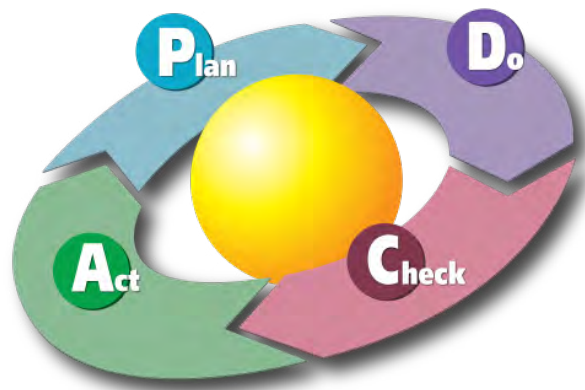


Figure 3: Classic Deming PDCA Cycle

There are also a number of process defect removal methods. I regard the Six Sigma DMAIC (Define, Measure, Analyze, Improve and Control) methodology as probably one of the most effective methods. See <http://www.buzzle.com/editorials/10-24-2005-79640.asp> for more information and further links.

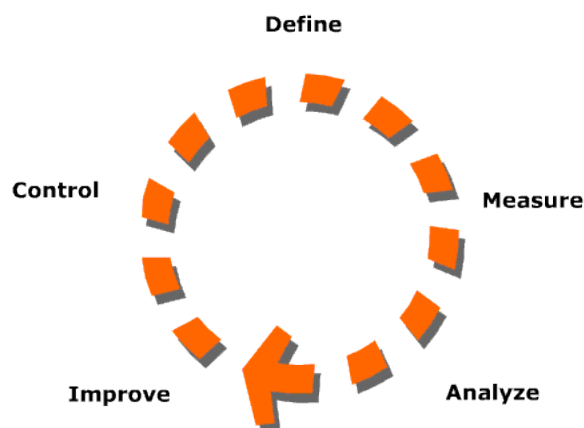


Figure 4: Classic DMAIC Cycle

Both methods require that you have process metrics to assist in diagnosing the problem and measuring your success in solving the problem.

It follows, therefore, that it is important to develop key business process metrics and use these to run the business, rather than just collecting them for the sake of it. A key metric that I developed with a previous company was that of measuring customer satisfaction. This metric is relevant in Process 1.2.1 of the PWC model.

It is imperative that qualitative information is turned into numbers. Numbers focus minds and help with monitoring results. “What gets measured gets done!” When I joined my last company, I inherited many years of feedback from past customers – some good, some not so good – but there was no evidence that anyone had done anything systematically about the feedback. By coming up with a structured questionnaire and a defined scoring system, I was able to change the customer feedback into a form that could be reported and tracked, and thereby targets set and improvement achieved. It was also a useful diagnostic where a customer had not actually complained. With the database of previous results, it was possible to interpret the level of customer satisfaction achieved and set thresholds, below which one could be sure the customer was unhappy, and above which the customer was very happy. By investigating the reasons for unhappy customers over the course of a couple of years, it was possible to improve the overall company customer satisfaction score by more than 15%. As any salesman will tell you, satisfied customers will buy from you again and again. Dissatisfied customers will not buy from you next time ... and they will tell all their friends about it as well. This is a direct contribution to the company bottom line!

So, in summary, we have looked at the practical means to create a model of all the key business processes necessary for the success of the organization (the Process Reference Model – the PRM) using a common framework. Also we have looked at where the forthcoming BPL fits into this. I have suggested some tools and techniques that I have used and found useful for continual improvement.

In conclusion, as improvement professionals, we must never lose sight of the fact that our end goal is continually to improve the performance of the business in measurable and tangible ways that contribute to a better company bottom line.

## Acknowledgements

The author acknowledges the kind permission of PWC Global Best Practices in allowing him to reproduce material derived from their web site as part of this article.

## References

- 1 **TickIT<sup>plus</sup>** is the name for the new standard to follow on from the existing TickIT scheme that will incorporate ISO 9001 requirements together with IT-related standards in a Capability and Maturity Assessment methodology derived from the principles in ISO 15504.
- 2 A concept introduced in **TickIT<sup>plus</sup>** where an organization constructs a model of its business processes using a common framework (the BPL).
- 3 A concept introduced in **TickIT<sup>plus</sup>** where an organization is provided with a common library of business processes from which to select those which are relevant to the organization and which are used to construct the PRM.

**TickIT<sup>plus</sup>** website – [www.tickitplus.org/](http://www.tickitplus.org/)

Price Waterhouse Coopers Global Best Practices Process Framework – <http://globalbestpractices.pwc.com/Home/ProcessFrameworks.aspx?FW=Process+classification+framework>

ASQ Deming Cycle – <http://www.asq.org/learn-about-quality/project-planning-tools/overview/pdca-cycle.html>

DMAIC Cycle – <http://www.buzzle.com/editorials/10-24-2005-79640.asp>

Quality in the Boardroom – Arthur Hill, TickIT International Q3 2003 – <http://www.tickit.org/ti3q03.pdf>

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# Software Process Improvement Implementation: Avoiding Critical Barriers

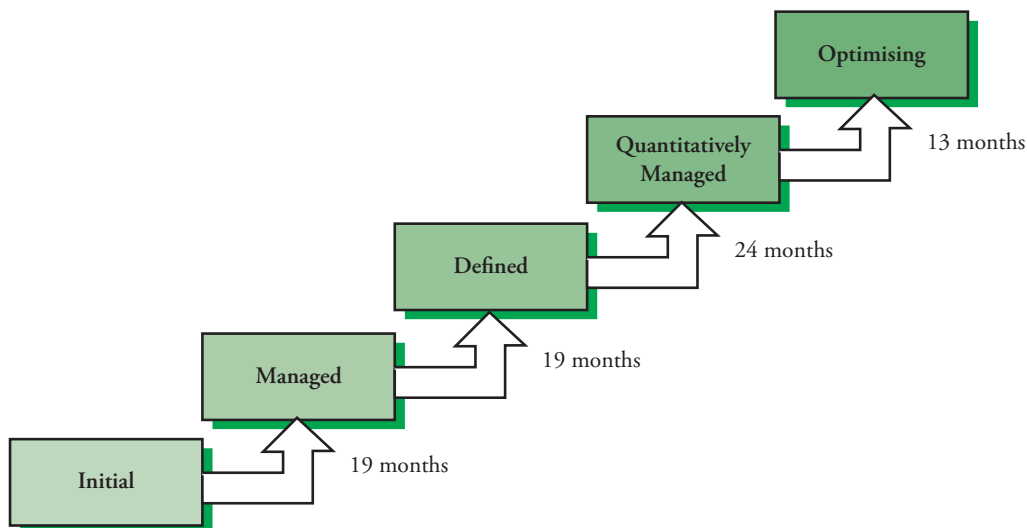
by Dr. Mahmood Niazi

(This paper was originally published in the January 09 edition of *CrossTalk*)

*This article seeks to identify perceptions and experiences of practitioners about critical barriers (CBs) that can undermine the implementation of Software Process Improvement (SPI) programs. The objective of this study is to summarize CBs and provide guidelines about how to avoid them. The results of this article provide advice to SPI managers and practitioners on what and how to address CBs when developing SPI implementation initiatives.*

There are three major elements involved in SPI initiatives: SPI appraisal, process definition, and process deployment<sup>[1]</sup>. The SPI appraisal consumes a larger percentage of the budget and resources, as it requires money to hire lead appraisers, time away from work for staff to be interviewed, and time away from work for the internal appraisal team. Process defining requires model knowledge, process definition knowledge/skills, and knowledge of the organization/company. Many organizations, however, do not have the model knowledge, the process definition knowledge, or the skills. Often, deployment is not only multi-project, but multi-site and multi-customer type. The whole SPI initiative is a long-term approach and it takes time fully to implement.

A Software Engineering Institute (SEI) report shows the number of months (see Figure 1) required to move from one maturity level of CMMI<sup>®</sup> to the next<sup>[2]</sup>. The SPI approach is often considered as an expensive approach for many organizations<sup>[3]</sup> because, in order fully to implement an SPI initiative, an organization needs to invest enough resources for a long time. This problem is exacerbated if the SPI initiative does not achieve the desired results. Even with the large advances in SPI approaches, the SPI initiative's failure rate is very high (that is, 70% <sup>[4]</sup>). This is one of the reasons that many organizations are reluctant to embark on a long path of systematic process improvement.



**Figure 1: Number of Months Required to Move Between CMMI Maturity Levels**

Thorough literature review revealed that many standards and models exist for SPI, but little attention has been paid to their effective implementation. The chaotic implementation process is the most common cause of SPI implementation failure <sup>[5]</sup>. Attention to a defined SPI implementation process is essential for the success of any SPI initiative.

This article presents the empirical findings of what can undermine the implementation of SPI initiatives. To focus this study, I investigated the following research questions:

- what barriers can undermine the SPI-implementing initiatives?
- how can one avoid these barriers?

The objective of addressing these research questions is to provide advice to SPI managers and practitioners on what and how to address CBs when developing SPI implementation initiatives.

## Research Methodology

This study uses data from interviews with 34 Australian SPI practitioners (15% of the requested participants). The target population in this research was those software practitioners who have participated in SPI implementation initiatives. The invitation letter included a brief description of the research project and the nature of the commitment required. In return, I offered to make the research findings available to the participating practitioners.

Software practitioners have cited those barriers that have undermined SPI implementation initiatives within their organizations. Based on their SPI implementation experiences, the practitioners have also suggested guidelines as to how to avoid SPI implementation barriers. It is worth mentioning that the data were collected from practitioners who were involved in tackling real SPI implementation issues, on a daily basis, in their respective organizations.

Interviews were conducted with three groups of practitioners:

- the first group was made up of designers/testers/programmers/analysts,
- the second group was made up of team leaders/project managers,
- the third group was made up of senior managers/directors.

All the interview transcripts were read to identify the major themes of CBs. These themes were noted and compared to the notes made during the interviews, in order to ensure that the transcripts being analyzed are indeed a true reflection of the discussion in the interviews. This two-step process also verifies that the transcription process has not changed the original data generated in the interviews. Different themes were grouped together under one category. For example, poor response (a user unwilling to be involved, and so on) were grouped together under the CB category *lack of support*. Each category represents a CB for the implementation of SPI initiatives.

In addition to interviews, I have analyzed published experience reports, case studies, and articles in order to identify factors that can play a negative role in the implementation of SPI programs. Each paper was reviewed carefully and a list of barriers was generated.

There were three categories of papers. The first category included papers in which the authors have described their SPI implementation experiences with lessons learned (that is, why their SPI implementation program was not successful, and so on). It was fairly easy to identify SPI barriers, because often authors provided a summary of barriers in the lessons learned. The second category included papers in which SPI implementation was discussed but authors did not provide any summary of barriers. In this case, I have had to read each paper carefully to identify the SPI barriers. The third category included a few papers that I analyzed where the results of empirical studies were described.

In order to reduce researcher bias, I have conducted inter-rater reliability evaluation during this process. Three research papers were selected at random and a colleague, who was not familiar with the issues being discussed, was asked to identify SPI barriers that appeared in the papers. The results were compared with previous results and no great disagreements were found.

For analyzing the data, I used frequency analysis, which is generally the most commonly used approach for similar studies by other researchers<sup>[6]</sup>. The presentation of data, along with their respective frequencies, is an effective mechanism for comparing and contrasting within or across groups of variables. In order to analyze the CBs, I recorded the occurrence of a CB in each interview transcript and research article and calculated the relative importance of each barrier.

## Findings

Seven CBs were identified that can undermine SPI implementation initiatives: inexperienced staff, lack of defined SPI implementation methodology, lack of SPI awareness, lack of support, lack of resources, organizational politics, and time pressure.

In the following section, these seven CBs are described. For each, guidelines are provided, suggesting how to avoid these CBs.

### Inexperienced Staff

In the SPI literature, many authors have described inexperienced staff as a barrier for SPI:

- Kautz and Nielsen describe why implementation of SPI was not successful in one company: “... the staff and technical director had no prior experience with SPI and its potential benefits”<sup>[7]</sup>.
- Moitra describes the problems and difficulties of managing change for SPI and identifies inexperienced staff as one of the barriers for SPI: “the quality and process improvement people are often quite theoretical – they themselves do not understand quite well the existing software development processes and the context in which they are used”<sup>[8]</sup>.

Software practitioners said in the interviews that the experienced staff should be involved in SPI initiatives because they have detailed knowledge of, and first-hand experience with, SPI implementation. With experienced staff, less rework of the documentation items is required and real issues can be resolved. The practitioners said that SPI initiatives can only be successful if staff members have a thorough understanding of the entire SPI process and related business. For inexperienced staff, practitioners emphasized training in SPI skills in order to achieve mastery of its use. This involves equipping the practitioners with the knowledge of the critical technologies (for example, how to measure a process) required for SPI initiatives. The overall objective of this training should be to transfer knowledge to inexperienced staff of SPI activities and interrelated business activities and objectives.

The following guidelines were suggested by the practitioners to avoid this barrier:

- people should be selected for SPI activities who have a track record of different SPI projects,
- the organization should develop a written training policy for SPI to meet its training needs,
- responsibilities should be assigned to each staff member regarding SPI implementation activities (for example, process design, process testing, and process deployment),
- a mechanism should be established to monitor the SPI progress of each staff member (for example, staff members are meeting the deadlines),
- a mechanism should be established to collect and analyze the feedback data from each staff member and to extract the main lessons learned (for example, data generated during process testing and results of pilot implementation).

### Lack of Defined SPI Implementation Methodology

Practitioners stressed the need to design an implementation methodology that contains an SPI implementation plan as well as SPI activities, practices, responsibilities, and procedures to be used during the implementation process. Often, the SPI projects have no specified requirements, project plan, or schedule<sup>[9]</sup>. It was recommended by the practitioners to treat SPI as a real project that must be managed like any other project.

Lack of defined SPI implementation methodology has emerged as a CB for successful SPI implementation. This is because little attention has been paid to the creation of an effective SPI implementation methodology. Studies show that 67% of SPI managers want guidance on how to implement SPI activities, rather than on what SPI activities to actually implement<sup>[10]</sup>.

The following guidelines were suggested by the practitioners in order to avoid this barrier:

- SPI implementation methodology should be developed using current technologies (for example, software tools for planning, tracking, and reporting projects),
- SPI implementation methodology should be tried and tested in pilot projects,
- staff members should be satisfied with the performance of the methodology in the pilot projects,
- training should be provided for developing the skills and knowledge needed to successfully use a methodology,
- work should be done to continuously improve a methodology with the aim of using it in the whole organization.

### **Lack of SPI Awareness**

Practitioners felt the need for awareness of SPI programs (that is, return on investment and impact) in order to fully understand the benefits of SPI. Practitioners said that since SPI implementation is the process of adoption of new organizational practices, it is very important to promote SPI awareness activities and share knowledge among different stakeholders. In addition, SPI is an expensive and long-term approach and it takes a long time to realize the real benefits. Hence, in order to get the support of management and practitioners and to successfully continue SPI initiatives, it is extremely important to provide sufficient awareness at the very beginning. SPI implementation is not as beneficial without sufficient awareness of its benefits. With this in mind, practitioners suggested involving all of the staff members in these awareness programs.

The following guidelines were suggested by the practitioners in order to avoid this barrier:

- the benefits of SPI should be promoted among the staff members of the organization before implementation,
- higher management should be aware of the investment required and long-term benefits of the approach before implementation,
- staff members should be aware of their roles and responsibilities (for example, through training and coaching) during the implementation of SPI within their unit of work,
- planning should be done to organize and continue SPI awareness events within the organization,
- planning should be done to make the SPI a part of the organization's culture.

### **Lack of Support**

Lack of support is one of the barriers that many practitioners think can undermine SPI implementation initiatives. Often, SPI initiatives are not treated as real projects, get low priority, and are easily replaced. As well, management often doesn't support SPI because they do not understand how SPI initiatives can help in their daily work. The practitioners stressed the need to provide sufficient support for SPI initiatives.

The following guidelines were suggested by the practitioners in order to avoid this barrier:

- management should show strong leadership and support for SPI,
- management should be committed to provide all of the required resources,
- a procedure should be established to aid staff members during implementation,
- staff members and higher management should be aware of the benefits of implementation,
- a mechanism should be established to monitor the SPI progress of each staff member.

### **Lack of Resources**

Management often agrees to SPI without sufficient knowledge of the investment required. In some organizations, management assumes that an SPI initiative will occur with very little investment. In others, management does not consider an SPI initiative as a real project and hesitate to allocate resources.

In addition to the findings from the 34 interviews, the following studies have identified lack of resources as one of the barriers for SPI implementation:

- Florence <sup>[11]</sup> discusses the lessons learned in unsuccessfully attempting CMM Level 4 at The MITRE Corporation. He states that they achieved CMM Level 3 because sufficient resources were provided, but failed to achieve Level 4 because sufficient resources were not provided.
- Kautz and Nielsen describe why implementation of SPI was not successful because “... the project managers were hesitant to use resources from their own projects on any improvement activity” <sup>[7]</sup>.
- In the experience of Oerlikon Aerospace, Laporte and Trudel<sup>[12]</sup> describe five elements for successful implementation of SPI and state that it is important to estimate and provide resources. Otherwise, frustration will end the organization’s readiness to adopt the SPI program.

The following guidelines were suggested by the practitioners in order to avoid this barrier:

- planning should be done to provide all the required resources (funds, tools, and people) for SPI implementation (for example, a typical project management activity in which a project manager does cost estimation and allocates required resources for a project),
- staff members should be allocated time for SPI efforts,
- staff members should agree to the allocated time (that is, extra time should be allocated for SPI activities),
- a procedure should be established to avoid *time pressure* (staff members having very little time to complete their tasks),
- a mechanism should be established so that SPI will not get in the way of day-to-day work (for example, SPI must be considered as a real project and software practitioners must not be expected to do SPI in addition to their daily software development activities).

### Organizational Politics

Many practitioners argued that organizational politics is one of the major barriers in SPI implementation. This is because the SPI is considered a change in the organization and often people resist this change.

Organizations are made up of groups and individuals who have differing values, goals, and interests. The SPI initiative may fit into one group’s goals but not into another’s. There are many factors that can trigger organizational politics, such as reallocation of resources, promotion opportunities, low trust, time pressures, and role ambiguity.

There are several studies that describe organizational politics as a barrier for SPI implementation. For example, Moitra describes the problems and difficulties of managing change for SPI and identifies organizational politics as one of the barriers for SPI: “... politics in organizations is probably one of the principal reasons why change management efforts for process improvement initiatives fail” <sup>[8]</sup>. The writers of <sup>[13]</sup> conducted a study of 14 companies, investigating some of the important success factors and barriers for SPI; they identified organizational politics as one of the barriers for SPI.

The following guidelines were suggested by the practitioners in order to avoid this barrier:

- management and staff members should provide strong support for SPI,
- planning should be done to make the SPI a part of the organization’s culture (for example, awareness training),
- the benefits of SPI should be promoted among the management and staff members of the organization,
- all of the key stakeholders should be involved in SPI implementation initiatives,
- a conflict resolution plan should be established.

### Time Pressure

Time pressure is often in the form of meeting project deadlines and getting the product within budget. Practitioners stressed the need to avoid time pressure on staff members during SPI implementation. As discussed in the Lack of Resources section, practitioners suggested that in order to avoid time pressure, SPI must be considered as real work, and software practitioners must not be expected to do SPI in addition to their day-to-day software development activities.

There are several studies that describe time pressure as a barrier for SPI implementation. A few of the key studies observed the following:

- In<sup>[14]</sup>, time pressure is identified as one of the obstacles to SPI: “... operational management feel that in the absence of all other obstacles, lack of time seems to be the overriding obstacle to SPI success in companies.”
- Paulish and Carleton<sup>[15]</sup> describe case studies for SPI measurement and illustrate time restriction as one of the SPI implementation problems.

The following guidelines were suggested by the practitioners in order to avoid this barrier for time pressure:

- staff members should be allocated time for SPI efforts and staff members should agree to the allocated time.
- a procedure should be established to avoid staff from having time pressure (that is, inadequate time to complete tasks).
- a mechanism should be established so that SPI will not get in the way of day-to-day work (that is, SPI should be added to daily activities),
- the SPI implementation effort should be staffed by people who indicated interest and commitment in the effort,
- a procedure should be established to facilitate (for example, to avoid time pressure) staff members during SPI implementation.

## Conclusion

The empirical study of CBs with 34 SPI practitioners is presented in this article. Seven CBs that can undermine the SPI implementation effort were identified. The identification of CBs in this study can act as a guide for practitioners when designing SPI implementation initiatives, making it easier to avoid the barriers that have been identified by SPI practitioners who are dealing with these issues on a daily basis. It is suggested that organizations should address these CBs when developing SPI implementation initiatives. This article also provides advice to SPI managers and practitioners on how to address CBs when developing these initiatives.

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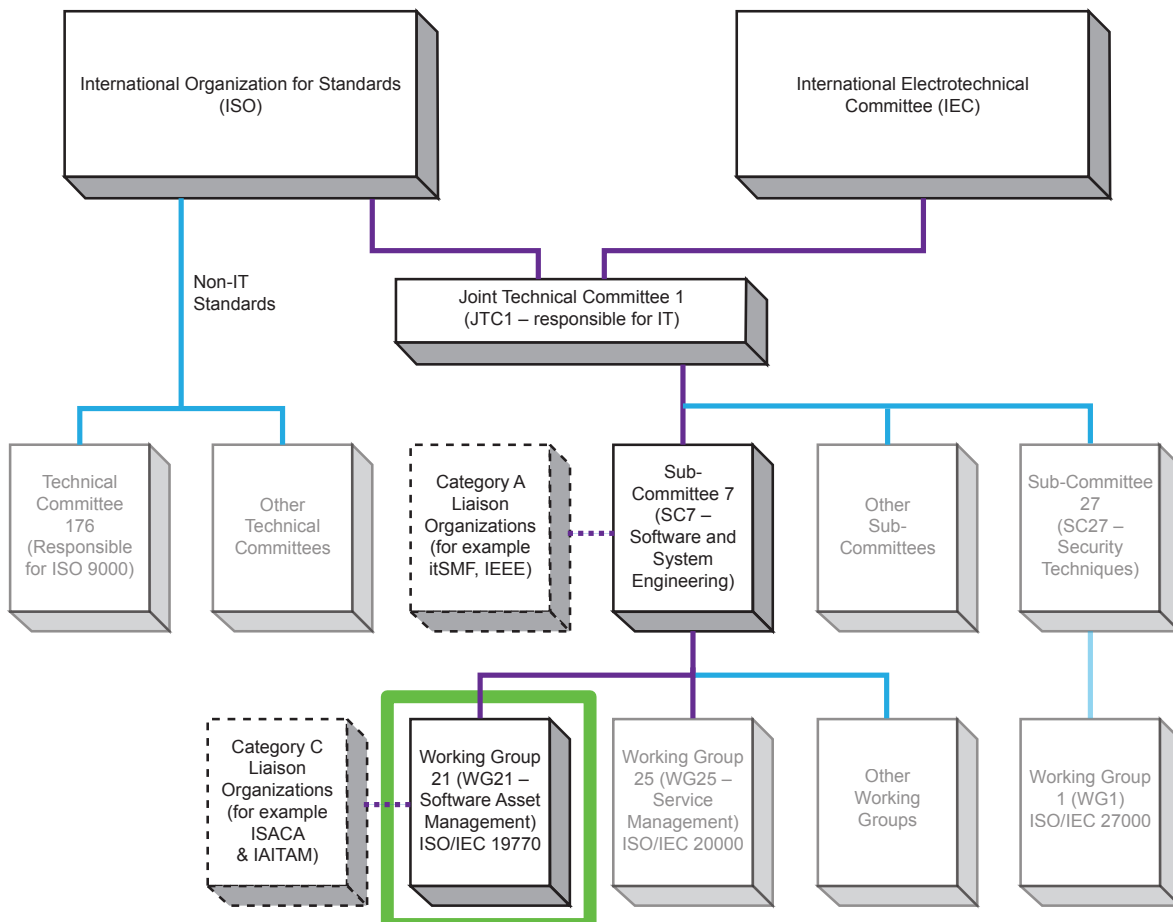


# ISO/IEC 19770 Standards Overview

This document provides a summary of the various ISO/IEC 19770 standards that have been released or are under development at the moment.

Note that the ISO/IEC 19770 standards are managed by Working Group 21 (WG21) which has the mandate to develop Software Asset Management standards. The convener for WG 21 is David Bicket.

The following image provides an overview of the ISO hierarchy:



The following descriptions provide a high-level overview of the ISO/IEC WG 21 Standards that have been published, or are currently under development

## 19770-0 – Overview and Vocabulary

**Status:** Proposed New Work Item

**Assigned Convener:** Roger Cummings, Symantec

This document will provide an overview of the SAM standards and provide the vocabulary used in the 19770 standards. Note, that this document will be built up from details included in the other standards and from new work done by WG21 and associated other working groups. This document will not be a republication of other commercially available documents created outside the ISO environment.

### 19770-1 – SAM Processes

**Status:** Published May 2006

This is a process standard that defines 70 processes grouped into a hierarchical set of categories that are expected to be in place for an organization to be considered having an effective SAM program implemented. The standard simply indicates what the processes are and what should be the outcomes from those processes.

### 19770-2 – Software Identification Tags

**Status:** Published November 2009

This is a data standard that defines a set of 7 mandatory and 30 optional elements to provide authoritative software identification information for software products. Based on an XML structure, the tagging definition is extensible and also provides support for digital signatures to prove provenance and tag integrity. TagVault.org ([www.tagvault.org](http://www.tagvault.org)), a program of IEEE-ISTO was established by Symantec, CA and ModusLinkOCS to speed the implementation of this standard in the market.

### 19770-3 – Software Entitlement Tags

**Status:** OWG formed, under development

**Convener:** John Tomeny, Sassafras Software

**Editor:** Krzysztof Baczkiewicz, Eracent and Steve Klos

This will be a data standard that defines a set of metrics that will be used by enterprise customers to determine if a software entitlement is in use or not. Based on an XML structure, this standard does not use license entitlement terminology to specify an entitlement. Instead, the standard will define the details of what actually needs to be measured to track entitlement usage. This may be as simple as identifying if a software title is installed all the way to the identification of specific network ports that should be monitored on a server to determine which clients connect and for how long.

### 19770-4 – Staged Adoption of SAM Processes

**Status:** Proposed New Work Item

**Assigned Convener:** David Phillips

This standard will provide an officially sanctioned staging for organizations interested in using 19770-1 processes as a template for SAM program development. This program was originally developed by the BSA which is assigning the rights to the documented conformance program over to ISO. The methodology is based on a tiered approach to demonstrating adoption of SAM processes, meaning that an organization is expected to have a complete set of processes in place for the assessed tier level and all lower tiers to be considered to be in conformance with the ISO standard at a specified tier level. The tier definitions are based on the hierarchical structure of 19770-1 and are defined on the BSA web site at <http://www.bsa.org/country/News%20and%20Events/News%20Archives/en/2008/en-11132008-sam-advantage.aspx>.

Although this standard is considered a 'new work item' by ISO standards, it is much more mature than a typical new work item due to the fact that the BSA has already developed many of the assessment criteria for each tier as well as the training behind the program. David Phillips provided an excellent write up of ISO/IEC 19770-1 in [issue 2Q08 of TickIT](#). He has also provided a detailed summary of the expectations of ISO/IEC 19770-4 in [issue 1Q09 of TickIT](#). Steve Klos provided details of the ISO/IEC 19770-2 draft standard as well as provide some information about the certification authority developed as a non-profit organization to bolster market support and product consistency in the rollout of SWID tags in [issue 4Q09 of TickIT](#).