



Delivering Quality in IT

The TickIT*plus* scheme

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The goal of IT quality – why bother?

The quality of delivered software has always been an issue. Thirty years or more ago when computers started to have an impact on business, scientific and military systems, late delivery, poor performance and the number of built-in defects were always a concern. Major projects would be initiated, sometimes with poorly defined requirements; many would overrun their budgets or fail to deliver – sometimes both. Today software and IT systems in general have a much wider scope and directly affect all our lives, so what in the past would have been accepted, can no longer be tolerated. Quality of the product and the service should be a prime concern to both users and their suppliers. In many areas the reliability and functionality of IT has improved out of all recognition, yet in other aspects the tools and methods used for specifying, designing, building and configuring software and the systems they run on has changed little. Despite years of effort, in many ways software engineering remains a poorly defined and ill regulated discipline.

As always there is a cost issue: can the cost of building the engineering into development and support be justified? Can the cost of imposing a quality regime, potentially with external certification benefit the organization? On the other hand, what are the costs of failing to deliver the right product or service? This can be extremely hard to quantify: project overruns, support costs, loss of reputation or business are all factors that can potentially unbalance this equation.

This document provides a brief overview of the **TickITplus** scheme, which pertains to the definition, development, delivery and ultimately the certification of IT quality. There is a general description of the new scheme – how it differs from its predecessor and what it promises to deliver - and a route map to the remaining documentation, concepts and structure of **TickITplus**. Finally, some basic business cases for using the scheme are described which are developed further in other material.

The TickIT scheme: 1991

Because of concerns with software quality and because the quality certification scheme available at that time did not specifically cater for this, TickIT was developed in the early 1990s with the specific aim of improving software development. This introduced a layer of guidance documentation, utilization of software trained auditors and an extended sector scheme built onto BS 5750, (later ISO 9001), accredited certification. TickIT was accredited both by UKAS in the UK and SWEDAC in Sweden, but applied internationally. The scheme was however only designed to cover software development and increasingly client organizations were seeking to extend this to other areas of IT such as service management and security. Inevitably other schemes arose to fill these needs based around standards such as ISO/IEC 20000 covering service management or ISO/IEC 27001 for information security. An organization wanting to extend

certification into these areas would therefore need to consider multiple schemes, with potential fragmentation, disruption and cost implications. In another example of how developments have moved on, process based capability assessment in the form of CMM and later CMMI, is now a key factor for those wishing to develop their systems to the higher quality levels.

Recognising this changing IT environment, responsibility for the TickIT scheme was placed under JTISC, (Joint TickIT Industry Steering Committee), which is administered by BSI who also provides the TickIT guidance documentation and other related facilities. In late 2007 JTISC decided to commission the development of a revised scheme which would address the shortcomings of the original TickIT and benefit users, both now and into the future.

The TickIT*plus* scheme: 2009

TickIT*plus* is more than a certification scheme and covers more than software development: this section summarizes its main features.

A basic concept of **TickIT*plus*** is flexibility: flexibility to select the level of capability assessment needed, flexibility to cover the necessary scope and flexibility to operate either within or outside the certification environment.

Process dimension

All defined activities undertaken can be described in terms of processes. These processes can be built into a system and used to define and deliver a specific scope of operations, whether it be software development, network management, data security or any of the other myriad uses to which IT is applied. Once the processes are defined they can be assessed for their capability performance in recognised stages: this is the approach of CMMI with its five levels of capability performance and organizational maturity. Rather than CMMI however, **TickIT*plus*** is built around the ISO/IEC 15504 standard – IT Process Assessment. Five levels of certified assessment are available:

- Foundation – this is the normal entry level and requires a process model to be defined and verified, but there is no direct process assessment.
- Bronze – this equates to level 2, (the Managed level in ISO/IEC 15504), and ensures the processes are operated with planned, monitored and adjusted management.
- Silver – this equates to level 3, (the Established level), and ensures that processes are capable of achieving their outcomes in terms of definition and deployment.
- Gold – this equates to level 4, (the Predictable level), ensuring that processes operate within predicted parameters.
- Platinum – this equates to level 5, (the Optimizing level), and ensures that quantified measures and improvements are applied to key processes.

Accredited certification will be available at all five levels and integrated with ISO 9001 audits. The scheme also introduces a number of other grade related requirements – such as improvement monitoring – and these are all detailed in the documentation. Whilst progression from one level to the next is expected, there is nothing to stop organizations entering at any grade other than Platinum, since to achieve this level a history of satisfactory performance within the scheme is needed. There is also nothing to prevent an organization entering at the Foundation grade and remaining at this level.

An integral part of the process assessment approach within **TickITplus** is the concept and use of the BPL, (Base Processes Library). This is a comprehensive reference set of IT-related processes which define the generic activities and products in a format designed to allow the construction of a consistent scoping and assessment model. Each process has been carefully defined using the basic process set from ISO/IEC 12207 but both rationalized and extended where necessary to meet ISO 9001 requirements and those of any other included optional standards – all of which are referenced from relevant processes.

BPL Process Categories

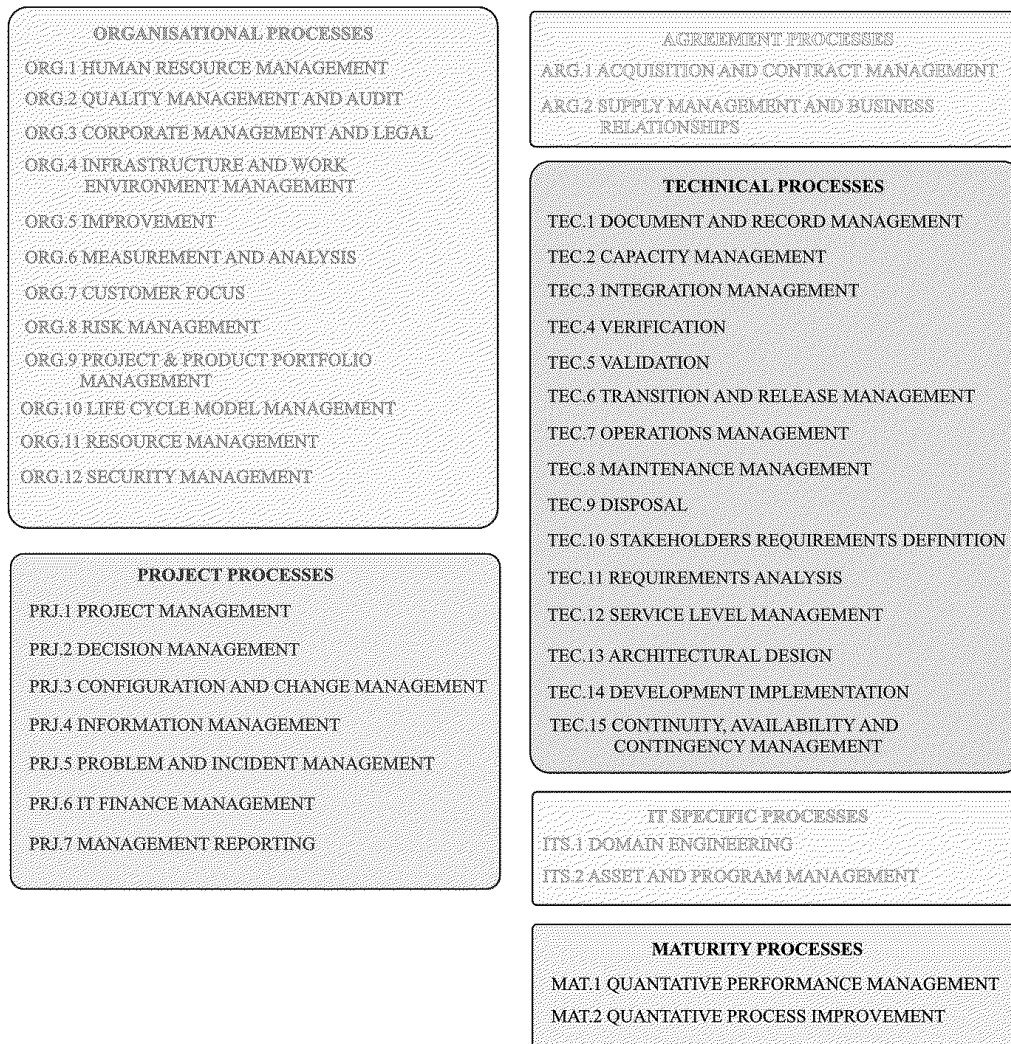


Figure 1: BPL Process categories

To simplify and make this approach still more consistent, a number of standard Scope Profiles are defined which describe typical activities and hence process sets used in IT focused organizations. The Scope Profiles can be combined and extended as necessary and the BPL includes a number of automated features for building the process model. Eight profiles are employed:

- IT systems engineering and infrastructure
- Product validation, quality and measurement
- Information management and security
- Corporate strategy planning and management
- Legal and compliance
- Project and programme management

- System and software development and support
- Service management

Standards dimension

Complementary to the process dimension is the inclusion of related IT standards within **TickITplus** certification. This allows, for example, service management or information security, to be directly integrated under one ISO 9001 compatible process model with the advantages of consistent and integrated assessment. The references within the BPL to inclusive standards allow an accurate process model to be developed. As the scheme evolves it is planned to add additional standards into this structure: those currently included are:

- ISO/IEC 20000 – IT Service Management
- ISO/IEC 27001 – IT Information Security Management Systems
- ISO/IEC 25030 – Software Product Quality Requirements

TickITplus Assessors and Practitioners

As with TickIT, there will be registration and training to ensure the competence of those involved in supporting and assessing the scheme. TickIT Auditors will be replaced by 3 grades of **TickITplus** Assessors:

- Foundation Assessors – direct entry and migration for existing TickIT Auditors who are limited to leading assessments at the Foundation level only.
- Capability (or Intermediate) Assessors – trained in capability assessment techniques and able to cover the grades up to Silver.
- High Maturity (or Advanced) Assessors – additionally trained in quantitative measurement, analysis and improvement assessment techniques and able to cover all grades.

To support these qualifications, 3 levels of training will be offered and matched to examinations independently administered by GASQ, (the Global Association for Software Quality), who will also accredit the training providers and courses.

Since **TickITplus** Assessors now cover a much wider potential scope, it is important that this can be reflected in their allocation and ability to investigate specialised areas of IT. Therefore each individual assessor will be registered with one or more Skills Profiles which are process structured in the same way as the Scope Profiles described above.

TickITplus extends qualifications to Practitioners. This is intended to apply to an organization's staff providing internal assessment, quality management and process development functions, but could equally well be used by consultants. Again, 3 grades are defined: Foundation, Capability and High Maturity, with the same course and examination structure: the principal difference from Assessors being that the external Lead Auditor registration is replaced by that for Internal Auditors. At all grades above Foundation, Practitioners will form a principal part

of the team for conducting external assessments and will also have defined requirements for covering internal assessments.

It is further planned to provide optional highly specialised advanced training for **TickITplus** Practitioners covering process development and optimization methods.

Self assessment

As well as certification, **TickITplus** is intended to appeal to those organizations who just want to use the tools and techniques but who do not necessarily want full certification. This is to encourage the take up of a common approach to IT quality and use of the standard process model. Fast track options will be available for those who have adopted this route and then wish to switch to full **TickITplus** and ISO 9001 certification later.

Extended documentation and website facilities

This is the initial document in an extended set of material that will be available from the new **TickITplus** website. Additional publically available documents will include:

- Business Cases for Quality in IT – an extension to the material outlined in this document.
- Scheme introduction and Guide – a detailed description of the full **TickITplus** scheme and its use.
- Quick Start and Self Assessment Guide – providing information to allow organizations to start the process and training development required for **TickITplus**. A full description on how to address self assessment and ensure compatibility with the certificated scheme.
- Requirements and Guide to Development and Implementation – a core part of the documentation, allowing users to understand the full requirements in detail with case studies and guidance.
- Requirements and Guide for Assessors and Practitioners – sets out all the regulations and requirements for qualifying in these grades.
- Certification Scheme Requirements – details how the accredited ISO 9001 certificated scheme will operate. **TickITplus** is now a combination of requirements and guidance for certified organizations rather than the limited guidance only scope of TickIT.
- Requirements for Training and Examinations – defines the criteria for training courses and the examination coverage.
- Scheme Administration – sets out the details for how JTISC and other parties will manage the scheme.

Some of this material will be available free of charge: all will be regularly updated as the scheme develops and will be available from the website.

Improvements planning

Improvements are integral to **TickITplus** and how these are monitored and controlled within the scheme depends on the different maturity grades. For example, at Foundation level the Improvements Plan is a requirement only; at higher grades the contents of this plan form a planned activity within assessments. At the Platinum level additional high maturity processes dealing with quantitative analysis and improvements are defined.

Migration to TickITplus

Extensive arrangements have been put in place to ensure existing TickIT certified organizations and TickIT Auditors can migrate to **TickITplus** with minimum of disruption, expense and uncertainty. Full details of requirements are shown on the website and in the scheme documentation.

Developing a business case for TickITplus

Whilst the need to obtain **TickITplus** and ISO 9001 accredited certification may be mandated on a supplier by a key customer, this is not a sustainable business case generally. This section identifies relevant examples where the benefits of both developing a formal quality management function and of moving this on to independent assessment and then **TickITplus** certification can be justified. It is not intended here to describe various costed scenarios as they could apply to different organizations, but the general business cases outlined are further expanded in the 'Business Cases for Quality in IT' part of the overall scheme documentation.

There are many potential stakeholders when considering quality development plus additional ones when a certification scheme is added to the equation. However, just considering the two most obvious:

- Customer organizations – these potentially have the most to gain from acquiring good, high quality IT services that meet their requirements. With a few exceptions however, such as government purchasers, few organizations are likely to be involved in making the decision to integrate quality management into operations – although many will simply assume this is been done – and even fewer will conduct their own verification of such operations.
- Supplier organizations – along with customers, suppliers of software and IT services generally have the most to gain from developing and supplying high quality products and services. They also however have the most direct cost to bear and hence it is in this area that the following business case discussions are directed.

Typical areas of costs and benefits for suppliers of IT products and services are likely to be in the following areas.

Formalized Quality Management

This assumed scenario considers an organization with an informal approach to quality: no written procedures or policies – not an uncommon situation - and adding a basic quality management function based on the principles of ISO 9001 but without **TickITplus** or any other form of independent certification. It's unlikely that such an organization will have any activities formally documented apart from isolated examples not forming any systematic approach.

Costs:

- Potential costs of external quality consultants and staff training.
- Production of documentation, such as: Quality Manual, procedures, work instructions etc.
- Verifying this material via review and induction into staff operations.
- Employing quality staff to manage this system and verify its effectiveness via internal audits.
- Lost production time for staff conducting assessments or being assessed and undertaking necessary corrective actions.
- Management overheads: reviews, HR for additional staff, etc.

Benefits:

- Consistent, integrated and repeatable procedures controlling operations, potentially less rework and predictable outputs.
- An aid to staff training.
- Semi independent internal verification of activities, less opportunity for bad practices to develop and better identification of those that may exist.
- Methods of identifying and correcting defects: the earlier defects are identified and corrected, the less the potential expense – a basic quality tenet.
- Management oversight into operations via reviews and reports.

Software and IT services development

This assumes a project development activity – potentially software, but it could also be a service management operation or network infrastructure support. It assumes that a supporting quality management function – as described above – is in place, but again, no independent certification. It also assumes that a basic project management function – such as controlling a schedule – would already be in place.

Costs:

- Generation and support of additional project management items consistent with ISO 9001, such as a Quality Plan.
- Definition of a development lifecycle and use of its formal approaches – control mechanisms and tools, e.g. for configuration management, testing requirements, etc.
- Identification, collation and review of user requirements.
- Management of specification documents and records.
- Staff time for conducting and recording reviews and any necessary follow-up actions.

Benefits:

- Extension of quality controls into project activities, such as risk management.
- Use of an established development lifecycle providing a route-map and more predictable outcomes.
- Control over products via the use of tools and procedures – e.g. configuration and identification of outputs.
- Traceability of defects and corrections via test records.
- Traceability of user requirements via configuration management and verification via testing.
- Production of project reports to management.
- Greater confidence in product quality and delivery schedules

Accredited certification

This stage assumes that both quality management and defined development lifecycles have been established and looks at the costs and benefits of using independent certification, but not **TickITplus** at this stage.

Costs

- External costs for independent assessment activities.
- Additional internal staff costs for preparing, participating in external assessment activities and for taking corrective actions.

Benefits

- Promotion of accredited certification status.
- Discipline of meeting formal external assessment requirements.
- Advantages of bids with reference to certification status.
- Increase in customer confidence.

Accredited certification to TickITplus

This final example looks at an organization that has opted for full ISO 9001 and **TickITplus** certification. It makes no assumption about the grade acquired however.

Costs

- Potential premium of **TickITplus** certification over standard ISO 9001 in terms of assessor fees and greater assessment costs.
- Staff costs for involvement in extended assessments.
- Training and registration for internal staff qualified as **TickITplus** Practitioners.
- Additional costs of BPL and in integrating formal process model structure.
- Costs in maintaining an extended improvements programme.

Benefits

- Maturity grade achieved gives both internal staff and external customers a real measure of the quality capabilities of the organization – distinguishes from standard ISO 9001 in the use of the ISO/IEC 15504 methods.
- Option of integrating additional IT standards certification under one accredited ISO 9001 based certificate: better systematic processes, one

assessment regime and an overall capability level covering the full scope of operations.

- Use of standard and accepted BPL process model.
- Use of established guidance material structured around **TickITplus** requirements.
- Recognised training and qualifications for internal quality personnel – **TickITplus** Practitioners.
- Rigorous development and improvement methodologies that need to be applied with quantifiable benefits.
- The ability to achieve higher maturity levels in graduated stages, with full recognition at each.
- Provides a route to full CMMI compliance if this is required but with regular surveillance under ISO 9001 accreditation.

Ways of utilizing **TickITplus**

As described in this document, **TickITplus** is intended to offer a flexible, multi-level approach to IT quality and certification. It is not intended to be an easy option: organizations seeking **TickITplus** at the Platinum grade can expect long and rigorous assessments with high demands on costs and staff time. However, it has the benefit of flexibility: assessment can be applied at whatever level is deemed appropriate to the quality and process maturity of the organization and the needs of its customers. If multiple IT standards need to be addressed, these can be covered under one certification arrangement.

The use of the BPL process library and accessibility to structured guidance documentation allows an organization to take advantage of the **TickITplus** environment and opt for self assessment without the necessity or costs involved in going for external certification. If later, certification becomes an objective, the 'fast track' options allow this earlier development to be utilised.

IT is a complicated business, quality management is complicated and formal process assessment can be very complicated. **TickITplus** tracks a route through this complicity in discrete stages and can apply to organizations of all sizes and scope of operations.