

The Test Engineering Development Programme

Developing Professional Test Architects and Consultants into Test Experts

Prepared for:	General Release
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Date:	June 10 th , 2019
Version:	1.0 Released
Our Ref:	PTE/2019

Contents

1	Executive Summary.....	3
2	Principles and Competencies of the Programme	4
3	The 5-Stream Programme.....	5
3.1	The Five Key Streams	6
3.2	The Test Expert	6
3.2.1	The Test Expert Roadmap	6
3.2.2	Test Expert Courses Narrative.....	8
4	Meeting the Needs of the Test Expert.....	10
5	Meeting the Needs of the Employer.....	10
6	Benefits of the Approach	10
A.	Training & SFIA Cross Reference	11

Index of Figures

Figure 1 – Test Expert Principles.....	4
Figure 2 - The Long-Term Software Test Engineer Career Development Programme	5
Figure 3 - The Test Expert Capability Roadmap	6

Version Management

Version	Date	Author	Comments
0.1	December 10 th , 2018	Bernard Melson	Initial draft
0.2	December 15 th , 2018	Bernard Melson	Following internal review
0.3	December 17 th , 2018	Bernard Melson	Validation
1.0	June 10 th , 2019	Bernard Melson	Revised following client workshop

1 Executive Summary

This document sets out a vision for developing professional Test Architect and Consultants into Test Experts through a targeted learning and development programme. People passing through the programme will increase their own skills and competencies in multiple disciplines and, importantly, organisational capability to help deliver the corporate strategy and systems solutions that underpin day to day business operations.

The programme has been developed in concert with (and rolled out to) a major systems integration company that was prepared to invest significantly in training to increase capability and extend its value proposition to new and existing clients alike.

The days of people having a single skill have long gone, so this cogent learning and development programme is based upon achieving multi-skilled competencies for people and organisations in order to maximise staff utilisation and reduce operational costs and staff attrition rates.

The programme comprises five learning and development streams, each of which seeks to imbue people with multi-layered competencies that are relevant to their experience and which provide extended capability within organisational teams – regardless of the development method they employ. The first stream defines a programme for apprentices and people new to testing, with the remaining four streams providing learning matched to career growth and the needs of a modern Test Practice. Each course within a stream has been mapped to SFIA, industry-accepted core principles, competencies and role types, as follows:

1. **Test Experts** who will be driving top level strategy and methods for corporate improvement.

This stream will imbue staff with the skills they need to:

- Test manage major programmes
- Set corporate testing strategy
- Assess and mature corporate test process, measurably and demonstrably
- Define and implement controls to measure the effectiveness of and reduce the cost of testing.

We recommend that the programme of learning be scheduled to run for around 2 years in order to allow students time to use their learning through classroom and on the job training to give them solid learning opportunities as the progress toward graduation. Within the stream is:

- Further details are available on request.
- The following pages contain the training and support details for developing ‘Professional ‘Lead Test Engineers’ into ‘Professional Test Architects and consultants’ who are competent to develop architecture for major programmes and the business case to support it
- A targeted learning & development programme that provides the necessary foundation for each person to take as part of building their general test capability and career growth;
- A series of optional developmental paths and routes to allow a Test Practice to fulfil its specialist technical needs by developing staff with cross-functional competencies.

People graduating from this stream will be able to demonstrate skills that are at the top of the profession and who can be relied upon to help drive and realise corporate strategy, programmes, methods and measures for short and long-term improvement.

2 Principles and Competencies of the Programme

Following our experience of learning and development programmes and research into what companies require of testing in the future, we have defined a series of ‘Principles and Competencies’ that fit the gamut and need of corporate skills required to deliver first-class systems that help underpin business operations, ranging from raw intake through to experienced Lead Engineers, Architects, and Experts as follows:

Principles	Test Architect and Consultant
Engineering at the heart of designing IT solutions	Accountable for defining and implementing methods and improvements to corporate level testing and major programmes
Execution excellence through engineering	Provision and guidance for testing excellence that helps deliver programmes that meet business needs, on time and to budget
Velocity - Pinpoint accuracy at speed, enabled by technology	Working at board level to define and present the business case for corporate improvement and rollout of methods to meet it
Culture, Collaboration and lifecycle continual improvement	Works across the organisation ensure the right process, methods and skills within people is in place to deliver value for money to internal and external clients commissioning new or changed systems to underpin business operations

Figure 1 – Test Expert Principles

3 The 5-Stream Programme

The professional Test Engineer career development programme contains five key streams, with each being rigorously designed and tested to reflect the principles and competencies that are key to success and growing capability within a Test Practice. Each stream interfaces seamlessly to the next to provide continuous investment in people and career growth:

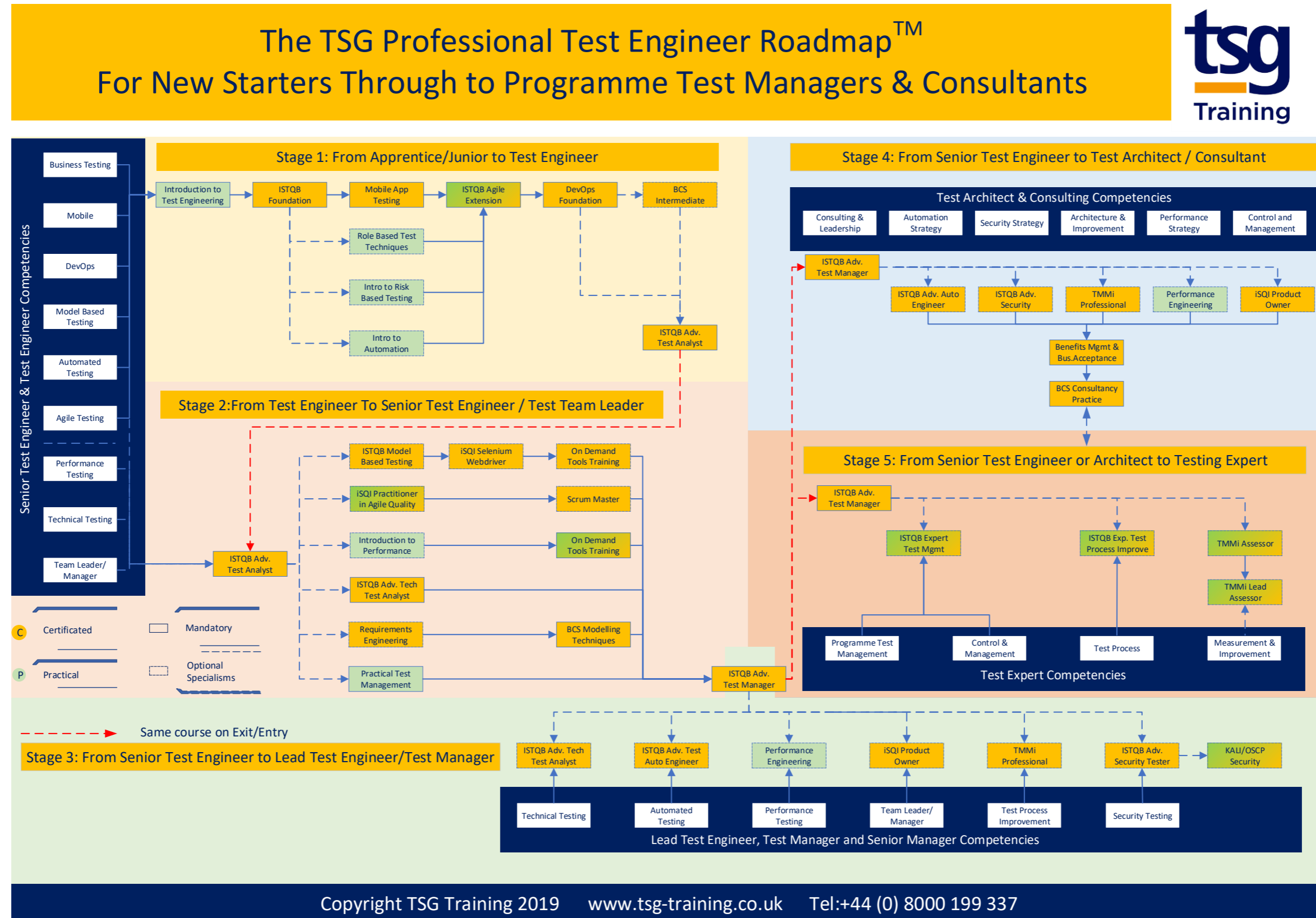


Figure 2 - The Long-Term Software Test Engineer Career Development Programme

3.1 The Five Key Streams

At the broadest level, each stream is designed to reflect modern test engineering principles, coupled with competencies that meet the needs of a Test Practice using varying development models, supported by capability from competent, multi-skilled individuals.

1. **The Test Engineer** for apprentices and entry level staff embarking on a career in software testing, and for experienced staff from other disciplines who may be transferring in.
2. **The Senior Test Engineer** with at least two years' experience, who is ready to step up to using more advanced techniques, choosing to specialise or move to the early stages of team leadership.
3. **The Lead Test Engineer** with at least four years' experience, already specialising and needing to be ready for the demands of test management or increasingly complex technical roles.
4. **The Test Architect** with at least five years' experience, ready to make the jump to the business-critical role of defining and building test architectures for major programmes.
5. **The Test Expert** who has at least 10-years' experience of leading major programme delivery and organisational change and benefit.

3.2 The Test Expert

The Senior Test Engineer stream is designed for people with at least four-years' software testing on projects and who have expressed a desire to make it their next career goal of test manager or technical specialist and move up the ladder of seniority within a Test Practice.

Students graduating Stream 4, 'The Test Architect and Consultant, are expected to join this stream at the beginning, whereas others with relevant experience can join at any point.

3.2.1 The Test Expert Roadmap

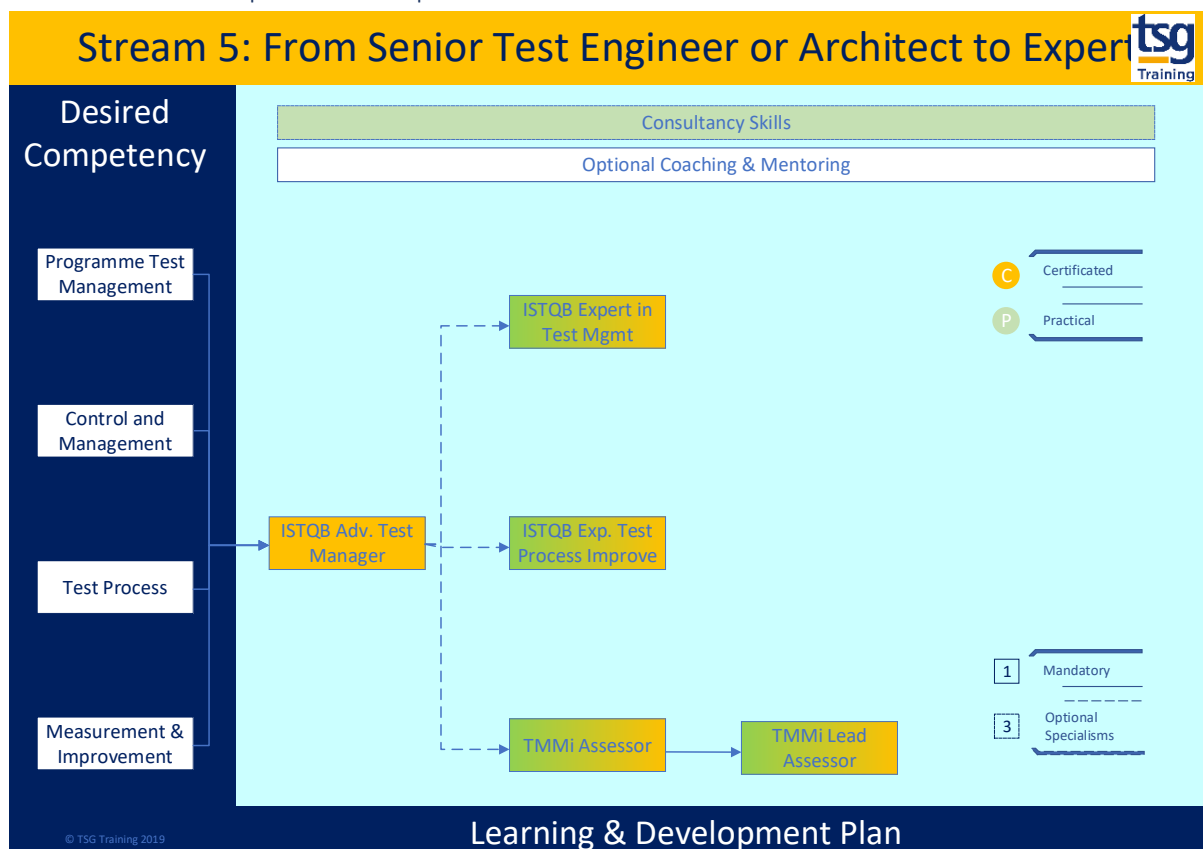


Figure 3 - The Test Expert Capability Roadmap

Some courses in Stream 5 are repeated from Stream 4. However, this is only to ensure that everyone has the full skill set. If a course has been taken in Stream 4 then it need not be taken again here.

The stream supports the key competencies of:

- Programme Test Management
- Control and Measurement
- Test Process
- Measurement and Improvement.

Supporting 4 strategic, key competencies, Stream 5 contains one mandatory course and 3-optional course paths that allow the Test Expert to specialise in key skills areas and take their place at the top of a Test Practice and as strategic part of its management team to drive major programmes and corporate improvements. Whilst the paths are optional, we recommend that at least one be completed to graduate.

It is not envisaged that any of the courses in this stream will be eligible for 'Government Apprenticeship Funding' unless someone is transferring into a role where there is a requirement to learn at least 51% of new skills to fulfil it.

3.2.2 Test Expert Courses Narrative

Test Expert Learning & Development	Mandatory	Days	Pre-Requisites	
			Months Exp.	Experience and Qualifications
ISTQB Advanced Test Manager and Exam	Yes	5	36-48	<p>ISTQB/ISEB Foundation Certificate and at least 36 months testing experience. Some team management experience helpful. Interest in setting the direction of testing. Familiarity with the challenges facing test teams in projects. Willingness to sit a multiple-choice exam lasting 3 hours. High flyers or those on accelerated learning may be ready to take this course at 24-months.</p> <p>It is expected, however, that people entering this stream will have previously completed this course and passed the exam.</p>
ISTQB Expert Test Management	Optional	8	60+	<p>This course, delivered over three separate sessions of 3+3+2 days, represents the pinnacle in test management and requires the ISTQB Advanced Test Manager Certificate and significant experience and dedication to the cause before it is attempted.</p>
ISTQB Advanced Test Manager and Exam	Yes	5	36-48	<p>ISTQB/ISEB Foundation Certificate and at least 36 months testing experience. Some team management experience helpful. Interest in setting the direction of testing. Familiarity with the challenges facing test teams in projects. Willingness to sit a multiple-choice exam lasting 3 hours. High flyers or those on accelerated learning may be ready to take this course at 24-months.</p> <p>It is expected, however, that people entering this stream will have previously completed this course and passed the exam.</p>

Test Expert Learning & Development	Mandatory	Days	Pre-Requisites	
			Months Exp.	Experience and Qualifications
ISTQB Expert in Test Process Improvement	Optional	7	60+	This course, delivered over three separate sessions of 3+2+2 days, is for those who seek to develop and define test processes at the corporate level and who will then provide guidance to teams on further development and capture of metrics and measures. An ISTQB Advanced Test Manager and significant experience of lessons learned and implementing improvement over several years is mandatory.
ISTQB Expert Test Management	Optional	8	60+	This course, delivered over three separate sessions of 3+3+2 days, represents the pinnacle in test management and requires an ISTQB Advanced Test Manager Certificate and significant experience and dedication to the cause before it is attempted.
TMMi Assessor	Optional	5	60+	Good experience of test process definition and improvement, coupled with an ISTQB Advanced Test Manager certificate.
TMMi Lead Assessor	Optional	5	60+	24+ months of activity and 7 assessments as a TMMi Assessor
Coaching and Mentoring	Y	Ongoing	Ongoing	None
Consultancy Skills	Optional	1	None	8 years testing experience for those expected to be deployed on client site as a fee-earning consultant.

Table 1 - Senior Test Engineer Courses, Pre-Requisites and Rationale

4 Meeting the Needs of the Test Expert

The programme has been designed to meet the skills of multiple business sectors and companies . It is composed of industry-accepted and proven courses to deliver best-practice training for Test Experts. The programme provides professional training that will allow Test Experts to learn and develop on the job as they exercise acquired skills and increase strategic competency in:

- Programme Test Management
- Control and Measurement
- Test Process
- Measurement and Improvement..

Training shall be delivered in the classroom with:

- An experienced trainer who has real coal face experience;
- A complete course manual and examples on which students can make their own notes;
- Support from the trainer via email for life.

5 Meeting the Needs of the Employer

The programme is based upon industry best practice and support a series of different development methods that are used in the market today.

TSG can work with the employer to define the most suitable work for students to undertake based upon each course. Work is expected to be exercised aligned with the skills learned in Section 4, Meeting the Needs of the Test , above.

The programme has been defined to turn out best-practice Test Experts who can play an effective role in developing and rolling out corporate strategy, develop measurable improvements that inform decision making and future direction, but it can be modified in technical content to meet the specific needs of any particular methods, environments, skills and architectures as the employer may rely upon to underpin their business systems.

6 Benefits of the Approach

In helping to meet the requirements of building capability within a modern Test Practice we have clearly delineated the roles and mapped them to training functions to be supported, aligned with stated principles and competencies:

- Courses will be delivered by experienced staff who have at least 20-years' experience gained from training and programme delivery at the sharp-end.
- The experience the trainers bring will allow them to offer the ever-important analogies and war-stories to make training relevant and accessible.
- Courses can be tailored to meet specific requirements; although for ISTQB courses we are limited to 10% variation without having to reaccredit.
- We can provide private training courses anywhere or staff can attend any of the courses that we run on our public schedule.
- We will agree and put in place a monitoring and measurement system to make sure that:
 - The delegate experience is rich.
 - People are passing exams at the expected rate.
 - The overall programme is delivering against its aims.

A. Training & SFIA Cross Reference

The following table identifies:

- The Knowledge Levels (K) that each course and exam is aimed at:
- The SFIA Levels and the suitability of courses by the identified role types.

Courses & SFIA Levels		Stream 5: Test Expert				
		ISTQB Advanced Test Manager	ISTQB Expert in Test Management	ISTQB Expert in Test Process Improvement	TMMi Assessor	TMMi Lead Assessor
Mandatory or Optional		5	8	7	5	5
Blooms Taxonomy		M	O	O	O	O
K-Levels	6: Evaluate					
	5: Synthesis					
	4: Analyse					
	3: Apply					
	2: Understand					
1: Remember						
SFIA Levels & Course	Strategy/Inspire <i>Head of Testing</i>	7				
	Initiate/Influence <i>Test Architect</i>	6				
	Ensure/Advise <i>Lead Test Engineer</i>	5				
	Enable <i>Senior Test Engineer</i>	4				
	Apply Assist <i>Test Engineer</i>	2/3				

Table 2 - SFIA Levels by Course and Role Type