

Australian Computer Society

GUIDELINES FOR CERTIFICATION

SEPTEMBER 2010



ICT Professionals Shaping Our Future

www.acs.org.au

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Certification Guidelines

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1. Authority

The Australian Computer Society (ACS) administers certification activity, including all procedures and activities intended to demonstrate the qualifications of ICT practitioners.

2. Purpose

This Quality Policy (QP) establishes a framework for the scheme for certifying persons as certified technologists and certified professionals. It provides the processes needed to establish, administer, and maintain the certification scheme.

3. Scope

These guidelines apply to the scheme intended to provide certification for persons working as ICT practitioners.

4. Certification scheme

4.1 Normative References

The following referenced documents are indispensable for the application of these guidelines.

- STD - ISO/IEC 17024:2003, Conformity Assessment – General requirements for bodies operating certification of persons
- STD - SO/IEC DIS 17024, General Requirements for Bodies Operating the Certification of Persons

4.2 Certification scheme description

4.2.1 Description of an ICT practitioner

ICT practitioners include (but are not restricted to) the following:

- those who are directly engaged in the usage and delivery of ICT for organisations including management and leadership – *the practitioners (both professionals and technologists)*;
- those developing and delivering educational, learning and development products and services for practitioners - *the educators*;
- those engaged in ICT research and development (new languages and utilities, new hardware and peripherals, fundamentally new applications, new techniques and tools for IT practitioners) including those in ICT supplier organisations as well as academic institutions – *the researchers*;
- those who regulate, support (including legal and commercial) and represent practitioners and their organisations - effectively another set of people who collectively own ICT related knowledge assets – *the supporters*;

4.2.2 Definition of a professional

The definition of a professional given by Professions Australia stresses both the possession “of special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level” as well as the possession of a Code of Ethics (Professions Australia, 2007). A view compatible with the ACS charter is that a professional is one who:

- possesses an underlying core body of specialised, in-depth, knowledge;
- adheres to a code of ethics;
- possesses the capacity for independent action, operating with a high level of responsibility and autonomy; and
- engages in continuing professional development, enhancing relevant technical and professional skills.

4.2.3 Professional ICT standard

The ACS has established a Professional ICT standard for the certification scheme.

The key features of the ACS Professional ICT standard include the following:

- The standard is vendor neutral and independent;
- The Skills Framework for the Information Age (SFIA) is the reference document for establishing the minimum standard of competency;
- Dependent on the maintenance of competency through continuing professional development; and
- Supported by a disciplinary code with a process for public complaint and sanctions.

4.2.4 Roles and responsibilities - Certified Technologist (CT)

The CT may be someone who has chosen a career as a technologist or is a early career professional without the necessary experience and/or qualifications with which to meet the professional category of certification.

The CT focuses mainly on practical applications – they may be ‘expert’ in installing, testing and monitoring particular systems or applications of computing, in the operation and maintenance of a particular system or application and even in supervising people (including trainees) in these activities. In some cases they may even be involved in selecting systems and applications to meet required specifications. It is unlikely that they will be involved in developing the specifications except in small, less complex systems and applications.

The CT would be required to be familiar with standards and codes of practice and become adept in their interpretation and application in a variety of situations. In some cases the CT will have a greater knowledge on detailed aspects of a system component or application than the CP that can contribute significantly to the efficacy and efficiency of a system or application. Very often this detailed knowledge will be attained through a vendor certification in relation to the system, system component or application.

The CT will have a basic grounding in the fundamentals underlining ICT supplemented by experience in a particular system or application or a certification of knowledge and competencies in a particular system, component or application supplemented with some training in standards, codes of practice and the nature of

systems (especially principles and analysis). Training and education is more likely to be competency-based, competencies that will allow them to implement, operate and maintain systems, components and applications under the control of standards and knowledge available in the public domain. Some may also have basic people management skills that allow them to lead or manage teams in these tasks.

4.2.5 Roles and responsibilities - Certified Professional (CP)

The CP is often required to deliver high-quality solutions to clients (internal or external) in response to varying business requirements. They utilise a wide variety product, technology, industry, architectural, and business skills. A CP utilises IT to add value to the organisation.

The CP will often use tools to manage, analyse, design, and implement solutions. CPs have an in-depth understanding of the technology, products, offerings, and services within their specialism area.

4.2.6 Criteria for Eligibility

Certified Technologist	Certified Professional
<ul style="list-style-type: none"> • they can operate effectively at SFIA level 3 generic capability • they can demonstrate in-depth competence in at least one specialism at SFIA level 3 • they have demonstrated a breadth of knowledge through CBOOK • they have an understanding of and commitment to the ACS codes and standards • they undertake 20 hours each year of continual professional development to maintain certification. This can include studies towards CP certification. 	<ul style="list-style-type: none"> • they can operate effectively at SFIA level 5 generic capability • they can demonstrate in-depth competence in at least one specialism at SFIA level 5 • they have demonstrated a breadth of knowledge through CBOOK • they have an understanding of and commitment to the ACS codes and standards • they undertake 30 hours each year of continual professional development to maintain certification.

Table 1: Criteria for CT and CP Eligibility

The effective CT typically possesses and exhibits the following:

Level of Competency	Description
Autonomy	<ul style="list-style-type: none"> • Works under general supervision. • Uses discretion in identifying and resolving complex problems and assignments. • Usually receives specific instructions and has work reviewed at frequent milestones. • Determines when issues should be escalated to a higher level.
Influence	<ul style="list-style-type: none"> • Interacts with and influences department/project team

	<p>members.</p> <ul style="list-style-type: none"> • May have working level contact with customers and suppliers. • In predictable and structured areas may supervise others. • Makes decisions which may impact on the work assigned to individuals or phases of projects.
Complexity	<ul style="list-style-type: none"> • Performs a broad range of work, sometimes complex and non routine, in a variety of environments.
Business Skills	<ul style="list-style-type: none"> • Understands and uses appropriate methods, tools and applications. • Demonstrates an analytical and systematic approach to problem solving. • Takes the initiative in identifying and negotiating appropriate development opportunities. • Demonstrates effective communication skills. • Contributes fully to the work of teams. • Plans, schedules and monitors own work (and that of others where applicable) competently within limited deadlines and according to relevant legislation and procedures. • Absorbs and applies technical information. Works to required standards. • Understands and uses appropriate methods, tools and applications. • Appreciates the wider field of information systems, and how own role relates to other roles and to the business of the employer or client.

Table 2: CT Generic Competencies

Effective CP typically possesses and exhibits the following:

Level of Competency	Description
Autonomy	<ul style="list-style-type: none"> • Works under broad direction. • Is fully accountable for own technical work and/or project/supervisory responsibilities. • Receives assignments in the form of objectives. • Establishes own milestones and team objectives, and delegates responsibilities. • Work is often self-initiated.
Influence	<ul style="list-style-type: none"> • Influences organisation, customers, suppliers and peers within industry on the contribution of own specialism. Has significant responsibility for the work of others and for the allocation of resources. • Makes decisions which impact on the success of assigned

	<p>projects i.e. results, deadlines and budget.</p> <ul style="list-style-type: none"> • Develops business relationships with customers
Complexity	<ul style="list-style-type: none"> • Performs a challenging range and variety of complex technical or professional work activities. • Undertakes work which requires the application of fundamental principles in a wide and often unpredictable range of contexts. • Understands the relationship between own specialism and wider customer/organisational requirements.
Business Skills	<ul style="list-style-type: none"> • Advises on the available standards, methods, tools and applications relevant to own specialism and can make correct choices from alternatives. • Analyses, diagnoses, designs, plans, executes and evaluates work to time, cost and quality targets. • Communicates effectively, formally and informally, with colleagues, subordinates and customers. • Demonstrates leadership. Facilitates collaboration between stakeholders who have diverse objectives. • Understands the relevance of own area of responsibility/specialism to the employing organisation. • Takes customer requirements into account when making proposals. • Takes initiative to keep skills up to date. • Mentors more junior colleagues. • Maintains an awareness of developments in the industry. • Analyses requirements and advises on scope and options for operational improvement. • Demonstrates creativity and innovation in applying solutions for the benefit of the customer.

Table 3: CP Generic Competencies

4.2.7 Pathways to CT

There are several pathways to attain CT status.

Graduate of an ACS/Seoul Accord Accredited Degree Program

Candidates may attain CT status if they:

- have graduated from a degree program in ICT (or equivalent) .

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Graduate of Any University Degree Program

Candidates may attain CT status if they:

- have graduated from a degree program in ICT (or equivalent), have no less than three (3) years relevant work experience;
- have demonstrated in-depth competency in at least one SFIA skill at level 3;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge); and
- have demonstrated effective interpersonal and communication skills.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Graduate of an ACS Accredited AQF 5/6 Program in ICT

Candidates may attain CT status if they:

- have graduated from an ACS accredited AQF 5/6 program in ICT (or equivalent), and
- have no less than two (2) years ICT work experience of which one (1) year has been at SFIA level 3 or above.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Vendor Certifications Alone

Candidates holding the following vendor certifications:

- Microsoft Certified Systems Engineer, Microsoft Certified Solution Developer, Certified Lotus Professional or Certified Novell Engineer (obtained after 1997)
- Certified Directory Engineer from Novell, Master Certified Novell Engineer, Certified Novell Instructor, CITEC Certified Engineer or Oracle Certified Master (from 2004)
- Microsoft Certified Professional Developer or Microsoft Certified IT Professional (from 2007)
- Certified Information Systems Auditor or Certified Information Security Manager from Information Systems Audit and Control Association (from 14 June 2007)
- Certified Information Systems Security Professional from International Information Systems Security Certification Consortium (from May 2008)
- Microsoft Certified Technology Specialist (from August 2009)

may attain CT status if they:

- have no less than three (3) years relevant ICT work experience, with at least one (1) year at SFIA level 3 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 3;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge); and
- have demonstrated effective interpersonal and communication skills.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Graduate of an AQF 4 Program in ICT

Candidates may attain CT status if they:

- have graduated from an AQF 4 program in ICT;
- have no less than four (4) years relevant ICT work experience, with at least two (2) years at SFIA level 3 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 3;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge); and
- have demonstrated effective interpersonal and communication skills.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Experience Only

Candidates may attain CT status if they:

- have no less than six (6) years relevant work experience at professional ICT level, with the last three years at SFIA level 3 or above,
- have demonstrated in-depth professional competency in at least one SFIA skill at level 3,
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge), and
- have demonstrated effective interpersonal and communication skills.

This pathway is available to either Australian citizens/permanent residents, or non-residents.

Mutual Recognition

Candidates may attain CT status if they have been certified at an equivalent level by a Society under the IP3 Accreditation Scheme.

4.2.8 Pathways to CP

There are several pathways to attain CP status.

4.2.8.1 Direct entry pathways are:

Normal, ICT Degree

Candidates may attain CP status if they:

- have graduated from a degree program in ICT (or equivalent) ;
- have no less than five (5) years relevant work experience at professional ICT level, of which eighteen (18) months has been at SFIA level 4 or above, and the last two (2) years at SFIA level 5;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 5; and
- have demonstrated effective interpersonal and communication skills.

This pathway is available to either Australian citizens/permanent residents, or non-residents.

Senior Manager

Candidates may be admitted through the Senior Manager pathway to CP status if they:

- have worked the last four (4) years at SFIA level 6 or above; and
- have demonstrated in-depth professional competency in at least one SFIA skill at level 6.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Academic (PhD or Similar)

Candidates may be admitted through the Academic pathway to CP status if they:

- have worked the last two (2) years at SFIA level 6 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 6 through a PhD or equivalent post graduate study; and
- are currently employed in an ICT school/faculty/department of an Australian university, or an accredited research facility.

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

4.2.8.2 The following pathways lead to a CP designation via successful completion of Computer Professional educational Program (CPeP):

Accelerated, ICT Degree (ACS/Seoul Accord Accredited)

Candidates may attain CP status if they:

- have graduated from an ACS/Seoul Accord accredited degree program in ICT (or equivalent);
- have no less than eighteen (18) months relevant work experience at professional ICT level; and
- have successfully completed the ACS Computer Professional educational Program (CPeP).

This pathway is available to either Australian citizens/permanent residents, or non-residents.

Non- ICT Degree

Candidates may attain CP status if they:

- have at least an Australian bachelor degree or equivalent overseas qualification (as determined by reference to the appropriate Country Education Profile (CEP));
- have no less than five (5) years relevant work experience at professional ICT level, with the last two (2) years at SFIA level 4 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 4;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge);
- have demonstrated effective interpersonal and communication skills; and
- have successfully completed the ACS Computer Professional educational Program (CPeP).

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

ICT Diploma, Advanced Diploma

Candidates may attain CP status if they:

- have at least an Australian Diploma or equivalent overseas qualification (as determined by reference to the appropriate Country Education Profile (CEP));
- have no less than six (6) years relevant work experience at professional ICT level, with the last two years at SFIA level 4 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 4;
- have demonstrated effective interpersonal and communication skills; and
- have successfully completed the ACS Computer Professional educational Program (CPeP).

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Vendor Certifications Alone

Candidates holding the following vendor certifications:

- Microsoft Certified Systems Engineer, Microsoft Certified Solution Developer, Certified Lotus Professional or Certified Novell Engineer (obtained after 1997)
- Certified Directory Engineer from Novell, Master Certified Novell Engineer, Certified Novell Instructor, CITEC Certified Engineer or Oracle Certified Master (from 2004)
- Microsoft Certified Professional Developer or Microsoft Certified IT Professional (from 2007)
- Certified Information Systems Auditor or Certified Information Security Manager from Information Systems Audit and Control Association (from 14 June 2007)
- Certified Information Systems Security Professional from International Information Systems Security Certification Consortium (from May 2008)
- Microsoft Certified Technology Specialist (from August 2009)

may attain CP status if they:

- have no less than six (6) years relevant work experience at professional ICT level, with the last two years at SFIA level 4 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 4;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge);
- have demonstrated effective interpersonal and communication skills; and
- have successfully completed the ACS Computer Professional educational Program (CPeP).

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Experience Only

Candidates may attain CP status if they:

- have no less than ten (10) years relevant work experience at professional ICT level, with the last two years at SFIA level 4 or above;
- have demonstrated in-depth professional competency in at least one SFIA skill at level 4;
- have demonstrated a broad technical understanding of ICT (refer to the ACS Core Body of Knowledge);
- have demonstrated effective interpersonal and communication skills; and
- have successfully completed the ACS Computer Professional educational Program (CPeP).

This pathway is available to either Australian citizens or permanent residents. This pathway is not available for non-residents.

Mutual Recognition

Candidates may attain CP status if they have been certified at an equivalent level by a Society under the IP3 Accreditation Scheme.

4.3 Conditions of the Certification Scheme

National Regulations (NR 2.5.5 and 2.5.6) allow that candidates who meet the requirements of this policy are entitled to add CT (Certified Technologist) or CP (Certified Professional) after their membership post nominal.

All candidates must agree to the certification agreement in order to be certified by the ACS and hold a certification designation.

The ACS will maintain and publish on its website a Register of all current Certified Technologists and Certified Professionals where approval has been provided from the member. The Register will be preceded by details of the requirements for the certified status and may include any caveats or limitations as required.

4.4 Continuing professional development (CPD)

CPD is a requirement to maintain CT or CP status.

To maintain CT status a member must:

- accrue 20 hours of appropriate professional development in any twelve month period;
- undertake any directed professional development as required; and
- have been actively practising in the profession in the qualifying period and provide two referees who can attest to their professional activity.

To maintain CP status a member must:

- accrue 30 hours of appropriate professional development in any twelve month period;
- undertake any directed professional development as required;
- undertake over any two year period five (5) hours of voluntary community or professional services;
- have been actively practising in the profession in the qualifying period and provide two referees who can attest to their professional activity.

In recognition of the widely differing roles, sectors and circumstances of ACS members, it is the ACS policy not to be prescriptive in what members are asked to do to satisfy their obligation to undertake CPD, in the belief that members and, where appropriate, their employers are best placed to decide what CPD is appropriate to maintain the knowledge and skills required for their current role, and for development into future roles.

CPD activities must be structured in that they have a clear set of objectives and a logical framework – they can include lectures, seminars, formal education, discussion groups and special interest groups, writing and delivering papers and conducting research.

CPD should be seen as a self-managed, lifelong process for all ICT professionals and practitioners. ACS recommends that members adopt a structured approach and plan their development to ensure they are able to:

- demonstrate their continuing commitment to the profession;
- develop the good practice of regularly reviewing their needs; and
- select relevant learning activities to help them fulfil these provisions.

As part of this, an appropriate recording system is available to members to track their activities and review progress which will produce an Activities Statement for each member.

4.5 Monitoring CPD compliance with requirements

The ACS expects its members to be able to demonstrate, if requested, their commitment to CPD. Written evidence will be required at re-certification. At other times members may be surveyed to establish whether the ACS policies and support services for professional development are useful and effective.

The ACS will audit a sample selection of Activity Statements each year. The extent and frequency of audits will depend upon varying circumstances such as results of previous audits, relative risk associated with activities, and the adequacy of systems of internal control, as described in OP - *Activity Statement Internal Audit*, Operating Procedure, Certification Support Practices. Activity Statement Internal Audits are part of compliance of internal audits of the ACS.

4.6 Sanctions for non-compliance

Certified Professionals and Certified Technologists who fail to comply with the ACS Professional Development requirements will have their CT or CP credential revoked and will no longer be allowed to present themselves as a CT or CP. Individuals who have their certification revoked will be required to obtain sufficient continuing professional development hours in order to get their CT or CP certification reinstated.

Any deliberate attempts to misrepresent activity will be regarded as a breach of the ACS Code of Ethics and be subject to disciplinary action.

4.7 Appeals

Certified Professionals and Certified Technologists who have had their certification revoked due to non compliance with certification requirements may appeal such revocation by submitting a written application to the CEO. This request must be received no later than sixty days after notice of revocation and should include a detailed explanation for the appeal.

In the event that a candidate for certification or a Certified Professional or Certified Technologist wishes to appeal a decision made by the ACS by invoking the appeals process defined in OP- Certification Process: Guidelines for Candidates, Operating Procedure, and wants the appeal to be anonymous, the ACS will facilitate an anonymous review on behalf of the candidate.

If a candidate or a Certified Professional or Certified Technologist is found to have colluded on, falsified or forged any documents then the case will be closed without the issue of result and referred to the Chair: Disciplinary Committee.

4.8 Confidentiality and disclosure

4.8.1 Confidentiality

All information relating to a candidate will be held confidential to the ACS during the certification process; that is, prior to the award of certification. This includes information related to the Application Form, Review and Appeal Forms.

The candidate's Certification Application will always be considered confidential information and shall not be disclosed in any publicly available document or to any third party by the ACS.

In addition the ACS will hold confidential all information on unsuccessful applications for certification.

4.8.2 Disclosure of Information

Any claims of conformance or information related to the certification process may only be made public after the ACS has notified the candidate in writing that they have successfully completed the certification process.

5. Definitions and abbreviations

For the purposes of this document, the terms and definitions given in ISO/IEC 17024:2003 and the following apply.

body of knowledge

a collection of knowledge items generally agreed to be essential to understanding a particular subject area. A body of knowledge is particularly useful when it is collected, explained, and/or organised by a guidance document. Such a document can be used as a basis for examination or comparison.

cognitive level

qualitative assessment of an individual's familiarity with a given topic.

qualification body

entity issuing certificates of qualification under Sections 1 to 6 of this document.

stakeholder

individual or organisation actively involved in a software project or whose interests may be positively or negatively affected as a result of project execution or completion.

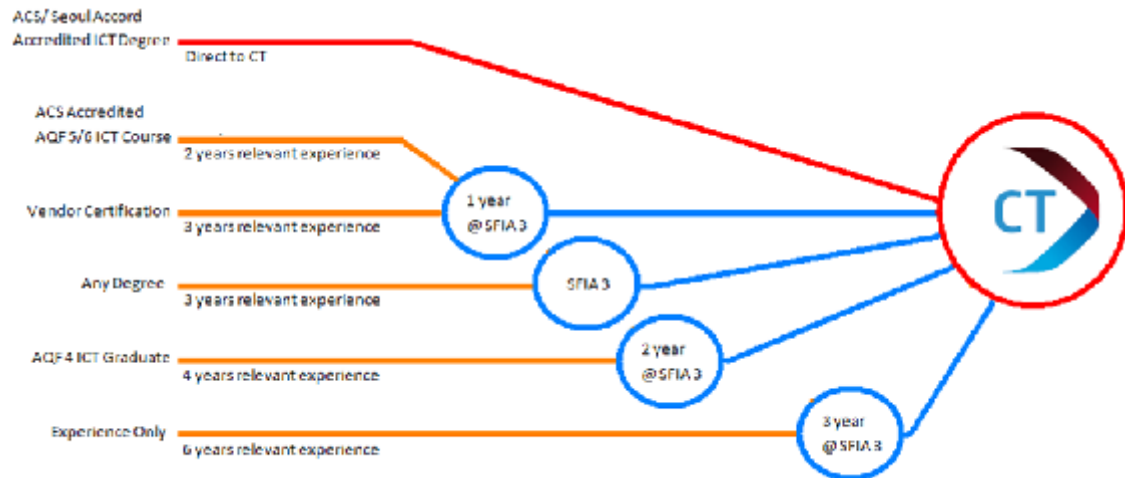
Refer to the QS Glossary located on the ACS website for definitions and abbreviations.

6. References

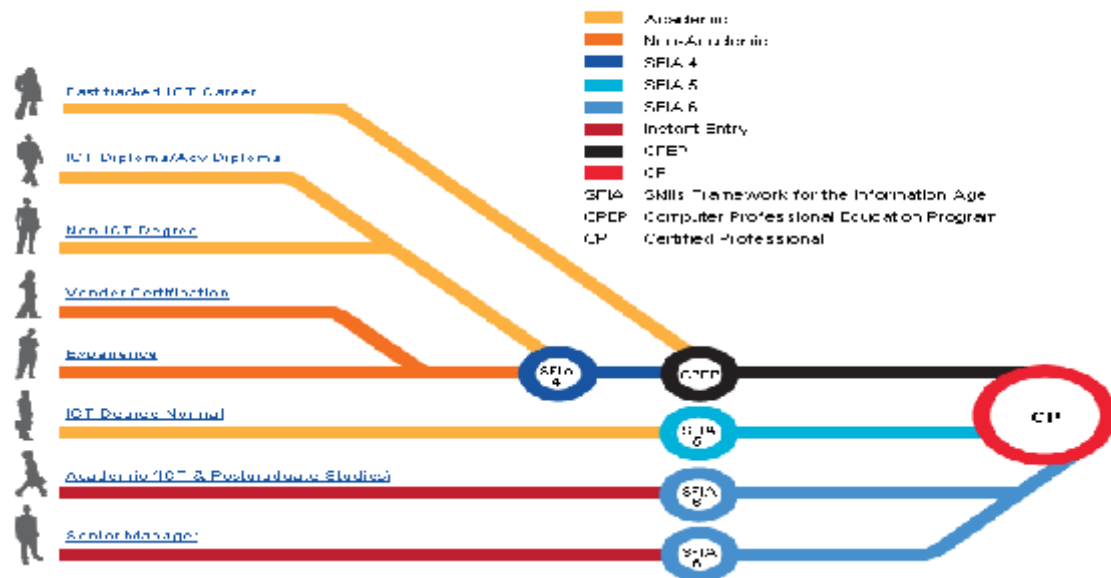
1. [Bloom] B. Bloom, ed. Taxonomy of Educational Objectives: Classification of Educational Goals, Mackay, 1956.
2. ISO/IEC 17024:2003, Conformity Assessment – General requirements for bodies operating certification of persons
3. Skills Framework for the Information Age, v. 4, www.sfia.org.uk.

7. Appendices

Appendices A & B– Roadmap to Certified Technologist & Certified Professional



CHOOSE YOUR BEST ROUTE TO BECOMING A CERTIFIED PROFESSIONAL



Appendix C – Skills Framework for the Information Age (SFIA)

In developing the ACS Certification Scheme, SFIA is used as an underlying structure to help with the organisation of the competence descriptions and as a resource to help in their validation. It is recommended to base competence descriptions neither on jobs (or job titles) nor on technology (software environments), as *stability of profiles* is of great importance.

The specifics of technology may form part of the profile description but should not influence the structure of the ACS Framework. These descriptions provide information as to what is required to be competent in a role. Levels should be attributed to the stated performance expectations.

The Skills Framework for the Information Age (SFIA) provides a common reference model for the identification of the skills needed to develop effective Information Systems (IS) making use of Information Communications Technologies (ICT). It is a simple and logical two-dimensional framework consisting of areas of work on one axis and levels of responsibility on the other.

It uses a common language and a sensible, logical structure that can be adapted to the training and development needs of a very wide range of businesses – or simply used ‘off the shelf’. SFIA enables employers of IT professionals to carry out a range of HR activities against a common framework of reference - including skill audit, planning future skill requirements, development Programs, standardisation of job titles and functions, and resource allocation.

It is easily accessible to:

- 1. ICT practitioners and users*
- 2. employers*
- 3. education and training providers; and*
- 4. government*

The framework provides a clear model for describing what ICT practitioners and users do. It is constructed as a two-dimensional matrix. For a full scale version of the SFIA Framework Chart, please refer to the Copy of the Framework or Downloadable Extracts sections.

Skills: One axis divides the whole of ICT into ‘skills’. Skills are grouped for convenience into subcategories or ‘business roles’. Subcategories are grouped into six categories or work areas - strategy & planning, management & administration, development and implementation, service delivery, sales & marketing, and use. The SFIA structure allows a consistent approach to ICT skills across the organisation and is not limited to a specialist department.

Levels: The other axis defines the level of responsibility and accountability exercised by ICT practitioners and users. Each of seven levels - from new entrant to strategist level - is defined in terms of autonomy, influence, complexity and business skills.

Descriptors: The matrix shows the complete set of skills used by ICT practitioners and users. For each skill at each level, ‘descriptors’ provide examples of typical tasks undertaken. A typical task for systems design at level 5 is ‘reviews others’ system design to ensure selection of appropriate technology, efficient use of resources, and integration of multiple systems and technology.’

The matrix is not fully populated, as most roles do not require people at every level of responsibility.

Skills: At the heart of the Framework are a set of skills which together aim to describe all the abilities that are needed to deliver and exploit effective information systems.

Source: www.sfia.org.uk

Candidates assessing themselves against SFIA are likely to find that they meet the SFIA criteria in several different categories.

SFIA Skill Descriptors – Comparative Examples

A number of specialist skills from SFIA are provided below to demonstrate the level expected.

Information assurance

The protection of systems and information in storage, processing, or transit from unauthorised access or modification. Denial of service to unauthorised users; or the provision of service to authorised users. Includes those measures necessary to detect, document and counter threats to the integrity of stored information, such as the application of firewalls and intrusion detection systems (IDS).

Level 3 (CT)

- Applies procedures to enhance resilience to unauthorised access.
- Recognises when an IT network/system has been attacked.
- Can take immediate action to limit damage and escalates event to higher authority.

Systems design

The specification and design of information systems, their components and architecture to meet defined business needs.

Level 3 (CT)

- Specifies user/system interfaces and translates logical designs into physical designs taking account of target environment, performance requirements and existing systems.
- Produces detailed designs and documents all work using required standards, methods and tools, including prototyping tools where appropriate.

Data analysis

The provision of specialist expertise and practical assistance in the investigation, evaluation and interpretation of data in order to ensure its coherence, availability, accuracy and security to meet information and communication systems requirements.

Level 3 (CT)

- Applies data analysis, data modelling and quality assurance techniques, based upon a detailed understanding of business processes, to establish, modify or maintain data structures and associated components (entity descriptions, relationship descriptions and attribute definitions).
- Advises database designers and other application development team members on the details of data structures and associated components.

Programming/software development

The design, creation, testing and documenting of new and amended programs from supplied specifications in accordance with agreed standards.

Level 3 (CT)

- Designs, codes, tests, corrects and documents moderately complex programs and program modifications from supplied specifications, using agreed standards and tools.
- Conducts reviews of supplied specifications, with others as appropriate.

Web site specialism

The design, creation, testing, implementation and support of new and amended collections of pages of information on the World Wide Web or an intranet or extranet.

Level 3 (CT)

- Liaises with clients/users to clarify details of requirements specifications.
- Designs, creates and tests moderately complex, well engineered web pages with specified content and layout, including basic web interfaces to new or existing applications.
- Uses appropriate tools to make finished web material available on intranet or Internet.

Content creation

The planning, design and creation of information content, to be delivered electronically or otherwise. This includes managing the quality assurance and publication process.

Level 3 (CT)

- Designs individual documentation plans for documentary items.
- Organises reviews of draft material.
- Manages the configuration of documentary items and documentation project files, within own area of responsibility.
- Organises final review and testing of documentary items.

Systems integration

The incremental and logical integration and testing of components and/or subsystems and their interfaces in order to create operational systems.

Level 3 (CT)

- Defines the integration build and produces a build definition for generation of the software. Accepts software modules from software developers and produces software builds for loading onto target hardware from software source code.
- Configures the hardware environment, produces integration test specifications, conducts tests and records the details of any failures.
- Carries out and reports fault diagnosis relating to moderately complex problems.

Porting/software integration

The integration of software products into existing software environments to produce new platform-specific versions of the software products.

Level 3 (CT)

- Assists in the configuration of software and equipment and systems testing of platform-specific versions of one or more software products.
- Documents faults, implements resolutions and retests to agreed standards.

Information assurance

The protection of systems and information in storage, processing, or transit from unauthorised access or modification. Denial of service to unauthorised users; or the provision of service to authorised users. Includes those measures necessary to detect, document and counter threats to the integrity of stored information, such as the application of firewalls and intrusion detection systems (IDS).

Level 5 (CP)

- Develops procedures and implements the application of firewalls and IDS to improve network/system resilience.

Systems design

The specification and design of information systems, their components and architecture to meet defined business needs.

Level 5 (CP)

- Specifies and designs large or complex systems.
- Selects appropriate design standards, methods and tools and ensures that they are applied effectively.
- Reviews others' system design to ensure selection of appropriate technology, efficient use of resources and integration of multiple systems and technology.
- Establishes policy for selection of architecture components.
- Evaluates and undertakes impact analysis on major design options.
- Ensures that the system architecture balances functional, service quality and systems management requirements.

Data analysis

The provision of specialist expertise and practical assistance in the investigation, evaluation and interpretation of data in order to ensure its coherence, availability, accuracy and security to meet information and communication systems requirements.

Level 5 (CP)

- Sets standards for data analysis tools and techniques, advises on their application and ensures compliance.
- Manages the investigation of corporate data requirements and coordinates the application of data analysis and data modelling techniques, based upon a detailed understanding of the corporate information requirements, in order to establish, modify or maintain data structures and their associated components (entity descriptions, relationship descriptions, attribute definitions).

Programming/software development

The design, creation, testing and documenting of new and amended programs from supplied specifications in accordance with agreed standards.

Level 5 (CP)

- Sets standards for programming tools and techniques, advises on their application and ensures compliance.
- Takes technical responsibility for all stages in the software development process. Prepares project and quality plans and advises systems development teams.

- Assigns work to programming staff and monitors performance, providing advice, guidance and assistance to less experienced colleagues as required.

Web site specialism

The design, creation, testing, implementation and support of new and amended collections of pages of information on the World Wide Web or an intranet or extranet.

Level 5 (CP)

- Selects appropriate tools, templates and standards for the creation of advanced web sites, appropriate to customer expectations (differentiating, for example, between needs such as optimisation and ease of modification).
- Sets design and coding standards, taking into account bandwidth and browser compatibility issues.
- Takes responsibility for project management of web site assignments, including design of the overall information structure and graphical style for substantial, complex or high-profile web sites.

Content creation

The planning, design and creation of information content, to be delivered electronically or otherwise. This includes managing the quality assurance and publication process.

Level 5 (CP)

- Develops standards and procedures to support documentation strategy.
- Designs overall support information package plans.
- Manages small teams of authors, ensuring that they are aware of and work to relevant standards.
- Advises on appropriate documentation formats and documentation systems to satisfy requirements.
- Organises reviews of draft material.

Systems integration

The incremental and logical integration and testing of components and/or subsystems and their interfaces in order to create operational systems.

Level 5 (CP)

- Designs and builds integration components and interfaces.
- Leads practical implementation work under the technical direction of the system designer/architect.
- May contribute to the overall design of the solution.
- May define the technical criteria for product/component selection.
- Contributes to decisions about tools, methods and approaches.

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