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David Lindley and Robert Hart

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Editor-in-Chief: Charles Sampford – c.sampford@griffith.edu.au

Managing Editor: Brian J. Adams – b.adams@griffith.edu.au

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Educating for Professionalism: An ACS Perspective

David LINDLEY and Robert HART

Australian Computer Society

just_ask@acslink.net.au

Introduction

This discussion is delivered from the perspective of an educationalist and practicing educator. It looks at professionalism as the product of a process; a status that can be achieved and justified by completing a series of activities. It does not attempt to explain what professionalism is, only how the ACS deems that it can be established.

In this paper, we aim to convey the following messages:

- Professionals require education beyond that offered in a typical university degree.
- The ACS Computer Professional Education (CPE) Program is constructed on the established SFIA skills framework; or Skills Framework for the Information Age; plus an additional skill set labelled *Professionalism*.

and to justify these messages we address the following questions:

- What is an ICT Professional?
- Are there grades of ICT professionalism?
- What is professional development for ICT Professionals?
- Where on the scale of *academically oriented education vs. competency based training* does ICT professional development lie?

What is an ICT Professional?

The ACS deems an ICT Professional as someone eligible for its Professional level of membership; that is, a *Member* (as distinct from an *Associate Member*) which the ACS specifies in terms of *knowledge, skills and competence* as follows;

- Factual and theoretical knowledge in broad contexts of ICT.
- Advanced knowledge of a discipline involving critical understanding of theories and principles.
- Advanced skills, demonstrating mastery and innovation required to solve complex and unpredictable problems in a discipline/field of ICT.
- Exercise management and supervision [skills] in contexts of work activities where there is unpredictable change.
- [Competent to] Take responsibility for complex technical and professional activities or projects.
- [Competent to] Review and develop performance of self and others.

In this context, the descriptors the ACS uses to define levels of membership can be defined as:

- *Knowledge*: facts, information, and skills acquired through experience and education,
- *Skills*: the ability to perform a task, and
- *Competence*: a standard necessary to perform a specific job.

Underpinning this choice of descriptors is the *Skills Framework for the Information Age* (SFIA), which is described as providing “a common reference model for the identification of the skills needed to develop effective information systems (IS) making use of information technologies (IT)”.

SFIA is a two dimensional table with *Skill Sets* on one dimension, and *Levels of Responsibility*, or competence, on the other. A tabular view of SFIA is provided in figure 1 below.

Skills Framework for the Information Age version 3.0

	Strategy & planning	Development	Business change	Service provision	Procurement & management support	Ancillary skills
	Information strategy Advice and guidance Business/IS strategy and Planning	Technical strategy and Planning Systems development	Human factors Installation and integration	Business change management Relationship management Infrastructure	Operation User support Supply management Quality Resource management	Education and training Sales and marketing
7 Set strategy, inspire, mobilise						
6 Initiate, influence						
5 Ensure, advise	Information management IRMG Consultancy CWSL Technical specialism TECH	Innovation INOV Business process improvement BPRI Strategic application of information systems STPL Business risk management BURM				
4 Enable	Information security SCTY Information assurance INAS	Systems architecture ARCH Emerging technology monitoring EMRG Continuity management COPA Software development process improvement SPIM Network planning NTPA Methods and tools MTL	Human factors integration HFIN	Project management PRMG Business process leading BPLS Change implementation planning and management CIPR Organisation design and implementation ODI Benefits management BENR Stakeholder relationship management BLMT	Procurement PROC Quality management QUMG Safety assessment SFAS	Information Systems coordination ISCO Client services management CSMG Professional development PDSI Procurement PDSI Education and training management ETMG
3 Apply	Research RSCH	Database design DBDS Programming/software development PRDG Safety engineering SFEN Web site specialism WBSW Systems testing TEST Content creation CCGN Non-functional needs analysis UNAN Usability evaluation USEV	Business analysis ANNA Porting/software integration PORT	Configuration management CFMG Change management CHMG Capacity management CPMG Systems software SYSW Security administration SCAD Radio frequency engineering RFEN Availability management AVMT Financial management for IT FMIT Data protection DPRO	Asset management ASMG Client services management CSMG Professional development PDSI Procurement PDSI Education and training management ETMG	Account management ACMG Selling SALE
2 Assist		Data analysis DZAN Systems design DESN Database design DBDS Programming/software development PRDG Safety engineering SFEN Web site specialism WBSW Systems testing TEST Content creation CCGN Non-functional needs analysis UNAN Usability evaluation USEV	Systems integration SINT Porting/software integration PORT	Application support ASUP Network control & operation NTOP Database administration DBAD Service level management SLMD Network support NTAS	Supplier relationship management SURE Quality assurance QUAS Compliance audit COMP Project office PROJ	Education and training delivery ETDL Marketing MMTG
1 Follow						Sales support SSUP

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Fig.1 – Tabular view of the *Skills Framework for the Information Age*

The ACS considers that graduates from some, but not all, Australian ICT degree programs can, after 18 months relevant industry experience, perform at SFIA Level of Responsibility 4 (“Enable”). With further experience, and studies within the ACS CPe Program, such graduates are expected to have achieved SFIA Level of Responsibility 5 (“Ensure, advise”) and be eligible for Professional level membership.

SFIA Levels of Responsibility 4 and 5 are defined Table 1a and 1b below.

SFIA Level of Responsibility 4 ("enable")

Autonomy

Works under general direction within a clear framework of accountability. Substantial personal responsibility and autonomy. Plans own work, to meet given objectives and processes.

Influence

Influences team, and specialist peers internally. Influences customers at account level and suppliers. Some responsibility for work of others and allocation of resources. Participates in external activities related to specialisation. Decisions influence success of projects and team objectives.

Complexity

Broad range of complex technical or professional work activities, in a variety of contexts.

Business

Selects appropriately from applicable standards, methods, tools and applications and use. Demonstrates analytical and systematic approach to problem solving. Communicates fluently orally and in writing and can present complex technical information to both technical and non-technical audiences. Is able to plan, schedule and monitor work activities in order to meet time and quality targets and in accordance with health and safety procedures. Is able to absorb rapidly new technical information and apply it effectively. Good appreciation of wider field of information systems, its use in relevant employment areas and how it relates to the business activities of the employer or client. Maintains awareness of developing technologies and their application and takes some responsibility for personal development.

Table 1a – Definition of SFIA Levels of Responsibility 4

SFIA Level of Responsibility 5 ("ensure, advise")

Autonomy

Works under broad direction. Full accountability for own technical work or project/supervisory responsibilities. Receives assignments in the form of objectives. Establishes own milestones, team objectives and delegates assignments. Work is often self-initiated.

Influence

Influences organisation, customers, suppliers and peers within industry on contribution of specialisation. Significant responsibility for the work of others and for the allocation of resources. Decisions impact on success of assigned projects i.e. results, deadlines and budget. Develops business relationships with customers.

Complexity

Challenging range and variety of complex technical or professional work activities. Work requires application of fundamental principles in a wide and often unpredictable range of contexts. Understands relationship between specialism and wider customer/ organisational requirements.

Business

Advises on the available standards, methods, tools and applications in own area of specialisation and can make correct choices from alternatives. Can analyse, diagnose, design, plan, execute and evaluate work to time, cost and quality targets. Communicates effectively, formally and informally, with colleagues, subordinates and customers. Demonstrates leadership. Clear understanding of the relationship between own area of responsibility/specialisation to the employing organisation and takes customer requirements into account when making proposals. Takes initiative to keep skills up to date. Maintains awareness of developments in the industry. Can analyse user requirements and advise users on scope and options for operational improvement. Demonstrates creativity and innovation in applying solutions for the benefit of the user.

Table 1b – Definition of SFIA Levels of Responsibility 5

While comprehensive in the range of skills it encompasses, SFIA has no skills category relevant to professionalism, or professional behaviour. To cover this area, the ACS has expanded on SFIA with an additional skill set that, for university and CPeP graduates, are defined in table 2 below.

Professionalism Skills of University Graduates

Develops a basic risk management plan for simple projects including the impact on social, business and ecological environments.

Identifies legal requirements and constraints imposed on the work/project and contributes to compliance.

Commits to a code of ethics, standards and practice and can apply these in basic projects.

Professionalism Skills of CPeP Graduates

Develops a risk management plan for projects including the impact on social, business and ecological environments and ensures compliance.

Ensures compliance with all legal/regulatory requirements.

Ensures compliance with appropriate professional codes of ethics, standards and practice.

Table 2 – Definitions of ACS Professionalism Skills

An ICT Professional, therefore, is someone who has full accountability for their own technical work and responsibilities; whose decisions impact on the success of projects and business relationships; who must apply fundamental principles in a wide and often unpredictable range of contexts; and who can analyse, diagnose, design, plan, execute and evaluate work to time, cost and quality targets. In addition, they can communicate effectively, demonstrates leadership, and keep their skills up to date. They are creative, innovative, and aware of their impact on social, business and ecological environments.

Are there grades of ICT professionalism?

An ICT professional, in the view of the ACS, is someone eligible for its Professional level of membership. This level is not easily achieved and thus, in the view of the ACS, ICT professionals are a subset, perhaps a *small* subset, of the universe of ICT practitioners.

But the ease or difficulty of gaining ACS membership at the Professional level is not the consideration. It is whether membership at this level means something about the person gaining the membership; and something about other practitioners who are not members at the Professional level.

The Professional level of membership aims to be a differentiator; between ICT practitioners the ACS verifies as reliable and competent at SFIA level of responsibility 5; and others who might be less than reliable at that level. Those with the ACS Professional level membership can use their membership as evidence for prospective employers and clients of their professionalism and professional abilities. Those who are not ACS Professional level members will require additional evidence, and additional corroboration, to justify similar claims.

Note that the ACS is not aiming to be elitist or exclusive with its Professional level of membership. There are other levels of ACS membership with less onerous prerequisites. The Associate level of membership, for instance, is mapped to the SFIA level of responsibility 3 (“Apply”). But it is the objective of the ACS for its members at these other levels to raise their knowledge, skills and competence to the level of the Professional. The ACS aims to be both an inclusive organisation, and an organisation that encourages continuing professional improvement and development amongst its members.

Indicative of the ACS view of professionalism is that the majority of assessments in its Computer Professional Education Program do not have a grade for exceptional achievement. Instead, most items of assessment are graded 0, 1, or 2, where 2 is measured *at or exceeds expectations*. The ACS does not view professionalism in multiple grades. Rather, a person is either an ICT Professional, or they are not. They either meet the criteria for membership at the Professional level, or they do not. They can either take-on professional responsibilities at SFIA level 5, or they cannot.

What is professional development for ICT Professionals?

The ACS specifies its Professional level of membership in terms of knowledge, skills and competence. Professions Australia defines a *profession* in similar terms; the possession of “special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level” (Professions Australia, 2007).

Considering again the definitions provided earlier, it seems reasonable now to define professional development as; *the acquisition of, and the continuing possession of, facts, information, and skills necessary to perform a task.*

Important is the distinction between the "acquisition of ... facts, information and skills", and the "continuing possession of ... facts, information and skills"; the first being *initial professional development*, and the second *continuing professional development*.

The UK Initial Professional Development Forum defines Initial Professional Development (IPD) as "a period of development during which an individual acquires a level of competence necessary in order to operate as an autonomous professional". It goes on to clarify the concept with the statement "Professional bodies may recognise the successful completion of IPD by the award of chartered or similar status".

Engineers Australia states "Continuing Professional Development (CPD) is essential to maintaining up-to-date technical skills and knowledge of processes, technology and legislation. CPD enables you to attain and maintain your Chartered Status".

The ACS now follows a similar strategy. To achieve its Professional level of membership, an applicant requires a minimum 4 years relevant experience plus having completed a course of study encompassing the ACS *Core Body of Knowledge*. This will entitle an applicant to use the post-nominal MACS, or *Member of the ACS*.

But to use the post-nominal MACS PCP, indicating an ACS recognised *Practicing Computer Professional*, a MACS must complete the ACS Computer Professional Education Program. Initial professional development, therefore is a course of study, typically a university degree in some aspect of information and communications technology, plus experience, plus postgraduate studies in professionalism (ie. the ACS CPe Program).

Then, to maintain their PCP status, a MACS must complete annually at least 35 hours of professional development; which is to say, *continuing* professional development. Unlike IPD, the ACS view of CPD is that it should be self-directed. Beyond its quantity, and that it must be relevant to a practicing computer professional at SFIA level 5 or above, the ACS does not prescribe what the professional development must comprise.

Where on the scale of *academically oriented education vs. competency based training* does ICT professional development lie?

To achieve the ACS Professional level of membership, an applicant requires a minimum 4 years relevant experience plus having completed a course of study encompassing the ACS Core Body of Knowledge. The ACS, therefore, deems professionalism to be acquired only through a combination of education and experience; not one *or* the other, but both education *and* experience.

It seems obvious that, if professionalism is defined in terms of knowledge, skills and competence, then a professional requires education beyond that offered in a typical TAFE diploma or university degree. They require more than just knowledge, and more than just technical skills. To be competent, which is to say, at a standard necessary to perform a specific job, they need to have attempted the job already, or at least, something similar to the job.

The professional requires *contextual awareness*; which is to say, how ICT, and the numerous ICT roles in industry, fit within and influence the world of business, society, and the environment. They also need a reasoned and objective assessment of themselves; their own knowledge, skills and competence. A person seeking a job on the basis of an innocent but incorrect assessment of their own ability is as unprofessional as a person who deliberately falsifies their résumé. And these two requirements lead to the skill set the ACS has added to those of SFIA, namely, the skills concerned with risk management.

So where does ICT professional development lie on the *academically oriented education vs. competency based training* scale? It lies across the entire scale, with perhaps initial professional development centred more towards the academically oriented end, and continuing professional development more towards the competency based end.

Conclusion

In answering these questions we hope we have conveyed an educator's view of ICT professionalism and how we translate that understanding into a manageable and measurable program of education. We hope we have successfully communicated our essential messages; namely, that professionals require education beyond that offered in a typical university degree, and that the ACS Computer Professional Education Program is built on the established SFIA skills framework, plus an additional skill set the ACS has labelled *Professionalism*.

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