SFIA 9 – a framework for Software Engineering skills

The global skills and competency framework for the digital world

Development and implementation

Core software engineering

Skill	Code	1	2	3	4	5	6	7
Requirements definition and management	REQM		2	3	4	5	6	
Software design	SWDN		2	3	4	5	6	
Programming/software development	PROG		2	3	4	5	6	
Configuration management	CFMG		2	3	4	5	6	
Functional testing	TEST	1	2	3	4	5	6	
Non-functional testing	NFTS	1	2	3	4	5	6	
Systems integration and build	SINT		2	3	4	5	6	
Data modelling and design	DTAN		2	3	4	5		
Systems development management	DLMG				4	5	6	7
Measurement	MEAS		2	3	4	5	6	

Related disciplines

Skill	Code	1	2	3	4	5	6	7
Product management	PROD		2	3	4	5	6	
Project management	PRMG				4	5	6	7
Solution architecture	ARCH				4	5	6	
Delivery management	DEMG			3	4	5	6	
Systems design	DESN		2	3	4	5	6	
Real-time/embedded systems development	RESD		2	3	4	5	6	
Hardware design	HWDE		2	3	4	5	6	

User centred design

Skill	Code	1	2	3	4	5	6	7
User research	URCH		2	3	4	5	6	
User experience design	HCEV		2	3	4	5	6	

Safety critical systems

Skill	Code	1	2	3	4	5	6	7
Safety engineering	SFEN		2	3	4	5	6	
Safety assessment	SFAS				4	5	6	

Enterprise change and transformation

Change implementation

Skill	Code	1	2	3	4	5	6	7
Portfolio management	POMG					5	6	7
Programme management	PGMG						6	7

Change analysis

Skill	Code	1	2	3	4	5	6	7
Business situation analysis	BUSA		2	3	4	5	6	
Feasibility assessment	FEAS		2	3	4	5	6	
User acceptance testing	BPTS		2	3	4	5	6	

This Software Engineering competency model is based on the SWEBOK v4 and SFIA v9 (published October 2024).

Presented here is a route map into SFIA software engineering skills aligned to the SWEBOK knowledge areas. The categories and sub-categories on this representation are tailored to software engineering and they are for navigational and visual display purposes only. The skill names are clickable and take you to specific web pages for the skill definition.

If you can't find a skill you are looking for, try the full SFIA framework.

Delivery and operation

Technology management

Skill	Code	1	2	3	4	5	6	7
Technology service management	ITMG					5	6	7
Release management	RELM		2	3	4	5	6	
Deployment	DEPL		2	3	4	5	6	
Infrastructure operations	ITOP	1	2	3	4	5		
System software administration	SYSP		2	3	4	5		
Systems and software lifecycle engineering	SLEN			3	4	5	6	7

Service management

Skill	Code	1	2	3	4	5	6	7
Change control	CHMG		2	3	4	5	6	
Capacity management	CPMG		2	3	4	5	6	
Service level management	SLMO		2	3	4	5	6	7
Application support	ASUP		2	3	4	5		
Service acceptance	SEAC			3	4	5	6	
Incident management	USUP	1	2	3	4	5	6	
Customer service support	CSMG	1	2	3	4	5	6	
Problem management	PBMG		2	3	4	5		
Availability management	AVMT			3	4	5	6	

Security services

Skill	Code	1	2	3	4	5	6	7
Vulnerability assessment	VUAS		2	3	4	5	6	
Penetration testing	PENT		2	3	4	5	6	

Relationships and engagement

Stakeholder management

Skill	Code	1	2	3	4	5	6	7
Stakeholder relationship management	RLMT				4	5	6	7

Supplier management

Skill	Code	1	2	3	4	5	6	7
Supplier management	SUPP		2	3	4	5	6	7
Contract management	ITCM		2	3	4	5	6	7

SFIA provides a structured and consistent approach to defining software engineering skills and competencies.

Each skill is clearly described, supplemented by guidance notes, and detailed level-by-level practice descriptions that align with the framework's 7 levels of responsibility. This uniform structure ensures ease of navigation and understanding, seamlessly integrating professional skills with behavioural factors to outline comprehensive role expectations. The consistent detail across all levels ensures robustness, allowing for precise skills and competency assessment.

Using SFIA to describe the nuances of software engineering roles at every responsibility level makes it invaluable for developing and benchmarking software engineering capabilities within an organisation.

Quality and economics

Software economics

Skill	Code	1	2	3	4	5	6	7
Budgeting and forecasting	BUDF		2	3	4	5	6	
Cost management	COMG		2	3	4	5	6	
Investment appraisal	INVA				4	5	6	
Benefits management	BENM			3	4	5	6	

Security and privacy policies

Skill	Code	1	2	3	4	5	6	7
Information security	SCTY		2	3	4	5	6	7
Information assurance	INAS		2	3	4	5	6	7

Software quality

Skill	Code	1	2	3	4	5	6	7
Quality management	QUMG		2	3	4	5	6	
Quality assurance	QUAS		2	3	4	5	6	

Software engineering practices

Skill	Code	1	2	3	4	5	6	7
Knowledge management	KNOW		2	3	4	5	6	
Scientific modelling	SCMO				4	5	6	7
Business modelling	BSMO		2	3	4	5	6	
Methods and tools	METL		2	3	4	5	6	
Artificial intelligence (AI) and data ethics	AIDE				4	5	6	7
Organisational capability development	OCDV					5	6	7

People and skills

People & skills management

Skill	Code	1	2	3	4	5	6	7
Resourcing	RESC		2	3	4	5	6	
Performance management	PEMT				4	5	6	
Professional development	PDSV				4	5	6	
Workforce planning	WFPL				4	5	6	

Generic attributes

Attributes

Skill	Code	1	2	3	4	5	6	7
Autonomy	AUTO	1	2	3	4	5	6	7
Complexity	COMP	1	2	3	4	5	6	7
Influence	INFL	1	2	3	4	5	6	7
Knowledge	KNGE	1	2	3	4	5	6	7

Business skills/Behavioural factors

Skill	Code	1	2	3	4	5	6	7
Collaboration	COLL	1	2	3	4	5	6	7
Communication	COMM	1	2	3	4	5	6	7
Improvement mindset	IMPM	1	2	3	4	5	6	7
Creativity	CRTY	1	2	3	4	5	6	7
Decision-making	DECM	1	2	3	4	5	6	7
Digital mindset	DIGI	1	2	3	4	5	6	7
Leadership	LEAD	1	2	3	4	5	6	7
Learning and development	LADV	1	2	3	4	5	6	7
Planning	PLAN	1	2	3	4	5	6	7
Problem-solving	PROB	1	2	3	4	5	6	7
Adaptability	ADAP	1	2	3	4	5	6	7
Security, privacy and ethics	SCPE	1	2	3	4	5	6	7

SFIA Levels of responsibility

SFIA's attributes of Autonomy, Influence and Complexity are the key to determining level of impact, responsibility and accountability. Click the SFIA level to find the details.

SFIA Level 1 Follow	SFIA Level 2 Assist	SFIA Level 3 Apply	SFIA Level 4 Enable	SFIA Level 5 Ensure, advise	SFIA Level 6 Initiate, influence	SFIA Level 7 Set strategy, inspire, mobilise
Performs routine tasks under close supervision, follows instructions, and requires guidance to complete their work. Learns and applies basic skills and knowledge.	Provides assistance to others, works under routine supervision, and uses their discretion to address routine problems. Actively learns through training and on-the-job experiences.	Performs varied tasks, sometimes complex and non-routine, using standard methods and procedures. Works under general direction, exercises discretion, and manages own work within deadlines. Proactively enhances skills and impact in the workplace.	Performs diverse complex activities, supports and guides others, delegates tasks when appropriate, works autonomously under general direction, and contributes expertise to deliver team objectives.	Provides authoritative guidance in their field and works under broad direction. Accountable for delivering significant work outcomes, from analysis through execution to evaluation.	Influences the organisation significantly, makes high-level decisions, shapes policies, demonstrates thought leadership, fosters collaboration, and accepts accountability for strategic initiatives and outcomes.	Operates at the highest organisational level, determines overall organisational vision and strategy, and assumes accountability for overall success.

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