

SFIA - overview for new users

SFIA 8

The framework reference

Data science DATS

Applying mathematics, statistics, data mining and predictive modeling techniques to data insights, predict behaviors and generate value from data.

Guidance notes:

- Data science is typically used for analyzing large volumes, high velocity and high variety data (structured, unstructured, text, image and video).
- Requires the ability:
 - to design and build data science solutions
 - to design and build data science solutions
 - to design and build data science solutions

Level 2

Apply statistical analysis to data and create models to solve business problems.

Level 3

Apply statistical analysis to data and create models to solve business problems.

SFIA 8 Summary Chart

The global skills and competencies framework for the digital world

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SFIA 8 Levels of responsibility

The framework of SFIA 8 provides a range of career levels, from entry level to the most advanced professional responsibility (SFIA 8 Level 8). The framework is based on the digital skills, knowledge, and experience that are required to perform the most advanced professional responsibility (SFIA 8 Level 8) in the digital world.

Level 8	Level 7	Level 6	Level 5	Level 4	Level 3	Level 2
Autonomous	Autonomous	Autonomous	Autonomous	Autonomous	Autonomous	Autonomous
Influence	Influence	Influence	Influence	Influence	Influence	Influence
Complexity	Complexity	Complexity	Complexity	Complexity	Complexity	Complexity
Business Skills	Business Skills	Business Skills	Business Skills	Business Skills	Business Skills	Business Skills
Knowledge	Knowledge	Knowledge	Knowledge	Knowledge	Knowledge	Knowledge

www.sfia-online.org

About SFIA

The global skills and competencies framework for the digital world

About SFIA

SFIA defines the skills and competencies required by professionals who...

**design, develop,
implement, manage and
protect**

the **data** and **technology**

that **power the digital world.**

SFIA 8



SFIA Evolution

SFIA has become the
globally accepted
common language

for the
skills and
competencies

for the digital world.

Within the scope of SFIA are many of the
world's most in-demand occupations, including
professionals working in fields such as...



Used across industries and organisational types

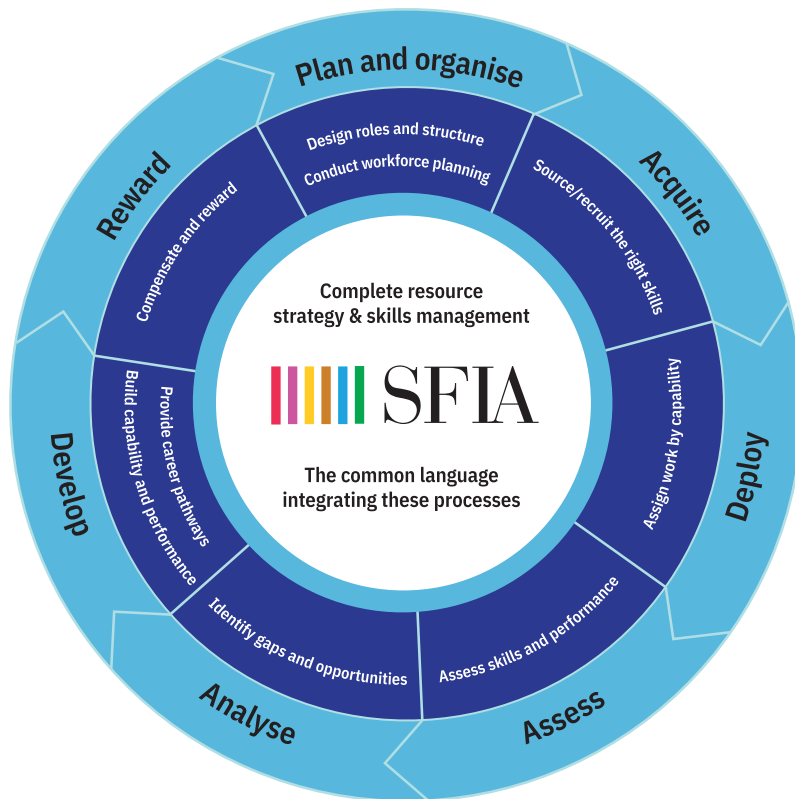


- ❑ individuals
- ❑ small and large teams
- ❑ departments or business functions
- ❑ small and medium-sized enterprises
- ❑ entire organisations with thousands of employees
- ❑ corporate, public sector and educational environments

SFIA and skills management

SFIA provides a common language throughout the skills management cycle.

By using SFIA, organisations can achieve a consistent and integrated skills and people management system.



Plan and organise

- ❑ Design roles and structure
- ❑ Conduct workforce planning

Acquire

- ❑ Source/recruit the right skills

Deploy

- ❑ Assign work by capability

Assess

- ❑ Assess skills and performance

Analyse

- ❑ Identify gaps and opportunities

Develop

- ❑ Provide career pathways
- ❑ Build capability and performance

Reward

- ❑ Compensate and reward

The context for SFIA

SFIA is industry and business led and at its core is **experience**.



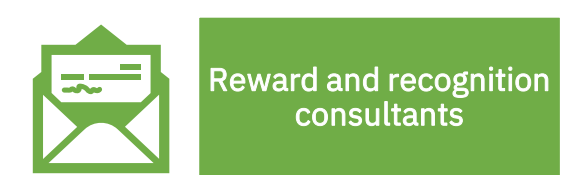
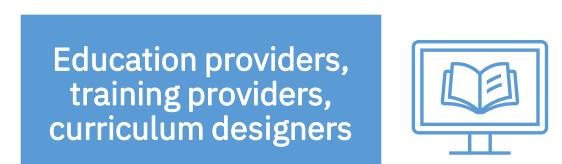
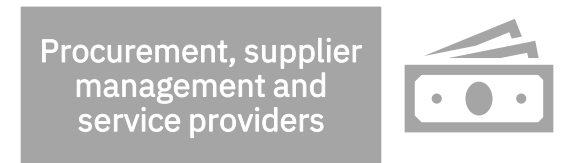
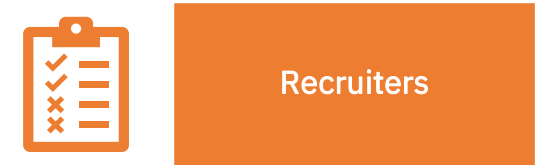
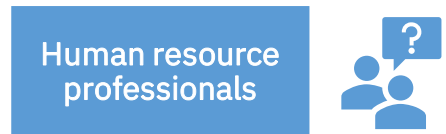
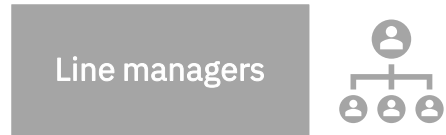
The context for SFIA is the real-world environment in which industry and business operate.

Skills proficiency and professional competency are attained at a particular level due to the practice of that skill, at that level, in a real-world situation.

Who uses SFIA?

The design and structure of SFIA makes it...

- ❑ a flexible resource
- ❑ with a proven track record
- ❑ of being adopted and adapted
- ❑ to support a wide variety of skills- and people-management related activities.



How SFIA works - 7 levels of responsibility

Level 7	Set strategy, inspire, mobilise
Level 6	Initiate, influence
Level 5	Ensure, advise
Level 4	Enable
Level 3	Apply
Level 2	Assist
Level 1	Follow

- ❑ The seven levels provide the backbone of SFIA.
- ❑ The skills and competencies are described at the levels at which they are practiced within the working world.
- ❑ Each of the seven levels is also labelled with a guiding phrase to summarise the level of responsibility.
- ❑ The generic attributes which contain behavioural factors and knowledge statements are described at each of the seven levels.
- ❑ These combine to provide a common language to describe levels of responsibility across roles in all the professional disciplines represented in SFIA.

Generic SFIA attributes

Increasing responsibility, accountability and impact

SFIA levels	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Guiding phrase	Follow	Assist	Apply	Enable	Ensure, advise	Initiate, influence	Set strategy, inspire, mobilise

Generic attributes

AUTONOMY	Demonstrating increasing levels of autonomy – the level of ownership and accountability for results in the workplace
INFLUENCE	Demonstrating increasing levels of influence – the level of positive impact with colleagues, clients, suppliers, partners, managers, leaders and the industry as a whole
COMPLEXITY	Demonstrating the ability to perform work of increasing complexity – the scale and impact of the issues, opportunities, tasks and processes addressed in the workplace
BUSINESS SKILLS AND BEHAVIOURS	Demonstrating increasing business skills and positive behaviours – operating effectively with the required level of impact in the workplace
KNOWLEDGE	Demonstrating increased responsibility for developing and applying knowledge to achieve individual and organisational objectives in the workplace

Generic attributes

- The levels of responsibility are characterised by generic attributes which describe behavioural factors such as...

collaboration, communication, creativity, decision making, execution performance, influence, leadership, learning and professional development, planning, problem solving, security, privacy and ethics.

- The generic attributes are:
 - Autonomy
 - Influence
 - Complexity
 - Business skills
 - Knowledge

Generic attributes underpin the levels of responsibility.

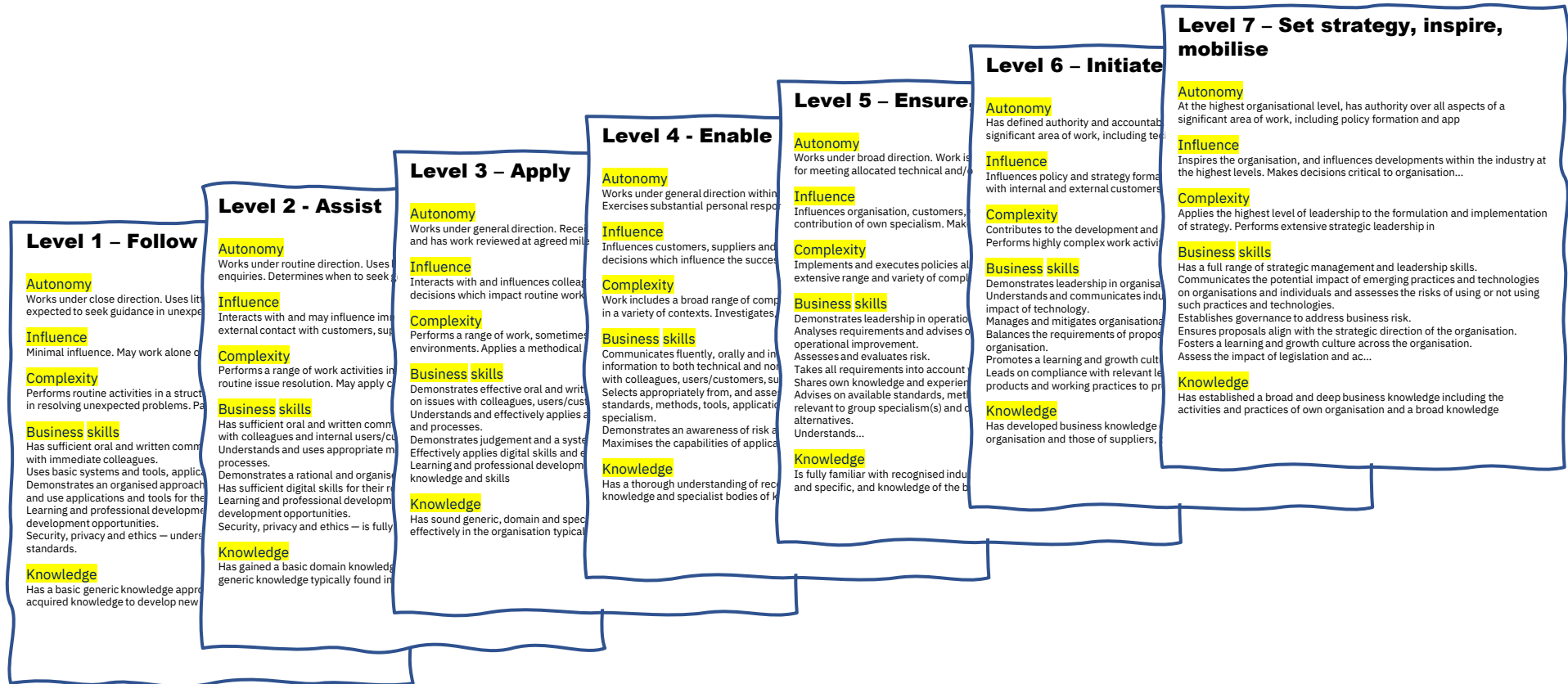
Follow	Autonomy	Works under close direction. Uses little discretion in attending to enquiries. Is expected to seek guidance in unexpected situations.
	Influence	Minimal influence. May work alone or interact with immediate colleagues.
	Complexity	Performs routine activities in a structured environment. Requires assistance in resolving unexpected problems. Participates in the generation of new ideas.
	Business skills	Has sufficient oral and written communication skills for effective engagement with immediate colleagues. Uses basic systems and tools, applications and processes. Demonstrates an organised approach to work. Has basic digital skills to learn and use applications and tools for their role. Learning and professional development — contributes to identifying own development opportunities.
	Level 1	Knowledge

The breakdown of each level of responsibility can be found in the levels of responsibility section.

SFIA Level 1 is shown here as an example.

Generic attributes

Increasing responsibility, accountability and impact



A SFIA professional skills definition

SFIA 8: The framework reference | Skills

Data science DATS

Applying mathematics, statistics, data mining and predictive modelling techniques to gain insights, predict behaviours and generate value from data.

Guidance notes

Data science is typically used for analysing high volume, high velocity and high variety data (numbers, symbols, text, sound and image).

Activities may include – but are not limited to:

- integrating methods from mathematics, statistics and probability modelling using specialised programming languages, tools and techniques
- sourcing and preparing data for analysis
- identifying, validating and exploiting internal and external data sets generated from a diverse range of processes
- developing forward-looking, predictive, real-time, model-based insights to create value and drive effective decision-making
- finding, selecting, acquiring and ingesting data sources,
- integrating and cleaning data to make it fit for purpose
- developing hypotheses and exploring data using models and analytics sandboxes
- refining requirements, validating, training and evolving models over time to discover deeper insights, make predictions, or generate recommendations.
- using advanced analytic techniques including – but not limited to – data/text mining, machine learning, pattern matching, forecasting, visualisation, semantic analysis, sentiment analysis, network and cluster analysis, multivariate statistics, graph analysis, simulation, complex event processing, neural networks.

Level 2

Under guidance, applies given data science techniques to data. Analyses and reports findings and remedies simple issues, using algorithms implemented in standard software frameworks and tools.

Level 3

Applies existing data science techniques to new problems and datasets using specialised programming techniques. Selects from existing data sources and prepares data to be used by data science models. Evaluates the outcomes and performance of data science models. Identifies and implements opportunities to train and improve models and the data they use. Publishes and reports on model outputs to meet customer needs and conforming to agreed standards.

SFIA 8: The framework reference | Skills

Level 4

Investigates the described problem and dataset to assess the usefulness of data science and analytics solutions. Applies a range of data science techniques and uses specialised programming languages. Understands and applies rules and guidelines specific to the industry, and anticipates risks and other implications of modelling. Selects, acquires and integrates data for analysis. Develops data hypotheses and methods and evaluates analytics models. Advises on the effectiveness of specific techniques based on project findings and comprehensive research. Contributes to the development, evaluation, monitoring and deployment of data science solutions.

Level 5

Plans and drives all stages of the development of data science and analytics solutions. Provides expert advice to evaluate the problems to be solved and the need for data science solutions. Identifies what data sources to use or acquire. Specifies and applies appropriate data science techniques and specialised programming languages. Reviews the benefits and value of data science techniques and tools and recommends improvements. Contributes to developing policy, standards and guidelines for developing, evaluating, monitoring and deploying data science solutions.

Level 6

Leads the introduction and use of data science and analytics to drive innovation and business value. Develops organisational policies, standards, and guidelines for data science and analytics. Sets direction and leads in the introduction and use of data science and analytics techniques, methodologies and tools. Leads the development of organisational capabilities for data science and analytics. Plans and leads strategic, large and complex data science initiatives to generate insights, create value and drive decision-making.

Level 7

Directs the creation and review of a cross-functional, enterprise-wide approach and culture for generating value from data science and analytics. Drives the identification, evaluation and adoption of data science and analytics capabilities to transform organisational performance. Leads the provision of the organisation's data science and analytics capabilities. Ensures that the strategic application of data science and analytics is embedded in the governance and leadership of the organisation. Aligns business strategies, enterprise transformation and data science and analytics strategies.

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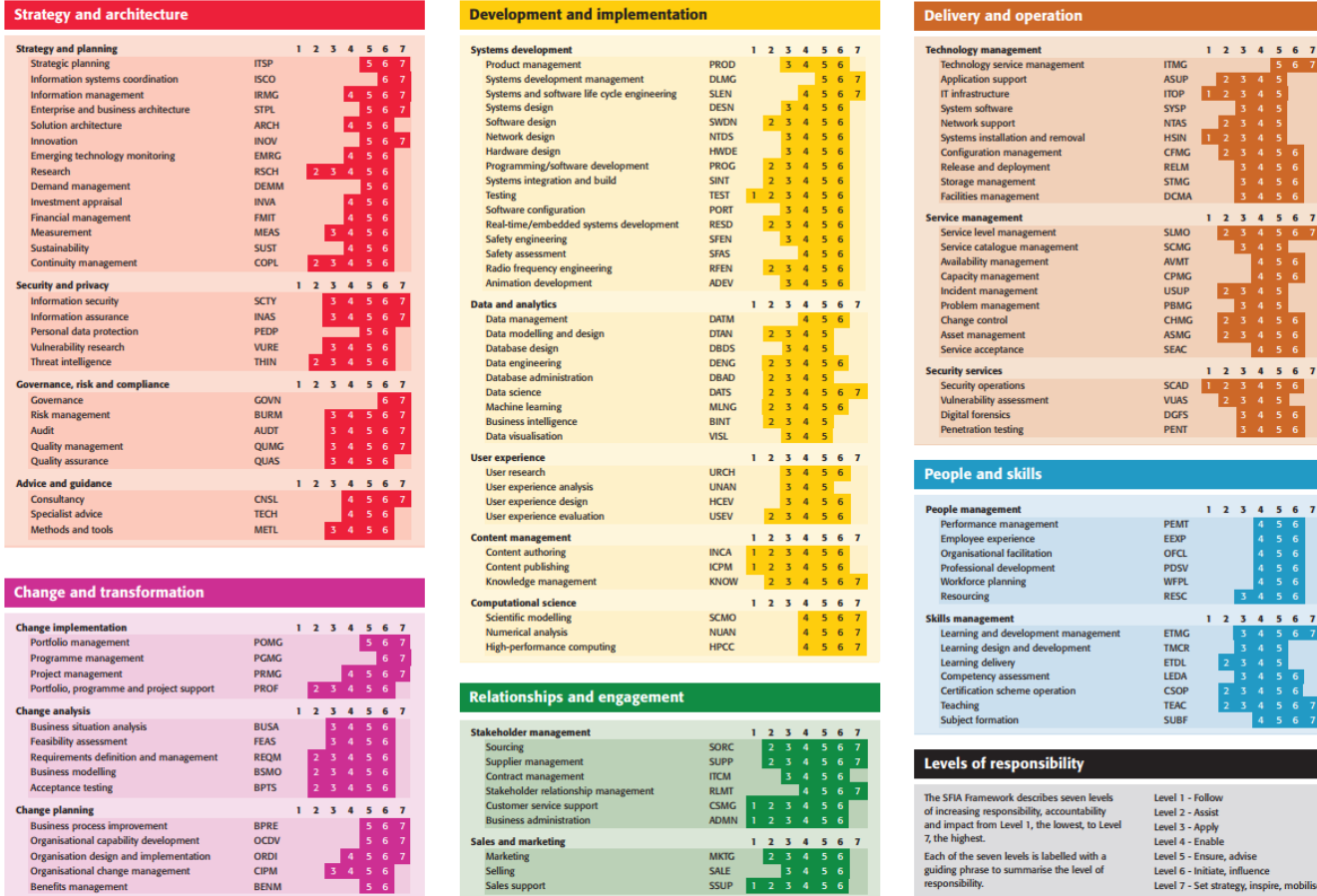
[SFIA full framework view
– \(sfia-online.org\)](https://sfia-online.org)

Each skill description comprises an **overall definition of the skill**, some **guidance notes** and a **description of the skill at each of up to seven levels** at which the skill might be exercised. These descriptions provide a detailed definition of what it means to practice the skill at each level of responsibility.

SFIA professional skills

SFIA 8 Summary Chart

The global skills and competency framework for the digital world



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SFIA professional skills

SFIA 8 Summary Chart

The global skills and competency framework for the digital world

Strategy and architecture							
Strategy and planning							
Strategic planning	ITSP	1	2	3	4	5	6 7
Information systems coordination	ISCO					5	6 7
Information management	IRMG			4	5	6	7
Enterprise and business architecture	STPL			5	6	7	
Solution architecture	ARCH			4	5	6	7
Innovation	INOV			5	6	7	
Emerging technology monitoring	EMRG			4	5	6	7
Research	RSCH	2	3	4	5	6	7
Demand management	DEMM			5	6	7	
Investment appraisal	INVA			4	5	6	7
Financial management	FMIT			4	5	6	7
Measurement	MEAS			3	4	5	6
Sustainability	SUST			4	5	6	7
Continuity management	COPL	2	3	4	5	6	7
Security and privacy							
Information security	SCTY			3	4	5	6 7
Information assurance	INAS			3	4	5	6 7
Personal data protection	PEDP			5	6	7	
Vulnerability research	VURE			3	4	5	6
Threat intelligence	THIN	2	3	4	5	6	7
Governance, risk and compliance							
Governance	GOVN					6	7
Risk management	BURM			3	4	5	6 7
Audit	ALUD			3	4	5	6 7
Quality management	QUIM			3	4	5	6 7
Development and implementation							
Systems development							
Product management	PROD			3	4	5	6
Systems development management	DLMG			5	6	7	
Systems and software life cycle engineering	SEEN			4	5	6	7
Systems design	DESN			3	4	5	6
Software design	SWDN	2	3	4	5	6	7
Network design	NTDS			3	4	5	6
Hardware design	HWDE			3	4	5	6
Programming/software development	PROG	2	3	4	5	6	7
Systems integration and build	SINT	2	3	4	5	6	7
Testing	TEST	1	2	3	4	5	6
Software configuration	PORT			3	4	5	6
Real-time/embedded systems development	RESO	2	3	4	5	6	7
Safety engineering	SFEN			3	4	5	6
Safety assessment	SFAS			4	5	6	7
Radio frequency engineering	RFEN	2	3	4	5	6	7
Animation development	ADEV			3	4	5	6
Data and analytics							
Data management	DATM	1	2	3	4	5	6
Data modelling and design	DTAN			4	5	6	7
Database design	DBDS			3	4	5	6
Data engineering	DENG	2	3	4	5	6	7
Database administration	DBAD			2	3	4	5
Data science	DATS	2	3	4	5	6	7
Machine learning	MLNG			2	3	4	5
Business intelligence	BINT	2	3	4	5	6	7
Data visualisation	VISL			3	4	5	6
Delivery and operation							
Technology management							
Technology service management	ITMG					5	6 7
Application support	ASUP			2	3	4	5
IT infrastructure	ITOP	1	2	3	4	5	6
System software	SYSP			3	4	5	6
Network support	NTAS			2	3	4	5
Systems installation and removal	HSIN	1	2	3	4	5	6
Configuration management	CFMG			2	3	4	5
Release and deployment	RELM			3	4	5	6
Storage management	STMG			3	4	5	6
Facilities management	DCMA			3	4	5	6
Service management							
Service level management	SLMO	1	2	3	4	5	6 7
Service catalogue management	SCMG			3	4	5	6
Availability management	AVMT			4	5	6	7
Capacity management	CPMG			4	5	6	7
Incident management	USUP			2	3	4	5
Problem management	PBMG			3	4	5	6
Change control	CHMG			2	3	4	5
Asset management	ASMG			2	3	4	5
Service acceptance	SEAC			4	5	6	7
Security services							
Security operations	SCAD	1	2	3	4	5	6
Vulnerability assessment	VUAS			2	3	4	5
Digital forensics	DGFS			3	4	5	6
Penetration testing	PENT			3	4	5	6

Data engineering	DENG	2	3	4	5	6
Database administration	DBAD	2	3	4	5	
Data science	DATS	2	3	4	5	6 7
Machine learning	MLNG	2	3	4	5	6
Business intelligence	BINT	2	3	4	5	
Data visualisation	VISL	3	4	5		

Change planning							
Business process improvement	BPPE					5	6 7
Organisational capability development	OCDV					5	6 7
Organisation design and implementation	ORDI				4	5	6 7
Organisational change management	CIPM			3	4	5	6
Benefits management	BENM					5	6

Business administration							
Business administration	ADMN	1	2	3	4	5	6
Sales and marketing							
Marketing	MKTG	2	3	4	5	6	7
Selling	SALE			3	4	5	6
Sales support	SSUP	1	2	3	4	5	6

of increasing responsibility, accountability and impact from Level 1, the lowest, to Level 7, the highest.

Each of the seven levels is labelled with a guiding phrase to summarise the level of responsibility.

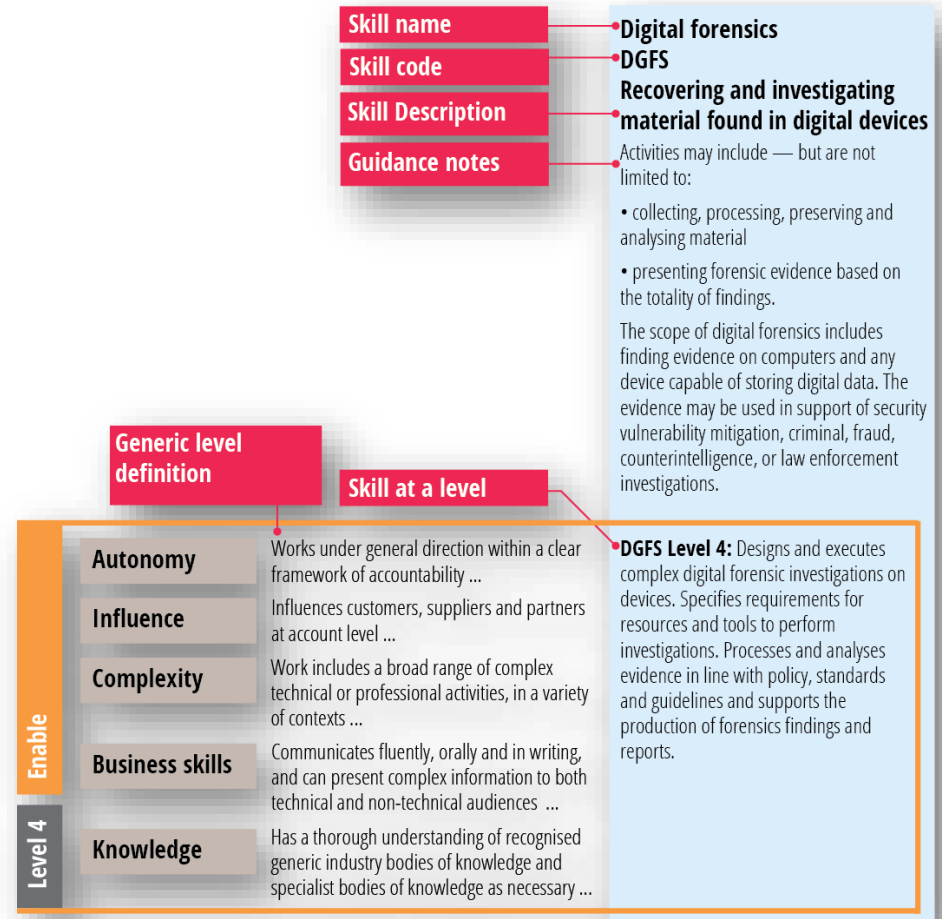
- Level 2 - Assail
- Level 3 - Apply
- Level 4 - Enable
- Level 5 - Ensure, advise
- Level 6 - Initiate, influence
- Level 7 - Set strategy, inspire, mobilise

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SFIA professional skills

Professional skills and generic attributes work together.

- ❑ The consistency of the levels of responsibility carries forward into the professional skills.
- ❑ A description of a skill at a level is written so that it is consistent with the level of responsibility at that level.
- ❑ This approach ensures the consistency of the levels throughout the whole framework, making it solid and robust.
- ❑ It also integrates behaviours/behavioural factors and professional skills at a level combining to describe overall responsibility, accountability and impact.

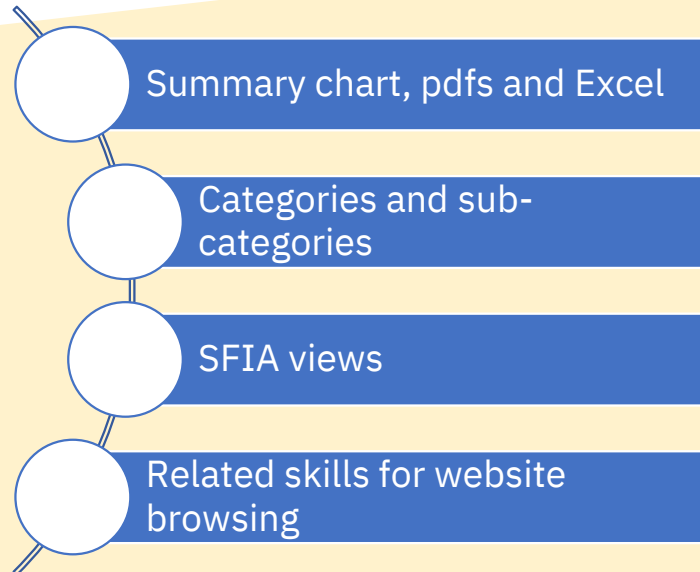


SFIA 8 - resources

Core framework

Navigation

Tools and resources



- ✓ Mappings to industry frameworks
- ✓ Standard skills profiles
- ✓ Assessment guidelines
- ✓ Links to c.50 bodies of knowledge
- ✓ User stories

Owned by the global user community

- ❑ The SFIA Foundation is a not-for-profit organisation
- ❑ It is built by industry and business for industry and business
- ❑ Adoption by governments, corporates and individuals in almost 200 countries
- ❑ Global collaborative development, governance and steering boards
- ❑ A 20+ year track record of successful use
- ❑ Proven sustainability with an established ecosystem and trusted infrastructure
- ❑ A neutral approach – it is not aligned to any specific technologies, vendors or professional bodies

Free of charge for most non-commercial use

Important: you need a licence to use SFIA

- ❑ For personal career development and for the majority of internal use for staff management, SFIA is available free of charge.
- ❑ There is a modest licence fee for large organisations using SFIA and for organisations that use SFIA for commercial purposes
- ❑ As a not-for-profit, the SFIA Foundation does not seek commercial gain over and above its subsistence needs.
- ❑ The licence fee supports the continued development of the framework and ecosystem support
- ❑ Organisations and individuals who contribute a licence fee can be proud that they are helping the continued development of the industry

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SFIA 8

The framework reference

Data science DATS

Applying mathematics, statistics, data mining and predictive modeling techniques to gain insights, predict behaviors and generate value from data.

Level 1

- Identifying methods that use statistical analysis and probability modeling using statistical software packages, tools and techniques
- Identifying methods that use machine learning and probability modeling using statistical software packages, tools and techniques
- Identifying methods that use data mining and probability modeling using statistical software packages, tools and techniques
- Identifying methods that use data mining and probability modeling using statistical software packages, tools and techniques
- Identifying methods that use data mining and probability modeling using statistical software packages, tools and techniques

Level 2

- Using statistical analysis packages and software to analyze data
- Using statistical analysis packages and software to analyze data
- Using statistical analysis packages and software to analyze data

Level 3

- Applying statistical analysis techniques to solve problems and identify using statistical software packages, tools and techniques
- Applying statistical analysis techniques to solve problems and identify using statistical software packages, tools and techniques

SFIA 8 Summary Chart

The global skills and competencies framework for the digital world

www.sfia-online.org

SFIA 8 Levels of responsibility

The framework of SFIA 8 is organized into six levels of responsibility, from Level 1 (the lowest) to Level 6 (the highest).

Level	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
AUTONOMY	Working under direct supervision	Working under close supervision	Working under general supervision	Working under minimal supervision	Working under no supervision	Working under no supervision
INFLUENCE	Working with others	Working with others	Working with others	Working with others	Working with others	Working with others
COMPLEXITY	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks
BUSINESS SKILLS	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks
KNOWLEDGE	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks	Working with simple tasks

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