

Data Science – Level Definitions

There will initially be two levels of certification associated with the Data Science standards. The standards will remain generic statements that can apply across a wide range of roles within the data science field.

The distinguishing features that define the levels are associated with the application of the standards and, therefore, levels of competence.

The distinction will be related to the following:

- **Responsibility** – the higher the level of certification, the greater level of responsibility and accountability.
- **Decision making** – the level of authority to make decisions and the impact across the organisation.
- **Complexity** – this can be delivered within two spheres of complexity:
 - Technical Complexity – specifically associated with the technical skills applied.
 - Organisational Complexity – associated with skills and decision-making responsibilities that would apply across, and potentially beyond, the organisation.
- **Business impact** – relating to how far-reaching actions may apply and impact, and understanding on how and on whom they impact.

Levels of Accountability and Responsibility

Advanced Data Science Professional

Applicants should demonstrate that they:

- Are fully accountable for their own work and that of others, including ethical considerations
- Undertake a range of complex work activities that have a significant impact.

They should also demonstrate some of the following:

- Have responsibility for a significant function across the organisation.
- Have significant decision-making authority within their given area of expertise.
- Act as an advisor/consultant at a strategic level.
- Consider the impact across the business and more widely, of actions undertaken based on their decisions.

Data Science Professional

Applicants should demonstrate that they:

- Have personal responsibility for their own work.
- Apply technical skills in delivering outcomes.

They should also demonstrate some of the following:

- Have responsibility for activities of a section or team.
- Have decision-making authority at the Section or team level.
- Act as an advisor/consultant and departmental level.
- Understands how their individual practice impacts other departments.

Taking this approach, individuals would provide evidence against the skills determined in the standard, demonstrating their level of application against the criteria above.

Knowledge Level Descriptors

The following table provides descriptions of the levels of knowledge.

Level	Description
Limited	Has knowledge and understanding of facts, procedures and ideas in the field of work. Can interpret relevant information and ideas. Is aware of a range of information that is relevant to the area of work.
General	Has factual, procedural and theoretical knowledge and understanding. Can interpret and evaluate relevant information and ideas. Is aware of the area of work. Is aware of different perspectives or approaches within the area of work.
Applied	Has practical, theoretical or technical knowledge and understanding of the field of work, enabling the applicant to address problems that are well defined but complex and non-routine. Can analyse, interpret and evaluate relevant information and ideas. Is aware of the nature of the approximate scope of the area of work. Has an informed awareness of different perspectives or approaches within the area of work.
Deep	Has advanced practical, conceptual or technological knowledge and understanding of the field of work, enabling the applicant to create ways forward in contexts where there are many interacting factors. Understands different perspectives, approaches or schools of thought and the theories that underpin them. Can critically analyse, interpret and evaluate complex information, concepts and ideas.

Dependent on the role, areas of strength and weakness within the standards may differ, for example:

- As people progress towards Leadership/Management positions so their responsibility will increase, but technical complexity may diminish.
- Others may not progress towards Leadership roles but will develop highly complex and valuable technical skills.

Therefore, it is not essential that an applicant meets all the criteria at the level applied for, but that on balance, the totality of their evidence for each section meets the required level.

In addition, different roles at the same level will have differing levels of competence within the Skill Areas defined in the standard. For example, a Data Engineer may have strong evidence against Skill Area B but less developed evidence against Skill Area D.

Taking this into consideration, it is expected that all applicants at either level can display an appropriate level of competence for Skill Area E. However, sections A, B, C and D may be weighted differently depending on the area of specialism.

At the Data Science Professional level, an applicant would be expected to deliver applied level of competence for Skill Area E two other Skill Areas. They should also demonstrate a limited knowledge of the other two Skill Areas.

At the Advanced Data Science Professional level, an applicant would be expected to deliver deep level of competence for Skill Area E and two other Skill Areas. They should also demonstrate a general knowledge of the other two Skill Areas.

It is expected that applicants deliver the following evidence for the different levels of certification:

Data Science Professional:

Skill Area E and 2 other Skills Areas – Applied

The remaining 2 Skill Areas – Limited

Advanced Data Science Professional:

Skill Area E and 2 other Skills Areas – Deep

The remaining 2 Skill Areas – General

Ethics and Efficacy

It is important that all professionals working within the field of Data Science have a clear understanding of the ethics which underpins the collection, management, use and communication of the data and the results with which they work. It is equally important that a Data Scientist takes responsibility for the assurance of the models they build. Assurance covers both the efficacy of the application and the ethical natures of its design and implementation. As such, these attributes are not something that can, or should, be assessed as one standalone criterion. Rather, when completing this application, you should wherever possible include your knowledge and working practices relating to the appropriate **ethical** considerations such as:

- Data: collection, validity for use in the intended purpose, permission for usage, storage, security
- Model: development, testing (e.g. fairness, bias, error rates) usage (how could the model and results be used for an unintended purpose?) and transparency
- Communication: explanation of why the science is required; the results achieved and how can misinterpretation of the results be minimised
- Relevant laws and permissions of usage for data (including legal rights of individuals, privacy and anonymity)

And **efficacy** considerations such as:

- Quality assurance of code and data
- Validation of model fit
- Robustness of the model and software implementation
- Ongoing monitoring of model implementation

It is important to note that the list is not exhaustive. It is here to serve as a guide to help you show the assessors you are aware of the professional expectations of those who work in this field. You should include any other areas of ethical and efficacy considerations you feel are important with your area of expertise.

How evidence might be expressed

To explain the levels and how the evidence might differ, below are a couple of examples:

Data Security - An applicant is applying at the lower level. When presenting their evidence with regard to data Security issues they may draw on specific examples of where they have had to consider and respond to and/or apply specific data security practices in their work. This may include direct changes in their own practice or to raise concerns and liaise with other stakeholders in their organisation.

An applicant applying at the higher level. When presenting their evidence with regard to data security issues they may draw on specific examples of where they have influenced, helped develop or implemented a policy to ensure that the organisation's practices are commensurate with data security requirements. They should also be able to demonstrate sufficient understanding of appropriate practical responses to data security issues, to be able to provide oversight and governance of others' practical work.

Modelling - An applicant applying at the lower level. When presenting their evidence with regard to data modelling they may draw on specific examples of where they have undertaken modelling, the tools and methods they used etc. They should critically appraise the appropriateness of their chosen modelling approach.

An applicant applying at the higher level. When presenting their evidence with regard to data modelling they may draw on specific examples of their role in determining the tools and techniques that the organisation may employ and why these tools and techniques were selected.