

## 2.3.4.1 Cognitive Taxonomy of Data

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### Cognitive Layers

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There are five different layers in the Cognitive Model. (See [Appendix I: Cognitive Model](#)). Each piece of “data” used within a DIDO can be classified accordingly. For example, the number of cents in a dollar might be classified as Data. **Note:** to help differentiate the generic, general, and all-encompassing use of “data” from the specific cognitive “Data”, the cognitive layer is referred to with *Title* case (i.e., the first letter is capitalized).

Stavros and Albrant <sup>1)</sup> define the five layers of the Cognitive Model as follows:

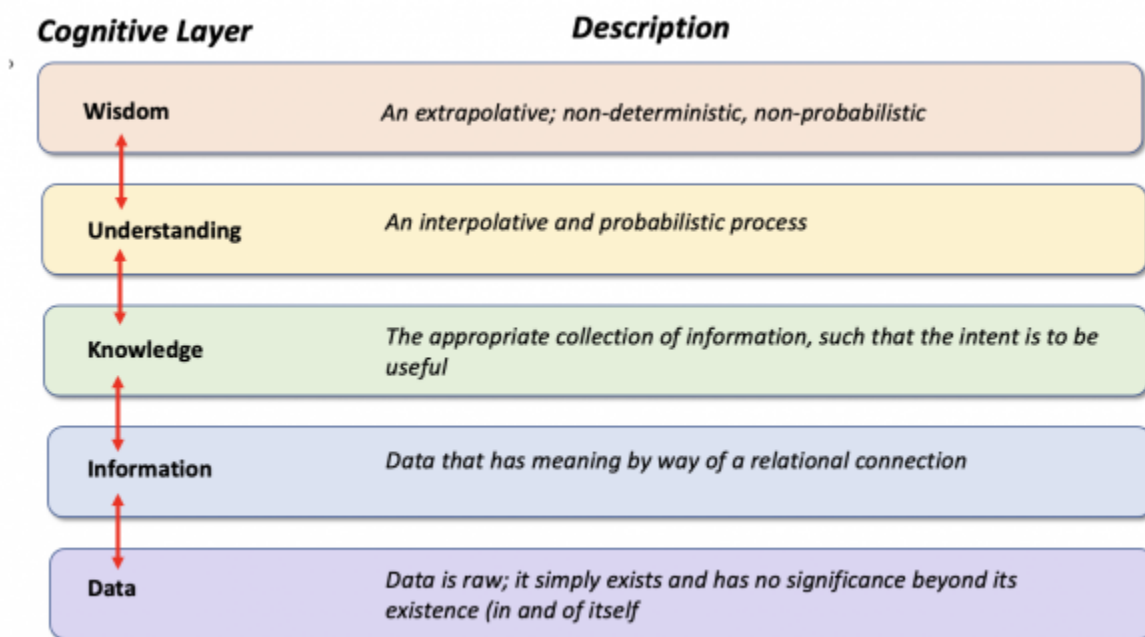


Figure 1: Cognitive Model

1. **Data** - Data that is a raw concept; it simply exists and has no significance beyond its existence (in and of itself). It is the basis upon which **Information** concepts are built.
2. **Information** - A concept aggregating data concepts together. In other words, **Data** has been given meaning by way of relational connection(s).
3. **Knowledge** - A concept relating an appropriate collection of **Information** concepts together, such that its intent is useful.
4. **Understanding** - An interpolative and probabilistic concept that reflects **Wisdom** concepts.
5. **Wisdom** - An extrapolative and nondeterministic, non-probabilistic concept, which is built upon **Understanding** concepts.

The flow between the cognitive layers is bidirectional and can have many-to-many relationships. For example, any particular **Wisdom** concept can be associated with any number of **Understanding** concepts. The inverse is also true; **Understanding** concepts can also be used to help support any number of **Wisdom** Concepts.

## Data Protection

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When it comes to Data Protection, it is important to differentiate between the raw content in the system and the system in which the raw data is stored. The raw data is generally considered as facts, whereas, the system in which it is stored is referred to as the [Database](#).

Facts are not by themselves protected under U.S. Copyright law. For example, you can not copyright the temperature recorded outdoors.

The U.S. does provide some protection of data (i.e., facts) organized into a data store (i.e., databases) <sup>2)</sup>:

*In the United States, facts by themselves are not protected by copyright. Therefore, data, as a collection of facts, is not protected by U.S. copyright law.*

*Databases as a whole can be protected by copyright as a compilation, but only under certain conditions. The first is that mere collection of data is not enough. The arrangement and selection of data must be sufficiently creative or original.* <sup>3)</sup>

The European Union (EU), under the Directive 96/9/EC, provides no protection of data <sup>4)</sup>

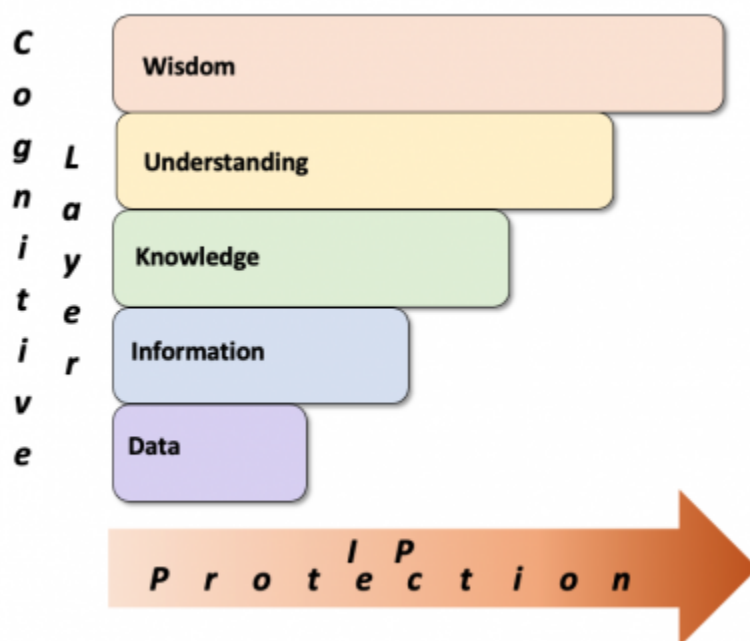


Figure 2: The relationship between Cognitive Layer and Intellectual Property Protection.

## Detailed Discussion

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☒ [char][✓ char, 2022-03-15][New section—review plus all subsections](#)

<sup>1)</sup> Stavros, Robert W. and Albrant, Jeremiah; Engineering Governance, SPAWAR, October 9, 2007,

<sup>2)</sup> Feist Publicans, Inc., Petitioner v. Rural Telephone Service Company, Inc., 499 U.S. 340(1991) Argued Jan. 9, 1991., Decided March 27, 1991.

<https://sco.library.emory.edu/research-data-management/publishing/copyright-data.html>

<sup>3)</sup> Copyright and Licensing for Data, Emory Libraries, Scholarly Communications Office, Accessed: 30 September 2021,

<https://sco.library.emory.edu/research-data-management/publishing/copyright-data.html>

<sup>4)</sup> Directive 96/9/EC of the European Parliament and of the Council on the Legal Protection of Databases, Official Journal of the European Communities, 11 March 1996, Accessed: 30 September 2021, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0009:EN:HTML>

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