Overview

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AI

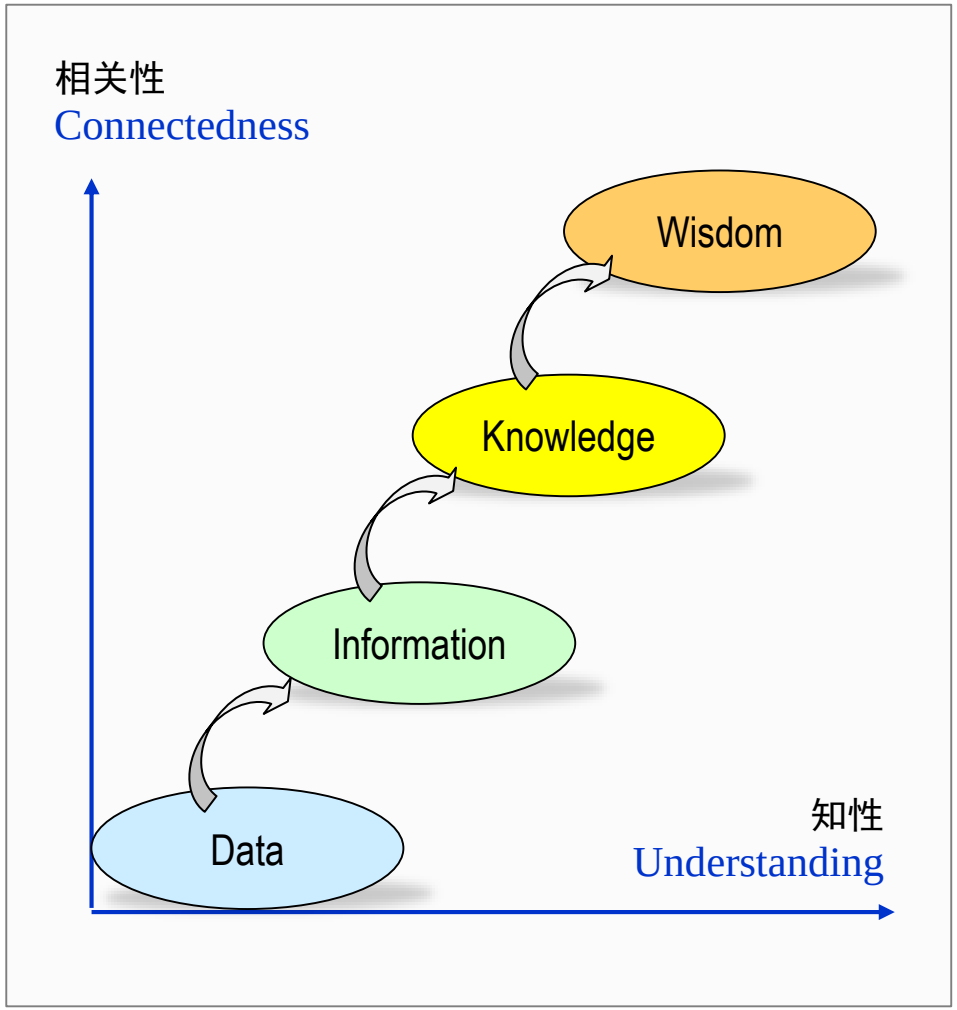
Contents

Data, Information, Knowledge and Wisdom 数据、信息、知识与智慧

Data 数据	➢ The measures and representations of the world. 世界的计量和表征。 ➢ As fact, signal, or symbol. 表现为事实、信号、或者符号。
Information 信息	➢ Produced by assigning meaning to data. 对数据赋予含义而生成。 ➢ Structural vs. functional, subjective vs. objective. 结构与功能的，主观与客观的。
Knowledge 知识	➢ Defined with reference to information. 对信息进行加工而确立。 ➢ As processed, procedural, or propositional. 表现为加工的、过程的或者命题的。
Wisdom 智慧	➢ The experience to make decisions and judgments. 作出决定和判断的经验。 ➢ As “know-why”, “know-how”, or “why do”. 表现为“知因”、“知然”、或“因何”。

Example: in Bank 在银行

- Data: 数据
  - The numbers 100 or 5 (out of context)
    数字100或者5（无上下文）
- Information: 信息
  - Principal amount: $100, interest rate: 5%
    本金：100美元；利率：5%
- Knowledge: 知识
  - At the end of year I get $105 back
    年底拿回105美元
- Wisdom: 智慧
  - Investment?
    投资？



Explicit and Tacit Knowledge 显性与隐性知识

- Explicit knowledge 显性知识
  - Can be articulated into formal language, including grammatical statements, etc.
    可以表示为形式语言，包括语法陈述、数学表达式、等等。
  - Can be readily transmitted to others.
    可以快捷地转化成其它形式。
  - Can be easily represented using computer languages, decision trees and rules.
    可以容易地用计算机语言、决策树和规则等表示。
- Tacit knowledge 隐性知识
  - Individual experience and intangible factors, such as perspective, and etc.
    个人的经验和无形的因素、如观点、等等。
  - Hard to articulate with formal language.
    难以用形式化语言来表示。
  - Neural network offers the method to represent tacit knowledge.
    神经网络提供了表示隐形知识的方法。

Knowledge Types 知识的类型

Types 类型	Features 特点
Static knowledge 静态知识	Unlikely to change 不太可能改变
Dynamic knowledge 动态知识	Records in a database 记录在数据库中
Surface knowledge 表层知识	Accumulated through experience 通过经验积累
Deep knowledge 深层知识	Theories/Proofs/Problem Specifics 理论 / 证明 / 问题细节
Procedural knowledge 过程性知识	Describes how a problem is solved 描述如何解决问题
Declarative knowledge 陈述性知识	Describes what is known about a problem 描述已知的问题是什么
Meta-knowledge 元知识	Describes knowledge about knowledge 描述知识的知识
Heuristic knowledge 启发式知识	A rule of thumb that guide the reasoning process 引导推理过程的经验法则

Knowledge Base and Knowledge Base System 知识库和知识库系统

- The term ‘knowledge base (KB)’ was to distinguish from the more common widely used term ‘data base (DB)’.

  “知识库（KB）”这个术语是用于区分更广泛使用的术语“数据库（DB）”。

- KB is used to store complex structured and unstructured knowledge. It consists of a set of sentences, each one is expressed in a language called a knowledge representation language and represents some assertion about the world.

  知识库被用于存储复杂的结构和非结构化知识。它由一套语句组成，每个语句都是由一种被称为知识表示语言来表示的，从而表示关于世界的某些断言。

- A KB system (KBS) consists of a KB and an inference engine, where, KB represents facts about the world, inference engine can reason about those facts.

  一个知识库系统（KBS）由知识库和推理引擎组成，其中，知识库表示关于世界的事实，推理引擎则可以基于这些事实进行推理。

Knowledge Engineering (KE) 知识工程(KE)

- KE refers to all technical, scientific and social aspects involved in building, maintaining and using KB systems.

  KE指的是构建、维护和使用知识库系统中所关联的所有技术、科学和社会的方方面面。

Knowledge-based Engineering (KBE) 基于知识的工程(KBE)

- KBE is the application of knowledge-based systems technology to the domain of manufacturing design and production.

  KBE是将基于知识的系统技术用于制造设计和生产领域。

KE or KBE is essentially engineering on the basis of knowledge models, that use knowledge representation to represent the artifacts of the design process. The initial use of the KE or KBE was expert systems.

KB或KBE本质上是在知识模型基础之上的工程，它采用知识表示来表征设计过程的产品。
KB或KBE最初的应用是专家系统。

Thank you for your attention!

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