INTRODUCTION TO **ARTIFICIAL INTELLIGENCE** FOR IT & NON-IT PROFESSIONALS

TRENDS AND TECHNOLOGIES

TRENDS AND TECHNOLOGIES

- AI trends and technologies are made up of software-level models and algorithms.
- Least visible to the average non-technical person
- Technologies were the area of AI least approachable to the average businessperson

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- Acceptable in the era of expert systems when everything was done manually.
- Now, it is important for anyone who will be making business decision involving AI

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❑Good Old-Fashioned AI (grift, 2019)

- As the name of the sub-category implies, static models do not change over time.

❑ Symbolic logic

- Symbolic logic relies on modeling the world as a set of symbols and interactions between the symbols (arithmetic, for instance, is a form of symbolic logic).

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❑Expert systems

- Expert systems (also called knowledge-based systems) codify human knowledge into a computer program
- Coded with if then rules

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❑Decision tree

- A set of comparisons applied to an input to reach a variety of predetermined outcomes
- Each comparison leads to a branch, which may have more comparisons to be made.
- This series of branching leads to the “tree” portion of the name.

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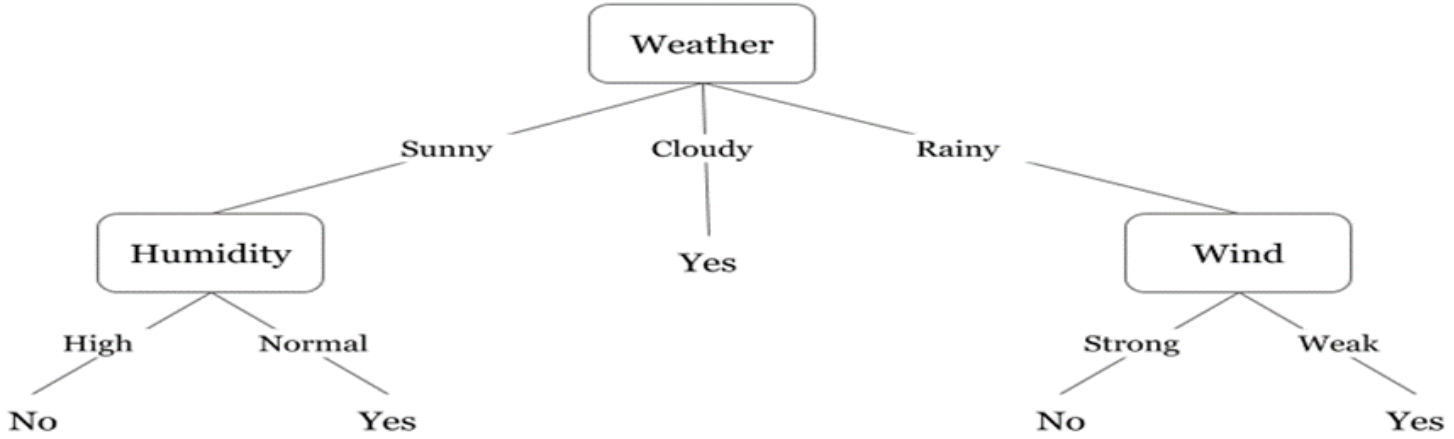
- For example



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❑Semantic graphs

- A method of storing information than a model for solving problems or making decisions.
- An important technology for most AI applications dealing with natural language understanding.

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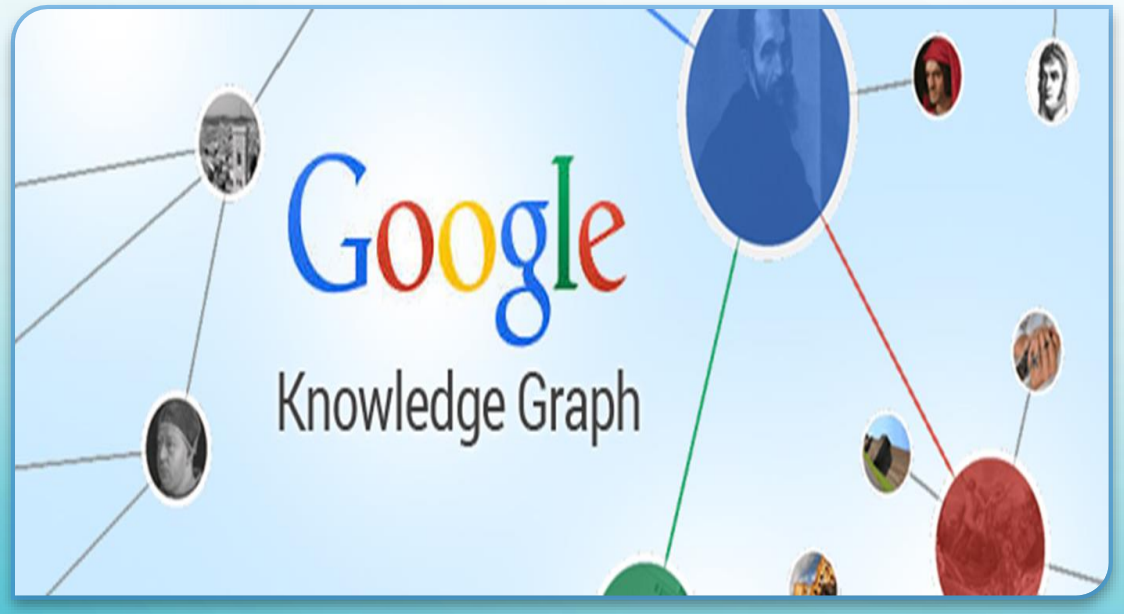

❑Knowledge Graph

- Famous example of a semantic graph is Knowledge Graph
- Google’s effort to document the structure and interrelationship of things in the world

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- When you see results returned directly to a Google search—rather than as a link to another website—often the result has been retrieved from Knowledge Graph.
- Google’s Knowledge Graph is so popular

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❑Optimization

- Optimization models are often impressive enough to be considered AI, interestingly
- It can be difficult to categorize static AI because of the lack of clear definitions in the field

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❑MODERN AI TECHNOLOGIES

- Machine Learning
- ML as an application of AI. Hard coded knowledge vs acquisition of own knowledge.
- It requires Acquisition, Inference, Updating and refining the KB, heuristics, etc

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❑**Internet of thing**

- **AI is the brain and IoT is the body**
- **With the application areas such as smart cities, smart grids, smart water managements, smart health, smart supply chain, and smart homes in the Internet of Things (IoT),**
- **Consider the AI as a complementary package of the smart networked objects.**

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❑**Neural networks**

- Human brain works with neurons that are connected in a complex manner.
- A kind of programming is being developed that makes machines to work on the neural networks.
- Artificial Neural Network (ANN) programming and developed under the deep learning technology.
- Artificial neural networks first came into application in the year 1989.

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❑Agent Technology

- Software-only equivalent of robots are often referred to as digital agents
- Programmed to navigate relatively complex sets of tasks and often emulate the behavior of humans.
- Can operate in several different contexts.
- Chabot is the most common implementation of the digital

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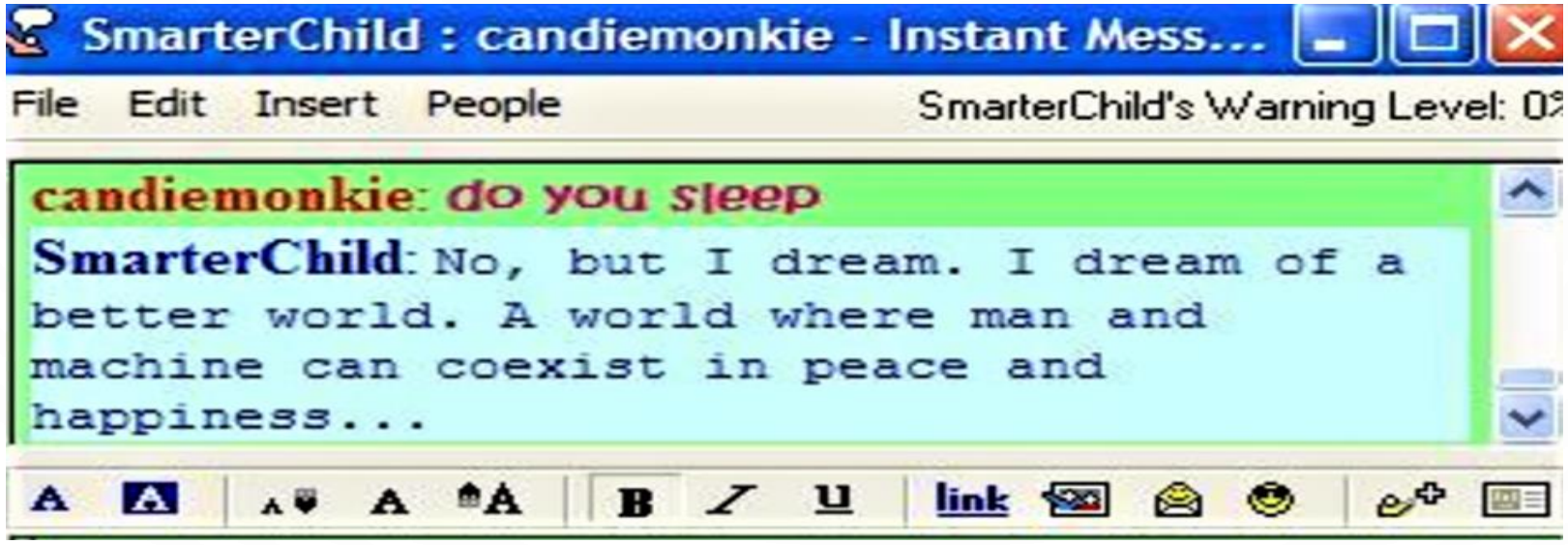
- Smarter Child was one of the more popular ones in the 1990s and 2000s
- It was robot that lived in the buddy list of millions of Americans Online Instant messenger (AIM) users.



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Blockchain

- Blockchain is a decentralized data structure with internal consistency
- It’s an enabling technology that resolved the Byzantine generals’ problem
- If the Internet democratized the peer-to-peer exchange of information, then the blockchain has democratized the peer-to-peer exchange of value.

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- Block chain is a peer-to-peer (P2P) distributed ledger technology (DLT) for transparent transaction.
- The concept and idea were first proposed in [22] on time-stamping of a digital document.
- The key elements of this definition rest with the keywords: appendable means can add to the ledger.

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- **Financial transaction**
- .Blockchain technology provides a way for untrusted parties to agree on the state of a database, without using a middleman.
- For example, three untrusted parties like X, Y and Z countries create blockchain network for a financial transaction without using a middleman, like a bank by providing a ledger that nobody administers,
- A blockchain could provide specific financial services — like payments, or securitization — without using a middleman, like a bank.

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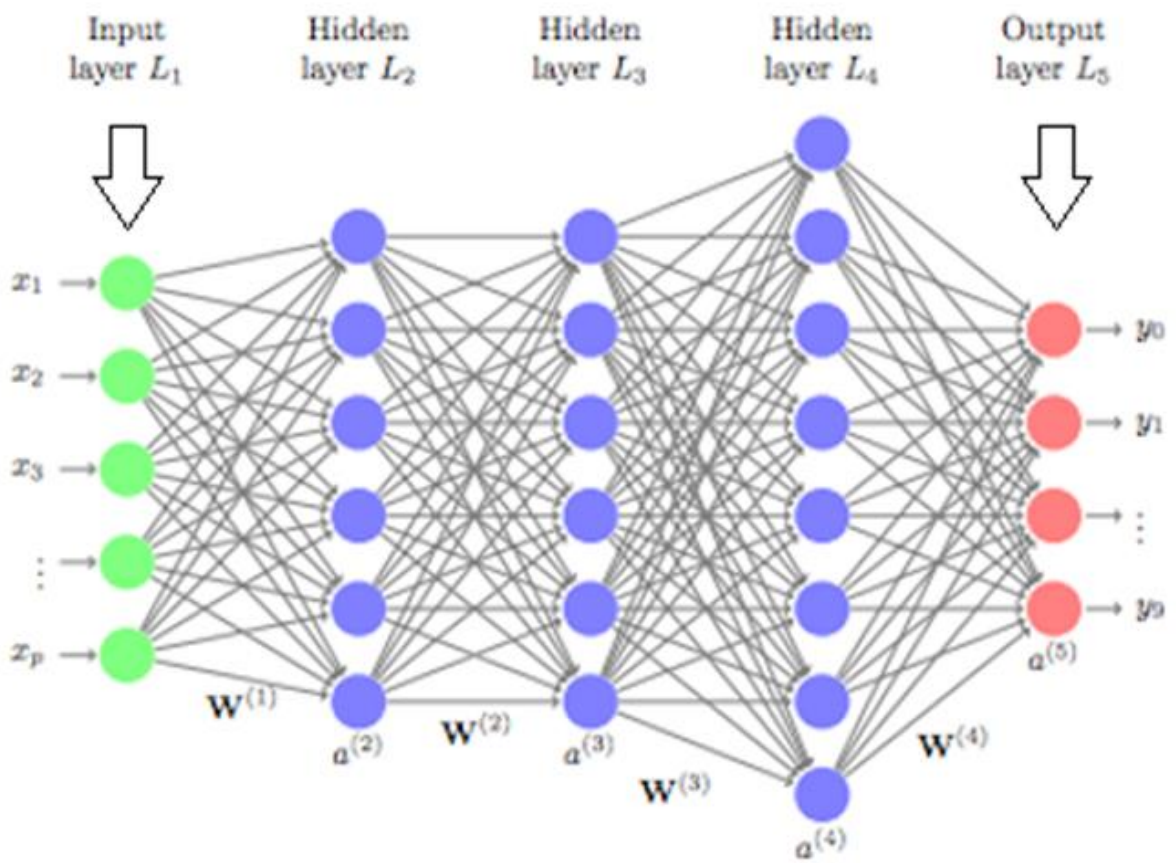
❑Deep Learning

- Deep learning is a specific subfield of machine learning
- **How many layers contribute to a model of the data is called the depth of the model.**
- **Modern deep learning often involves tens or even hundreds of successive layers of representations**

DEEP LEARNING LAYERS



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❑Augmented reality

- AR as a variation of **virtual reality (VR),** which completely immerses a user inside a synthetic environment
- AR allows the user to see the real world, with virtual objects superimposed upon or composited with the real world

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❑**Natural language processing**

- how to make use of the copious knowledge that is expressed in natural language
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❑**Robotics process Automation**

- AI robots are meant for navigation and exploration of their local environment, with demonstrable intelligence and many times are meant for a task or role,
- Explorer robots,
- Household robots,
- Search and rescue robots etc
- **A robot is a machine, situated in the world that senses, thinks, and acts . . .** "

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❑Prediction

- Prediction employs one of the core ideas of AI in that it uses lots of historical data in order to match a new piece of data to an identified group
- Data in order to match a new piece of data to an identified group
- What do knowledge calls a ‘recommendation’ is a prediction they make in order to sell you more stuff.

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- Some decisions can be described as predictions—if you apply for a loan that is assessed by a machine, then the AI will try and predict whether you will default on the loan or not.
- It will try and match your profile (age, salary, regular spending, other loans, etc.) with other customers that have similar profiles.
- If those other matching customers generally default on their loans then you will likely be refused the credit line.

AI TOOLS/LIBRARIES

- Uizard
- Microsoft Azure
- BigML
- Orange
- MATLAB
- A great library ecosystem: python