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Decision Support Systems (DSS) is a specific class of computerized information systems with purpose of supporting organizations decision-making activities. A DSS constitutes an interactive software based system to help decision makers choose and compile useful information from existing systems, documents, personal knowledge and / or business models in order to identify and solve problems and make decisions.[[1]](#footnote-0)

By implementing a DSS into a business it can make everyday decisions faster and more easily, and it also decreases the cost of decision making. One downside to implementing a DSS is the cost of developing one. If a DSS doesn’t have enough data, it will then make inaccurate decisions which also a downside.[[2]](#footnote-1)

Reasoning strategies may be used within AI when a conclusion may not be directly available from the data that is provided. When dealing in certain conditions, even humans have to make a probable decision when the information is not clear cut - to translate this into the domain of AI, various reasoning strategies may be used to help derive a conclusion when such a case occurs. These reasoning strategies include, but are not limited to - deductive, inductive, abductive, case-based and probabilistic reasoning. These strategies are vital when implementing both AI and expert systems in the form of Reasoning Systems.[[3]](#footnote-2)

Which types of DDS exists today?.

There are different Decision Support Systems that can be categorized into five types:[[4]](#footnote-3)

* *Communication-driven DSS* is a type of DSS that emphasizes communications, collaboration and shared decision-making support. Its intention is to support and help organize a meeting or help users to collaborate.
* *Data-driven DSS* is used to retrieve information from a database or data warehouse to find specific answers for specific purposes.
* *Document-driven DSS* is the most common support application targeted among a wide base of users. Its main function is to search web pages and look for documents based on precise set of keywords or terms.
* *Knowledge-driven DSS* is a specific class of computerized information system that supports organizational decision-making activities and problem-solving expertise. The expertise consists of knowledge about a particular domain, understanding of problems within that domain, and skill at solving the problems.[[5]](#footnote-4)
* *Model-driven DSS* uses a different models to solve problems or helps with decision making. These model can be statistical, financial, mathematical, analytical, simulation or optimization.[[6]](#footnote-5)

What is Business Intelligence?

Business Intelligence, also called decision support, is a process or collection of methods for analyzing data and presenting information with which the owner, board, CEO, and other business developers within a company use to make smart decisions.[[7]](#footnote-6)

What are the limitations of DSS?

A DSS does not have creativity, imagination or intuition to make reflective decisions.

Another downside to implementing a DSS is the cost of developing one. If a DSS doesn’t have enough data, it will then make inaccurate decisions which also a downside.[[8]](#footnote-7)

What are the four tasks of a cycle in case-based reasoning?

* Retrieve - Retrieve similar cases from the case base.
* Reuse - Adapt the retrieved cases to fit to the new case.
* Revise - Revise it based on how well it works.
* Retain - Retain this new case in the case base.[[9]](#footnote-8)

What is a database and what type of relation does it have with DSS?

A database is a collection of information organized in such a way that it is easy to search for and retrieve individual tasks, as well as to change information often.

The database is one of the fundamental components of a DSS architecture. [[10]](#footnote-9)

What is monotonic and non monotonic reasoning?

Non-monotonic reasoning from data in a knowledge base is that given a conclusion made from the existing data, adding new data *may* invalidate the previous conclusion if it contradicts it. In monotonic reasoning on the contrary, by adding new data to the knowledge base, previous conclusions cannot be changed due to the newly added data. So if A is true for non-monotonic reasoning, adding B may invalidate A. If B is added using monotonic reasoning, A cannot be changed to be false.

What is a drawback when using Inductive reasoning?

Using inductive reasoning may cause a fact to be concluded as true, even though it runs the risk of being false. If for example removing a dollar bill from a wallet turns out that the dollar is $5, inductive reasoning may determine all dollar bills in the wallet to be $5. This may hold for the first bill, but does not mean that it is true for the whole wallet. In conclusion, inductive reasoning says that: *if* nothing contradicts A, let A be true. Adding new data may change A to be false, but it is assumed that A is true, as long as nothing contradicts it.

Explain what Deductive reasoning is and give an example

Deductive reasoning is when given a set of facts, reach a conclusion that something is true based on the given facts. Classic example is the following: All men are mortal (fact 1), Socrates is a man (fact 2), therefore, socrates is mortal (conclusion). This way of thinking can be seen as “top-down”, while inductive reasoning is “bottom-up”.

What is the benefit of developing a DSS?

When dealing with large sets of data, complex problems or time consuming calculations, conclusions done by hand may not be reasonable to do. By developing a DSS, decisions may be made much faster and sometimes new ways of thinking may be discovered by the system in the process

In a expert system, all data is stored inside a database. What is the knowledge base used for and how does it relate to the data stored in the database?

In the database, data is stored in its purest form. For example, a temperature may be stored as 37C - it only says what the temperature is, but not the context. Is it the temperature of water? A car engine? By using the knowledge base, the facts can be combined to create facts. For example, if 37C is found in the database along with ‘temperature = engine’, the conclusion may be made that the engine temperature is 37 C - this is what is stored in the knowledge base, where the presence of data create facts.

1. <https://www.investopedia.com/terms/d/decision-support-system.asp> [↑](#footnote-ref-0)
2. <https://www.managementstudyguide.com/limitations-and-disadvantages-of-decision-support-systems.htm> [↑](#footnote-ref-1)
3. Lecture 3 in this course [↑](#footnote-ref-2)
4. <https://www.gdrc.org/decision/dss-types.html> [↑](#footnote-ref-3)
5. <http://dssresources.com/dsstypes/kddss.html> [↑](#footnote-ref-4)
6. <https://dssresources.com/dsstypes/mddss.html> [↑](#footnote-ref-5)
7. <https://searchbusinessanalytics.techtarget.com/definition/business-intelligence-BI> [↑](#footnote-ref-6)
8. <https://www.managementstudyguide.com/limitations-and-disadvantages-of-decision-support-systems.htm> [↑](#footnote-ref-7)
9. <https://ibug.doc.ic.ac.uk/media/uploads/documents/courses/syllabus-CBR.pdf> [Page 11] [↑](#footnote-ref-8)
10. Lecture 3 in this course [↑](#footnote-ref-9)