

Systems analysis

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"**Systems analysis** is a problem solving technique that decomposes a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose".^[1] According to the Merriam-Webster dictionary, systems analysis is "the process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way". Analysis and synthesis, as scientific methods, always go hand in hand; they complement one another. Every synthesis is built upon the results of a preceding analysis, and every analysis requires a subsequent synthesis in order to verify and correct its results.

This field is closely related to requirements analysis or operations research. It is also "an explicit formal inquiry carried out to help someone (referred to as the decision maker) identify a better course of action and make a better decision than she might otherwise have made."^[2]

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Overview

The terms analysis and synthesis come from Greek where they mean respectively "to take apart" and "to put together". These terms are used in scientific disciplines from mathematics and logic to economics and psychology to denote similar investigative procedures. Analysis is defined as the procedure by which we break down an intellectual or substantial whole into parts. Synthesis is defined as the procedure by which we combine separate elements or components in order to form a coherent whole.^[3] Systems analysis researchers apply methodology to the analysis of systems involved to form an overall picture. System analysis is used in every field where there is a work of developing something. Analysis can also be defined as a series of components that perform organic function together. An example of system analysis can be system engineering. Systems engineering is an interdisciplinary field of engineering that focuses on how complex engineering projects should be designed and managed. An interdisciplinary field is the combining of two or more fields of study. An example of this would be history (one academic field) and economics (another academic field) department are offering a seminar on Asia.

Information technology

The development of a computer-based information system includes a systems analysis phase which produces or enhances the data model which itself is a precursor to creating or enhancing a database (see Christopher J. Date "An Introduction to Database Systems"). There are a number of different approaches to system analysis. When a computer-based information system is developed, systems analysis (according to the Waterfall model) would constitute the following steps:

- The development of a feasibility study, involving determining whether a project is economically, socially, technologically and organizationally feasible.
- Conducting fact-finding measures, designed to ascertain the requirements of the system's end-users. These typically span interviews, questionnaires, or visual observations of work on the existing system.
- Gauging how the end-users would operate the system (in terms of general experience in using computer hardware or software), what the system would be used for and so on

Another view outlines a phased approach to the process. This approach breaks systems analysis into 5 phases:

- Scope Definition: which is denoting an instrument for observing, viewing, or examining.
- Problem analysis: Analyzing the problem that arises.
- Requirements analysis: encompasses the conditions that need to be met.
- Logical design: look at logical relationship among the objects.
- Decision analysis: where a decision is made.

Use cases are a widely used systems analysis modeling tool for identifying and expressing the functional requirements of a system. Each use case is a business scenario or event for which the system must provide a defined response. Use cases evolved out of object-oriented analysis.

Practitioners

Practitioners of systems analysis are often called up to dissect systems that have grown haphazardly to determine the current components of the system. This was shown during the year 2000 re-engineering effort as business and manufacturing processes were examined as part of the Y2K automation upgrades.^[4] Employment utilizing systems analysis include systems analyst, business analyst, manufacturing engineer, systems architect, enterprise architect, software architect, etc.

While practitioners of systems analysis can be called upon to create new systems, they often modify, expand or document existing systems (processes, procedures and methods). Researchers and practitioners rely on system analysis. Activity system analysis has been already applied to various research and practice studies including business management, educational reform, educational technology, etc.

A set of components interact with each other to accomplish some specific purpose. Systems are all around us. Our body is itself a system. A business is also a system. People, money, machine, market and material are the components of business system that work together that achieve the common goal of the organization.