# Planetary system

A planetary system is a set of gravitationally bound non-stellar objects in or out of orbit around a star or star system. Generally speaking, systems with one or more planets constitute a planetary system, although such systems may also consist of bodies such as dwarf planets, asteroids, natural satellites, meteoroids, comets, planetesimals and circumstellar disks. The Sun together with the planetary system revolving around it, including Earth, forms the Solar System. The term exoplanetary system is sometimes used in reference to other planetary systems.
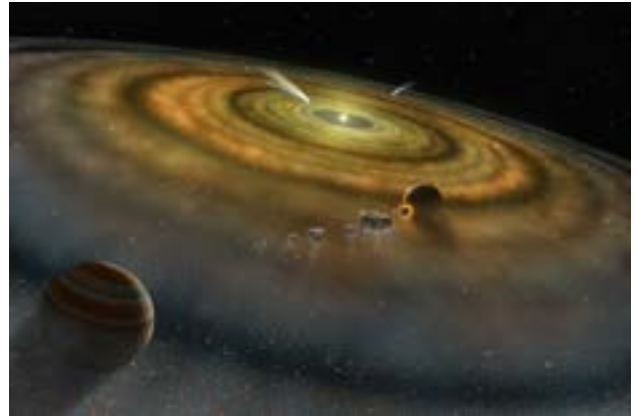
Plugboard

A plugboard or control panel (the term used depends on the application area) is an array of jacks or sockets (often called hubs) into which patch cords can be inserted to complete an electrical circuit. Control panels are sometimes used to direct the operation of unit record equipment, cipher machines, and early computers.
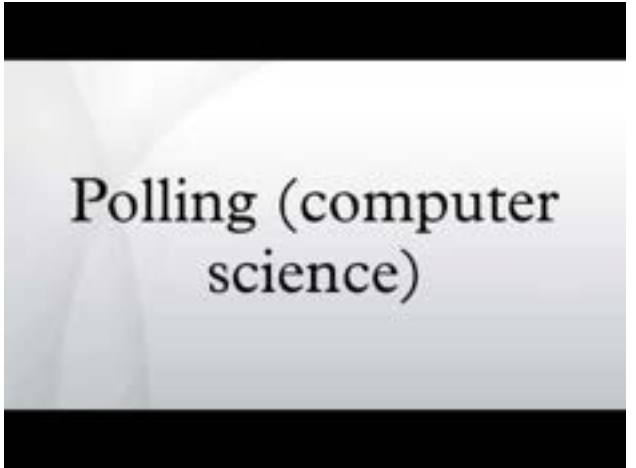
Political system

In political science, a political system means the type of political organization that can be recognized, observed or otherwise declared by a state.It defines the process for making official government decisions. It usually comprizes the governmental legal and economic system, social and cultural system, and other state and government specific systems. However, this is a very simplified view of a much more complex system of categories involving the questions of who should have authority and what the government influence on its people and economy should be.
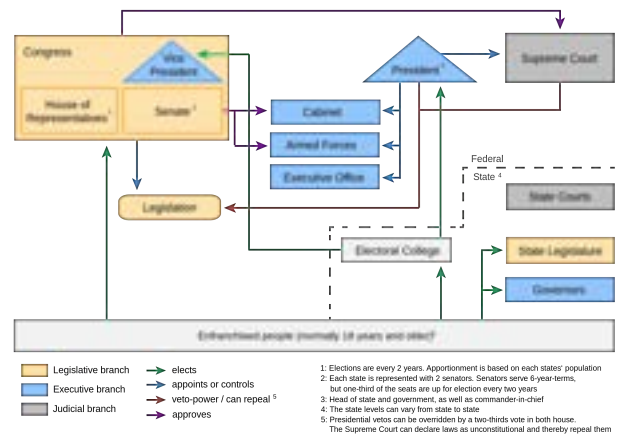
Polling (computer science)

Polling, or polled operation, in computer science, refers to actively sampling the status of an external device by a client program as a synchronous activity. Polling is most often used in terms of input/output (I/O), and is also referred to as polled I/O or software-driven I/O. A good example of hardware implementation is a watchdog timer.

Popek and Goldberg virtualization requirements

The Popek and Goldberg virtualization requirements are a set of conditions sufficient for a computer architecture to support system virtualization efficiently. They were introduced by Gerald J. Popek and Robert P. Goldberg in their 1974 article "Formal Requirements for Virtualizable Third Generation Architectures". Even though the requirements are derived under simplifying assumptions, they still represent a convenient way of determining whether a computer architecture supports efficient virtualization and provide guidelines for the design of virtualized computer architectures.

Ported

In software engineering, porting is the process of adapting software for the purpose of achieving some form of execution in a computing environment that is different from the one that a given program (meant for such execution) was originally designed for (e.g., different CPU, operating system, or third party library). The term is also used when software/hardware is changed to make them usable in different environments.Software is portable when the cost of porting it to a new platform is significantly less than the cost of writing it from scratch. The lower the cost of porting software relative to its implementation cost, the more portable it is said to be.

Positive feedback

Positive feedback (exacerbating feedback, self-reinforcing feedback) is a process that occurs in a feedback loop which exacerbates the effects of a small disturbance. That is, the effects of a perturbation on a system include an increase in the magnitude of the perturbation. That is, A produces more of B which in turn produces more of A. In contrast, a system in which the results of a change act to reduce or counteract it has negative feedback. Both concepts play an important role in science and engineering, including biology, chemistry, and cybernetics.

Preboot Execution Environment

In computing, the Preboot eXecution Environment, PXE (most often pronounced as pixie, often called PXE Boot/pixie boot.) specification describes a standardized client?server environment that boots a software assembly, retrieved from a network, on PXE-enabled clients. On the client side it requires only a PXE-capable network interface controller (NIC), and uses a small set of industry-standard network protocols such as DHCP and TFTP.
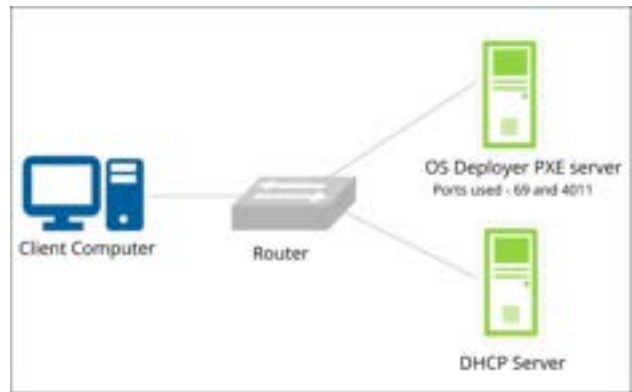
Preemption (computing)

In computing, preemption is the act of temporarily interrupting an executing task, with the intention of resuming it at a later time. This interrupt is done by an external scheduler with no assistance or cooperation from the task.:?153? This preemptive scheduler usually runs in the most privileged protection ring, meaning that interruption and resuming are considered highly secure actions. Such a change in the currently executing task of a processor is known as context switching.

Preemptive multitasking

In computing, preemption is the act of temporarily interrupting an executing task, with the intention of resuming it at a later time. This interrupt is done by an external scheduler with no assistance or cooperation from the task.:?153? This preemptive scheduler usually runs in the most privileged protection ring, meaning that interruption and resuming are considered highly secure actions. Such a change in the currently executing task of a processor is known as context switching.

PREEMPTIVE
MULTITASKING
VERSUS
COOPERATIVE
MULTITASKING

| PREEMPTIVE MULTITASKING	COOPERATIVE MULTITASKING
Task in which a computer operating system uses to decide for how long to execute a task before giving another task to use the operating system	Type of computer multitasking in which the operating system never initiates a context switch from a running process to another process
Interrupts applications and gives control to other processes outside the application's control	Process scheduler never interrupts a process unexpectedly
UNIX, Windows 95, Windows NT are some examples for operating systems with preemptive multitasking	Macintosh OS version 8.0-9.2.2 and Windows 3.x operating systems are based on cooperative multitasking

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Prentice Hall

Prentice Hall was an American major educational publisher owned by Savvas Learning Company. Prentice Hall publishes print and digital content for the 6?12 and higher-education market, and distributes its technical titles through the Safari Books Online e-reference service.
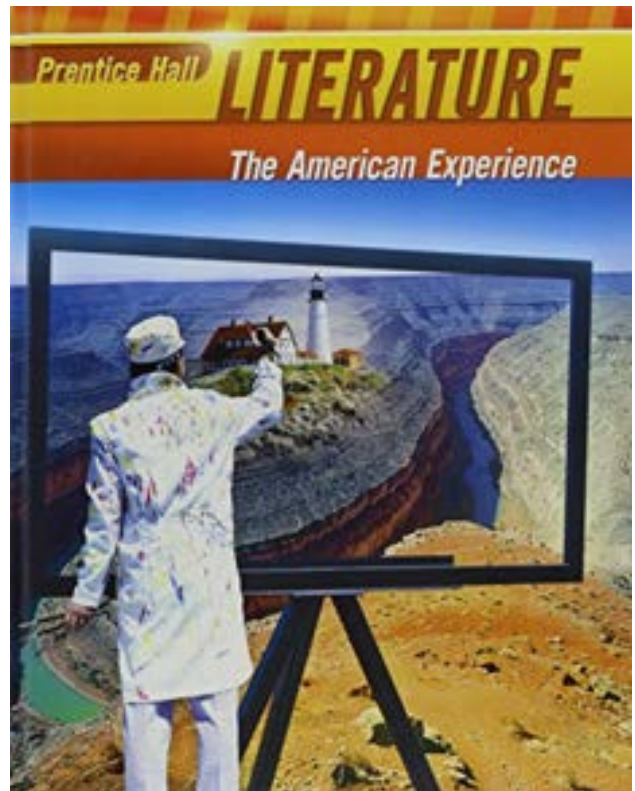
Principia Cybernetica

Principia Cybernetica is an international cooperation of scientists in the field of cybernetics and systems science, especially known for their website, Principia Cybernetica. They have dedicated their organization to what they call "a computer-supported evolutionary-systemic philosophy, in the context of the transdisciplinary academic fields of Systems Science and Cybernetics".
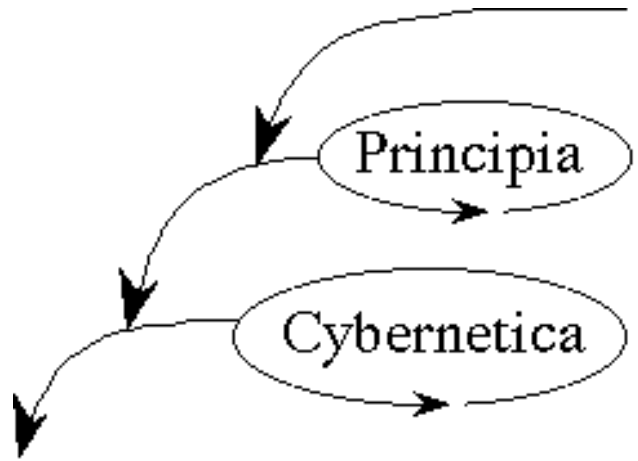
Printed circuit board

A printed circuit board (PCB; also printed wiring board or PWB) is a medium used in electrical and electronic engineering to connect electronic components to one another in a controlled manner. It takes the form of a laminated sandwich structure of conductive and insulating layers: each of the conductive layers is designed with an artwork pattern of traces, planes and other features (similar to wires on a flat surface) etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate. Electrical components may be fixed to conductive pads on the outer layers in the shape designed to accept the component's terminals, generally by means of soldering, to both electrically connect and mechanically fasten them to it. Another manufacturing process adds vias: plated-through holes that allow interconnections between layers.

Printer (computing)

In computing, a printer is a peripheral machine which makes a persistent representation of graphics or text, usually on paper. While most output is human-readable, bar code printers are an example of an expanded use for printers. Different types of printers include 3D printers, inkjet printers, laser printers, and thermal printers.

Probability

In science, the probability of an event is a number that indicates how likely the event is to occur. It is expressed as a number in the range from 0 and 1, or, using percentage notation, in the range from 0% to 100%. The more likely it is that the event will occur, the higher its probability. The probability of an impossible event is 0; that of an event that is certain to occur is 1. The probabilities of two complementary events A and B ? either A occurs or B occurs ? add up to 1. A simple example is the tossing of a fair (unbiased) coin. If a coin is fair, the two possible outcomes ("heads" and "tails") are equally likely; since these two outcomes are complementary and the probability of "heads" equals the probability of "tails", the probability of each of the two outcomes equals 1/2 (which could also be written as 0.5 or 50%).
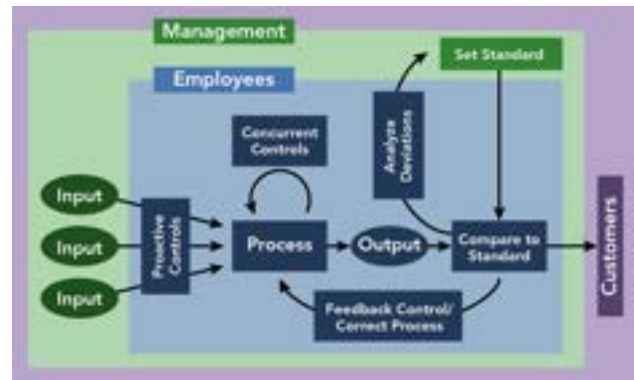
Process (computing)

In computing, a process is the instance of a computer program that is being executed by one or many threads. There are many different process models, some of which are light weight, but almost all processes (even entire virtual machines) are rooted in an operating system (OS) process which comprises the program code, assigned system resources, physical and logical access permissions, and data structures to initiate, control and coordinate execution activity. Depending on the OS, a process may be made up of multiple threads of execution that execute instructions concurrently.While a computer program is a passive collection of instructions typically stored in a file on disk, a process is the execution of those instructions after being loaded from the disk into memory. Several processes may be associated with the same program; for example, opening up several instances of the same program often results in more than one process being executed.
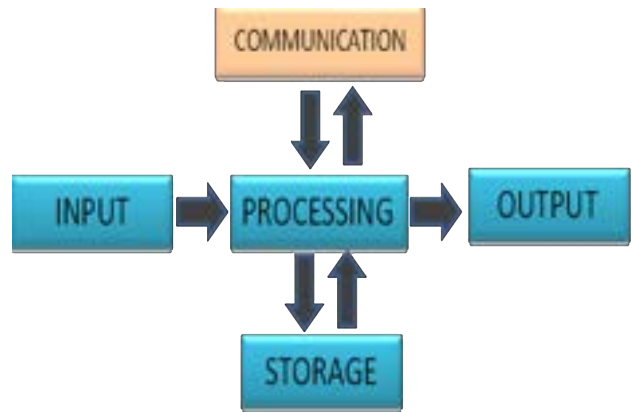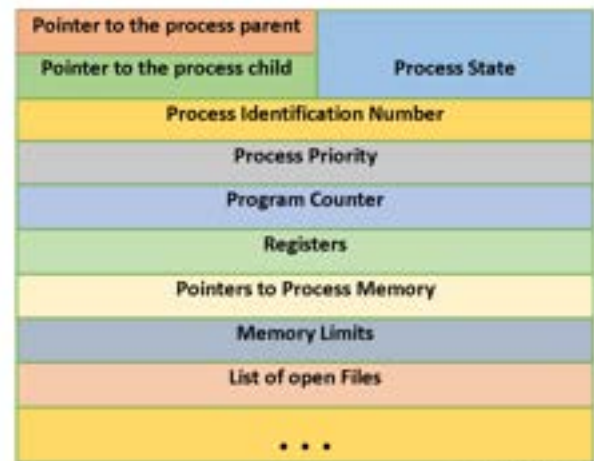
Process control

An industrial process control in continuous production processes is a discipline that uses industrial control systems to achieve a production level of consistency, economy and safety which could not be achieved purely by human manual control. It is implemented widely in industries such as automotive, mining, dredging, oil refining, pulp and paper manufacturing, chemical processing and power generating plants.There is a wide range of size, type and complexity, but it enables a small number of operators to manage complex processes to a high degree of consistency. The development of large industrial process control systems was instrumental in enabling the design of large high volume and complex processes, which could not be otherwise economically or safely operated.The applications can range from controlling the temperature and level of a single process vessel, to a complete chemical processing plant with several thousand control loops.

Process control block

A process control block (PCB) is a data structure used by computer operating systems to store all the information about a

| Pointer to the process parent	Process State
Pointer to the process child	
Process Identification Number	
Process Priority	
Program Counter	
Registers	
Pointers to Process Memory	
Memory Limits	
List of open Files	
. . .	

Process identifier

In computing, the process identifier (a.k.a. process ID or PID) is a number used by most operating system kernels?such as those of Unix, macOS and Windows?to uniquely identify an active process. This number may be used as a parameter in various function calls, allowing processes to be manipulated, such as adjusting the process's priority or killing it altogether.
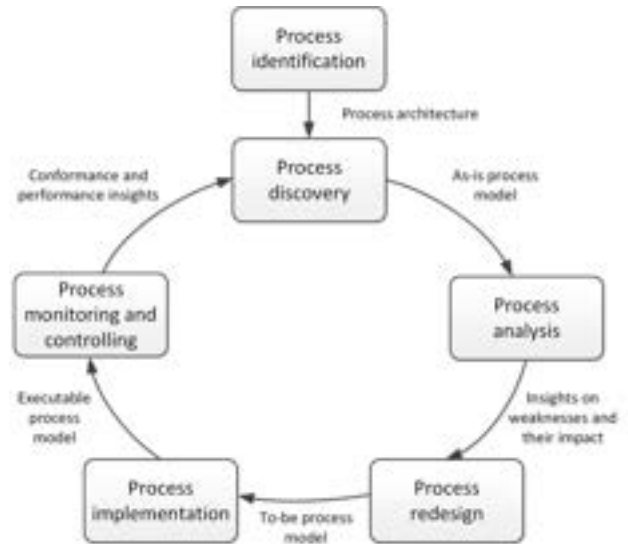
Process management (computing)

A process is a program in execution, and an integral part of any modern-day operating system (OS). The OS must allocate resources to processes, enable processes to share and exchange information, protect the resources of each process from other processes and enable synchronization among processes. To meet these requirements, the OS must maintain a data structure for each process, which describes the state and resource ownership of that process, and which enables the OS to exert control over each process.
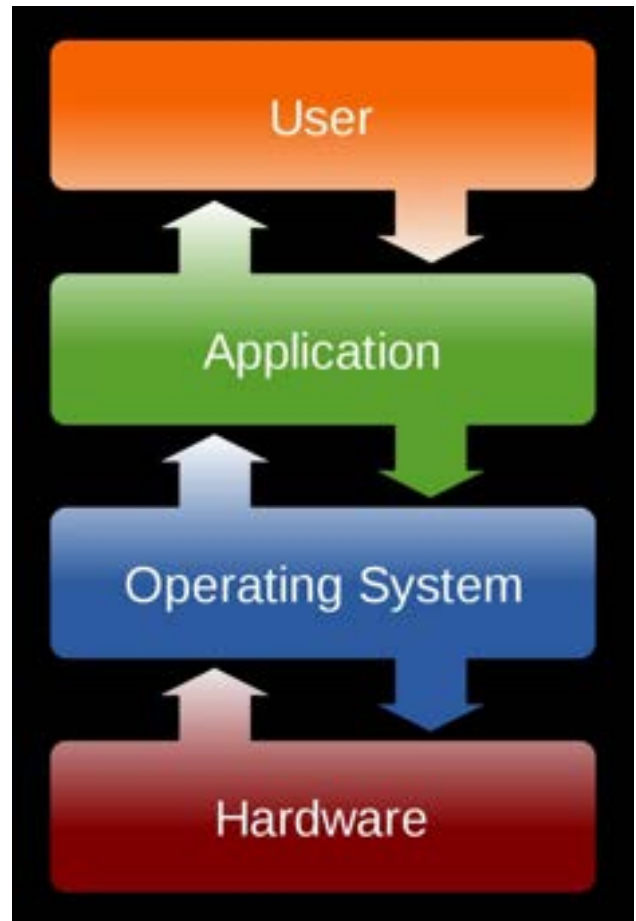
Processor register

A processor register is a quickly accessible location available to a computer's processor. Registers usually consist of a small amount of fast storage, although some registers have specific hardware functions, and may be read-only or write-only. In computer architecture, registers are typically addressed by mechanisms other than main memory, but may in some cases be assigned a memory address e.g. DEC PDP-10, ICT 1900.Almost all computers, whether load/store architecture or not, load data from a larger memory into registers where it is used for arithmetic operations and is manipulated or tested by machine instructions. Manipulated data is then often stored back to main memory, either by the same instruction or by a subsequent one. Modern processors use either static or dynamic RAM as main memory, with the latter usually accessed via one or more cache levels.
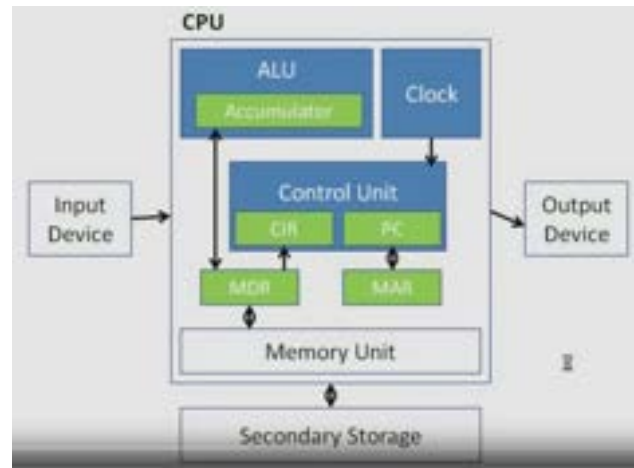
Program counter

The program counter (PC), commonly called the instruction pointer (IP) in Intel x86 and Itanium microprocessors, and sometimes called the instruction address register (IAR), the instruction counter, or just part of the instruction sequencer, is a processor register that indicates where a computer is in its program sequence.Usually, the PC is incremented after fetching an instruction, and holds the memory address of ("points to") the next instruction that would be executed.Processors usually fetch instructions sequentially from memory, but control transfer instructions change the sequence by placing a new value in the PC. These include branches (sometimes called jumps), subroutine calls, and returns. A transfer that is conditional on the truth of some assertion lets the computer follow a different sequence under different conditions.
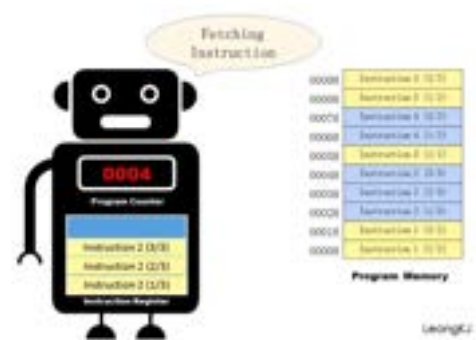
Programmable Interrupt Controller

In computing, a programmable interrupt controller (PIC) is an integrated circuit that helps a microprocessor (or CPU) handle interrupt requests (IRQ) coming from multiple different sources (like external I/O devices) which may occur simultaneously. It helps prioritize IRQs so that the CPU switches execution to the most appropriate interrupt handler (ISR) after the PIC assesses the IRQ's relative priorities. Common modes of interrupt priority include hard priorities, rotating priorities, and cascading priorities. PICs often allow mapping input to outputs in a configurable way. On the PC architecture PIC are typically embedded into a southbridge chip whose internal architecture is defined by the chipset vendor's standards.
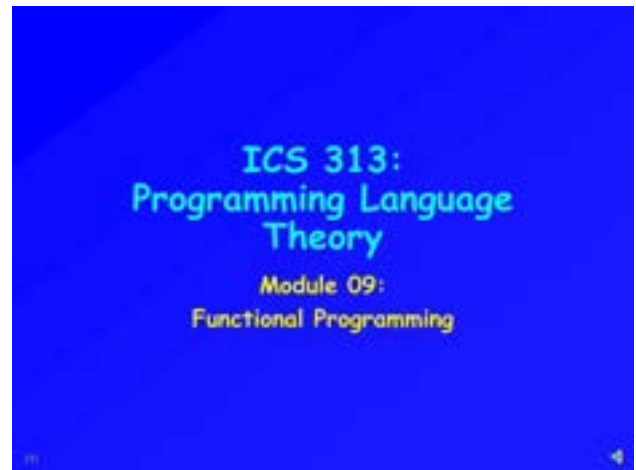
Programming language

A programming language is a system of notation for writing computer programs. Most programming languages are text-based formal languages, but they may also be graphical. They are a kind of computer language.

Programming language theory

Programming language theory (PLT) is a branch of computer science that deals with the design, implementation, analysis, characterization, and classification of formal languages known as programming languages. Programming language theory is closely related to other fields including mathematics, software engineering, and linguistics. There are a number of academic conferences and journals in the area.

ICS 313:
Programming Language
Theory

Module 09:
Functional Programming

Programming paradigm

Programming paradigms are a way to classify programming languages based on their features. Languages can be classified into multiple paradigms.

Programming team

A programming team is a team of people who develop or maintain computer software. They may be organised in numerous ways, but the egoless programming team and chief programmer team have been common structures.

Programming tool

A programming tool or software development tool is a computer program that software developers use to create, debug, maintain, or otherwise support other programs and applications. The term usually refers to relatively simple programs, that can be combined to accomplish a task, much as one might use multiple hands to fix a physical object. The most basic tools are a source code editor and a compiler or interpreter, which are used ubiquitously and continuously. Other tools are used more or less depending on the language, development methodology, and individual engineer, often used for a discrete task, like a debugger or profiler. Tools may be discrete programs, executed separately ? often from the command line ? or may be parts of a single large program, called an integrated development environment (IDE). In many cases, particularly for simpler use, simple ad hoc techniques are used instead of a tool, such as print debugging instead of using a debugger, manual timing (of overall program or section of code) instead of a profiler, or tracking bugs in a text file or spreadsheet instead of a bug tracking system.

Proprietary software

Proprietary software is software that is deemed within the free and open-source software community to be non-free because its creator, publisher, or other rightsholder or rightsholder partner exercises a legal monopoly by modern copyright and intellectual property law to exclude the recipient from freely sharing the software or modifying it, and?in some cases, as is the case with some patent-encumbered and EULA-bound software?from making use of the software on their own, thereby restricting their freedoms. It is often contrasted with open-source or free software. For this reason, it is also known as non-free software or closed-source software.

Protected mode

In computing, protected mode, also called protected virtual address mode, is an operational mode of x86-compatible central processing units (CPUs). It allows system software to use features such as virtual memory, paging and safe multi-tasking designed to increase an operating system's control over application software.When a processor that supports x86 protected mode is powered on, it begins executing instructions in real mode, in order to maintain backward compatibility with earlier x86 processors. Protected mode may only be entered after the system software sets up one descriptor table and enables the Protection Enable (PE) bit in the control register 0 (CR0).Protected mode was first added to the x86 architecture in 1982, with the release of Intel's 80286 (286) processor, and later extended with the release of the 80386 (386) in 1985. Due to the enhancements added by protected mode, it has become widely adopted and has become the foundation for all subsequent enhancements to the x86 architecture, although many of those enhancements, such as added instructions and new registers, also brought benefits to the real mode.

Protection ring

In computer science, hierarchical protection domains, often called protection rings, are mechanisms to protect data and functionality from faults (by improving fault tolerance) and malicious behavior (by providing computer security).

Punched tape

Punched tape or perforated paper tape is a
form of data storage that consists of a long
strip of paper in which holes are punched. It
developed from and was subsequently used
alongside punched cards, differing in that
the tape is continuous.

QNX

QNX (or) is a commercial Unix-like real-time operating system, aimed primarily at the embedded systems market. QNX was one of the first commercially successful microkernel operating systems.The product was originally developed in the early 1980s by Canadian company Quantum Software Systems, later renamed QNX Software Systems.

Qian Xuesen

Qian Xuesen, or Hsue-Shen Tsien (Chinese: ???; 11 December 1911 ? 31 October 2009), was a Chinese aerospace engineer, astrodynamics scientist, physicist, and cyberneticist who made significant contributions to the field of aerodynamics and established engineering cybernetics.
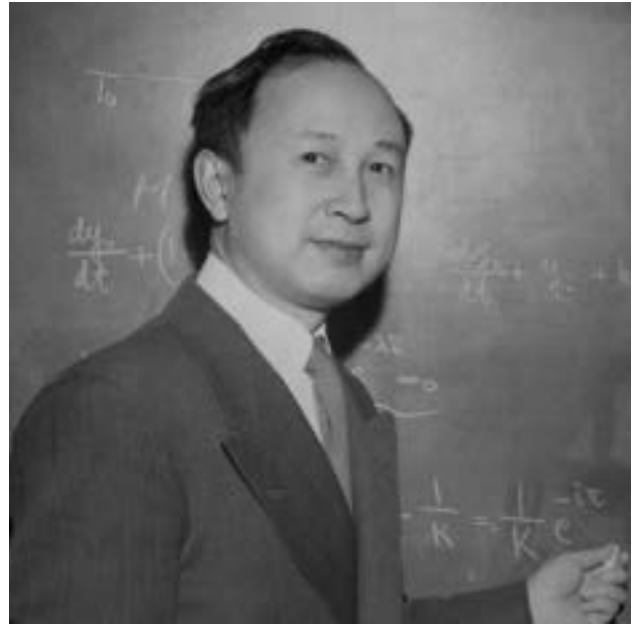
Qt (software)

Qt (pronounced "cute") is cross-platform software for creating graphical user interfaces as well as cross-platform applications that run on various software and hardware platforms such as Linux, Windows, macOS, Android or embedded systems with little or no change in the underlying codebase while still being a native application with native capabilities and speed.

RISC OS

RISC OS is a computer operating system originally designed by Acorn Computers Ltd in Cambridge, England. First released in 1987, it was designed to run on the ARM chipset, which Acorn had designed concurrently for use in its new line of Archimedes personal computers. RISC OS takes its name from the reduced instruction set computer (RISC) architecture it supports.

RSX-11

RSX-11 is a discontinued family of multi-user real-time operating systems for PDP-11 computers created by Digital Equipment Corporation. In widespread use through the late 1970s and early 1980s, RSX-11 was influential in the development of later operating systems such as VMS and Windows NT.

RT-11

RT-11 (Real-time 11) is a discontinued
small, low-end, single-user real-time
operating system for the full line of Digital
Equipment Corporation PDP-11 16-bit
computers. RT-11 was first implemented in
1970. It was widely used for real-time
computing systems, process control, and
data acquisition across all PDP-11s. It was
also used for low-cost general-use
computing.

RTLinux

RTLinux is a hard realtime real-time operating system (RTOS) microkernel that runs the entire Linux operating system as a fully preemptive process. The hard real-time property makes it possible to control robots, data acquisition systems, manufacturing plants, and other time-sensitive instruments and machines from RTLinux applications. The design was patented. Despite the similar name, it is not related to the Real-Time Linux project of the Linux Foundation.RTLinux was developed by Victor Yodaiken, Michael Barabanov, Cort Dougan and others at the New Mexico Institute of Mining and Technology and then as a commercial product at FSMLabs. Wind River Systems acquired FSMLabs embedded technology in February 2007 and made a version available as Wind River Real-Time Core for Wind River Linux. As of August 2011, Wind River has discontinued the Wind River Real-Time Core product line, effectively ending commercial support for the RTLinux product.

Radhika Nagpal

Radhika Nagpal is an American computer scientist and researcher in the fields of self-organising computer systems, biologically-inspired robotics, and biological multi-agent systems. She is the Fred Kavli Professor of Computer Science at Harvard University and the Harvard School of Engineering and Applied Sciences. She is also a Core Faculty Member of the Harvard Wyss Institute for Biologically Inspired Engineering. In 2017, Nagpal co-founded a robotics company under the name of Root Robotics. This educational company works to create many different opportunities for those unable to code to learn how.

Random access memory

Random-access memory (RAM;) is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code. A random-access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory, in contrast with other direct-access data storage media (such as hard disks, CD-RWs, DVD-RWs and the older magnetic tapes and drum memory), where the time required to read and write data items varies significantly depending on their physical locations on the recording medium, due to mechanical limitations such as media rotation speeds and arm movement.

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Randomized algorithm

A randomized algorithm is an algorithm that employs a degree of randomness as part of its logic or procedure. The algorithm typically uses uniformly random bits as an auxiliary input to guide its behavior, in the hope of achieving good performance in the "average case" over all possible choices of random determined by the random bits; thus either the running time, or the output (or both) are random variables.

(a) Deterministic algorithm structure

(b) Randomized algorithm structure
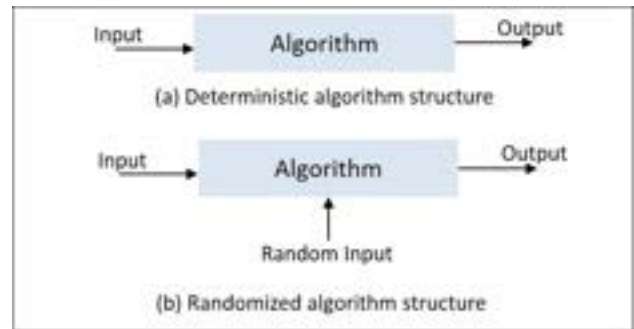
ReactOS

ReactOS is a free and open-source operating system for amd64/i686 personal computers intended to be binary-compatible with computer programs and device drivers made for Windows Server 2003 and later versions of Windows. ReactOS has been noted as a potential open-source drop-in replacement for Windows and for its information on undocumented Windows APIs.ReactOS has been in development since 1996. As of February 2022, it is still considered feature-incomplete alpha software, and is therefore recommended by the developers only for evaluation and testing purposes. However, many Windows applications are currently working, such as Adobe Reader 9.3, GIMP 2.6, and LibreOffice 5.4.ReactOS is primarily written in C, with some elements, such as ReactOS File Explorer, written in C++. The project partially implements Windows API functionality and has been ported to the AMD64 processor architecture. ReactOS, as part of the FOSS ecosystem, re-uses and collaborates with many other FOSS projects, most notably the Wine project, which presents a Windows compatibility layer for Unix-like operating systems.
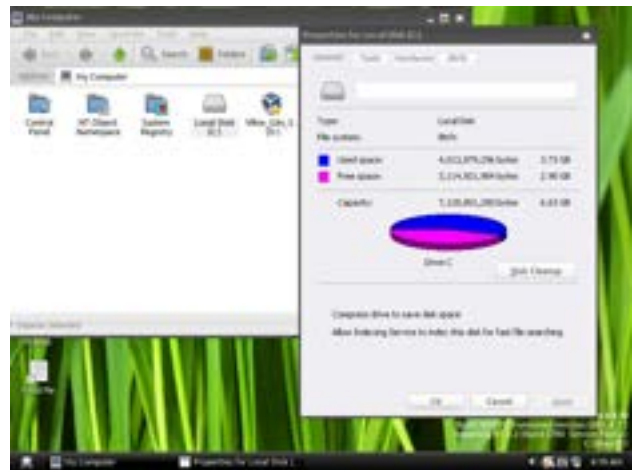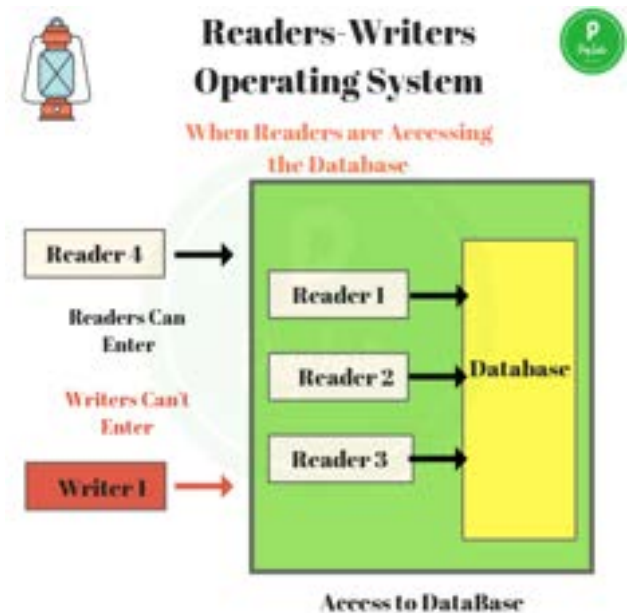
Read-only memory

Read-only memory (ROM) is a type of non-volatile memory used in computers and other electronic devices. Data stored in ROM cannot be electronically modified after the manufacture of the memory device. Read-only memory is useful for storing software that is rarely changed during the life of the system, also known as firmware. Software applications (like video games) for programmable devices can be distributed as plug-in cartridges containing ROM.

Readers?writers problem

In computer science, the readers?writers problems are examples of a common computing problem in concurrency. There are at least three variations of the problems, which deal with situations in which many concurrent threads of execution try to access the same shared resource at one time.

Readers-Writers Operating System

When Readers are Accessing the Database

Readers Can Enter

Writers Can't Enter

Access to DataBase

Real-time computing

Real-time computing (RTC) is the computer science term for hardware and software systems subject to a "real-time constraint", for example from event to system response. Real-time programs must guarantee response within specified time constraints, often referred to as "deadlines".Real-time responses are often understood to be in the order of milliseconds, and sometimes microseconds. A system not specified as operating in real time cannot usually guarantee a response within any timeframe, although typical or expected response times may be given. Real-time processing fails if not completed within a specified deadline relative to an event; deadlines must always be met, regardless of system load.
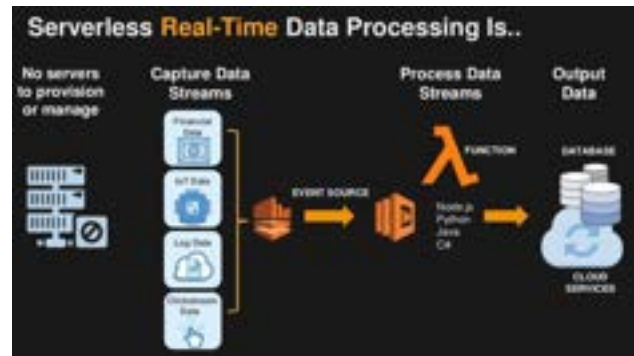
Real-time operating system

A real-time operating system (RTOS) is an operating system (OS) for real-time computing applications that processes data and events that have critically defined time constraints. An RTOS is distinct from a time-sharing operating system, such as Unix, which manages the sharing of system resources with a scheduler, data buffers, or fixed task prioritization in a multitasking or multiprogramming environment. Processing time requirements need to be fully understood and bound rather than just kept as a minimum. All processing must occur within the defined constraints. Real-time operating systems are event-driven and preemptive, meaning the OS can monitor the relevant priority of competing tasks, and make changes to the task priority. Event-driven systems switch between tasks based on their priorities, while time-sharing systems switch the task based on clock interrupts.
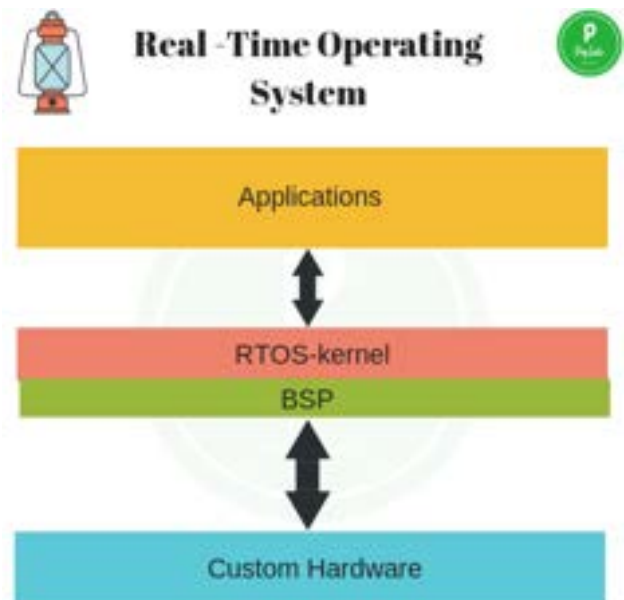
Red Hat Enterprise Linux

Red Hat Enterprise Linux (RHEL) is a commercial open-source Linux distribution developed by Red Hat for the commercial market. Red Hat Enterprise Linux is released in server versions for x86-64, Power ISA, ARM64, and IBM Z and a desktop version for x86-64. Fedora Linux serves as its upstream source. All of Red Hat's official support and training, together with the Red Hat Certification Program, focuses on the Red Hat Enterprise Linux platform.

Reinforcement learning

Reinforcement learning (RL) is an area of machine learning concerned with how intelligent agents ought to take actions in an environment in order to maximize the notion of cumulative reward. Reinforcement learning is one of three basic machine learning paradigms, alongside supervised learning and unsupervised learning.
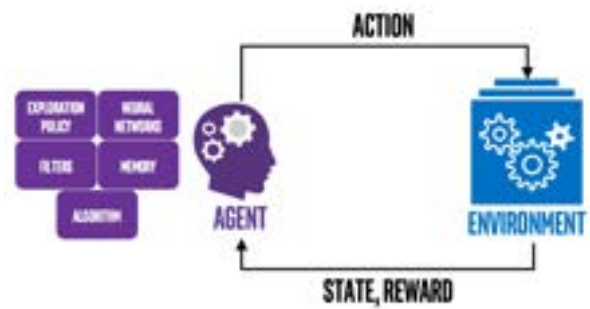
Reiser4

Reiser4 is a computer file system, successor to the ReiserFS file system, developed from scratch by Namesys and sponsored by DARPA as well as Linspire. Reiser4 was named after its former lead developer Hans Reiser. As of 2021, the Reiser4 patch set is still being maintained, but according to Phoronix, it is unlikely to be merged into mainline Linux without corporate backing.

ReiserFS

ReiserFS is a general-purpose, journaling file system initially designed and implemented by a team at Namesys led by Hans Reiser and licensed under GPLv2. Introduced in version 2.4.1 of the Linux kernel, it was the first journaling file system to be included in the standard kernel. ReiserFS was the default file system in Novell's SUSE Linux Enterprise until Novell decided to move to ext3 on October 12, 2006, for future releases.Namesys considered ReiserFS version 3.6 which introduced a new on-disk format allowing bigger filesizes, now occasionally referred to as Reiser3, as stable and feature-complete and, with the exception of security updates and critical bug fixes, ceased development on it to concentrate on its successor, Reiser4. Namesys went out of business in 2008 after Reiser's conviction for murder. The product is now maintained as open source by volunteers. The reiserfsprogs 3.6.27 were released on 25 July 2017.ReiserFS is currently supported on Linux without quota support. It has been discussed for removal from the Linux kernel since early 2022 due to a lack of maintenance upstream, and technical issues inherent to the filesystem, such as the fact it suffers from the year 2038 problem; it was deprecated in Linux 5.18, with removal planned for 2025.

Remote procedure call

In distributed computing, a remote procedure call (RPC) is when a computer program causes a procedure (subroutine) to execute in a different address space (commonly on another computer on a shared network), which is coded as if it were a normal (local) procedure call, without the programmer explicitly coding the details for the remote interaction. That is, the programmer writes essentially the same code whether the subroutine is local to the executing program, or remote. This is a form of client?server interaction (caller is client, executor is server), typically implemented via a request?response message-passing system. In the object-oriented programming paradigm, RPCs are represented by remote method invocation (RMI). The RPC model implies a level of location transparency, namely that calling procedures are largely the same whether they are local or remote, but usually, they are not identical, so local calls can be distinguished from remote calls. Remote calls are usually orders of magnitude slower and less reliable than local calls, so distinguishing them is important.


Implementation of RPC mechanism
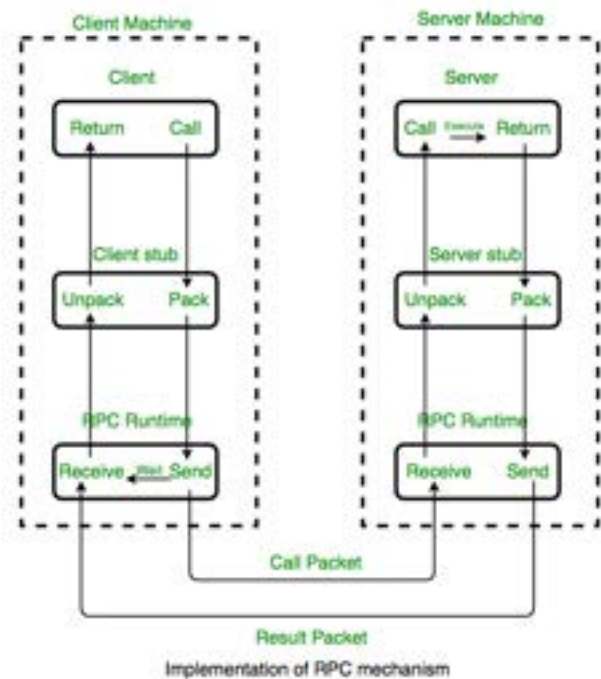
Rendering (computer graphics)

Rendering or image synthesis is the process of generating a photorealistic or non-photorealistic image from a 2D or 3D model by means of a computer program. The resulting image is referred to as the render. Multiple models can be defined in a scene file containing objects in a strictly defined language or data structure. The scene file contains geometry, viewpoint, texture, lighting, and shading information describing the virtual scene. The data contained in the scene file is then passed to a rendering program to be processed and output to a digital image or raster graphics image file. The term "rendering" is analogous to the concept of an artist's impression of a scene. The term "rendering" is also used to describe the process of calculating effects in a video editing program to produce the final video output.

Requirements analysis

In systems engineering and software engineering, requirements analysis focuses on the tasks that determine the needs or conditions to meet the new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements.Requirements analysis is critical to the success or failure of a systems or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design.
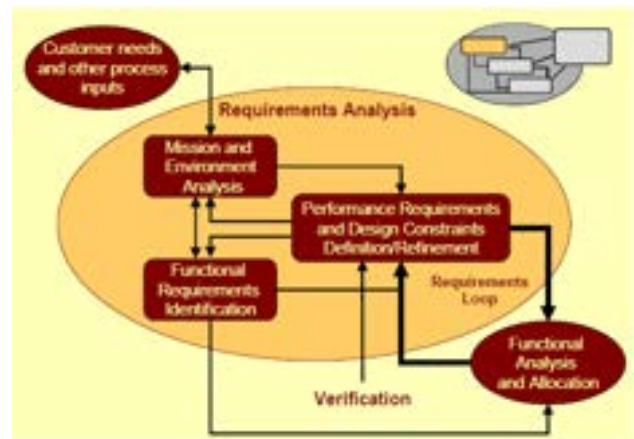
Resident monitor

In computing, a resident monitor is a type of system software program that was used in many early computers from the 1950s to 1970s. It can be considered a precursor to the operating system. The name is derived from a program which is always present in the computer's memory, thus being "resident". Because memory was very limited on those systems, the resident monitor was often little more than a stub that would gain control at the end of a job and load a non-resident portion to perform required job cleanup and setup tasks.

Richard E. Bellman

Richard Ernest Bellman (August 26, 1920 ?
March 19, 1984) was an American applied
mathematician, who introduced dynamic
programming in 1953, and made important
contributions in other fields of mathematics,
such as biomathematics. He founded the
leading biomathematical journal
Mathematical Biosciences.

Richard Stallman

Richard Matthew Stallman (; born March 16, 1953), also known by his initials, rms, is an American free software movement activist and programmer. He campaigns for software to be distributed in such a manner that its users have the freedom to use, study, distribute, and modify that software. Software that ensures these freedoms is termed free software. Stallman launched the GNU Project, founded the Free Software Foundation (FSF) in October 1985, developed the GNU Compiler Collection and GNU Emacs, and wrote the GNU General Public License.

Round-robin scheduling

Round-robin (RR) is one of the algorithms employed by process and network schedulers in computing.

Round-Robin Scheduling

Process	Burst Time
P_1	53
P_2	17
P_3	68
P_4	24

The Gantt chart is:

P_1	P_2	P_3	P_4	P_1	P_3	P_4	P_1	P_3	P_3

0   20   37   57   77   97   117   121   134   154   162
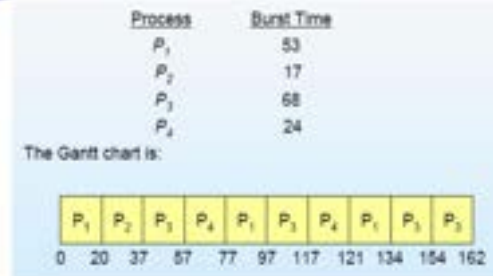
Rump kernel

The NetBSD rump kernel is the first implementation of the "anykernel" concept where drivers either can be compiled into or run in the monolithic kernel or in user space on top of a light-weight kernel.
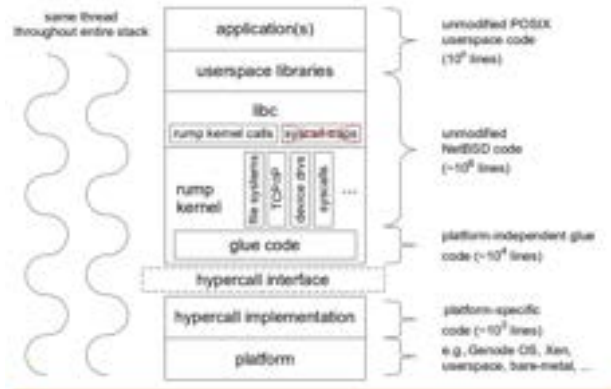
# Runtime library

In computer programming, a runtime library is a set of low-level routines used by a compiler to invoke some of the behaviors of a runtime environment, by inserting calls to the runtime library into compiled executable binary. The runtime environment implements the execution model, built-in functions, and other fundamental behaviors of a programming language. During execution (run time) of that computer program, execution of those calls to the runtime library cause communication between the executable binary and the runtime environment. A runtime library often includes built-in functions for memory management or exception handling. Therefore, a runtime library is always specific to the platform and compiler.

Russell L. Ackoff

Russell Lincoln Ackoff (February 12, 1919 ? October 29, 2009) was an American organizational theorist, consultant, and Anheuser-Busch Professor Emeritus of Management Science at the Wharton School, University of Pennsylvania. Ackoff was a pioneer in the field of operations research, systems thinking and management science.
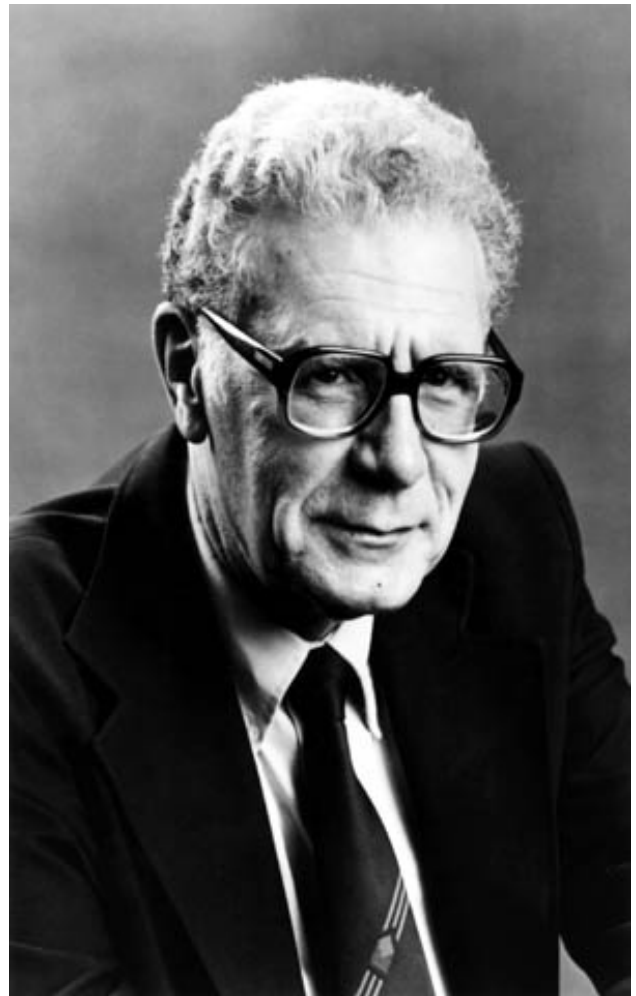
Ruzena Bajcsy

Ruzena Bajcsy (born 1933 in Bratislava, now Slovakia) is an American engineer and computer scientist who specializes in robotics. She is professor of electrical engineering and computer science at the University of California, Berkeley, where she is also director emerita of CITRIS (the Center for Information Technology Research in the Interest of Society).

S2CID (identifier)

Semantic Scholar is an artificial intelligence?
powered research tool for scientific
literature developed at the Allen Institute for
AI and publicly released in November 2015.
It uses advances in natural language
processing to provide summaries for
scholarly papers. The Semantic Scholar
team is actively researching the use of
artificial-intelligence in natural language
processing, machine learning, Human-
Computer interaction, and information
retrieval.Semantic Scholar began as a
database surrounding the topics of
computer science, geoscience, and
neuroscience. However, in 2017 the system
began including biomedical literature in its
corpus. As of September 2022, they now
include over 200 million publications from all
fields of science.

SCOPE (software)

SCOPE (Supervisory Control of Program Execution) is a series of Control Data Corporation operating systems developed in the 1960s.

# SCSI RDMA Protocol

In computing the SCSI RDMA Protocol (SRP) is a protocol that allows one computer to access SCSI devices attached to another computer via remote direct memory access (RDMA). The SRP protocol is also known as the SCSI Remote Protocol. The use of RDMA makes higher throughput and lower latency possible than what is generally available through e.g. the TCP/IP communication protocol.

SHARE Operating System

The SHARE Operating System (SOS) is an operating system introduced in 1959 by the SHARE user group. It is an improvement on the General Motors GM-NAA I/O operating system, the first operating system for the IBM 704. The main objective was to improve the sharing of programs.
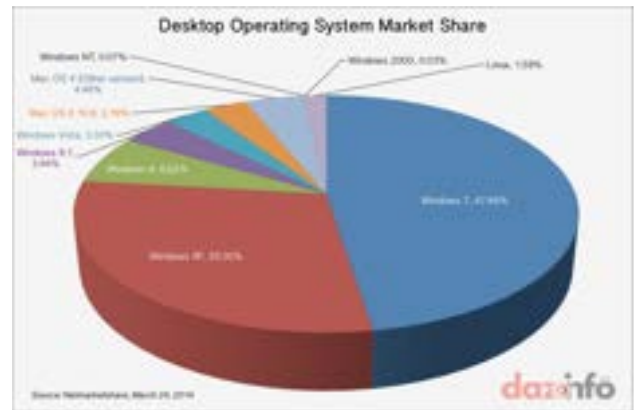
SIGBUS

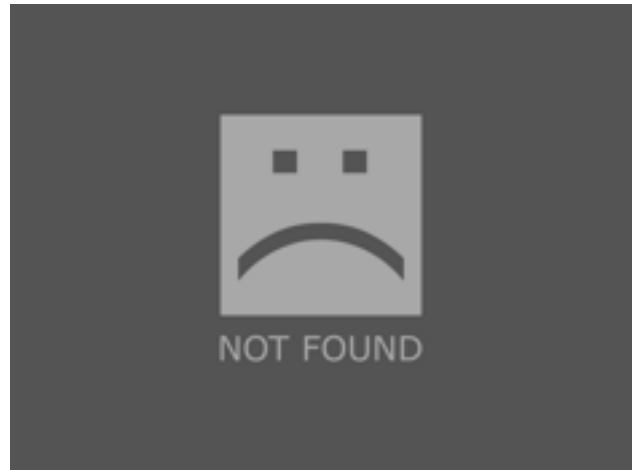In computing, a bus error is a fault raised by hardware, notifying an operating system (OS) that a process is trying to access memory that the CPU cannot physically address: an invalid address for the address bus, hence the name. In modern use on most architectures these are much rarer than segmentation faults, which occur primarily due to memory access violations: problems in the logical address or permissions.

SIGSEGV

In computing, a segmentation fault (often shortened to segfault) or access violation is a fault, or failure condition, raised by hardware with memory protection, notifying an operating system (OS) the software has attempted to access a restricted area of memory (a memory access violation). On standard x86 computers, this is a form of general protection fault. The operating system kernel will, in response, usually perform some corrective action, generally passing the fault on to the offending process by sending the process a signal. Processes can in some cases install a custom signal handler, allowing them to recover on their own, but otherwise the OS default signal handler is used, generally causing abnormal termination of the process (a program crash), and sometimes a core dump.

SPARC

SPARC (Scalable Processor Architecture) is a reduced instruction set computer (RISC) instruction set architecture originally developed by Sun Microsystems. Its design was strongly influenced by the experimental Berkeley RISC system developed in the early 1980s. First developed in 1986 and released in 1987, SPARC was one of the most successful early commercial RISC systems, and its success led to the introduction of similar RISC designs from many vendors through the 1980s and 1990s.

Sabre (computer system)

Sabre Global Distribution System, owned by Sabre Corporation, is a travel reservation system used by travel agents and companies to search, price, book, and ticket travel services provided by airlines, hotels, car rental companies, rail providers and tour

Samba (software)

Samba is a free software re-implementation of the SMB networking protocol, and was originally developed by Andrew Tridgell. Samba provides file and print services for various Microsoft Windows clients and can integrate with a Microsoft Windows Server domain, either as a Domain Controller (DC) or as a domain member. As of version 4, it supports Active Directory and Microsoft Windows NT domains.

Sandbox (computer security)

In computer security, a sandbox is a security mechanism for separating running programs, usually in an effort to mitigate system failures and/or software vulnerabilities from spreading. The isolation metaphor is taken from the idea of children who do not play well together, so each is given their own sandbox to play in alone. It is often used to execute untested or untrusted programs or code, possibly from unverified or untrusted third parties, suppliers, users or websites, without risking harm to the host machine or operating system. A sandbox typically provides a tightly controlled set of resources for guest programs to run in, such as storage and memory scratch space. Network access, the ability to inspect the host system, or read from input devices are usually disallowed or heavily restricted.

With and Without a Sandbox
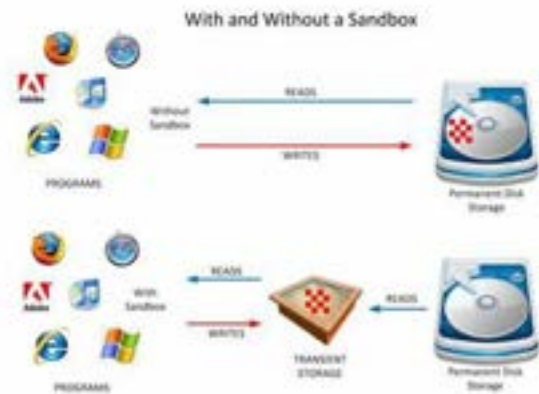
Scheduler (computing)

In computing, scheduling is the action of assigning resources to perform tasks. The resources may be processors, network links or expansion cards. The tasks may be threads, processes or data flows.

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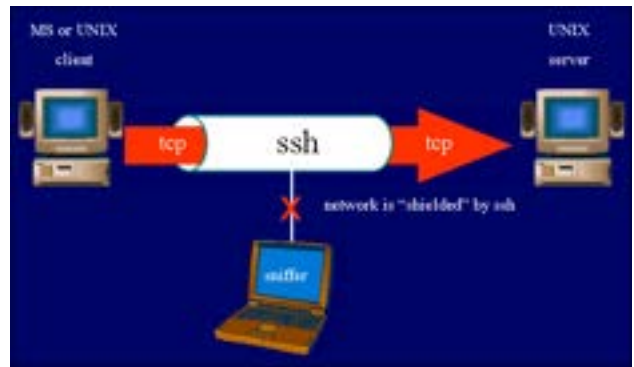
Secure Shell

The Secure Shell Protocol (SSH) is a cryptographic network protocol for operating network services securely over an unsecured network. Its most notable applications are remote login and command-line execution.

Security service (telecommunication)

Security service is a service, provided by a layer of communicating open systems, which ensures adequate security of the systems or of data transfers as defined by ITU-T X.800 Recommendation.

Security-focused operating system

This is a list of operating systems specifically focused on security. Operating systems for general-purpose usage may be secure without having a specific focus on security.Similar concepts include security-evaluated operating systems that have achieved certification from an auditing organization, and trusted operating systems that provide sufficient support for multilevel security and evidence of correctness to meet a particular set of requirements.
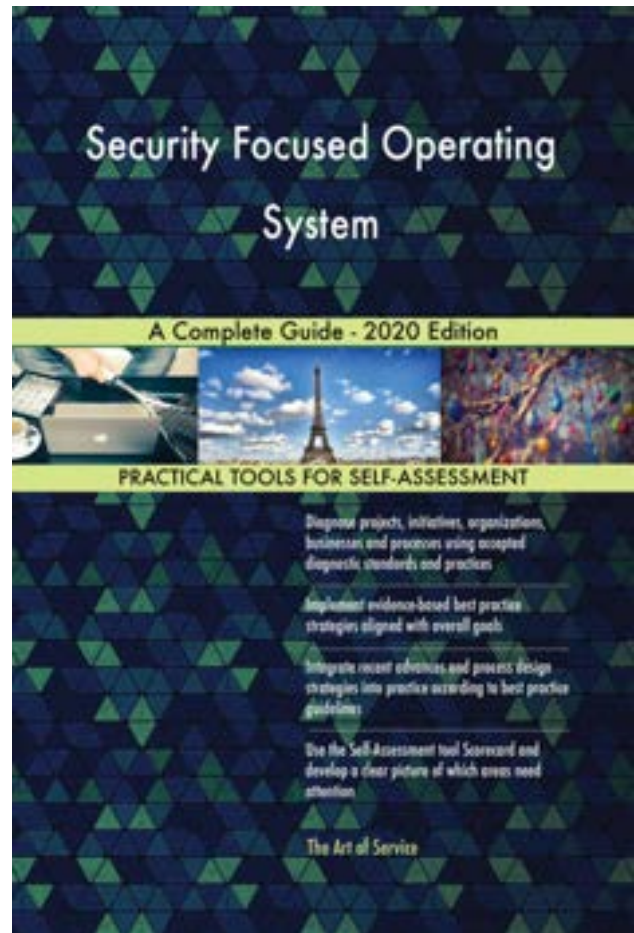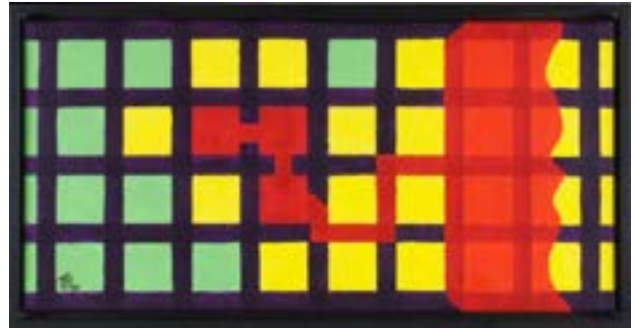
Segmentation fault

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Semantics (computer science)

In programming language theory, semantics is the rigorous mathematical study of the meaning of programming languages. Semantics assigns computational meaning to valid strings in a programming language syntax.

Sensory system

The sensory nervous system is a part of the nervous system responsible for processing sensory information. A sensory system consists of sensory neurons (including the sensory receptor cells), neural pathways, and parts of the brain involved in sensory perception and [interoception]]. Commonly recognized sensory systems are those for vision, hearing, touch, taste, smell, balance and visceral sensation. Sense organs are transducers that convert data from the outer physical world to the realm of the mind where people interpret the information, creating their perception of the world around them.The receptive field is the area of the body or environment to which a receptor organ and receptor cells respond. For instance, the part of the world an eye can see, is its receptive field; the light that each rod or cone can see, is its receptive field. Receptive fields have been identified for the visual system, auditory system and somatosensory system.
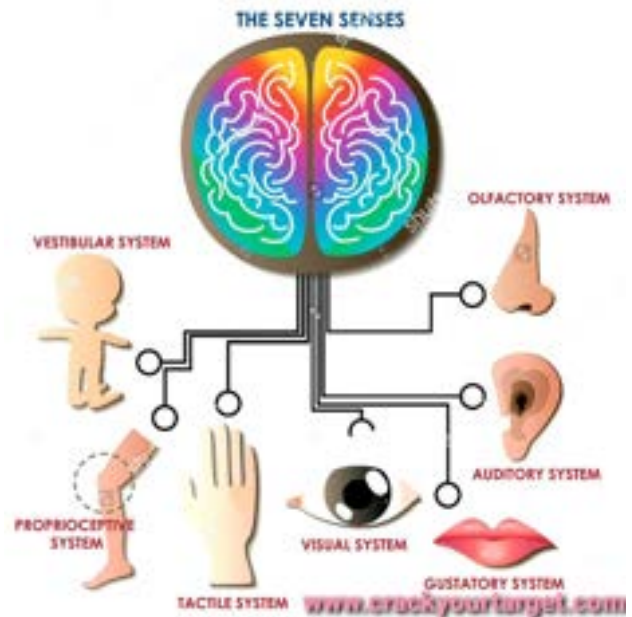
Server (computing)

In computing, a server is a piece of computer hardware or software (computer program) that provides functionality for other programs or devices, called "clients". This architecture is called the client?server model. Servers can provide various functionalities, often called "services", such as sharing data or resources among multiple clients, or performing computation for a client. A single server can serve multiple clients, and a single client can use multiple servers. A client process may run on the same device or may connect over a network to a server on a different device. Typical servers are database servers, file servers, mail servers, print servers, web servers, game servers, and application servers.Client?server systems are usually most frequently implemented by (and often identified with) the request?response model: a client sends a request to the server, which performs some action and sends a response back to the client, typically with a result or acknowledgment. Designating a computer as "server-class hardware" implies that it is specialized for running servers on it. This often implies that it is more powerful and reliable than standard personal computers, but alternatively, large computing clusters may be composed of many relatively simple, replaceable server components.

Server message block

Server Message Block (SMB) is a communication protocol originally developed in 1983 by Barry A. Feigenbaum at IBM and intended to provide shared access to files and printers across nodes on a network of systems running IBM's OS/2. It also provides an authenticated inter-process communication (IPC) mechanism. In 1987, Microsoft and 3Com implemented SMB in LAN Manager for OS/2, at which time SMB used the NetBIOS service atop the NetBIOS Frames protocol as its underlying transport. Later, Microsoft implemented SMB in Windows NT 3.1 and has been updating it ever since, adapting it to work with newer underlying transports: TCP/IP and NetBT. SMB implementation consists of two vaguely named Windows services: "Server" (ID: LanmanServer) and "Workstation" (ID: LanmanWorkstation). It uses NTLM or Kerberos protocols for user authentication.
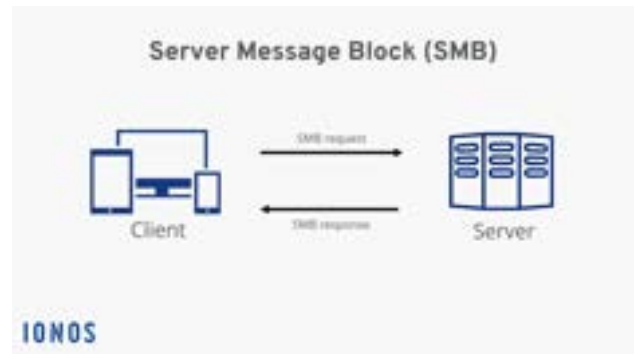
Shell (computing)

In computing, a shell is a computer program that exposes an operating system's services to a human user or other programs. In general, operating system shells use either a command-line interface (CLI) or graphical user interface (GUI), depending on a computer's role and particular operation. It is named a shell because it is the outermost layer around the operating system.Command-line shells require the user to be familiar with commands and their calling syntax, and to understand concepts about the shell-specific scripting language (for example, bash), while graphical shells place a low burden on beginning computer users and are characterized as being easy to use, yet most GUI-enabled operating systems also provide CLI shells, normally for performing advanced tasks.

Grid Computing
Environment Shell

By Mehmet Nacar

Las Vegas, June 2003

Shortest job next

Shortest job next (SJN), also known as shortest job first (SJF) or shortest process next (SPN), is a scheduling policy that selects for execution the waiting process with the smallest execution time. SJN is a non-preemptive algorithm. Shortest remaining time is a preemptive variant of SJN.
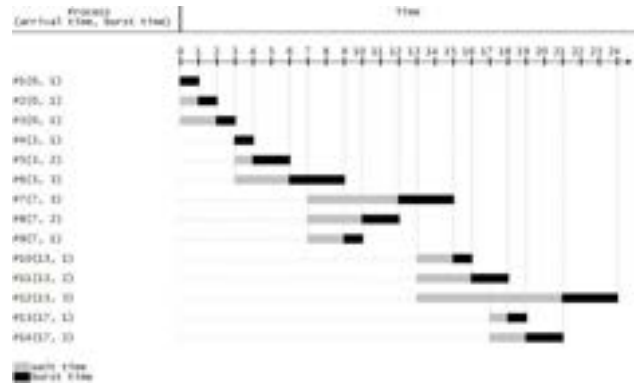
Signal (IPC)

Signals are standardized messages sent to a running program to trigger specific behavior, such as quitting or error handling. They are a limited form of inter-process communication (IPC), typically used in Unix, Unix-like, and other POSIX-compliant operating systems.

Single address space operating system

In computer science, a single address space operating system (or SASOS) is an operating system that provides only one globally shared address space for all processes. In a single address space operating system, numerically identical (virtual memory) logical addresses in different processes all refer to exactly the same byte of data.Single address-space operating systems offer certain advantages. In a traditional OS with private per-process address space, memory protection is based on address space boundaries ("address space isolation"). Single address-space operating systems use a different approach for memory protection that is just as strong. One advantage is that the same virtual-to-physical map page table can be used with every process (and in some SASOS, the kernel as well). This makes context switches on a SASOS faster than on operating systems that must change the page table and flush the TLB caches on every context switch.

Single-board computer

A single-board computer (SBC) is a complete computer built on a single circuit board, with microprocessor(s), memory, input/output (I/O) and other features required of a functional computer. Single-board computers are commonly made as demonstration or development systems, for educational systems, or for use as embedded computer controllers. Many types of home computers or portable computers integrate all their functions onto a single printed circuit board.

Singularity (operating system)

Singularity is an experimental operating system developed by Microsoft Research between July 9, 2003, and February 7, 2015. It was designed as a high dependability OS in which the kernel, device drivers, and application software were all written in managed code. Internal security uses type safety instead of hardware memory protection.

Smartphone

A smartphone is a portable computer device that combines mobile telephone functions and computing functions into one unit. They are distinguished from older-design feature phones by their stronger hardware capabilities and extensive mobile operating systems, which facilitate wider software, access to the internet (including web browsing over mobile broadband), and multimedia functionality (including music, video, cameras, and gaming), alongside core phone functions such as voice calls and text messaging. Smartphones typically contain a number of metal?oxide? semiconductor (MOS) integrated circuit (IC) chips, include various sensors that can be leveraged by pre-installed and third-party software (such as a magnetometer, a proximity sensor, a barometer, a gyroscope, an accelerometer, and more), and support wireless communication protocols (such as Bluetooth, Wi-Fi, or satellite navigation). More recently, smartphone manufacturers have begun to integrate satellite messaging connectivity and satellite emergency services into devices for use in remote regions where there is no reliable cellular network.

Smartwatch

A smartwatch is a wearable computer in the form of a watch; modern smartwatches provide a local touchscreen interface for daily use, while an associated smartphone app provides management and telemetry, such as long-term biomonitoring. While early models could perform basic tasks, such as calculations, digital time telling, translations, and game-playing, smartwatches released since 2015 have more general functionality closer to smartphones, including mobile apps, a mobile operating system and WiFi/Bluetooth connectivity. Some smartwatches function as portable media players, with FM radio and playback of digital audio and video files via a Bluetooth headset. Some models, called watch phones (or phone watches), have mobile cellular functionality such as making telephone calls.While internal hardware varies, most have an electronic visual display, either backlit LCD or OLED. Some use transflective or electronic paper, to consume less power. They are usually powered by a rechargeable lithium-ion battery. Peripheral devices may include digital cameras, thermometers, accelerometers, pedometers, heart rate monitors, altimeters, barometers, compasses, GPS receivers, tiny speakers, and microSD cards, which are recognized as storage devices by many other kinds of computers.

Social computing

Social computing is an area of computer science that is concerned with the intersection of social behavior and computational systems. It is based on creating or recreating social conventions and social contexts through the use of software and technology. Thus, blogs, email, instant messaging, social network services, wikis, social bookmarking and other instances of what is often called social software illustrate ideas from social computing.

Social software

Social software, also known as social apps or social platform, include communications and interactive tools that are often based on the Internet. Communication tools typically handle the capturing, storing and presentation of communication, usually written but increasingly including audio and video as well. Interactive tools handle mediated interactions between a pair or group of users. They focus on establishing and maintaining a connection among users, facilitating the mechanics of conversation and talk. Social software generally refers to software that makes collaborative behaviour, the organisation and moulding of communities, self-expression, social interaction and feedback possible for individuals. Another element of the existing definition of social software is that it allows for the structured mediation of opinion between people, in a centralized or self-regulating manner. The most improved area for social software is that Web 2.0 applications can all promote cooperation between people and the creation of online communities more than ever before. The opportunities offered by social software are instant connection and the opportunity to learn.An additional defining feature of social software is that apart from interaction and collaboration, it aggregates the collective behaviour of its users, allowing not only crowds to learn from an individual but individuals to learn from the crowds as well. Hence, the interactions enabled by social software can be one-on-one, one-to-many, or many-to-many.

Social system

In sociology, a social system is the patterned network of relationships constituting a coherent whole that exist between individuals, groups, and institutions. It is the formal structure of role and status that can form in a small, stable group. An individual may belong to multiple social systems at once; examples of social systems include nuclear family units, communities, cities, nations, college campuses, corporations, and industries. The organization and definition of groups within a social system depend on various shared properties such as location, socioeconomic status, race, religion, societal function, or other distinguishable features.

Sociotechnical system

Sociotechnical systems (STS) in organizational development is an approach to complex organizational work design that recognizes the interaction between people and technology in workplaces. The term also refer to coherent systems of human relations, technical objects, and cybernetic processes that inhere to large, complex infrastructures. Social society, and its constituent substructures, qualify as complex sociotechnical systems.The term sociotechnical systems was coined by Eric Trist, Ken Bamforth and Fred Emery, in the World War II era, based on their work with workers in English coal mines at the Tavistock Institute in London. Sociotechnical systems pertains to theory regarding the social aspects of people and society and technical aspects of organizational structure and processes. Here, technical does not necessarily imply material technology. The focus is on procedures and related knowledge, i.e. it refers to the ancient Greek term techne. "Technical" is a term used to refer to structure and a broader sense of technicalities. Sociotechnical refers to the interrelatedness of social and technical aspects of an organization or the society as a whole.Sociotechnical theory is about joint optimization, with a shared emphasis on achievement of both excellence in technical performance and quality in people's work lives. Sociotechnical theory, as distinct from sociotechnical systems, proposes a number of different ways of achieving joint optimisation. They are usually based on designing different kinds of organisation, according to which the functional output of different sociotechnical elements leads to system efficiency, productive sustainability, user satisfaction, and change management.

The sociotechnical IDT paradigm

Software

Software is a set of computer programs and associated documentation and data. This is in contrast to hardware, from which the system is built and which actually performs the work.

Software architecture

Software architecture is the set of structures needed to reason about a software system and the discipline of creating such structures and systems. Each structure comprises software elements, relations among them, and properties of both elements and relations.The architecture of a software system is a metaphor, analogous to the architecture of a building. It functions as the blueprints for the system and the development project, which project management can later use to extrapolate the tasks necessary to be executed by the teams and people involved.

Software configuration management

In software engineering, software configuration management (SCM or S/W CM) is the task of tracking and controlling changes in the software, part of the larger cross-disciplinary field of configuration management. SCM practices include revision control and the establishment of baselines. If something goes wrong, SCM can determine the "what, when, why and who" of the change. If a configuration is working well, SCM can determine how to replicate it across many hosts.

Software construction

Software construction is a software engineering discipline. It is the detailed creation of working meaningful software through a combination of coding, verification, unit testing, integration testing, and debugging. It is linked to all the other software engineering disciplines, most strongly to software design and software testing.