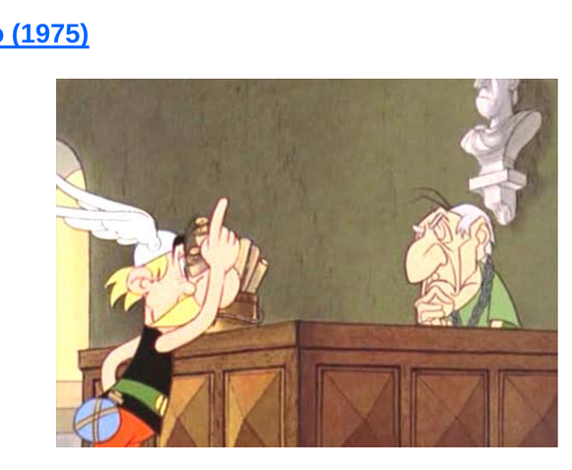
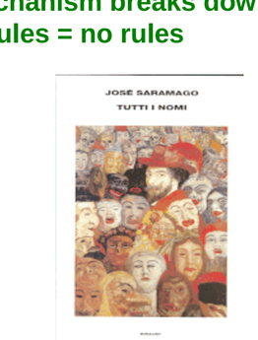
Eiderdown Project

Eiderdown, or eider down, comes from the Eider Duck, a large migratory sea duck. Eiderdown is exceptionally soft and has insulating properties superior to any other down. The eiderdown used in luxury duvets and pillows comes from Iceland, in special sanctuaries where the eider ducks can safely rest and nest during their annual migration.

Period	Information and Communication Technology		Organizational Theories & Perspectives	Authors	Description	Movies and Literature (Novels)
…-'30s	Around 1810: Punched Card 1904 Vacuum tubes 1905 Electronic calculator 1914. Calculator with floating point numbers	1	CLASSIC PERSPECTIVE		This theory studies the formal aspects of organizations and articulates universal management principles. The "Human Relations" perspective will enrich the organizational analysis with the discovery of informal aspects while many studies - based on comparative analyses - will show the limits of the universal management principles approach.	
	1932 Relay-based memory 1937 First calculation center (London) Turing's calculator	1.1	SCIENTIFIC MANAGEMENT	Taylor (1895, 1903, 1911)	The organizational model proposed by Taylor is characterized by a clearly defined division of labor and the presence of a strong hierarchy that assures the coordination of tasks. The new management principles are: 1) knowledge development based on science; 2) scientific selection of laborers; 3) workers' preparation and training on scientific bases 4) collaboration between management and workers. Criticism to the Taylorism approach focuses mainly on the concept of scientific organization as an organizational solution and, in particular, on the rigidity and problems related to learning and training. The main criticisms include: lack of social consideration of work, authoritarian-orientation, and individuals viewed as "machines".	Movies: "Modern Times", Chaplin (1936) Scene: "assembly chain" (57sec) Themes: • Extreme task fragmentation • De-humanization of work • Man-machine "La classe operaia va in paradiso" Petri (1971) (Working class goes to heaven) Novels: "Hard Times" Dickens (1854) 
	1938 First calculator programmable by the user (Z1)	1.2	SCIENTIFIC ADMINISTRATION PRINCIPLES	Fayol (1916), Mooney (1937) Mooney & Reiley (1939), Gulick & Urwick (1937)	The scientific administration view studies management functions and their working principles. Fayol is mainly interested in the administration function because it is characterized by specific content that cannot be included in other functions (i.e. technical, commercial or financial functions). According to Fayol, every function requires specific capabilities. More specifically, administration capabilities are: 1) planning, 2) organization, 3) command, 4) coordination, and 5) control. The administration function has: 1) *Universality*: the 5 administrative capabilities (above) are organization-independent. 2) *Pervasiveness*: the administration capabilities do not pertain only to the top management but to the organization as a whole (in different ways, based on hierarchy and size….) Administration capabilities can be improved by practice and formal teaching and training (this is a key difference from Taylor)	
1940s	1941 First calculator managed by a program (Z3) 1943 Colossus calculator: used for decrypting codes in the military environment 1944 Harvard-Mark-I: magnetic drum memory 1945 Born in Pankalkul first programming language	1.3	BUREAUCRATIC THEORY	Weber (1922) (English translation, 1947)	The bureaucratic theory analyzes the domain, problems and forms of influencing behaviors. According to Weber, exercising authority on a large number of people needs a specific organizational configuration. The purest form of legal exercise of authority uses a bureaucratic organizational configuration. Therefore, bureaucracy is an "ideal" organizational model. Bureaucracy is characterized by: a well-defined hierarchy; the specialization of tasks; an operating model based on formal rules and procedures; and, by the impersonal relationships among organizational actors. The objective of bureaucracy is to guarantee both the efficiency in the execution of the tasks and the fairness in the treatment of staff and customers. Comparative analyses show that this management style can be applied outside public organizations and that there are many forms of bureaucracy. The unintended consequences of this organizational configuration – individual alienation, shift in ends-means relationships, apathy, and operational stiffness - have been widely studied (see Airoldi pg. 15: Merton, Selznick, Etzioni up to Crozier. See also Parson, Gouldner, Blau, Scott).	
	1946 Von Neumann's principles for universal calculators; First completely electronic calculator (ENIAC) 1947 First version of a transistor High-performances analogic Calculator Fundamentals of the information theory 1948 In Manchester the Mark I, first modern computer, executes the first program, with a memory of 96 words, a speed of 1 instruction every 1,2 millisecond (0,00083 MIPS). Just in 1952 followed by the EDVAC of Von Neumann	2	BEHAVIORISM		This movement was born around 1930 from two main research streams: the work of Chester Barnard and the so-called Hawtorn's experiments. The work of Barnard "The Functions of the Executive" is one of first systematic attempt to elaborate an organizational theory that will greatly influence the behavioral thought, the institutional concepts of Selznick, and Simon's decisions theory. The Hawthorne experiments took place in a Western Electric Co plant and they were conducted by Roethlisberger and Dickson, and later analyzed and interpreted by Mayo. Contrary to the structural guidelines of classic theory, the behaviorism develops a different vision focused on the human nature and actor behaviors inside organizations. The organizational structure is not ignored, but it is more closely related to needs. Behaviorism posits that organizational structure is modeled from individual needs, abilities, and limits and it influences individual behaviors. These behavioral approaches are focused on the analysis of organizational operations. Different streams coexist in behaviorism based on the relative importance placed on key variables and on diverse methodological research approaches. The Human Relation perspective takes a normative approach; the Carnegie School follows a descriptive approach.	
		2.1	HUMAN RELATIONS MOVEMENT	Barnard (1938), Roethlisberger & Dickson (1939), Mayo (1933,45)	The Human Relations movement groups multiple related research streams: the study of work groups, the study of informal relations in organizations, the issue of supervision styles. The movement highlights the importance of human factors in organizations and the importance of considering social and self-esteem/recognition needs as factors affecting productivity increases. Individual social needs highlight the existence of both a personal and organizational personality of each individual. They stress seeking a balance between input-output in terms of benefits received and contributions to the organization. The importance of human factors suggests a change in the definition of managerial styles compared to classic theories. Management needs to support collaboration, listening and empowerment. The limits of this movement are: an incomplete understanding of the multiple needs and behaviors of individuals; a simplistic interpretation of conflicts; and an anticipation management practices that can degenerate in manipulation.	
1950s	1950 "Turing's test" presentation 1951 Mass production of the first electronic calculator (Univac I, 5.600 valves, 18.000 diode valves, 19 tons of weight, 1 million $) Start of commercial application of calculators 1952 Magnetic tape memory 1953 Mass production of a big calculator (IBM 701) based on the valves technology	2.2	CARNEGIE SCHOOL (decision-making approach)	Simon (1947, 1957), March & Simon (1958), Cyert & March (1963)	The Carnegie researchers, whose works dates back to the end of 40's, investigate the organizational consequences of limited individual capabilities to manage information and solve problems. They fundamentally contribute to the understanding of decisional processes in the organizations. They were the first users of the concept of rationality; the notion of organizational learning; and the vision of the organization as a dynamic coalition of multiple conflicting interests that decision-makers try to satisfy in a sequential way (based on the notion of quasi-resolution of conflicts). In earlier movements (human relations and behaviorism) the most important organizational variable is the organizational climate. The Carnegie approach focuses on the way individual behavior is programmed by operating and heuristic procedures, on the political aspects of organizations, and on decision-making processes. This movement benefits from the contributions of applied mathematics and operations research. For the first time, it gives systematic relevance to the use of automatic tools for the management of information and decision support. A strongly innovative aspect is the focus on two specific components of organizational dynamics: information and decision-making.	Movies: "2001: A Space Odyssey ", Kubrick (1968) "Star Wars" Lucas (1977) (Theme: the myth of intelligent robots)
	1954 Refined version of low-cost transistor 1955 TRADIC: first calculator completely based on transistors; IPL-II: first language for the development of IA application 1956 First OS (used on IBM 704); Logic Theorist: first program based on AI techniques; Experimental use of the keyboard to introduce data and commands	2.3	HUMAN RESOURCES MANAGEMENT (or New Human Relations)	Argyris (1957, 1962), Herzberg, Mausner & Snyderman (1959), McGregor (1960), Likert(1961), Herzberg (1966)	Born around the mid-50s, the human resources perspective emphasizes individual needs and motivation (similar to the human relations perspective). However, it stresses self-realization more than social and recognition needs. Organizational configurations should enable individuals to realize their full potential. Such configurations (mainly participative modes) contrast the classic bureaucratic principles of management, which are deemed as a cause of frustration and waste of individual talents. Key contributions of this perspective include change management, conflict management and the development of human resources approaches. As in the human relations school, this school of thought underrates conflicts and over-rates motivational issues at the expenses of individual intellectual capital. As in the classic perspective, this group tends to generalize principles and universal concepts.	Movies: "Time Out", Cantet (2001) Scene: the leading actor sleeps in the car Theme: Motivation - Maslow's scale
	1957 FORTRAN: first application at the Westinghouse 1958 First integrated circuit 1959 ERMA: first system for reading magnetically characters, firstly adopted by Bank of America 60s: development of first DBMS (IDS) 1960 COBOL language; Dataphone: the first commercial modem; Production of the first laser engine; 1962 Integrated circuit (chip)	3	FUNCTIONALISM	Parsons (1951), Merton et al. (1952), Merton(1957)	Functionalism is based on the work of Comte, Spencer, Pareto and Durkheim. Parsons developed a general model for the analysis of any type of community, from small primary groups to entire societies. Parsons defines four fundamental functions that all social systems must carry out to survive and summarizes them in the *AGIL* acronym (Adaptation, Goal, Integration, and Latency). - *Adaptation*: the need to obtain sufficient resources. - *Goal*: the need to define and achieve intended goals. - *Integration*: the coordination among subunits of the system. - *Latency*: the creation, preservation and transfer of specific culture and values of the system. The AGIL model can be applied to establish a functional connection between organizations and society (ecological level). At the structural analysis level, it defines the subsystems every organization must develop to meet the AGIL fundamental requirements. Merton's studies initially focused on the degeneration aspects of the ideal-type of bureaucracy described by Weber (whose work was translated in English at the end of 40s). Merton is recognized for the description of bureaucratic dysfunctions and for the identification of the ends-means shift. Merton succeeds in clarifying some fundamental aspects of functionalism. The most important are: the focus on dysfunctions; the distinction between manifest and latent functions; the concept of functional alternative and the persistence in fostering the discovery and understanding of functional mechanisms and tasks. However, Merton abandons the search for an all-inclusive theory (typical of the functional approach) to take a perspective defined as "medium range theory". The medium-range theory is characterized by a limited set of assumptions from where specific hypotheses can be inferred and empirically verified. Durkheim, Parsons and Merton consider human actions as pre-determined, driven by forces, needs, rules, and internal values typical of every society. Every functionalist considers human behavior as pre-determined and, therefore, fully explainable.	Critics to Bureaucracy: Merton's "goal displacement"  Movies: "Falling down", Schumacher (1993) Scene: McDonald (112 sec) Themes: • Unnatural smile, use of first names, false friendness • Rejected request: blind sticking to rules and regulations. "The Twelve Tasks of Asterix", Goscinny-Uderzo (1975) Scene: "receptionist" (79sec) • Inability to listen, rude manners, wrong info Scene: "staff employees" (70sec) • Lack of personal interest • Transfer of responsibility Scene: "forms" (45sec) Excess of formal procedures Final scene (126sec) • The mechanism breaks down Too many rules = no rules   Novels: "Tous les noms" Saramago (1998) Themes: crisis/change in the bureaucracy
1960s	1963 ASCII: for data exchange between PCs 1964 Calculator with integrated circuits; First application of on-line transaction processing; (SABRE system: American Airlines) to connect 2.000 terminals in 65 cities; BASIC language 1965 Dendral: first expert system developed by the Stanford University	4	INSTITUTIONAL SCHOOL	Selznick (1949, 1957) Perrow (1961)	According to Selznick, who had Perrow as a student, "the most important thing for organizations is that, although they are instruments, nevertheless everyone has its own life" (Selznick, 1949, p. 25). Selznick defines as "institutionalization" the process through which an organization develops its particular character. According to Selznick, "to institutionalize means to infuse with value beyond the technical requirements of the task at hand" (1957, p.17). In 1957 Selznick introduced the concept of "distinctive competence."	Movies: "Raise the red lantern", Yimou (1991) "Trading Places", Landis (1983) "The Discreet Charm of the Bourgeoisie", Bunuel (1972) "Philadelphia" Demme (1993) Themes: social and institutional conditioning Novels: "The Human Stain", Roth(2000)
	1966 Informatics as a scholastic discipline 1969 UNIX OS ARPANET: its planning	5	SYSTEM THEORY (Organizations as "Open Systems")	Beer (1964), Haberstroh (1965), Katz and Kahn(1966)	System theory, based on Gestalt Theories, views the organization as a "whole" within an environment where it exchanges energy based on input/output relations. The system can be divided into sub-systems, but the relations among sub-systems are essential to understand the "whole" (which is different from the sum of its parts). The system approach brings many contributions to organization studies: the listing of system attributes and properties that are open to the external environment (the energy transformation cycle, entropy notions, homeostasis, differentiation, equi-finality); the identification of the members of the system; the analysis of their interactions; the analysis of the forces that model a system, etc. This school provided 'descriptions' of organization functioning as well as 'prescriptions' through cybernetic concepts inspired by self-regulated mechanisms sciences. Among these studies, Haberstroh first defined the concept of black box.	
1970s-'80s	1970 First law on data protection and privacy; Definition of the relational model; First cash dispenser at the Citizens and Southern Bank; Realization of the first 4 ARPANET nodes 1971 First floppy disk 8 inches 1972 8008: 8 bit-microprocessor; Supercomputer (CRAY-1); SmallTalk: first OO language 1973 Ethernet: at the Xerox Research Centre at Palo Alto 1974 First PC (Mark-8) 1976 Definition of the Entity-Relationship Model; Optical commutator	5.1	STRUCTURAL CONTINGENCIES	Burns & Stalker (1961), Woodward (1965), Lawrence & Lorsch(1967), Aston group (Pugh, Hinings, Hickson), Child (1972) Galbraith (1973, 1977), Mintzberg (1979, 1983)	The theorists of structural-contingency paradigms abandon the universalistic approach to organizational design. They state that organizational configurations should be based on contextual factors. According to this perspective, the context or situational variables define organizational boundaries. The structural-contingency movement had and still has an important role in organization theory. Key proposed contextual variables are: technology, size, and environment, and strategy, Galbraith tries to develop a vision to integrate the four contextual elements by exploiting "tasks predictability". According to Galbraith, an organizational configuration is influenced by the complexity of the information needed in the specific context (in term of uncertainty, inter-dependence and frequency/amount). Mintzberg provides another integrating perspective. He foresees the need for coherence between the environment and the structure, and among the elements of the organizational system. Mintzberg's vision is the first step towards a criticism to the strong deterministic character of contingency theories. This determinism can be an obstacle to the complete comprehension of the organizational design process. In addition, the so-called strategic contingencies perspective (Child) finds that technology and other environmental conditions only create weak ties on the structure, while strategy plays a strong role.	
	1978 First floppy disk : 5 1/4 inches 1979 MS-DOS OS; C++ language; Visicalc: first electronic sheet developed for Apple II 1980 First optical disk	5.2	SOCIO-TECHNICAL PERSPECTIVE	Trist & Bamforth (1951), Emery (1959), Emery & Trist (1960), Emery & Thorsrud (1964)	Inspired by the system approach, the socio-technical theory is the result of studies of psychologists and sociologists of the Tavistock Institute of Human Relations in London and the Institute for Labor in Oslo. Its key contribution is that of considering the organization as an open system composed of a techno-economic system and a social system that must be jointly optimized. It states that technical, economic and social forces in organization system are interdependent. The socio-technical theory defines principles of work management opposite to Taylor's. It emphasizes an independent workers' ability to organize in groups and auto-manage.	
	1981 PC IBM; Launch of Windows OS; WordStar: the first PC word processor 1982 Lotus 1-2-3: the electronic sheet	6	ACTION THEORY	Berger and Luckman (1967), Thompson (1967), Weick (1969), Silverman (1971)	Action theory is based on Weber's view of social action as understandable only based on its meaning for the players involved. It was also influenced by the social philosopher Robert Mead, one of the founders of symbolic interaction. The action theorists oppose functionalism and its tendency to materialize interactions typical of certain system approaches that consider behaviors as impersonal and binding process. They assume the time is a fundamental variable and place the emphasis on processes, on organizing rather than on the organization. Organizations are socially constructed and they must take into account human actions based on the specific meanings of the actors. These meanings are guided by society but they can also be modified by human actions. The positivistic explanation - that binding external forces determine human action and behaviors - becomes unacceptable.	Novels: "La mossa del cavallo", Camilleri (1999) ("The horse move")
	1983 The word processor (Word) is born	7	STRATEGIC ANALYSIS PERSPECTIVE	Crozier (1963), Crozier & Friedberg (1977)	The strategic analysis perspective considers the organization as a social construct made of actors who develop individual strategies. The organization is as a system of concrete actions where the different strategies of the actors unfold. Contrary to the deterministic belief, this theory insists on the relative freedom of every actor in organizations and on the sources of power s/he can activate to optimize his/her strategy (managing uncertainty). The strategic analysis revisits the role of power which had been neglected by many organization theories after Weber's contributions.	
	The CEE (now European Union) starts the Esprit program to develop the Fifth Generation of computing 1985. Introduction of the Windows Operating System. The NFSNET network is launched to connect 5 supercomputers across five universities. C++ object-oriented programming becomes a *de facto* standard	8	ORGANIZATIONAL CULTURE PERSPECTIVE	Smircich (1983), Schein (1985)	At the end of the 70s, the concept of "organizational culture" is researched in depth from multiple points of view. Early authors take a managerial perspective and define "culture" as an internal organizational variable that impacts effectiveness. Some authors define it as a manageable and malleable variable and propose definitions and models of the 'winning' organizational culture. Others view this approach as grotesque and point out that the culture of an organization is influenced by many factors, particularly by managers and leaders who have the responsibility to enrich and cultivate it. The latter is a socio-anthropological approach that focuses on understanding what culture is, rather than trying to manipulate it based on management needs. This approach takes a holistic and complex view of organizational culture and highlights symbolic phenomena (symbols, rituals, languages, myths and beliefs, representations) based on anthropology, symbolic interactions, language theory and cognitive research.	
1980s-'90s	1988 The memory chip expands to megabit capacity 1989 "'Virtual Reality" is first conceptualized	9	POPULATION ECOLOGY	Hannan e Freeman (1977), Aldrich (1979), Carrol (1984)	The population ecology perspective is based on the biological sciences, particularly on Darwinian evolution. This approach differs from other perspectives for its focus on "populations" in organizations rather than single entities and individuals. Its fundamental tenet is that organizational change is based on natural selection: environmental characteristics drive organizational survival through a natural selection process based on the alignment between organizational structure and environmental characteristics. Some researchers (i.e. Hannan & Freeman 1977) focus on mortality rates of organizational populations as the primary driver of the natural selection process; others (Carrol 1984) focus on the founding (or birth) rate of organizational populations.	
	1990 HTML language, first web browser and web servers are developed	10	RESOURCE-DEPENDENCE THEORY	Pfeffer e Salancik (1978)	While the population ecology theory emphasizes the selection process, the resource-dependence theory emphasizes the processes of adapting, molding and transforming the external environment to the benefit of the organization. The theory assumes that single organizations can improve their chances of survival. One of the contributions of this perspective is the identification and description of the organizational strategies used to modify or adapt to the environment. These strategies span from the institutionalization of links (cushioning approach) to diversification and mergers & acquisition (M&A) strategies.	Movies: "The Pelican brief", Pakula (1993) "Erin Brockovich", Soderbergh (2000) "Insider– behind the truth", Mann (1999) (theme: environmental control by large corporation) Novels: "Jacaré", Sepulveda (2001) "Colluttorius" in "Outland rock", Cacucci (1988) (theme: environmental control by large corporation)
	The WWW is launched at the Gineva CERN Center Microsoft Windows 3.0 provides the first graphical interface compatible with PC IBM environments. 1991. Parallel Computing 1992. 1995 Internet reaches the public domain	11	TRANSACTION COSTS THEORY	Williamson (1975)	Oliver Williamson's studies critique neoclassic economic theories (Coase 1937). These theories were based overly simplistic and unrealistic hypotheses, such as the existence of completely informed rational agents and the view of enterprises as mere production management agents. The latter were believed to make decisions only based on the optimal combination of inputs. To account for the higher complexity of the real economic framework, Williamson uses two key concepts: the "bounded-rationality" (based on Barnard and Simon) and the "transaction" theory. Shifting the focus away from manufacturing goods to conducting transactions (the exchange of goods and services), he emphasizes the importance of the structures that govern such exchanges. Two types of governance structure are available: the "market" and the "organization" or "hierarchy." In a market system, sellers and buyers negotiate exchanges based on contractual agreements. These transactions are governed by the pricing system. Under uncertainty, it is increasingly difficult and expensive to define comprehensive contracts (taking into account any possible contingency). In such circumstances, resorting to a production control system (i.e. organizational hierarchy) may be more beneficial than relying on market-mediated transactions. Williamson identifies "uncertainty" and "complexity" as the factors that inform choosing between the control system (hierarchy) and the market. When information management capabilities are inadequate to face uncertain and complex situations, alternatives to market-mediated approaches become important. For example, one alternative resides in using the hierarchy to integrate individual choices into organizational configurations. Opportunism and small numbers also drive the selection of hierarchical or market-based strategies. Opportunism posits that individuals pursue personal agenda also through deceit. Hierarchies can cope with opportunism better than markets. They can also better cope with quasi-monopolies, that when transactions are completed when only small number of alternative partners is available (Williamson). Market and hierarchy also differ by type of transactions. In the 20's, the institutional economist John Commons, who first analyzed work contracts, observed that a laborer "... when he sells his work it is for a specific scope. He sells his promise to obey to orders." (Commons 1924, p. 284). Under uncertainty, this "open" contract yield obvious advantages: compliance is guaranteed towards a large range of tasks that will be adapted to unforeseeable and specific local conditions. The use of hierarchy reduces transactions costs under uncertainty and limited exchanges. The transaction costs theory explains how single organizations determine the own boundaries and define their governance structure.	Movies: "Paul, Mick & the others", Loach (2001)(theme: outsourcing) "A beautiful mind", Howard (2002) (theme: negotiations mechanisms- Nash Equilibrium)
1990s– today	2001 New Market Crash (Enron, Worldcom) 2001 Intel PC processor speeds above 1 Ghz 2001 Mobil Oil launches Mobipass, the first RFID commercial application for contact-less charges at gas stations.	12	NEO-INSTITUTIONAL PERSPECTIVE	Meyer & Rowan (1977), DiMaggio & Powell(1983), Meyer & Scott (1983), Zucker (1977, 91)	Neo-institutional research draws from multiple disciplines such as sociology, economics, and political science. Its introduction into the organizational field is associated with the publication of Meyer and Rowan's 1977 article and Zucker's 1977 work. These articles derive the notion of institution from the actionist scholars such as Silverman (1971), Berger and Luckmann (1967). While classic institutionalists emphasized the normative facets of institutions, the neo-institutionalists focus on the cognitive dimensions. Organizational structures are defined by their environment, through a continuous interaction with professions, national states and mass-media that rationalize their cultural norms. Therefore, organizations reflect a socially constructed society and can assume similar societal forms (institutional isomorphism), relying on external legitimization rather than internal efficiency or enterprise logic. DiMaggio and Powell hypothesized the existence of as set of mechanisms – coercive, mimetic and normative measures - through which institutional effects spread throughout organizations. Meyer and Scott emphasized technical and institutional measures acting in different ways in various types of organizations. Zucker (one of Meyer's student) emphasizes that cognitive beliefs can guide behaviors: "social knowledge, once institutionalized, takes its own life as an objective reality and can be transmitted in a direct way". (Zucker 1977, p. 726).	
		13	CRITICAL PERSPECTIVE	Braverman (1974), Clegg & Dunkerley (1977)	Inspired by Marxism, this theory analyzes organizations from the power/control perspective. It denounces ideological management logics. The critical perspective studies emphasize the underrating of work functions by industrial capitalism, employee control by bureaucratic systems, and the segmentation of the labor market.	Movies: "Human Resources", Cantet (1999) "Il vangelo secondo precario", Obino (2005) (The Gospel According to the Precariat)
		14	POSTMODERNISM	Smircich & Calas (1987), Cooper & Burrel(1988), Alvesson & Deetz (1996)	Postmodernism, a theoretical perspective widely influenced by French authors like Barthes, Derrida, Focault, expanded into various streams. The expression "postmodern theories" identifies a period of organizational changes (the new flexible and/or participative organizational forms) and/or new approaches and perspectives on organizational studies. In the latter denomination, postmodernism ideas are focused on the centrality of the dialogue, the power of language, the quest for permanent forms independent from their creators, the de-codification of these forms, the decline of grand political projects, and the relationships between knowledge and power. Postmodernist theories were applied to organizational studies from linguistics, semiotics, and literature. They were supported by a keen interest for interpreting organizations and their symbolism. Postmodernists view reality as multifaceted, fragmented and contradictory.	Movies: "American Beauty", Mendes (1999) "Death Poet Society" Weir (1989) Theme: power/knowledge and rebellion Novels: "Volevo solo dormirle addosso", Lolli (1998) (theme: corporate language and culture invading private life) Film: "You've got mail", Ephron (1998), (theme: new media/languages and socialization) Novels: "Pure life", De Carlo (2002) (theme: new media/languages and socialization)

Information Systems

Ad Hoc approach

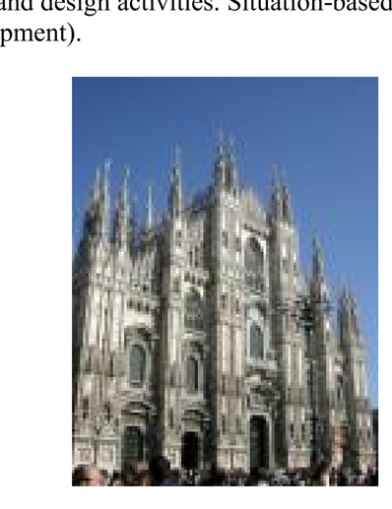
Checkland and Howell provide a nice example of a system with the characteristics of an information system but without the use of computers as components.
One of the first information systems whose development has been documented is the early warning system used by the English RAF to defend the southern coast of England from German raids. The information system, which did not make use of computers, was formed by a 1000 human observers placed in holes with observation instruments, 20 of the first radars. Humans and radars reported the observed events (DATA) to the central command in Bentley Priori where mathematicians, military, operations researchers calculated speed and direction of German raiders and referred the attack position (information) to the airfields taking into account both delays and tactics. The methodology used was ad hoc and started from the system goal working backwards to system components, methods and interactions **(Checkland P. and Holwell s., 1998, Information, Systems and Information System, Wiley, Chichester (Chapter 5)).**

Structured Approach
DeMarco (1979), Yourdon (1989)
Objectives: to guarantee high quality software development (in term of reliability and maintenance) with high productivity.

Basic concepts: separation between the conceptual and implementation models. Exact documentation system to make the development process visible. Use of graphic annotations. Top down and divisible transformation and process models. Graphic representation of specifications to reduce ambiguity and redundancy. Models characterized by high cohesion and logic independence.

Fundamental concepts: conceptual model/ model of implementation. Process (Data Transformation). Data flow. Data store. Module. Cohesion. Connections.

Principles: A detailed sequence (step by step) of analysis and design activities. Situation-based strategy (waterfall models, prototyping, concurrent development).



"Information Modeling" Approach
Chen (1976), Martin (1989)

Objectives: Implement an information system and a database extended to the enterprise as a whole in order to allow a coordinated development of integrated applications and their long term evolution.

Basic Concepts: Data-oriented approach. Data are considered as basic elements of information systems. Separation between conceptual models and internal schema/models. The conceptual schema is the key element of information system since it is used to design applications. The development is based on a rigorous engineering methodology.

Fundamental concepts: Information/database. Conceptual Schema. Internal Schema. External Schema. Entity. Attributes. Relationships.

Principles: incremental design of conceptual schema. Integrated vision.

"Decision Support Systems" Approach
Keen e Scott-Morton (1978), Sprague & Carlsson (1982)

Objectives: to develop systems to support semi-structured decisional activities.

Basic Concepts: DSS aim is to support (and not to substitute) the decision maker. DSS involve interactivity, learning and continuous evolution.

Fundamental concepts: semi-structured decisions, database, models, DSS generators.

Principles: evolving development (adaptive)

"Trade Unionist" Approach
Bjerknes et al. (1987), Hehn (1988), Bjerknes & Bratteteig (1995

Objectives: to create the conditions for efficient worker participation, in order to develop democracy and quality of work.

Basic Concepts: computers are considered as instruments under worker control.

Fundamental concepts: technical system. Social system. Technical needs. Social needs (Job satisfaction).

Principles: independent and parallel processing of knowledge accumulation. Designing by doing. Participative design.

Object Oriented Approach
Goldberg (1991), Henderson-Sellers & Edwards (1995)
Objectives: the object oriented approach was born to facilitate: the respect of scheduled time and development plan; the correspondence between final product and planned requirements; the rapid modifications needed to satisfy user requirements and the correction of mistakes; continuous improvements to guarantee software evolution and adaptability to new standards/ market needs; the increased involvement and motivation of the development team.

Basic concepts: Analysis, design and implementation, without interruption.

Fundamental concepts: problem domain/implementation domain. Object and class, encapsulation, hereditariness, polymorphism, communication among objects

Principles: iterative and incremental development, reuse.

Socio-technical Approach
Mumford (1983), Pava (1983, 86)
Goals. Develop systems involving end-users from the planning phase. In addition to technical and operational requirements completion, focus on ensuring customer satisfaction to ensure organizational adoption and alignment.

Basic Concepts. Participatory development. Minimum structured development. Open planning and programming. Seek alignment between technology (technical system) and human factors (social system). Joint optimization.

Fundamental concepts: Technical system. Social system. Technical needs. Social needs (*job satisfaction*).

Principles. End-user participation. Socio-technical planning. Evolution

"Soft Systems Methodology" Approach
Checkland (1981), Wilson (1984), Checkland & Scholes (1990), Avison & Wood-Harper (1990)
Goals. Development approach based on alignment between end-user expectations and technical feasibility.

Basic Concepts. Use of "Human Activity Systems "concepts: multifaceted models that can be applied to any social system. Information systems should support more relevant "human activity systems."

Fundamental concepts: . General View (Weltanschauung). Human Activity Systems.

Principles. Cultural analysis. Logical analysis of systems.

"Professional Work Practice" Approach
Mathiassen (1987), Andersen et al. (1990)
Goals. Promote the professional growth of system developers.

Basic Concepts. Professional practice must inform development tasks. Experience cannot be replaced with methods only. System development environments vary and require different professional experiences. Effective system development is based on both technical performance and sound management principles.

Fundamental concepts: Performance/management. Focus on product/focus on process. Analysis/development. Planning/Evaluation.

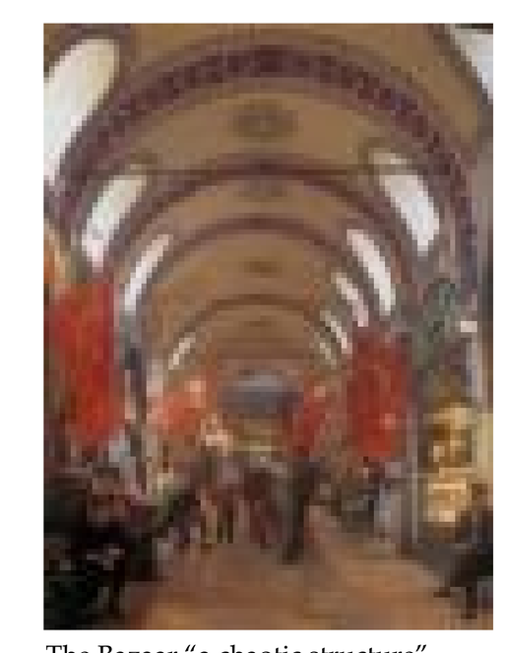
Principles. The above principles are interlinked and need to be applied simultaneously.

"Agile" Approach
Beck (1999), Fowler (2002), Lindstrom and Jeffries (2004)
Goals: Attempt to compromise between no process and too much process, providing just enough process to gain a reasonable payoff (Fowler M.). Implement intrinsically valuable information systems. Frequently release functional prototypes to end-users.

Basic Concepts. Agile methods are adaptive rather than predictive. Agile methods are people-oriented rather than process-oriented (people refers to programmers not to users). About requirements: not only are requirements changeable, they ought to be changeable.
Speed up the development time to its maximum. The key to develop information systems that are useful for the users is in addressing well-defined sub-problems that can be handled in few weeks. Developers and users need to practice with the system. Testing prototypes in the real production environment guarantees the effectiveness of the proposed solution.

Fundamental concepts: Customer focus. Of the three project management principles (time, budget and requirements) only two can be fixed (costs and time). The third, requirements, needs to be flexible.

Principles. Test before coding, re-factoring, paired programming, user on location, user testing.



The Bazaar "a chaotic structure"
A metaphor for agile methodologies

Phylosophical References

Rationalism (Leibnizian Philosophy)

Reality exists and is the same for every individual. Reality can be objectively described. What happens in reality is governed by laws of causality.

Within this philosophy the inquirer discovers through formal logic the truth governing the world. The system under study is considered as closed and governed by causal relationships. The inquirer creates networks of hypotheses, *fact nets*, and proceeds to build on these hypotheses until logic reveals a counterhypothesis that invalidates a part of the net. The Leibnizian inquirer is the isolated individual, the monad (Churchman 1971, p. 30), reasoning on the causal relationships governing the system that he wants to improve. The individual's logic becomes the guarantor of the truthfulness of the fact net.

Rationalism and ISD methodologies: The point of departure is that there exist a solution for each problem which is optimal. This is the solution we have to achieve or try to. Optimal requirements for an information system can be found using reason. Pure structured methodologies (Eg. Waterfall, Information Engineering and "linear" methodologies in general) are built on the ideas of the Leibnizian philosophy: once requirements are specified the programmer proceeds on his own to develop the information system based on his internal logical reasoning. The software will therefore reflect the fact nets developed by the inquirer (i.e. the programmer).

Rational behind this choice: Because the hypotheses is made that there is only one truth governed by cause and effect than it is perfectly justifiable to separate the development in sub-activities carried out by different parties. The choice is also highly culturally determined as the Rationalist philosophy is very rooted in western culture and well suited to research the domain of natural sciences. First educated computer scientists were coming from mathematics.
He image of the cathedral, used later by Raymond as a metaphor for structured methodologies is well connected to Leibnitz philosophy whose ultimate goal was to prove the existence of God.

Empiricism (Lockean Philosophy)
Reality exists and is the same for every individual. Reality can be objectively described. What happens in reality is governed by laws of causality. The individual has no preconception of reality and all input come from the outside.

This mode of inquiry gives more weight to data than theory. The inquirer is open to the environment and finds the truth in the external world. The inquirer is not isolated like the monad but participates in creating knowledge with a community of inquirers, the Lockean community. The inquirer uses data and the opinion of his community to explain the world. The community acts guarantor of the truth through agreement and consensus. The Lockean inquiring system searches a single truth but there is no guarantee that two communities will agree on a common truth. If there is a winning or prevailing community this is often the result of power unbalance.

Empiricism and ISD methodologies: In ISD, the groups of users and developers can be considered as two Lockean communities, where agreement can be found within a community but it is difficult to find it across communities. The trade unionist approach is partially based on the idea of different communities having to agree on the solution provided by the information system. Phased and linear development process is acceptable since the goals for any phase can be specified a priori.

Rational behind this choice: Because the hypotheses is made that there is only one truth governed by cause and effect than it is perfectly justifiable to separate the development in sub-activities carried out by different parties. The choice is also highly culturally determined as the Rationalist philosophy is very rooted in western culture and well suited to research the domain of natural sciences. First educated computer scientists were coming from mathematics.

Idealism (Kantian Philosophy)
This mode of inquiry gives equal weight to data and theory. It recognizes that there are multiple ways in which a problem may be analyzed using multiple models that can be applied to the data. However the inquirer does not accept multiple truths; the objective is to find the ideal, and only, truth. The Kantian inquirer proceeds testing the fitness of a model to the data and creates knowledge by finding the model that best fits the data.
Kant and ISD methodologies: There is not a clear cut connection between ISD methodologies and Kant's philosophical precepts. In ISD it can be imagined that the Kantian inquiring system is used when developers search a model to mirror the client system into the software system. Many possibilities are tried and recursively eliminated until only one, the one with the best fit, the truth, remains.

Dialectic (Hegelian Philosophy)
This philosophical approach sees the truth emerging the debate between opposing views: the thesis and the antithesis. Debate between different worldviews (Churchman, 1968; Linstone, 1984; Orlikowski, 1992) is seen as the only way to develop theses and antitheses to arrive at a synthesis that accommodates both worldviews. Hegel introduces the idea of multiple interpretations of reality even though he believed in a final "grand synthesis". Churchman (1968) envisioned two groups of people engaged in an ardent debate respectively defending their thesis and trying to destroy the other group's antithesis. The issue is then resolved by an impartial observer that synthesizes the arguments to create a synthesis. Synthesis generated from the impartial observer acts as the guarantor of the truth (Courtney, Croasdell, and Paradice, 1998). A good example of this inquiring system is the scenario approach at Shell where groups with opposing views engaged in a dialectic inquiry and predicted the oil crisis in 1973 (Shoemaker, 1995; Senge, 1990 p. 178).

Dialectic and ISD methodologies: The point of departure is that the grand solution - if it can be found—can only emerge from the ardent debate. The process cannot be leaner because the nature of the debate is not linear nor it is known the nature of the synthesis. The synthesis could be a quantum leap with respect to the pre-exiting knowledge.
The socio-technical approach where the system emerges from the two worldviews of the social and the technical system is based on the idea of dialectic inquiry.
The Soft system methodology approach is a derivate of the socio-technical one but it is more modern and more detailed (and therefore more structured). In the SSM approach the two weltanschauung (that shape thesis and antithesis) are represented but the human activity system (the served system) and the technical system (the serving system).

Rational behind the choice: the Hegelian process of creating knowledge is indicated to attach complex problems where the solution is not clear at the offset. These problems are known as ill-structured. In this cases the debate helps to reach an agreement on the solution..

Pragmatism (Singerian Philosophy).
Singer was particularly interested in the creation and exchange of knowledge. Singer philosophy was at the base of Churchman's work (1971) on the design of the inquiring systems. The Singerian inquiring system is based on the ardent debate of the Hegelian philosophy to create progress but accepts multiple sources of data and multiple interpretations of reality and consequently multiple truths. It is called pragmatic inquiring system because the truth/s produced is/are relative to the context and to the objectives of the inquiry. The multiple truths are found via an approach that continuously attacks currently held beliefs from multiple points of view. The world inquired is interpreted as an open system where all components might become part of the inquiry. The truth is temporary and contextually dependent because the more elements are "swept in" (Courtney et al., 1998) the more the truth is likely to change. Progress is the ultimate goal of the system and it is measured quantitatively whenever possible otherwise the groups' intuition that progress is made becomes the guarantor for qualitative measures (Richardson et al., 2001).
Pragmatism and ISD methodologies: In ISD the use of the Singerian inquirer can be recognized in recent methodologies like the ones coming from Soft Systems Methodology (Atkinson, 2000; Winter et al., 1995), Multiview2 (Avison et al. 1998) and in agile methodologies (Beck, 1999; Fowler, 2002). The testing carried out using agile methodologies is completely in line with the pragmatic nature of the knowledge needed to be exchanged during the ISD process. Richardson and Courtney (2004) propose a design theory for knowledge management systems based specifically on the Singerian inquiry. These methodologies let the information system emerge from the debate between developers and users letting multiple truths be created pragmatically by the participants and not imposed top-down.
Rational behind the choice: in today's world the only software that is developed ad hoc is specialized software that respond to a very specific need (otherwise it is more convenient to buy and customize) consequently the problematic involved present very complex knowledge dynamics that can be tackled with the Singerian concepts of debate, sweep-in, knowledge exchange based on practice.

Musical References

1911
♪ Schönberg, Sechs kleine Klavierstücke op. 19
♪ Schönberg's paintings in the art exibitions of Kandinsky and Marc's « Der blaue Reiter » Association
♪ Schönberg, Herzgewächse, on a text by Maurice Maeterlinck, published in facsimile in the « Jahrbuch » (Almanach) of « Der blaue Reiter » Association
♪ Schönberg writes his contribution to the « Jahrbuch » (Almanach) of « Der blaue Reiter » : The Relationship with the Text
♪ Schönberg, Harmonielehre (first edition)
♪ Maurice Ravel, L'heure espagnole
♪ Jean Sibelius, Symphony no. 4
♪ Igor Stravinsky, Petrushka
♪ Richard Strauss, Der Rosenkavalier
♪ Alexander Skrjabin, Prometheus

1912
♪ Arnold Schönberg, Pierrot lunaire
♪ The European tournée, conducted by the composer with the so called Pierrot Ensemble, is a big success
♪ Alban Berg, Fünf Orchester-Lieder nach Ansichtskartentexte von Peter Altenberg op. 4
♪ Franz Schreker, Der ferne Klang

1913
♪ First performance of Schönberg's Gurrelieder (Vienna, Franz Schreker conductor)
♪ Igor Stravinsky, Le Sacre du Printemps (first performance with the Djagilev's « ballets russes », Paris)
♪ Claude Debussy, Jeux

1914
♪ Erik Satie, Sports et Divertissements
♪ Igor Stravinsky, Le Sacre du Printemps (first performance without coreography in Moscow and Paris)
♪ Alban Berg, Drei Orchesterstücke op. 6

1915
♪ Schönberg starts writing the text of his (unfinished) oratorio Die Jakobsleiter

1916
♪ Richard Strauss, Ariadne auf Naxos

1917
♪ Igor Stravinsky, Les noces and Renard

1918
♪ « Verein für musikalische Privataufführungen » (Association for private musical performances) : the first series of private concerts arranged and performed in Vienna by Schönberg and his circle (until 1922)
♪ Igor Stravinsky , Histoire du Soldat

1919
♪ Richard Strauss, Die Frau ohne Schatten

1920
♪ Igor Stravinsky, Pulcinella
♪ Erik Satie, Socrate

1921
Schönberg tells to some of his students about his new idea of a « method of composing with twelve tones »
Schönberg becomes aware of his being a Jew (the so called « Mattsee Episode »

1922
♪ Jean Sibelius, Scaramouche

1923
First Festival of ISCM (International Society for Contemporary Music) in Salzburg
♪ Edgard Varèse, Hyperprism
♪ Arthur Honegger, Pacific 231
♪ Alexander von Zemlinsky, Lyrische Sinfonie

1924
♪ Berg: Drei Bruchstücke aus der Oper Wozzeck first performed by Heinrich Scherchen at the Frankfurt Festival of the ISCM. *On that occasion Theodor Wiesengrund Adorno meets Alban Berg,and decides to go to Vienna to study composition with him*
♪ Edgar Varèse, Octandre

1925
Schönberg is called to teach the master class in composition at the Akademie der Künste, Berlin (he held this position until 1933)
♪ Alban Berg, Wozzeck
♪ Arnold Schönberg, Drei Satiren op. 28

1926
♪ Edgard Varèse, Amériques
♪ Kurt Weill, Der Protagonist
♪ Paul Hindemith, Cardillac

1927
♪ Bela Bartók, Piano Concerto no. 1
♪ Sergej Rachmaninov, Piano Concerto no.4
The Automatic Instrument Company (AMI) introduces the selective phonograph (jukebox)

1928
♪ Arnold Schönberg, Variationen für Orchester op. 31
♪ Igor Stravinsky, Oedipus Rex
♪ Anton Webern, Sinfonie op. 21
♪ Maurice Ravel, Bolero
♪ Bertolt Brecht/Kurt Weill, Die Dreigroschenoper

1930
♪ Arnold Schönberg, Von heute auf morgen
♪ Dmitri Shostakovic, Symphony no. 3
♪ Kurt Weill, Aufstieg und Fall der Stadt Mahagonny

1932
♪ Schönberg ends the composition of the second act of his (unfinished) three-acts opera Moses und Aron

1934
♪ Arnold Schönberg, Suite für Streichquartett
♪ Paul Hindemith, Mathis der Maler
♪ Anton Webern, Konzert für neun Instrumente op. 24
♪ Alban Berg, Sinfonische Stücke aus der Oper Lulu
♪ Igor Stravinsky, Persephone

1935
♪ Richard Strauss, Die schweigsame Frau
♪ George Gershwin, Porgy and Bess
♪ Anton Webern, Das Augenlicht op. 26

1936
♪ Béla Bartok, Musik für Saiteninstrumente, Schlagzeug und Celesta

1937
♪ Benjamin Britten, Variations sur un thème de Frank Bridge

1938
♪ Arnold Schönberg, Kol Nidre

1939
♪ Kuigi Dallapiccola, Volo di notte

1940
♪ Anton Webern, Variationen für Orchster op. 30

1942
♪ Arnold Schönberg, Ode to Napoleon op. 41

1946
♪ Arnold Schönberg, String Trio op. 45
Beginning of Ferienkurse für Neue Musik (International Summer Courses in New Music) in Darmstadt, Schoenberg is named honorary president
♪ Bela Bartók, Piano Concerto no. 3
♪ Benjamin Britten, The rape of Lucretia
♪ Richard Strauss, Metamorphosen

1947
♪ Arnold Schoenberg, A survivor from Warsaw op. 46
♪ John Cage, The Seasons
♪ Kurt Weill, Street Scene
Atlantic Records founded by Ahmet and Nesuhi Ertegun

1948
♪ Olivier Messiaen, Turangalila
♪ Pierre Boulez, Second Piano Sonata
♪ John Cage, Sonatas and Interludes
♪ Luigi Dallapiccola, Il prigioniero
♪ Goffredo Petrassi, Il cordovano
Columbia begins marketing the 33rpm LP

1949
♪ Arnold Schönberg, Fantasy for Violin and Piano, op. 47
♪ Giorgio Federico Ghedini, Billy Budd
The first Congress of Dodecaphonic Music is held in Milan
RCA introduces the 45 rpm disc.

1950
Foundation of the Electronic Music Studio at Westdeutscher Rundfunk in Köln
♪ Pierre Schaeffer: Symphonie pour un homme seul **(first extended piece of electronic music)**
♪ Luigi Nono, Variazioni canoniche su una serie dell'op. 41 di Schönberg
♪ Goffredo Petrassi, Noche oscura

1951
♪ Pierre Boulez, Terza Sonata
♪ Francis Poulenc, Stabat Mater
♪ Igor Stravinsky, The Rake's Progress
♪ John Cage, Music of Changes
♪ Karlheinz Stockhausen, Kreuzspiel
Stefan Kudelski builds the first Nagra portable, self contained tape recorder

1952
Otto Luening and Vladimir Ussachevsky present the first american concert of electronic music at MOMA, N.Y.
♪ John Cage, Imaginary Landscape n. 5
♪ Karel Goeyvaerts, Composition n. 4 aux sons morts
♪ Bruno Maderna, Musica su due dimensioni

1954
Boulez founds the Domaine Musical in Paris, dedicated to the promotion and performance of contemporary music
♪ Luigi Nono, La victoire de Guernica
♪ Igor Stravinsky, Septet, In memoriam Dylan Thomas

1955
Foundation of the "Studio di Fonologia" at RAI in Milano
♪ Serge Prokofiev, War and Peace
♪ Igor Stravinsky, Canticum sacrum
Invention of the RCA Electronic Music Synthesizer

1956
♪ Karlheinz Stockhausen, Gesang der Jünglinge
♪ Glenn Gould, recording of Bach's Goldberg Variations
♪ Luigi Nono, Il canto sospeso
♪ Louis and Bebe Barron produce **the first electronic music for a commercial film,** Forbidden Planet

1957
♪ Karlheinz Stockhausen, Gruppen
♪ Igor Stravinsky, Agon

1958
♪ Luciano Berio, Sequenza I
♪ Max Mathews, of Bell Laboratories, generates music by computers

1959
♪ Sylvano Bussotti, Five piano pieces for David Tudor

1960
♪ Bernd Alois Zimmermann, Die Soldaten
♪ Gyorgy Ligeti, Apparitions
Recording studios begin using multitrack tape machines

1961
♪ Luigi Nono, Intolleranza 1960
♪ Krzysztof Penderecki, Threnody for the victims of Hiroshima
♪ Elliott Carter, Doppio concerto

1962
First Issue of the Journal Perpectives of new music
♪ Gyorgy Ligeti, Aventures
♪ Franco Evangelisti, Die Schachtel
♪ Mauricio Kagel, Antithese
♪ Igor Stravinsky, The Flood

1964
♪ Bruno Maderna, Hyperion
♪ Luigi Nono, La fabbrica illuminata

1965
♪ Sylvano Bussotti, La Passion selon Sade

1966
♪ Terry Riley, In C
♪ Iannis Xenakis, Terretektorh

1967
♪ Karlheinz Stockhausen, Hymnen
♪ Gyorgy Ligeti, Cello concerto, Lontano
Invention of Dolby noise-reduction system for use in tape-recording

1968
♪ Luciano Berio, Sinfonia
♪ Luigi Dallapiccola, Ulisse

1970
♪ Sylvano Bussotti, Rara Requiem
♪ Karlheinz Stockhausen, Mantra
♪ Philip Glass, Music in fifths

1972
♪ Bruno Maderna, Aura
♪ Sylvano Bussotti, Lorenzaccio
Issue of the first LP made from digital masters

1973
♪ Gérard Grisey, Dérives

1975
♪ Luigi Nono, Al gran sole carico d'amore
♪ Iannis Xenakis, Empreintes

1976
♪ Luciano Berio, Coro
♪ Elliott Carter, A Mirror on Which to Dwell
♪ Philip Glass, Einstein on the beach

1977
♪ Arvo Pärt, Fratres, Cantus In Memoriam Benjamin Britten, Tabula Rasa
♪ Opening of Centre Georges Pompidou in Paris and opening of IRCAM, directed by Pierre Boulez

1978
♪ Gyorgy Ligeti, Le Grand Macabre

1979
♪ John Cage, Roaratorio
Sony introduces the first "walkman" portable cassette player

1980
♪ Brian Ferneyhough, Funérailles
♪ Salvatore Sciarrino, Les cailles en sarcophage

1981
♪ Karlheinz Stockhausen, Donnerstag aus "Licht"
♪ Pierre Boulez, Répons
♪ Salvatore Sciarrino, Vanitas
Sony introduces the CPD-101, the first Compact Disc audio CD player

1982
♪ Luciano Berio, La vera storia
♪ Philip Glass, Glassworks
♪ Philips introduces the first digital audio 5 -inch disc

1983
♪ Salvatore Sciarrino, Lohengrin
Standard MIDI (Musical Instruments Digital Interface)

1984
Foundation of the Journal Contemporary Music Review
♪ Luigi Nono, Prometeo
♪ Franco Donatoni, Atem

1986
♪ Sofija Gubajdulina, Stimmen… Verstummen
♪ Franco Donatoni, In cauda

1987
♪ Adriano Guarnieri, Il trionfo della notte
First DAT (digital audio tape) machines appear on the market

1988
♪ Gérard Grisey, Le temps et l'écume
♪ Helmut Lachenmann, Gran Torso

1990
♪ Iannis Xenakis, Tetora
Sony introduces the writeable CD

1991
♪ Stefano Gervasoni, Least Bee on poems by Emily Dickinson

1992
♪ Gérard Grisey, L'icone paradoxale (Hommage à Piero della Francesca)
♪ Wolfgang Rihm, Gesungene Zeit

1993
♪ Steve Reich, The Cave

1996
♪ Thomas Adès, The Premises are Alarmed

1998
Founding of the mp3.com website

2000
Prometeo by Luigi Nono is first performed in Milan after Nono's death: more than 100 Italian intellectuals sign an appeal against the critic of "Corriere della Sera" because of his misunderstanding of the work (among them Claudio Ciborra)

2001
♪ Stefano Gervasoni, Chhamp for orchestra

2002
♪ Adriano Guarnieri, Medea
♪ Salvatore Sciarrino, Macbeth

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