

1. The traditional view of public administration and information systems

The purpose of this chapter is to show how the traditional understanding of public administration and integrated information systems, respectively, focuses exclusively on technical aspects. First, the traditional understanding of administration is presented. Next, the development towards the use of integrated information systems in administration is explained. It is further explained how integrated information systems as policy phenomena have been placed as part of the modernization programs for public administration. Finally, a preliminary critique of the traditional theoretical understanding of administration and integrated information systems follows.

1.1 THE TRADITIONAL PERCEPTION OF ADMINISTRATION

In a traditional theoretical framework, administration is considered to be constituted via the constitution.⁷⁰ This starting point has served as the basis for the so-called constitutional analyses. These are functional analyses based on the tasks that the administration performs or should perform.⁷¹ These analyses are usually based on the constitutional three-way division of power. The administration is associated with the executive branch of the three-way division into legislative, executive and judicial power. An example of a functional definition of administration is: "... to delimit the organization whose main function in the system is to be executive. The organization is usually called the administration".⁷²

In functional analyses, the parliamentary chain of control is usually used.⁷³ This chain of control consists of four links. The starting point is the sovereign people, who elect their representatives and express their opinion in the public debate. The second link is the legislative assembly, the Folketinget, which ensures that decisions are delivered and money is allocated. The third link, the government or the executive branch, ensures that the decisions are implemented. This is done via the fourth link, the administration. Government and administration are structured with a minister as head of a department, who ensures that the implementation of decisions made in the legislative assembly is led. The chain of control itself emerges in the relationships between these four links.

If we consider the relationship between administration and government, administration is technically neutral. A sharp distinction is thus drawn between politics and administration. Weber defined rational bureaucratic administration⁷⁴ by 1) control based on specialized knowledge, 2) defined areas of competence and 3) that the work is carried out based on a clearly defined regulatory framework. This system of "rational rules" is considered "generally binding norms". The system of rational rules thus legitimizes the power of those exercising authority, as long as it is in accordance with these rules. The rational exercise of power occurs on a formal basis and based on objective decisions. Personal considerations are not to be found in such a system, and the work is carried out according to the principle "sine ira et studio" (without anger and personal desire). Weber saw in this

⁷⁰ Bogason, 1992, p. 34.

⁷¹ An example of a functional management definition is as follows: "... to define the organization whose main function in the system is to be executive. The organization is often referred to as the administration" Bogason, 1988, p. 2.

⁷² Bogason, 1988, p. 2.

⁷³ Bogason, 1992, Olsen, 1972. In Olsen, the parliamentary chain of governance is presented as a model for liberal constitutional democracies. The connection between constitutional theory and the parliamentary chain of governance is made by Bogason.

⁷⁴ Weber, 1982, pp. 126ff.

This organizational form had a "technical superiority", not least because the principle of division of labor had been implemented based on purely professional considerations.

To place the decision-making process issue more precisely in these formally organised areas, the concept of rationality is central. In relation to the parliamentary chain of control, decisions are made by the Folketinget and the government. The administration as a technically neutral area is characterised by objective-rational action placed in a regular hierarchical structure. The individual office can be defined by Weber as follows: "the body of officials working in an agency along with the respective apparatus of material implements and the files makes up the bureau"⁷⁵

Thus, the office can be considered a technically neutral area that, among other things, involves working with these document archives, which are considered solely as technical aids.

Central to the traditional view of management are technical skills:

"Technical skills is the important term here, because the characteristics of bureaucracy suggest that the organization of the bureaucracy is oriented towards, first, insulating those skills from dilution by influences from outside and corruption from within the organization and, then, grouping and specializing those skills for efficient use"⁷⁶

As the quote illustrates, it is essential to precisely separate technical skills from political influence and then group and specialize these for effective application.

Actual discussion of the problem and problem solving is assumed to be unnecessary for each individual work operation. This argument is based on the fact that rule-based knowledge is considered part of the technical skills described above:

"The reduction of modern office management to rules is deeply embedded in its very nature. The theory of modern public administration, for instance, assumes that the authority to order sudden matters by decree - which has been legally granted an agency - does not entitle the agency to regulate the matter by individual commands for each case, but only regulate the matter abstractly."⁷⁷

The assumption of hierarchical authority relations is central. Political decisions are made in government and channeled via the "chain of command" through the administration, where only decisions of a purely professional nature can be made. To define this "chain of command" in more detail, Weber uses the concepts of "power" and "dominance". Power is defined as the imposition of one's own will on the behavior of others⁷⁸, whereas domination is seen as the more general condition that members of society "submit" to certain institutions in society such as legislation. Weber further distinguishes domination by virtue of authority and domination by virtue of a constellation of interests:

"Beside numerous other possible types of domination, there are two types that form clear opposites: - namely, on the one hand, domination by virtue of a constellation of interests (and especially by virtue of a monopoly situation), and on the other hand, domination by virtue of authority (authority to command and duty to obey) (...) Dominion by virtue of authority is based on a duty to obey, a duty which disregards all motives and interests, which is duty simply and right"⁷⁹

With domination by authority, administration is thus bound together as a rational organization in a hierarchical system of authority relations. If a person receives an order that he or she disagrees with, he or she is obliged to assert his or her point of view to the

⁷⁵ Weber, 1968, p. 957.

⁷⁶ Harmon & Mayer, 1986, p. 69.

⁷⁷ Weber, 1968, p. 958.

⁷⁸ Weber, 1982, p. 74.

⁷⁹ Weber, 1982, p. 75.

If the point of view is not taken for granted, the person is obliged to perform the task to the best of his ability.⁸⁰

In conclusion, it can be said that administration in the traditional theoretical framework is only considered from an executive perspective. Thus, implementation analyses with this starting point will typically focus on relations between politicians and civil servants as elements of a simple management process. The political wishes for the administration are formulated and communicated and their compliance is monitored. Within this paradigm, the administration is seen solely as a neutral implementing body. Explanations for the lack of effects are often explained here by external factors. These may, for example, be natural processes.

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1.2 INFORMATION TECHNOLOGY AND MANAGEMENT IN A HISTORICAL PERIOD PERSPECTIVE.

This section first explains the historical use of information systems in administration. Then, the focus is on introducing the idea of integration as an element in information systems in administration. The overall focus of the report will be on which problems and problem solutions have been formulated in connection with the use of the computer. Thus, priority is not given to either the "technological" or the "social", but instead focuses on how the computer has historically led to the formulation of new problems and problem solutions. The focus is thus on the interaction between the "social" and the "technical".

Manual systems are "translated" into digital form

The use of computers for administrative purposes is usually dated to the early 1960s. The first Danish computer, DASK, was constructed in 1957 and I/S Datacentralen was established in 1959.

Technologically, the use of computers for administrative purposes is made possible by the fact that it becomes possible to represent characters in digital form. Previously manual archives are transferred from paper to other media. Specifically, these were punched cards, card strips and later magnetic tapes.

Characteristic of these media is that they are read sequentially. With this medium, one or more permanent files on magnetic tape were often operated on, and these were then updated via transactions, which were often represented in the form of punched cards. Applications were constructed for each work area. Central to the application was that no real integration occurred as a result of the new technology. Tasks that were previously performed separately were also performed separately in the automated system. The most significant change in the working situation consisted of collecting corrections together during the day and then having them performed once a day or once a week. The execution of these tasks under state auspices was during this period handled by the Data Center. In practice, transactions were coded on punched cards and transported in the Data Center.

Physically, these runs took place in the same building where the mainframe was located. This execution of transactions in batches was called batch runs, a concept that has now crept into every organization with a large computer.

⁸⁰ "If he receives an order he disagrees with, he is obliged to make his views known to his superiors.

If, however, he maintains his position, it is assumed that the official carries out the order to the best of his ability. Bureaucratic ethics dictate that the duty of obedience ranks highest. The bureaucrat's position must be based on a professional assessment and be completely independent of personal likes and dislikes" Olsen, 1972, p. 26.

⁸¹ "For many diseases, most people recover on their own, which may be the real explanation for why the effect of an administrative measure has an effect on some but not on others." Winter, 1994, p. 114.

In the early days, the problem of information technology was formulated exclusively in technical terms, aimed at handling a completely new technology. With a simple application of the technology for administrative purposes, the task consisted of a "simple" translation of existing systems from manual to digital form. As the systems grew larger, new problems emerged. However, these were not primarily of a technical nature.

The problem can be formulated as an organization and coordination problem: how to coordinate the new type of work process that must be carried out in connection with the construction of computer systems?

Systems development methods are introduced to solve the organization and coordination problem. One such method is SYSKON (SYStemKONstruktion)⁸² formulated as part of a project under the EDB-rådet (1968-72). The method has formed the background for most development projects in Denmark and is still used today. The method recommends dividing a project into a number of successive temporal phases and a division of actors associated with the project. The phases are idea, analysis, sketch, design, specification, programming, conversion and operation phases. The actors are divided into a group of decision-makers, a group with performing activities and a reference group, which will coordinate between future system users.

The integration is introduced.

With the development of direct-read and -write media, the traditional batch environment with the bundling of transactions was replaced by "online solutions". In the batch-oriented information systems with increasing amounts of information, the problem of establishing connections between previously separate information systems was faced. A phenomenon that is still very widespread, for example, in the case of the merging of registers. Currently, the "creation of the connection" between registers is still a subject of political attention. For example, the political problems of the merging of unemployment insurance fund and company registers for the purpose of controlling the allocation of social benefits are being discussed.

If the integrated system is considered as the collection, storage, processing and transmission of data, the crucial technical difference compared to traditional batch systems is that all these elements undergo centralization. Previously, the individual information systems were characterized by a direct connection to task areas. Collection, storage, processing and transmission were often managed by one and the same person, who acted as responsible for a given management area.

The effort in the integrated information system is the design of the elements of acquisition, storage, processing and transmission as a common resource for the entire organization.
The introduction of the concept of "Corporate Database" expresses this effort.

For example, it is not "rational" to have the same data about customers registered in both the accounting and marketing departments. Data about customers and other data are placed in the common database, and applications are built that meet the needs of the accounting and marketing departments. In addition, processing is centralized, as functions that were previously performed decentralized are now implemented as part of a central system. An example of integrated systems in the administration is efforts to establish common journalization systems under state auspices.

Theoretical reflections are an element in this development towards the establishment of integrated information systems. A dominant trend is referred to by the English acronym MIS ("Managing Information Systems"). A corresponding trend is referred to as "Information

⁸² Anderson, 1986.

Engineering".⁸³ This theory is based on an organizational strategy, where the important thing is to determine what information is needed to implement the chosen strategy. In contrast to previous designs of strategies for computer use, "Information Engineering" includes all tasks that are carried out in a given organization. A data model⁸⁴ is then established for the entire organization. With this data model, redundant information and workflows can be removed. Information that is used in several places is stored in only one place and appears in only one place in the data model.

With this trend, the theoretical prerequisites are present to formulate an ideal of an integrated information system. The primary application of this theory has been more technical centralization of data than actual comprehensive organizational changes.⁸⁵

Thus, CJ Date⁸⁶ is often used exclusively as the overall theoretical framework for the introduction of new information systems. With this framework, the following issues are thematized:

1. Redundancy can be reduced
2. Inconsistency can be avoided
3. Data can be shared
4. Standards can be enforced
5. Security restrictions he enforces
6. Integrity can be maintained.
7. Conflicting demands can be balanced.

Considering the presented theoretical framework, it can be seen that the problem regarding the introduction of integrated information systems is formulated exclusively with a focus on technical aspects. For an overall assessment of integrated information systems as a phenomenon in the administration, the next section will illustrate how the database thinking has concretely translated into government policy publications. As will be seen, this ideal does not only cover the Danish administration, but also includes an ideal of integrated information systems at the EU level.

1.3 INTEGRATED INFORMATION SYSTEMS AS A POLICY PHENOMENON.

In relation to the establishment of databases and communication infrastructures, the administration's reflections are clearly seen in the Ministry of Finance's report *Effective IT in the Government*⁸⁷ from 1989. The starting point in the report is that IT has predominantly been used for the automation of existing tasks:⁸⁸

"Throughout the 70s and 80s, we have become accustomed to using IT to automate large routine tasks (e.g., benefit payments and tax collection) and to support well-known

⁸³ This trend dates back to the early 1980s. A central work is *Information Engineering* from 1981 by Clive Finkelstein and James Martin. A more recent development is seen in Edwards et al. (1991) with the book *The Essence of Information Systems*.

⁸⁴ A data model is defined by a series of "entities" containing properties of each entity. In addition, relationships between entities are specified. An example of such an entity is a model with the entities customers, orders and products. In the entity customers there is an instance for each customer. Similarly, there is an instance for each product in the entity products. In the entity order, one or more relationships are established from a customer to the order entity.

⁸⁵ Date, 1990, Edwards et al. (1991), Finkelstein and Martin (1981).

⁸⁶ Date, 1990.

⁸⁷ *Effective IT in the state - report from the IT Policy Committee on the state's use of information technology in the 1990s* Ministry of Finance, Department of Administration and Personnel, April 1992.

⁸⁸ Ibid. pp. 21-27.

work processes, such as accounting, word processing and journaling (...) After the introduction of computers, the same people have performed the same work, now only with the help of computers"⁸⁹

Manual tasks are translated into digital form. Establishment of communication technology solutions is introduced as a new element. Emphasis is placed on building a general information network with data communication across traditional organizational boundaries, including, among others, between public and private and between the state and the EU:

"Appropriate development requires that the individual state institutions establish data communication solutions that ensure that everyone can communicate with everyone within the state, and that other sectors can easily establish communication links with the state (...) The Ministry of Finance should investigate whether it would be possible and advantageous to establish joint communication facilities between the Danish administration and the EU administration"⁹⁰

Based on the demand for renewal of the public sector and the ideas about the use of information and communication technology described in *the Info-society year 2000*

Information and communication technology is now given significant importance.

The state IT policy in *Effective IT in the state* is formulated with the following elements:

"Results orientation: ensures that IT is integrated into the general modernization and efficiency policy.

Market management: used to the maximum

Decentralization: problems are solved at the lowest possible organizational level. Only when there are special reasons should higher levels intervene"⁹¹

The last element is consistent with "Information Engineering" as described above. Strategies must be formulated at specific levels depending on the use of data.

Four levels are used: an institutional, ministerial, national and EU level. In the ideal understanding of information systems, data analyses should in principle be carried out and a strategy and data model should be designed at each level. Only where there are cross-cutting national interests such as data communication, security and supranational IT interests should a national policy be formulated by the Ministry of Finance. The IT policy tasks are then divided based on the above levels. At the institutional level, the following applies:

"As part of its corporate strategy, each individual state institution must formulate a strategy for how it will utilize information technology ... and the results must be followed up - through the establishment of measurable success criteria"⁹²

At the ministerial level, an IT coordination structure must be established:

"This applies in particular to the inclusion of IT in "group management" and the exploitation of data communities in the ministry's areas and in the parts of society that the ministry's work affects"⁹³

At the national government level, the role of the Ministry of Finance is highlighted:

"The Ministry of Finance should - as before - assume overall responsibility for the implementation of the joint state IT policy in the areas of action where a joint state effort is necessary"⁹⁴

At the EU level, the state must ensure open systems through standardization, regulation of public procurement and creating data communication between the EU and the national administrations.

In conclusion, it can be said that integrated information systems have become the subject of significant political attention. With *Effective EDB in the state* and especially *the Info-society of the year 2000*

⁸⁹ Ibid. pp. 41-42.

⁹⁰ *The information society in the year 2000*

⁹¹ *Effective IT in the state*, p. 1.

⁹² Ibid. p. 30.

⁹³ Ibid. p. 31.

⁹⁴ Ibid. p. 31.

The ideal is formulated as an integrated information system that should encompass large parts of the administration. Furthermore, this ideal has been positioned as an essential element in publications, etc., that focus on decentralization and market orientation of the administration.

Information technology is thus established as an important element in the renewal of the public sector.

1.4 A PRELIMINARY CRITICISM OF THE TRADITIONAL UNDERSTANDING OF ADMINISTRATION AND INTEGRATED INFORMATION SYSTEMS

In general, there is a correspondence between the traditional management theoretical understanding and the government IT strategy for integrated information systems. The impact on management is formulated exclusively as a technically neutral relationship.

The theoretical sources of inspiration from "management information system" literature clearly shone through in the Ministry of Finance's formulation of the ideal of connecting the administration in a comprehensive communication network.

Theories of this type typically describe, from a normative theoretical perspective, how an administrative organization and its current or future data processing and communication processes can be analyzed and then supported and built in the form of an information system.

Such theories are fundamentally based on, firstly, systems theory, where a given process is broken down into its components or sub-processes, also called subsystems, and secondly, information theory, where communication and the content of communication can be broken down into some specifiable minimum units, namely information. Theories from this perspective are thus method-recommending. A systems development method is "...a method that can be used when developing a new computer system".⁹⁵ There are a large number of theories in this area, and new works are constantly being added with their special "discoveries" of processes in the organization that can be supported - routine tasks, the tasks of middle managers, specialists and top management, the communication between them, etc.⁹⁶

If these theoretical contributions are considered in relation to administration, they are all based on a "Weberian" model, where administration must neutrally provide information to political decision-makers.

This framework explains both normatively and descriptively how decisions are made. These are deduced from a functional systems theory understanding of management. Deviations from this model are formulated as a management problem:

"... an organization constantly aims to increase the extent to which its decision system is guided by a criteria of rationality and its actions maximize the interests of the organization as a whole. Such an organization will be controlled firmly by top managers, whose authority is evident on the organization chart"⁹⁷

Thus, this theoretical framework does not provide tools that are able to view the decision-making process as a complex, composite problem-solving activity, where, in addition to technical-rational factors, political and economic aspects also appear as central aspects when introducing integrated information systems in administration.

⁹⁵ Pries-Heje, 1995; p. 121.

⁹⁶ The range of works is long: Wood-Harper, Antill & Avison (1985), Edwards, Wards & Bytheway (1991).

⁹⁷ Danziger, 1992, p. 13.

1.5 SUMMARY

In the first part of this chapter, the traditional view of management was presented. The introduction of information technology into administration was then explained. It was found that the focus was primarily on technical aspects of the introduction of integrated information systems. Viewed as a policy phenomenon, it was found that the theoretical framework from the MIS literature was dominant. Finally, it was pointed out that both the traditional management concept and the theory of information systems are based on a simple system model. With such a basis, the introduction of information systems cannot be conceptualized as a complex interplay between technical, economic, information and resource-related factors. In the following, an alternative theoretical framework will be set up. First, the focus is on technology and the concept of information in Chapter 4. Then, the focus is on management theory in Chapter 5.