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EXPERT SYSTEMS AND CITIZENS IN PUBLIC ADMINISTRATION (Legal Aspects in Yugoslavia)

SUMMARY

Reform and modernization of public administration in regard to new technology is particularly present today, with new many approaches, methods, and processes. Expert systems have also started making their way into the legal field, with potential application particularly in the area of judicial and administrative legal reasoning and decision-making. The informatization of public administration is gradually developing around the knowledge base of collecting, handling, communicating and disseminating information within and by administrative and government authorities. In Yugoslavia, economic and other developments have been unsatisfactory both viewed against official expectations and in comparison with other countries.

There is serious disproportion between constitutional and legislative norms and real social processes. Questions relating to the citizen - public administration interface, have been normatively regulated only from the point of the obligation of the citizen to give data. As consequence, the "normativity gap" in the reality of Yugoslavia is very strongly expressed. Is could be said that the implementation of expert systems and knowledge bases in public administration in Yugoslavia has to wait for the resolution of preliminary questions, namely, the economic reform, the social reform and the constitutional changes.

I. INFORMATION TECHNOLOGY AND PUBLIC ADMINISTRATION

1.1. Information has always been an important factor in governing public affairs. It is the image of files and records, of protocols and dossiers containing information on a particular matter or person that symbolize government and public agencies at work.[1]

1.2. In modern society, collecting, processing and transmitting information can be regarded as a principle public function of government and public agencies on all community levels. The task of government and public service can be seen as a general need to carry out administrative and social functions in an efficient, economic and legal manner. This view of the public administration as processor of recorded information can be il-

lustrated with many examples from different areas of public activity - from tax collecting to population census statistics. The accumulated data is processed, transmitted and evaluated electronically by the mighty technological potential of today's "computer state".[1] Advanced research is being done in the field of highly sophisticated expert systems using the "artificial intelligence" (AI) techniques and processing capacities of the fifth generation supercomputers.

1.4. Reform and modernization of public administration in regard to new technology is particularly present today, with new many approaches, methods, and processes. The process is predominantly oriented towards the implementation of information processing technology. Still, it could be said that there are certain areas of difficulties - from material and normative limitations, to socio-psychological resistance and existing habits - that have to be taken into account.[2]

"Because of technological progress, the instruments (of administrative reform) cannot only be reduced to the computer. The future brings a network of different procedures interconnected by general communication systems:
- at the base, work-stations (minitel, micro-computer network, specialized postal service) (...);
- at the office and service levels, mini and macro computer systems assure uninterrupted production;
- at the national and international level, large data processors will play the role of collective data banks, storing and redistributing strategic information, training methods and research (computer assisted training, diagnostic, expertise)."[3]

2. ARTIFICIAL INTELLIGENCE

2.1. For the last four decades, scientists have worked at two fields of information technology - one trend oriented toward writing programs that show features of artificially produced human intelligence, and the other, toward more power and speed of the computer equipment. Recently, the diverse trends are starting to converge - the result being artificial intelligence expert systems supported by knowledge bases and supercomputers.

2.2. Artificial intelligence - "AI" is an "umbrella" term that describes a group of technologies that is aimed at making computers imitate human thinking. Artificial intelligence was not a true science until 1959, the year in which Marvin Minsky, now at Massachusetts Institute of Technology (MIT), Claude Shannon, of Bell Laboratories, and other luminaries of information science met at a conference at Dartmouth Collage. John McCarthy, then assistant professor of mathematics at Dartmouth, coined the term artificial intelligence for the theme of the conference. The conference's high point was the unveiling of what some consider the first expert system - Logic Theorist. It produced non-numerical symbols instead of crunching numbers and was able to prove several theorems in the Principia Mathematica of Alfred North Whitehead and Bertrand Russell.[4]

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[1] David Burnham: "The Rise of The Computer State", New York, 1979, p. 7.
[2] Jean-Louis [redacted]quist & Celine Wiener: "Nouvelles Technologies et Reforme Administrative", Revue Francais d'[redacted]tration Publique, No. 37, 1986, p. 9.
[3] Jean-L[redacted]quist & Celine Wiener, supra, p. 11.
[redacted] Magazine, Vol. 4, No

3. EXPERT SYSTEM SOFTWARE - KNOWLEDGE BASES

3.1. During the 1960's, other computer programs imitated human decision making processes, by using such "skills" as educated guessing and inference drawing. Some 4-5 years ago, it was estimated that approximately 50 expert systems were in operation - among them: MICYN and "Caduceus", which help doctors diagnose bacterial infection; CATCH, which scans 250.000 photographs to assist New Work City police in identifying criminal suspects; "Prospector", which sifts geological data to estimate the probability of a large ore deposit: it found a molybdenum deposit worth $100 million.[1] Now there is a estimated 1.000 to 3.000 in daily use, and the number is increasing 50% annually. Commercial systems derived from artificial intelligence suddenly seen to be everywhere.[2]

3.2. An expert system is supported by a knowledge base, (as opposed to a data base of an "ordinary" computer) in information processing. Simply speaking, expert systems process knowledge, as they rest on information flows based on so-called "if-then" facts, and general rules. Expert system designers found that, due to specific subconscious psychological processes, formulating general rules by experts whose expertise is stored in knowledge bases is very difficult. Formulating knowledge is a challenge, and consequently knowledge acquisition systems have been developed to help experts articulate their "feeling" into a form that is acceptable to computer processing.

4. EXPERT SYSTEMS HARDWARE - SUPERCOMPUTERS

4.1. Supercomputers of the fifth generation are the supporting hardware of expert systems. Speed and power are the main features of the supercomputers that distinguish them from the computers of the third and fourth generation. In the early days of the development of the computers, the speed of data processing was measured in units of thousands of FLOPS (i.e. floating point operations per second). Today's supercomputers operate at speeds of GIGAFLOPS (i.e. billions of operations per second), while tomorrow's machines will operate at speeds measured in TERAFLOPS (i.e. trillions of operations per second). A single supercomputer operating at teraflops speed will have the power of some 10 million personal computers working full capacity.[3] The most powerful supercomputers are surprisingly small and sleek. But looks can be deceiving. They are tightly packed workhorses that require a whole array of supporting equipment. The machines can be connected, by cable or satellite, to hundreds of remote terminals that can transform raw numerical output into stunning 3-D graphics."[4]

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[1] Brad Lemely: supra.
[2] Eugene Linden: "Putting Knowledge To Work", Time Magazine, No. 13, 1988, p. 33-34.
[3] [illegible]

5. LEGAL EXPERT SYSTEMS

5.1. Expert systems have also started making their way into the legal field, with potential application particularly in the area of judicial and administrative legal reasoning and decision- making.[1]

5.2. The possibility of building an "intelligent" legal information system, an information system which in some sense "understands" the concepts of a particular area of law, has attracted much attention in recent years. Part of the interest in intelligent systems arises from a desire to surpass the current techniques for legal document retrieval, which still rely exclusively on full-text and key-word search. Another reason for interest in intelligent legal information systems has to do with the success of expert systems in several other professional disciplines, most notably in medicine and geology.[2]

"Increasingly, the leading researches in the expert system field are stressing the importance of these deep conceptual models for the next generation of expert systems, and the argument seems to me to be particularly pervasive for legal systems. (...) What is our purpose of building a conceptual model of a legal domain? (...) We are looking for a language which is rich enough to express the important facts about a particular legal world, and yet abstract enough to suppress the irrelevant detail. The purpose of our conceptual model, then, is to specify exactly which of these details should be expressed, and which should be suppressed, and how."[3]

5.3. One of the main obstacles in constructing expert legal systems, lies in the need to clarify basic legal theory prior to attempting to represent complex legal matters. It is therefore important to have a foundation of a consistent legal theory upon which complex legal notions are to be conceived.[4]

6. ADMINISTRATIVE SYSTEMS

6.1. As modern industrial and social systems grow more complex, government regulatory and administrative functions increase. On the other hand, the large governmental and administrative bureaucratic organizational systems become models for industrial enterprises and public service institutions.[5]

6.2. In such social and administrative environments, most individuals usually leave a "record trail" behind their actions in communicating with various government offices, public agencies and private institutions (birth certificates, school and medical records etc). Before the wide-spread use of computer information processing, collecting and linking particular bits of information into integrated patterns was technically very difficult, if not altogether impossible. Today, however, computer-based record systems and

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[1] Anne Garner: "Overview of Artificial Intelligence Approach To Legal Reasoning" in "Computing Power and Legal Reasoning" Edited by Charles Walter, West Publishing Co, St. Paul, 1986. p. 247-274.

[2] L. Thorne McCarty: "Intelligent Legal Information Systems - Problems and Prospects", Rutgers Computer and Technology Law Journal, Vol. 9, No. 2, 1983, p. 265-294.

[3] L. Thorne McCarty, supra, page 267-268.

[4] Cary deBessonet: "An Automated Intelligent System Based on a Model of a Legal System", Rutgers Computer & Technology Law Journal, Vol. 10, No. 1, 1983, p. 31-58.

[5] J. A. H. (ed.): Zagreb, 1985 (in Serbo-Croatian).

electronic communications networks, make it possible to overcome the time and cost barriers. Computer information technology permits instant communication linkage - integrated data-processing, of a large number of record systems (e.g. on individuals), literally in seconds.[1]

6.3. Administrative processes are modified by the introduction of modern technology, particularly by information processing technology. The everyday tasks of administrative functionaries and employees are being transformed by new methods of decision-making, information-processing and services.[2]

"The introduction of new technology has three major organizational consequences: 1) information technology redefines the tasks of administrative agencies; 2) new information techniques balance the internal equilibrium of the administration; 3) modernization of the administration is the opportunity of the administration to modify its relations regarding service consumers."[3]

7. CITIZENS AND ADMINISTRATIVE INFORMATIZATION

7.1. Through the introduction of information technology combined with telecommunication technology, the informatization of public administration is gradually developing around the knowledge base of collecting, handling, communicating and disseminating information within and by administrative and government authorities. Local and large networks are in operation in which the technology and comparative advantage of personal computers are combined with telecommunication facilities. In this way "intelligence" is distributed widely throughout the organizational and procedural structure of the public administration.[4]

"Departments, as part of public agencies, will gain in autonomy, as far as their operational activities are concerned. Flows of information, which are being processed parallel to the operational activities, are constantly at hand for the different levels in the departments. (...) The job of the street level bureaucrat will certainly become more interesting, as the horizontal span of his tasks will increase and the variation of his case-load will grow. (...) On the other hand, it has become much easier for his superiors, to monitor his activities."[5]

7.2. The informatization process has significant consequences on the relation between the citizen and public administration. The relation between the citizen, i.e. the "citizen-public administration interface" is in focus, particularly in its transformation from traditional relations of an authoritative, nature toward a high-technology, service-oriented role of the public administration as a global information processor. Within this context, legal questions of data personal protection in public and official agen-

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[1] Stevan Lilić: "Data Protection and New Technologies In Public Administration" (in English), Zbornik Pravnog fakulteta u Zagrebu, br. 6, 1989, p. 793-805.

[2] Christophe Stener: "Les nouvelles Techniques Informatiques et la Modernisation du Travail Administratif", Revue Francais d'Administration Publique, No. 37, 1986, p. 17.

[3] Christophe Stener, supra, p. 26.

[4] F. Snellen & W. van de Donk: "Some Dialectical Developments Of Informatization in Public Administration", Conference on New Technologies in Public Administration, Vienna Center, Zagreb, november,

cies, particularly reflect the contradictions of the realization of the public interest and the rights and liberties of the citizen.

8. LEGAL ASPECTS IN YUGOSLAVIA

8.1. Strategic questions of economic, technological and scientific development are priority issues in many countries in the mid and late 80's, Yugoslavia not excluded. Not only are these topics considered and discussed in professional and academic circles, but at the highest instances of government as well. Economic and social developments in Yugoslavia during the past several years have been dynamic and complex. Economic and other developments have been unsatisfactory both viewed against official expectations and in comparison with other countries.[1]

8.2. In the Report on the State and Problems of Internal and External Policy, the Presidency of Yugoslavia particularly stressed points regarding technology developments.

"Advanced scientific and technological progress is an essential feature of the contemporary world. Yugoslavia is behind the most developed nations in the development of science and technology. This situation negatively reflects on her economic and general development, as well as on her position in international economy."[2]

8.3. The "hyperproduction" of laws and regulations in the economy are frequently in mutual contradiction to the extent, that some experts argue that it is a real wonder that, for example, the economy is functioning at all.[3]

8.4. The same could be said of the normative and organizational structure of the administrative system. The position of the public administration in Yugoslavia, at this moment must be viewed in relation to the existing economic and social situation, as well as the rather complex process of constitutional change. This was explicitly stressed in a general Report of the Federal Government on the state of the administration, as well as in expert opinions The Federal Expert Commission on Public Administration.[4]

"The Expert Commission holds that fundamental critical reexamination of the basic normative orientations on which the position and role of the state administration, as part of the political system of socialist selfmanagement, should be initiated without delay, in order to define solutions in due time, and to incorporate them into the text of the constitutional amendments."[5]

8.5. Very illustrative negative tendencies can be seen through the normative structure of the administrative procedure. It is very successfully argued, that measures should be taken to modernize and introduce new technology into this procedure.[6]

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[1] OECD Economic Surveys - Yugoslavia, Paris, 1987, p.7-8.

[2] Report Of The Presidency Of Yugoslavia On The State and Problems Of Internal and External Policy (in Serbo-Croatian), Biblioteka Skupštine SFRJ, Kolo XXIV, Sveska 8, Belgrade, May 1987, p. 46.

[3] Vlatko Mileta: "Strength and Impotence Of The Federation In The Sphere Of The Economy" (in Serbo-Croatian), Naša zakonitost br. 2-3, veljača-ožujak, 1988, Zagreb, page 181.

[4] Bulletin - Federal Secretariat for the Judiciary and the Organization of Federal Administration (Informacije, Savezni sekretarijat za pravosuđje i organizaciju savezne uprave), Beograd, Br. 30, Decembar 1987.

[5] Opinions, Proposals and Initiatives of the Expert Commission for Public Administration, regarding the Report of the Federal Executive Council on The Realization of the System and the Transformation of the System of State Administration (Mišljenja, predlozi i inicijative Stručnog saveta za oblast uprave dati povodom razmatranja Izveštaja o ostvarivanju osnova sistema i transformacije državne uprave), Bulletin, supra, p. 26.

[6] [illegible] "Technology Development in Administrative Procedure" (Razvoj tehnike in upravni pos-

"The government should put under critical analysis all the norms of the administrative procedure, form the point of introducing modern technologies. The novelization would go through two stages. In the first stage, the traditional procedure rules would remain, and new ones would be introduced were possible. The second stage would gradually relieve the traditional regulations and deal with the new problems stemming from the application of contemporary technology."[1]

8.5. Questions relating to the citizen - public administration interface, have been normatively regulated only from the point of the obligation of the citizen to give data.[2]

"The analysis of the positive laws regarding the government data bases, shows, above all, the explicit obligation of the citizen and other subjects to furnish correct and complete data for realizing the public interest, while the question of specific legal protection is not explicitly regulated."[3]

e) The of application of new technologies in public administration in Yugoslavia is at a rudimentary level. Therefore, the implementation of expert systems is even further off, as there is practically no activity and projects on these systems (with some exceptions - e.g. as in the area of penal law).[4]

8.4. As consequence, the "normativity gap" in the reality of Yugoslavia is very strongly expressed not only in the economic, but also in the administrative system. Economic inflation is paralleled by a normative inflation, and some estimates put the number of general acts (laws, regulations, "self-management acts") at nearly 4 million!

8.5. Concluding, it could be said that the implementation of expert systems and knowledge bases in public administration in Yugoslavia has to wait for the resolution of preliminary questions, namely, the economic reform, the social reform and the constitutional changes. Only in these circumstances can "normativity turn into reality", and the citizen have benefit of such mandatory "abstract" clauses of the Administration Systems Act, as the one that prescribes that:

"The executive organs, and the administrative agencies, base their proposals, opinions, regulations and other acts they prepare (...) on scientific and professional knowledge...".[5]

The day this becomes reality, the country will have pulled out of the crisis.

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[1] Rupko Godec, supra, p. 149.

[2] Stevan Lilić: "Legal Aspects of Data Protection in Government Data Bases" (Pravni aspekti zaštite podataka u službenim evidencijama - in Serbo-Croatian), Institut za javno upravo, Ljubljana, Zbornik referatov, (Nova Gorica), May, 1988, p. 25-46.

[3] Stevan Lilić, supra, p. 37.

[4] Among them - Bostijan Zupančič: "Possibilities of Constructing Expert Systems in (Penal) Law" (Možnost za izdelavo ekspertnega sistema v (kazenskem) pravu - in Slovenian), Institut za javno upravo, Ljubljana, [illegible] 1988, p. 157-166.