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URBAN PROPERTIES DATABASE AS A NEW COMMUNICATION SYSTEM

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ABSTRACT

Big data collected in computer systems plays an important role in the organization's interaction with citizens. Public communication with urban management organizations including municipalities, is routinely streamlined in the database. Therefore, the role of the communication of these databases can be considered. Because these computer systems, in addition to the role of storing information and structuring them, have always a communicative function within the organization. But with the development of computer systems, the database is moving toward a social communication function today. Thus, with this new function, they can be introduced as media. To know the municipality properties database, the most important components of this bank, that is, fields of properties information questionnaire in Tehran (properties survey) are studied in five periods over forty years. In the next step, a quantitative content analysis method is used to accurately group and census fields based on communication and management definitions to be clear, that the current tendency of this system is more toward surveillance function or organizational transactional performance. Eventually, the database system of Properties information in the process of organizational information, openness in the context of the organizational portal of the municipality of Tehran, with an emphasis on communication function, can play an effective role in the free flow of information in a community. Therefore, in order to persuade urban management organizations to open up their database contents in the organizational portal mechanism, database fields should be sorted and analyzed so that, based on the results of these studies, an operational and efficient process for organizational data openness be designed and at the end, provides smart urban intelligence development.

Keywords: *Database, Urban Properties Database, Organizational Portal, Metadata*

INTRODUCTION

Problem Statement

Nowadays, there is vast information available to urban management organizations, which is the basis for the performance of these organizations. At the present time, this mass data that is collected and stored in computer systems plays an important role in the organization's interaction with citizens. Public communication with urban management organizations, including municipalities, which is routinely ongoing, flows in the database systems. Therefore, the role of the communication of these systems, which can be taken into consideration, is less common among existing research. Database system could play significant role in interactions between municipality and citizens, which today do not play an effective role in municipality-citizens relationships.

What remarkable is that what are the goals of Information System developers? and what structural changes have been made to Information Systems during the process of development? Ultimately, what matters is that "does data base at the present conditions organize the requirements of a smart city for the free flow of information or not?

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Research Purposes

Recognition and analysis of database that can improve relationship between citizens and municipality are what can promote the service quality of municipality and satisfaction of citizens. Meeting needs of citizens in urban community is the main goal of all urban management organizations that undoubtedly will be possible through the scientific knowledge of the systems used in these organizations.

Communication Approach in administrative systems can be considered in order to achieve managerial strategies in an organization. The database not only is information and management system, but also can also play a communicational role. So far, databases traditionally have communicational role within organization. But the important discussion is the possibility of its communication at the public level, and ultimately this research aims to examine such possibility.

The main goal of the research is to identify the new database of Tehran City. What is searched here is the introduction of urban properties databases as a communication system that can play a media role in urban society. Of course, this system, in addition to communicational role, has supervisory role in social life. Therefore, both different roles of database are examined in this study. On the other hand, new pattern is provided to recognize database by social science methods, so it can pave the way for more researches related to databases especially database employed in the large organizations and database playing a wide functional role in the life of citizens.

Research Background

Studies conducted on databases have often focused on technical or managerial characteristics, and their social and relational characteristics have been less addressed by humanities methods. Regarding many discussions on IT development to improve urban management called smart city, urban database have been less addressed.

Studies performed on properties database do not have much scientific background in the scientific works. One of first studies conducted on the metadata of local government database by means of content analysis method is “The Role of Content Analysis in Evaluating Metadata for the U.S. Government Information Locator Service (GILS)” that was published by researchers of University of North Texas in America. In this study, the authors conducted a heuristic study by content analysis method. Their study that is performed on the metadata of local government database has some special characteristic. For example, it shows that in order to increase efficiency of information locator service needed by users in local government database, scientific analysis of metadata is inevitable. Of course, content analysis of metadata that is main goal of authors is directed to record content analysis of instances. Consequently, their analysis focuses on the records while study on the metadata, regarding their standard definition, is like data about classified categorical data that considers field rather than records of database.

In United Nations Conference on Housing and Sustainable Urban Development known as Habitat, took place in Istanbul in 1996, a discussion about creating a properties database in a computer system is seriously brought up. United Nations Resettlement Program proposes some design principles of a database for urban residences that are implemented in African cities and are considered as factor of managerial development and urban cities. The first point that is mentioned in properties database is to match property information with maps and geographic

information. Finally, the main goal of such database is defined as creation of tax revenue for the municipality to provide optimal services.

RESEARCH METHOD

In this research, according to the theory of modules in the management of information systems, the content analysis of the of database fields is discussed. In the computer science discourse, the description of computer science's characteristics is called metadata as well. In this research, **metadata** is studied by research method of social science. Consequently, we try to study computer system in terms of content, because database system is textual system and its field that is like written text can be analyzed. Therefore, the intention and object of this system's designer can be found. What goals and objectives of the agents and designers of the management and computer systems are in an organization like the municipality or which categories of goals including control, supervision, financial and applied goals they have on the mind, will be further recognized by the content analysis method.

Overall, this research utilizes the researches that study a technology system with content analysis as a common method in the humanities. Undoubtedly, electronic system is a creation of human being, so it can be analyzed as human work. Klaus Krippendorff, who is among first researchers, states that content analysis method is useful to recognize computer system. He believes that common aspect of thesaurus method and semantic grouping put emphasis on the word that is identified in written text, is separated from language environment, is individually categorized and is entitled and is finally counted. The aim of categorization or nomination of word (recording unit) is replication of common judgments about semantic similarities between words or synonyms. Therefore, **semantic grouping** of words in the content analysis can be studied and arranged based on researcher's studied issues. The words can be individually grouped apart from text based on the category and definition. And each group of categorization can be measured and compared "Manual coding or recording of textual units into abstract categories that embrace a diversity of more specific instances of text is not that different from what a computer thesaurus and dictionary are designed to do, representing large bodies of text in fewer and simpler terms-except that the latter applies to character strings without anyone reading them. If done well, the construction of computer thesauri and dictionaries serves as a theory of how readers rearticulate given texts in simpler terms and categorize them according to the needs of their research." (Krippendorff, 1988: p. 284).

In the content analysis, which data the database field is and how it is analyzed will be shown in this research practically. Database field and available data are a kind of **contextual discourse** that doesn't have wording and specified syntactic structure. That is, fields have separate word and phrase that have special meaning in the mind of audience and that can be analyzed. But in the content analysis, we can study words of fields based on the **professional description**. Professional description, in fact, is a description that a social group working in a given profession can draw specific meaning from a bunch of words and have a consensus on them. Therefore, applied description for grouping database fields can be studied based on the professional description. So the results and solutions obtained from the research can be understandable and applicable to the database administrators. This is why the research is being carried out in the urban properties database by experienced administrator working in the categorization of fields with regard to common professional perceptions in urban

management.

Each of words in the field is like textual system which can have **intertextual** features, because if they are recognized separately, their results will not be reliable, unless their root and background are traced like previous written work in other contextual discourse. That is, applied words in some database fields can be carefully checked and collated one by one in a legal text. Consequently, one or more groupings of database field's word can be created by other previous texts. We can obtain independent new content analysis with its recognition. Legal material and text is the most important reference of designer and producers of database fields. Originally, applied field is main basis of interaction between organization and users.

In the content analysis, investigated content of the phenomenon is changed into a unit (unitization) to measure accurately. There are many discussions about study unit in content analysis method and there are two types of categorization, i.e. the **research unit and the content unit,** that are the main ones. Research units are components of the study text that are selected for research, on the other hand, content unit is elements that examine meaning and content present in the components. Each of two units is divided into other subsets.

Referring to content analysis method from different research units, the analysis unit will be intended to respond to research questions. Therefore, each of database field is recognized and measured as **analysis unit.** Fields of table, in fact, has meaningful content that can be examined. Furthermore, of content units in this study, **referential unit** index will be utilized. Here, due to the shortage of fields available in database system, each of them as are **census** at every group individually. In order to analyze applied fields, we refer to legal text in order to accurately understand fields.

In order to achieve comprehensive analysis over time and to answer first hypothesis, this paper aims to utilize **"trend study"** Urban database that is like computer system is examined in 30 year process, so its change and evolution can be clarified from early traditional time to new electronic age. Here, while resorting search trend, we can accurately recognize development background of database in social life. Research variables include two categories: **independent variable** and **dependent variable**. Independent variable is database that will be formed from relationship within the community by specific manner. Dependent variable will be citizens and spatial atmosphere of Tehran metropolis that will found new identity by databases.

Research Hypotheses

Main Questions: How can we reach to the meaning grouping of urban properties database cells of Tehran municipality using content analysis? To answer the first question, content analysis method is used so as to reach to a new meaning grouping by referring to legal texts and counting data base fields. This is basis for answering to two research hypothesis?

First Hypothesis (H1). Does development of Tehran's properties database from 1969 to 2009 (about 40 years) strengthen the supervision power in the urban society.

In order to answer the above hypothesis, longitudinal research method or trend research is used. And kinds of data cells among forms used over time are compared, to show what quality the increase of cells has had.

Second Hypothesis (H2). Do information and applied cells embedded into general pages for Tehran citizens 'view on Tehran Municipality portal suggest openness of urban properties database or do not?

Main Concepts

Database

Up to now, information is used in different ways in human life. Information as mentioned in communication science and media is a set of data that flows among people to transfer meaning in their mind. When the communication and information technologies make progress, we face two kinds of data: the first one is non-structured data that can include all data and information available in the text and that have meaning coming to mind, the second one is structured data that include a set of data arranged and classified in the table. What is the main discussion of this paper is that it is possible to find the role of structured data in the communication process and it can be brought up as media. Especially in this research, the structured data is a set of data that can be registered and stored in the table and it can be continuously restored and transferred. Usually, the table structures every set of data in two dimensions. In two-dimensional table, if we want to know row-oriented dimension, in fact, total records available in the database is addressed. Action is taken for the set of data in prevalent analysis in the research every day, so we can obtain recognition of phenomenon. It is like data mining that consists of attributes of phenomena in specific society. But if we analyze column- oriented dimension in which registered phenomena and records are described in the table by means of indexes, we can, in fact, achieve a kind of recognition and system analysis and its creators. This action leads us to real identification of the database content.

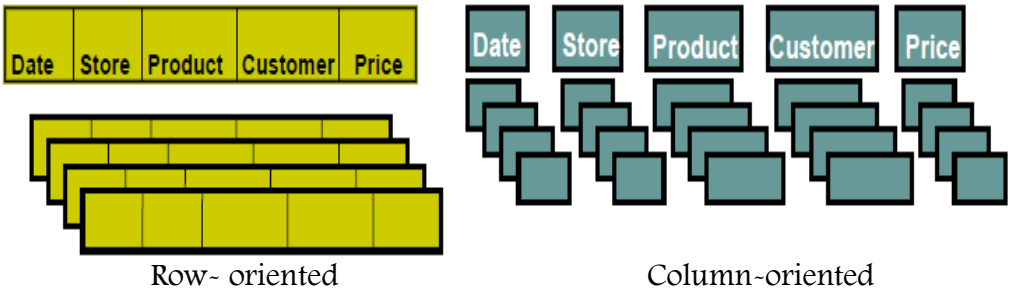

Figure 1: Two Models for Database Analysis

Database is computer system that can collect and register a set of mass data according to classification and structure. In the discussion of computer system, the concept of cyberspace is widely used.

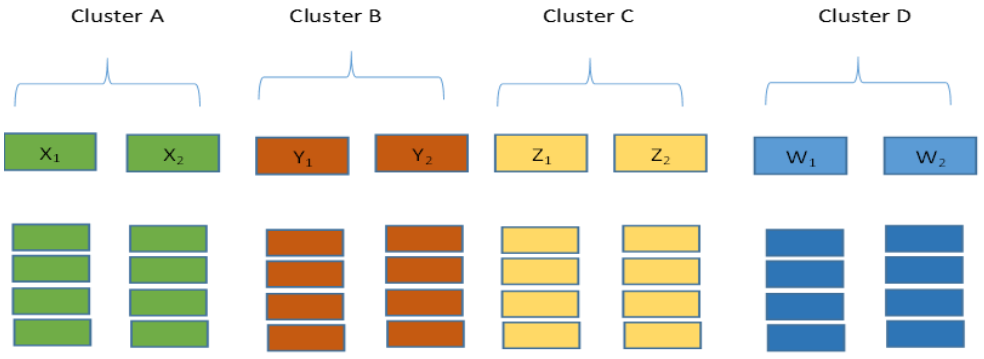

Figure 2: Clustering Database Fields

Thus, the database will also be debatable in the cyberspace because databases, as one of the cyberspace systems, simulate reality. "Virtual technology, to put the matter in a schematic way, generate images directly from coded instructions-images that transcend, or at least are designed to give the appearance of transcending constraints of distance and difference." (Bogard, 2010: p. 13). In all books in order to introduce database, they divide databases into three kinds: hierarchical or pyramid database, network database, and relational database. Third kind of database that is the most widespread kind in the today's systems is based on different tables and there is fixed relationship between them. Database that does main operation beyond registration and storage of data include data addition, data retrieval, data change, and data deletion.

In addition to information and management role, database can play communicational role. Their communicational role like notification system is on the path of information flow within an organizational structure. But given that some progress is made in database, their performance goes beyond this limit and some of its parts gradually are publicized and are joined to free flow of information. The early sample of publicized database is post office code and national identity code.

The most important feature of database is update and change of data continuously. Thus, software system of database can undoubtedly be regarded as up-to-date media with new information when the data is renewed. In all organizations, personnel, who are employed as user of computer and software systems, play the first main role in registration and submission of new information. The data, whose basis is real, occurs in the urban space and then is inserted in the database.

Nowadays, while developing global internet network, we enter new stage of database evolution that is known by new nominations in the computer science. Furthermore, big data has been much discussed today. With the advent of a new stage of information systems, social and communication analyses increasingly draw more attention in recognition of these new systems. Three features of big data in new database are summarized as follows: (a) increase in data volume, (b) velocity of data transfer, (c) Variety of data in computer format and content that is called 3V model (Volume, Velocity, and Variety).

Main performance of the database is a kind of representation. Representation in database begins with encoding process. The main part of information structure in database is digital signage that represents a person or a phenomenon, called the "entity" in the common language of the database. The database gives new identity to human being who can be recognized by electronic encoded identity. In today's societies, there are three main database systems that represent the identities of people in the community including (a) personal and identity certificate information on which many data from other databases have been uploaded, (b) credit and financial information that involves financial account and financial power of person in the banking centers, (c) local and urban information that is collected information about ownership of individuals in specific geographical spots and their possible residence specially in the city. Urban properties database, in fact, represent two aspects i.e. (a) people's legal ownership and (b) people's spatial characteristics and connections. It is clear that database in other social centers and institutes have collected a lot of data that is represented in electronic system in different ways. For example, judicial system has stored textual and legal data of many criminals and defendants. But the features of other databases are that they belong

to special social groups and do not undoubtedly involve all social elements.

Of the top ten leading technology-driven government agencies, Gartner, Inc. that is an American research and advisory firm put emphasis on the new database system and new methods of data processing over the last three years. Gartner considers openness of all data that was revealed by governments for general public as the main factors of technical superiority of a government agency. It is a method to contribute free flow of information. Gartner introduces another superior technology called scalability in governments. Organization's information exchange and interaction with user, audience and its partners should be evaluated scalabily and accurately from perspective of Gartner and provide new reporting facilities. "Many tend to equate open data with public data, however data can be defined as open when it is machine-readable and is accessible through an API. This can apply to potentially any data that needs to be processed: whether it be public, discoverable through Freedom of Information Act requests, or restricted for use by a particulate government agency. This leads to new ways of mashing up data coming from different sources as well as the ability to build new services and processes based on open data" (Gartner, 2004)

Metadata

With regard to the massive accumulation of data and the emergence of large data in our human life, we are faced with a new concept called metadata. This concept is formed by the development of structured computer information. In all sources, metadata are generally defined as data that gives us information about other data. If we provide descriptive and informative information about a structured data in computer systems, they are called metadata. Today, one of the most important elements of database system recognition is metadata. In fact, instead of examining the dataset in a system, these data identify the main indexes in which the data is collected.

Practically in the industrial countries, two informatics companies are specialized in the field of metadata and have taken effective steps in its scientific explanation. The first is Oracle Corporation, which specializes in designing and launching advanced secure databases. In published documents, Oracle Corporation has introduced a new concept called "metadata management," whose main function is to: documentation and metadata writing, data mining, linear and effective analysis, analogy, guidance, and integration of metadata.

Also, Dublin Core Company is one of the first companies that take step to clarify the concept of metadata and to classify the types and utilizations of metadata. The company, whose initial expertise was the design of databases in the bibliography of scientific sources, sought to classify the content of fields and database cells in fifteen groups. A classification goes beyond the databases of scientific resources and bibliography in another area.

In Iran, the most important source of social and economic statistics is **the Iranian Statistics Organization**. "So presentation of data (metadata) about registered data and their quality is necessary for users until it contributes them for making decision about using this data"
(Statistical Center of Iran. 2009. P: 66)

The main intersection of a system analysis with a social analysis lies in two points. The first point is that in the primary stage, the social analysis will be needed to design an efficient database; because, efficiency and effectiveness of system is promoted at social and organizational communication level and satisfy users and audience while referring to social analysis. After implementation and execution of a system, the second point is that social

analysis provides new background through which efficiency of system can be improved and whose inefficient points can be repaired.

In the information system management, concept **"data dictionary"** is widely discussed. Even before formation of strong computer systems, data dictionary is used to better recognize table of the information system. Data dictionary is like encyclopedia describes the variables used in the table, so they can be analyzed and interpreted easily. Therefore, data dictionary is the main form of **database documentation** and complied document in order to recognize and analyze database.

Every data dictionary is primarily composed of **data elements**. Data element is the smallest unit in which the semantic definition of data is embedded. We can use many units and indexes to explain fields of tables. The definition of table's field can include many features such as name of field, lexical definition, size or volume, date of registration, data type (string or integer), or creator of field. Regarding these indexes, **semantic contents** of field that is important in this study can be determined.

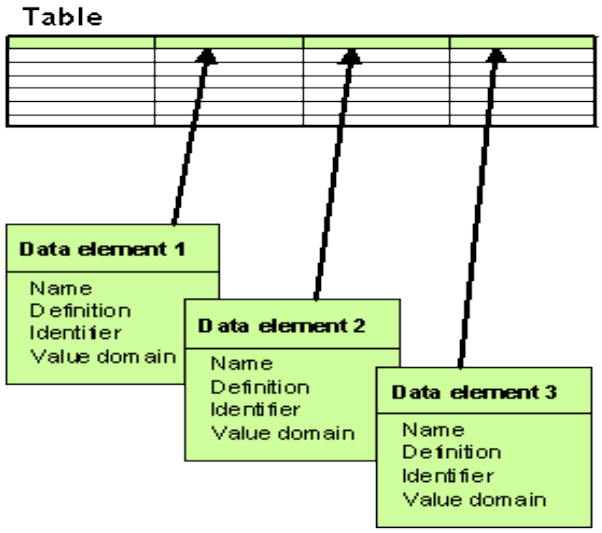

Figure 3: Metadata for each field

In this study in order to recognize the semantic content of urban properties database, some data elements are used. Four cases are paid attention in data elements. They include (1) name of field, (2) definition of field, (3) history reference of field, (4) external reference of field. In data dictionary, each field has **attributes** that define and explain feature and specification of a field. Attributes of field can be different or unknown. Therefore, they can be interpreted with different approaches. Recognition of field's content and meaning lead us to this fact that how database can restore and represent social phenomenon. This paper is going to show that specification of information field cannot be defined and explained by indexes mentioned in computer science. But, data elements can go beyond study of communication and social science due to unknown dimensions.

Organizational Portal

Nowadays, websites of large institutes and organizations is the main communicational media between audience and organizational units. Such websites are introduced in Iran under title of

"portal" and gradually it takes interactive form. After that these websites go beyond communication media and turned into an operational system (action and reaction) that takes not only some administrative and managerial functions of the organization but also the some functions of clients and contractors. "It should be noted that organizational portals are fundamentally designed with two main goals including centralized management of business information and presentation of up-to-date informational service. On the other word, organizational portals not only provide centralized management of information in the organization and open new, clear door of organization for audience, customer, personnel, and generally users, but also inform users of the last news, information, and services of business area. These portals, in addition to giving notification, provide an interactive background between managers, experts, personnel, and customers and generally users.

Today, organizational portals play a significant practical role in social communications. "In contrast to commercial and publication portals such as YAHOO which are the Internet ports and gateways, organizational portals provide access to practical software programs and information on the Intranet from a certain point. Organizational portals are a developed form of the Internet which present employees and customers an organized focal point to get in touch and converse with the organization" (Alikhanzadeh, Amir. 2014. P:153). Some needs of the Municipality addressees composed of a large number of urban citizens were supplied on the Municipality portal. A limited access to the urban properties database in general pages of Municipality portal has been made possible.

What directs an organizational portal towards free information flow is the amount of data observable and available to the addressees from inside the organization. Today the data which are usable to the public are known as "**open source information**". Open source is regarded as the data which are collected and stored in Data base and are available to the public according to management policies and organizational requirements. The basis of effective and continuous interaction is the data available to the public and measuring it may contribute to comprehending the interaction rate of an organizational portal. In case of recognition of every component of Data base used by an organization and its classification, it can be concluded that how much components of each Data base can be available on the organizational portal. It is very clear that public accessibility to all data of Data base of an organization is not justifiable in any management system. On the other hand some layers of data are specialized and are merely meaningful and useful for inter-organizational users and even some data are categorized into security layers for which protective layers have been defined. Definitely how much data can be available to the addressees needs to be studied through scientific methods. Results of such studies will be useful in making decisions on the openness of data and developing organizational interactions.

Urban Properties Database

As a mentioned in United Nations Human Settlements Program documents "Public finance experts regard taxes on immovable property as a suitable source of revenue for local governments." (UN-HABITAT. 2013. P1) "The use of computers to store property tax records and assist with administrative processes including valuation is almost essential. Computers increase analytical capabilities, perform routine calculations, and produce reports. They facilitate access to data and increase data security, especially from disasters like fire." (UN-HABITAT. 2013. P58)

Urban database, in fact, is computer system that are considered main tool of systematic communication between citizens and organization. Therefore, communicational role of this system is studied in this research. This is role attracts less attention. Urban database is the main data center that collects urban space information in itself. Regarding the content, this information includes two categories, i.e. properties and passageway information. In this study, properties database is paid attention because this system plays important role in urban space management in financial interaction with citizens. There is urban properties information among some organizations including Registry *Organization* of *Documents* and Properties, but the most complete data are collected in municipality system because all spatial information (including not only structural information such as dimension, and area of land and building but also applied information such as being residential, commercial or cultural) is available in it.

Tehran's Municipal Property System is among the most comprehensive system of municipal properties database that contains technical, financial and personal information of the owners. This information system is based on collecting field information from Tehran City's Properties, and has been practically carried out every ten years as the home-to-home population census has been done

The specific features of this system are that it gradually collects properties information over 50 last years. Therefore, it as coherent and disciplined system provides possibility of longitudinal study at time frame. This statistical information system of urban properties is basis of function for some technical and financial system as well as financial systems in the municipality of Tehran. Therefore, analysis of this system as main index contributes to better recognition of urban database system.

"Every separated unit is called a property or property unit by legal authorities. All properties have owners; this can be distinguished by property document (issued by General Office of *Registry Organization* of *Documents* and Properties). Every property is observed in different forms such as land, building, garden and so on. The property has four limits and at least one of four limits must have access to passageway and other three limits can be limited by adjacent properties." (Hashemi, M. 2009. P: 85)

Theories about Database

The basic premise in this research goes back to **information-based communication**. Since the communication that is not considered a kind of action is in fact relaying on the data available in human mind. Set of data, which makes the information, have unlimitedly expanded in the new age thanks to computers. Information in fact finds new structure in recent system and takes coherent classification and arrangement that is called "database" in new technology.

In a multi-disciplinary study, the use of a theory in each discipline can be debatable. In management department, known systems theory is remarkably considered. The systems theory is dependent on the interrelationships between components and structures, recently, the most fundamental macro theory is in computer and managerial systems undoubtedly have effect on each research about database. In computer science, the module theory has been one of the most basic theory of design and analysis of software systems. According to the module theory, the components of applied software are divided into categories that create the mechanism of the software together.

Humanities sciences pay a lot of attention to database in social occasions. At the end of 70s and

at the beginning of 80s, two famous scholars called Alvin Toffler and Jean Francois Lyotard discussed this matter in the frame of information age. In his famous book "Third Wave", Alvin Toffler as future researcher brought up concept of social memory. For Toffler, social memory and human history are changed in the data storage and retention with the evolution of current age. He did not refer to database clearly, but he recognized and introduced information storage in an electronic system and considered it as signs of historical change, because new memories, which rely on the technical facilities, give new attitude toward social reality. Jean Francois Lyotard is among first postmodernism theorists. In his book "The Postmodern Condition", he considered database as a kind of narrative that worked with regard to rules of language. From perspective of Lyotard, database was main factor to transfer human knowledge.

This theory that database can play communicational role and that can perform some media functions in new media framework is main basis of this study. Probably at first glance, the database is not like understandable media but we can compare them with mass media due to scientific and technical reasons. The first database that is examined in terms of communication and media has two main points: first, main bases of new media and computer systems are dependent on the database that stores a lot of information within itself. The main example is such search engine as Google which becomes the largest general portal for the global internet network at the present time and that even plays effective role more than computer search engine.

The second point is that real performance of new computer media is based on the users' demand on the other word, moreover interactive character, new media have **on demand - based** features. It is worth to mention that new media did not put audience in front of specific categories of news and information, but users voluntarily refer to the media to get information with regard to their questions and curiosity, and data available in World Wide Web is presented to the users based on their demand. This capacity is only done by relying on gigantic databases that have accumulated a huge amount of data and its data are not just about news data. The vast amount of information that can be searched in this network includes a wide range of data (including text, image and audio) and what specialists of communication science know as **media convergence** is in fact implemented while relaying on the strong database. Demand orientation is first raised in the area of the TV channel on the World Wide Web that was known as the Internet television. Unique property of internet television is selective access to their programs during days and nights. Programs of TV channel are stored in storage database. All of the programs can be separately received and watched by all viewers through computer. This internet system is known as **"video on demand."** As recently proclaimed by researchers, this approach involves a kind of cultural media. This culture based on the demand of audience brings a kind of democratic media distribution. Tryon Chuck in his new work, call it on-demand culture in media use "especially as we seek to make sense of an emerging **"on-demand culture"** on that provides viewers new forms of immediate access to movies and television shows, even while introducing a number of potential constraints. Although many observers have read these changes as democratizing media distribution, arguing that they offer people a wider range of options to watch movies and television, these distribution practices also contribute to a more fragmented, individualized media culture. These new modes of access- whether online streaming services such YouTube or Netflix, digital downloads at iTunes..." Now, on demand-orientation can be extended in cyberspace to different types of data

including video, and specially text. Pursuant to the above discussion in new media, we face new concept that is called **information retrieval**, a process that is continually in progress by users in cyberspace. Information retrieval is fundamental flow in information and news

But, in the field of humanities, the theory of database has not been comprehensively developed, but this phenomenon drew attention of many theorists in the human sciences. In Based on the theories of three new human sciences scientists, David Lyon, and Mark Poster, and William Bogard, who have been pioneers in this domain in the humanities, the role of databases in the life of the urban community can be examined. These three theorists have a common intellectual basis, that is, the controlling and monitoring attitude toward the database, inspired by the thoughts of Michel Foucault and his controversial concept, **Panopticon.** Of course, before introducing new theorists, it is worth to mention that Marx Weber is first one to discuss management theory and organized supervision in his bureaucratic management theory. Meanwhile, in his book "Mode of Information", Mark Poster, the theorist of the University of California in the 1990s, introduced database with the social science approach as communication media and then he completed his discussion in this regard in his next book "The Second Media Age." His fundamental theory was the basis of this study, because it was considered an innovative theory in its own right. He recognized all computer media that have in the late 20th century as "**new media**" and then he discusses database in its subset. Mark Poster was influenced by concepts of postmodernism while innovatively looking at new media. In "The Second Media Age", he wrote "Computerized databases are another form of electronically **mediated communication** that have been studied from various perspectives." (Poster, M.1996. P.68)

It should be noted that Mark Poster considered database as kind of discourse or manner of expression "Databases are inherently limited and restricted structures of information. Unlike the narratives, which are complex and flexible, they are severely restricted forms of discourse. In database programs only certain marks may be made in certain "fields" or areas. For instance, if after the name of the individual, a "field" of magazine, but only with a code for certain groups of magazines." (Poster, M.1996. P.71)

Then he added that database compressed human knowledge and made them short. Shortness of information in this system would be a new representation of human knowledge. "Such **simplification of data** drastically distorts, one might complain, particular experience, but it also vastly facilities the speed with which information may be retrieved." (Poster, M.1996. P.71)

Mark Poster believed that database was like language that gave new identity to people and objects and that recognized them beyond first recognition. "Computerized databases are nothing but performative machines, engines for producing **retrievable identities**." (Poster, M.1996. P.93) According to theory of Mark Poster, database of individuals and objects, like other media, creates a new identity and multiplies it at various social levels in such a way that the representation of the new identity is the basis of action, whether at the macro level or at the micro level. The importance of his theory is that its main concepts can be the basis of the assumptions of a scientific research, because his concepts about database are taken from humanities discussion rather than technical and engineering science.

David Lyon, theorist and professor of Queen's University (Ontario, Canada), puts emphasis on the controlling and monitoring aspect of database. Undoubtedly, his perspective is taken from Michel Foucault. In his famous **social sorting theory**, David Lyon believes that listing social

phenomena in a log book, database, in fact, offers a new formulation of phenomena in order to provide them with continuous and effective control. Of course, David Lyon's attitude is not merely communication and media attitude, but it has played an important role in developing a coherent theory about databases in the humanities science.

At the beginning of the new millennium in his book "Surveillance Studies", David Lyon mentioned integration of surveillance systems and he believed that there was a kind of continuum among new surveillance systems, so surveillance on all component of society was made possible by creation of comprehensive system "Using personal data, techniques derived from military, administrative, employment, policing and marketing practices combine to create a complex matrix of powers: **a surveillance assemblage.** This assemblage is as the word hints, a coming together of disparate elements to create a loosely associated surveillance entity" (Lyon, 2007: p. 95). Collection of surveillance system in this study is considered as exploratory concept among the databases. Whether the database like communication and surveillance system can connect urban organizations over time or not is basis of first hypothesis of this study.

Here, William Bogard's theory can be discussed. William Bogard is a student and disciple of Jean Baudrillard. In his book "The Simulation of Surveillance: Hyper-*Control* in *Telematic* Societies," he did not have optimistic attitude toward new surveillance system and believed that finally new simulation system resulted in the human self-control. The simulation concept of Jean Baudrillard was effective in description of cyberspace, because cyberspace was also known as kind of simulation from his perspective. William Bogard integrated surveillance with simulation methods in telematics society; accordingly, surveillance in new system that relies on simulation undergoes fundamental changes in its entirety. Bogard described surveillance in simulated systems with properties of cyberspace "as virtual systems of all sorts today- digital communications, tele-presenting, profiling, gaming, genetic modeling- begin to reconfigure many of the control functions of older disciplinary mechanisms (e.g. as cybernetic control replaces direct supervision , virtual environments substitute for real distributions of space and time, bio-electronic sensors for practices of enclosure or confinement)" (Bogard, 2010: p. 8)

As noted above, the dominant view among the theorists of the database in the field of human sciences is the supervisory attitude toward this system focusing on the functions of the sovereignty. In contrary, we see the critical views of this approach raised by Thomas Mathiesen who put a new concept of synopticon against Michel Foucault's *Panopticon* at the end of 90s. The main contradiction between these two concepts is that *Panopticon* means, there are one or more people to permanently monitor their performance. But in contrary, synopticon means all of them look at one or some specified people at the same time to monitor their performance. Undoubtedly, synopticon's attitude toward database is close to communication and media approach. Here, research on examples of databases that are massively used in collective life can help us evaluate each of these theories in the field of scientific research.

RESEARCH FINDINGS

Meaning Grouping of Urban Properties Database fields

Forms to collect data have specific structure in computer systems and are composed of different components. These components are called cells and in the current study these cells

are regarded as the most important units of census data systems which in other words are called **data base fields**. It should be mentioned that existing categories of include several main pages developed by organizational designers based on working chapters' categorization from the beginning. Computer systems display data in the form of tables and cells. Working chapters were constantly categorized into four rubrics including A: Property. B: Building, C: Apartment and D: vocational, but meaning groupings in the current study are as follow:

1. **Encoding Fields.**

Encoding, in fact, is a kind of representation of social phenomenon
that is carried out by nomination or notation method. Encoding follows the machine language, and a phenomenon in the real world is introduced to electronic machine by this method and enter virtual world. Generally, encoding is defined as set of conventional symbols that are used for facility of information flow relaying on common language.

In table discussed in database, a field that is usually encoded play relational role as common field in different tables. This field is called **primary key**. Consequently, encoding field in fact is common language between machine systems through which not only can different machines communicate with each other but also the subsets of database can connect each other within themselves.

In urban properties database, the first data index is encoding system that is main introductive of property unit. Among the many coding methods including sequential, group, and specific codes, the most important method used in the properties database system is **the block coding method**. "In block codes, specific number is given to any block of item. At each block, some numbers can be predicted for accounts that will be opened in future" (Zahedi, S. 1995. P: 405).

Their dynamics of coding and continuous update are important features of this method. The main basis of coding system in properties database is hierarchical space-driven classification of each unit. That is, each property code has some spatial components including region, district, neighborhood, block, property. "Code's regulatory properties mean that. Calibrated appropriately, they may have protective and socially supportive aspects." (Lyon.2015.P100) In a book "Property survey Reengineering" published by Interior Ministry of the Islamic Republic of Iran, "coding is defined as the process of converting information into conventional symbols and consists of the following three steps : a) recognition b) classification c) code assignment." (Ghahghahani, R. 2013. P: 23)

Operationally, the coding is considered as classified numbers that the designing and executing organization of the database has assigned to a unit in order to allow identification of its identity. There is no possibility of its development, but there is a possibility to change and replace it. As a result, new and old codes are also included in the count as a coding content. Another point in property coding is the assignment of one- or two-digit codes to some features of the property, whose options (responses) are predictable. Such codes are also known as coding content in the database system.

2. **Information Fields.**

These fields are cells that contain specific information to identify properties and to provide more accurate and complete knowledge of a record. These cells contain technical and engineering information as well as information related to other organizational and informational databases. These cells provide adjustment and trace of a record's information

among systems inside and outside of organization. As a result, in this study data cells fall into three groupings: 1-Fields of property attributes and specifications 2-Fields of property owners' information. Both fields display data associated with municipality internal system. 3-Inter-organizational coding field represents codes associated with organizations outside of municipality such as Post Office, Finance Office, and Property Registration Office and will have inter-organizational roles.

A. Properties information:

historically this categorization has been the basis of working in Municipality from beginning. So, in the current study every group is studied and summarized. First, estate and building which are the essential parts of database fall into two categories: first, information regarding the level of the ground of building which is known as estate area and secondly, information regarding building includes technical information of building construction and also information regarding the utilization of building. Two subgroups include apartment and vocation. These two subgroups which are like sub-categorization have been designed in terms of urban usage and personal ownership status. It should be mentioned that text format in computer data system falls into three categories:

1. Fields with numerical data,
2. Fields with letter data
3. Field with selective data (they are opened in the form of drop-down menu and the user chooses one option only).

B. BOwners information:

Information cells that portray features of property within an organization will monitor both the location of the citizen as well as the economic power and ownership of the property. Property, like bank liquidity, is also part of the citizens' assets, which form an important part of their legal identity in urban society. As data base of the banking network is constantly monitoring the financial potential of citizens, the urban properties data base will also monitor their ownership of urban space. As a result, each of these systems can represent people's condition and give them identity. Information cells not only represent the people of society as owners of immovable property, but also, more importantly, identify and monitor all levels of urban spaces.

In fact, data cells that are representative of internal-organizational information of municipality are set of data that are utilized for management and planning of municipality. Of course, information cells themselves can have operational applications, and it necessarily does not exist in ongoing and computational affairs, but it has meaning in the macro-planning. "This accurate, comprehensive, up-to-date database, which is provided by scientific principles, is undoubtedly main pillar of planning and sustainable development in every city. It will be new chances for urban managers, and all organizations, offices, institutes, and educational and research institutions for providing desirable service to citizens and so on" (Ghahghahani, R. 2013. P: 206).

Specialized informational properties cells for urban management as dominant system in urban society also have supervisory role. From another perspective, database systems that are already mentioned in theories of social supervision play surveillance and controlling role in urban society while simulating spatial forms.

C. Extra-organizational encoding fields:

Indeed, Extra- organizational cells actually represent the attributes of an object in the information system of other urban service organizations that play fundamental role in **inter-organizational communication**. Since, the adjustment of the encoding system of organizations is definitely one of the greatest steps taken in creating a common language in order to establish a common interaction. This movement is among the first inter-organizational effort of Iran's society that is implemented for interaction between Tehran's municipality and other organizations. "Since, different executive institutes have made their own zoning based on their needs and planning, their zoning do not match with the area number and neighborhood of the municipalities. Therefore, in order to use information which is collected by these organizations in surveying properties plan, boarder and area number of water, power, gas, phone, police station, education and training organization, social security insurance, health offices, asset offices, detailed plan should be taken from these offices and then it should be performed in zoning after examining and adjusting the area number of each organization or institute with municipal districts in the zoning area".(Ghahghahani, R. 2013. P: 67).

Extra-organizational encoding fields have the same concept and meaning of coding and include all numbers that represent a unit but are generated and assigned by authorities outside the municipality in order to identify the unit. Of course, subdivision municipality that do not have a direct relationship with the project executives of properties data base are also known as an extra- organizational unit because the data base designers in different organizations do not necessarily have a common purpose. Extra-organizational codes are known as separate groups in research divisions because they provide information of properties that are not objective and that are virtually defined by governmental organizations for a single unit.

3. Applied Fields.

In urban database, the applied field plays important role in the enforcement of social and official rules. Fields in which the information of form is put are basis of financial calculation from which a series of payments and receipts between citizens and urban management organization can be gotten. These cells are embedded on the governmental rules and laws, then its data is processed in order to apply managerial operation on it.

It is important to remember that classification does not merely sort things out in an objective or neutral way. It is based on practices of meaning-making and judgment calls and medium through which those practices continue to occur. (Lyon, D. 2015. P. 94)

Applied field of database in fact is formation of interaction between organization and customers. Nowadays, for definition of electronic government, there are three kinds of services: (1) informational service, (2) communicational service, and (3) **transactional service**. Organization's portal should be completed from simple kind (that give audience the specific information) to communicational kind that provides continuous communication between organization and audience; at last stage, transactional kind is performed relaying on advanced computer systems including database. "Obviously, necessary databases are prepared to protect such transactions. In this stage, relational methods are arranged in such a way that relationship is bilateral. This ability gives more active role to the citizens…."

(Alikhanzadeh, Amir. 2014. P: 114) task involves a kind of executive operation; nowadays its main kind is financial transaction and also is extensively in progress in organization including banks and insurance company.

One of the main transactions available in municipalities is financial transaction of properties that contains tax payment system for urban properties and that take the main part of financial turnover of municipalities. "Urban management fundamentally requires sustainable income system through which it can do its inherent duties", (Ghahghahani, R. 2013. P: 207)

Applied cells in any computer system and related to each official organization are in fact a representative of the rules and regulations related to that specialized field. The best way to know how to use data base cells in workflow of organizational operations is to refer to the texts of the law and relevant regulations. It is formed relaying on the rules called ***Property Transaction Booklet***, in this paper, calculation cell is recognized and introduced in order to better recognize concept of applied cells, referring to the content of this law. In this research, the applied data cell will be identified by referring to legal texts. Whether the title of each cell refers to which of the law and where the text of the law is, it needs to precisely understand the concepts and to realize the legal texts. Furthermore, equating the title of cells with words and terms used in the text of the law will clarify this point. Applied cells (in this treatise) are recognized and counted accurately by direct referencing to the page number, and will eventually be compared with other types of data base data. With ***"intertextualities approach"*** can root words' meaning and concepts that are used in the reference text.

Table 1. Meaning Grouping in Tehran's properties database

Header	Encoding filed	Information field			Applied Field	Total
		Extra-organizational encoding	Attributes and specification	owners		
Property and building	25	26	176	14	31	272
Apartment	9	7	61	14	4	95
Business building	10	8	56	14	7	95
Total	44	41	293	42	42	462

Historical Background of Tehran's Properties Database

The initial formation of the bureaucracy system is based on a file-oriented management. The files in the workflow of the present day system have played a fundamental role and, with the advent of computer systems, the records are changed from paper to digital format. In the governmental management, electronic records have increased the speed of the workflow, and as a result, the processing of information and subsequent changes in the structure of organizational communication have evolved.

In the file-oriented management system, the basis for the formation of databases was a questionnaire that is provided to collect information in different aspects and is used to classify set of data. Questionnaire is a phenomenon that plays important role in formation and compilation of initial structured data and that even plays fundamental role in the formation of scientific researches. Hence, the questionnaire can be considered as the main basis for the formation of managerial information in the institutional and organizational structure of the new age. The questionnaire has traditionally been the basis for the exchange of information between the organization and the public, because organizational communication has always been formed by it. In the age of information technology after the emergence of computer and electronic systems, the first important function of these systems in the management of the organization was to change structured data stored manually on paper into a computerized database. This was the main basis for the transformation of the bureaucracy structure of

modern and semi-modern society.

The division of the information fields into three categories: first and second categories of certain attributes, which are used within the organization, shows the level of mastery and supervisory power of the municipality. These categories of fields have always been expanding in different periods of database design. Third category of data are indexes of codes used by external database and their increase indicates the tendency towards the integration of database in the different organizations. To answer the first hypothesis, the process of changing the properties information form as a case study among urban data base will show that at the first look, the forms have had cell development and their fields have increased in number and gradually have developed. The increase of the number of properties data base fields (in every grouping) from the beginning of their formation in handy forms to modern computer systems regarding the lack-openness of the content of these information for citizens indicate the tendency of these systems towards developing their monitoring performance. Making changes in forms, besides changing displaying data will also result in management policies.

Table 2. Background of Tehran's properties database

Audit Period	Encoding filed	Information field			Applied Field	Total
		Extra-organizational encoding	Attributes and specification	Owners		
First period	5	3	23	6	7	44
Second period	16	6	28	9	13	72
Third period	17	4	32	13	12	78
Fourth period	20	10	57	9	12	99
Fifth period	25	26	176	14	31	272

Data Openness of Tehran's Properties Database

Data openness present in database is in fact the basis of the communication function of a database. One of the indicators for measuring the data openness of the organization is the number of database fields that is displayed in the portal of the organization to the owners or users and that provides a platform for continuous and effective communication between citizens and urban management. Therefore, measuring the capacity of an organization to share its data in virtual space will involve many points that will show level of the effective communication to organizational executives and public community. In other words, how has organization established an interactive framework in the context of new media?

Fields of the properties database, which are in the organizational portal, are available for the public and are the first step towards communication of databases. Thus, the database, which traditionally has been the cause of inter-organizational communication, leads to public communication. Thus, the database can play a new role and is the basis of a series of collective communication. Although the message will not have massive audiences, it can be a new virtual media in collective communication.

Now, the Tehran's Municipality Portal has been set up for over a decade. When the Municipal Web Portal has been set up, a section has been placed on the home page, which allows Tehran's citizens to see and pay annual municipality taxes. This module, which is a remarkable example in effective interaction with the citizens of Tehran's municipality's portal, includes a simple information structure that seems to be designed only to facilitate the reception of property taxes. Over the recent years, with regard to the many developments of cities and the

ever-increasing number of properties, taxing in large cities has been remarkably advanced both qualitatively and quantitatively; as a result, the mechanism for calculating and collecting the taxes has witnessed many developments while using modern computer tools both at the processing level and at the communication level. Openness of database for citizens that are ready to pay taxes is controversial, because citizens who want to give municipal taxes have some question about how to calculate tax.

In order to reopen the database information, many managerial discussions, conducted by the statistical centers especially professional experts, emphasize on the summarization of publicly available data; hence they wrote: "…the sources and accuracy of the information should be briefly announced on the respective websites and journals, and become available to the public (Statistical Center of Iran, 2009. P: 63)

The text of the municipal law in Iran also focuses on informing citizens of the outcome of their property assessment at the end of the information collection "(article 7). The municipality should inform the owners at the end of the audit of each area by publishing the notification in widely circulated newspaper and affixing it to public passages and other appropriate devices; in addition, the survey of any property should be notified to the owner of the by post. Tax payers can also refer to the relevant authorities specified in the notification and object to the result of their property survey." (Law on Renovation and Urban Development approved 1968. City and municipality laws and regulations. Didar Press. Tehran. 2009. P:341)

In order to respond to the question of how much data of properties database in municipality of Tehran has exposed to the public citizens and beneficial owner, we should refer to the Internet portal of the municipality. A new media space is supposed to be an interactive platform between citizens and the municipality for ideas of a smart city. Hence, by counting the database fields that are exposed to citizens in the Tehran's municipality Portal, it can be concluded that an effective step has not been taken to the data openness; because the few fields, which have been embedded only in the tax receipt due to the limited space of paper from the past, are also nowadays designed on the portal of municipality, while ignoring virtual space and computer as a new opportunity of interaction between urban management and citizens.

Table 3. Fields of properties database in the Tehran's Municipality Portal

Operational Header of field	Total of fields per header	Embedded Fields (Public Accessible) in Municipality Portal				Ratio of Portal fields to properties database
		Encoding field	Informational field	Applied field	Total	
Property form	272	7	11	5	23	0.08
Apartment	95	7	11	5	23	0.24
Vocational form	95	7	12	5	24	0.25
Total	462	21	34	15	77	0.15

CONCLUSION

According to ***free flow information*** concepts, data base has gone beyond from government organizations to public sphere. Free flow information has been recognized not only in developed countries but also in Iran with reliance on approved laws.

With data base systems development in the future on one hand and the development of free flow information on the other hand, we can predict that these systems being placed in the Worldwide Web are converted into an information and communication tool. One of the most important foundations of establishing **electronic cities** is urban data bases which are the basis of free flow information among citizens and urban service organizations.

By lawful support in Iran's parliament, the organizational portals of informatics cells and interactions between the Municipality and citizens and the properties data base system can be improved. Certainly, accomplishment of concepts such as electronic city or smart city requires interactive and free information among urban management systems.

We will gradually face Open Source Information from official organizations by consolidating the foundation of free flow of information. If the organizational management believes the interaction and openness of information in his or her communicative process, his or her information collection will be much more enriched and updated because a remarkable number of users will pay attention to organizational information around themselves. Based on statistics obtained from census in Iran in 2016, high rate of online contribution of people in filling out fields of household data base which is certainly the greatest database of every country has been remarkable and show the tendency of the society to interact with national statistics management so as to update personal information.

The process of openness of the data in the free flow of organizational information in a phased approach is converted into media data through an engineered process. It should be noted here that if data bases are viewed from a communicative standpoint, the process of openness of the data will be accomplished.

The most important outcome to be achieved is to analyze the content of data base to identify components whose openness of their information in organizational portals will be possible. This issue finally will provide a solution for phasing information openness operations and will contribute to strategic organization managers where begin the openness of organizational information to provide maximum security and minimum vulnerability.

The obvious case of openness of data in today's Iran society is real properties data base on Tehran Municipality portal which is the remarkable example in this discussion. Current circumstances in governmental organizations can be studied to make it clear that to what extent managers and decision makers have made practical actions in the direction of interacting and releasing the data of their organization. It is very clear that in the process of opening up the data we will face so many challenges such as feeling of insecurity in organization management because of publicizing the important data of the organization and also the possibility of abusing citizens' personal information in urban systems. All these challenges can be managed by **layering accessibility users**.

Ultimately, what can be a platform for a practical solution is the organizational portal which can localize structured content of urban information to offer to citizens. The Web-based portal system can be developed or improved by creating or opening up data bases to citizens. Joseph Firestone, in Enterprise Information Portal Theory has explained this solution well. The theory can be established as the basis for new studies because this theory, with reliance on the portal first attempts to introduce communication discussions to organizational knowledge management. He believes that communication and information sharing can promote organization knowledge.

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