Formation of the database in the history of development of geodesy and cartography science (an example of Medieval East)

Eshkobul Safarov  
*National University of Uzbekistan, safarov57@mail.ru*

Sunnatilla Uvrayimov  
*National University of Uzbekistan, alextemirov32@gmail.com*

Kuatbay Bekanov  
*National University of Uzbekistan, quwatbay1989@gmail.com*

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FORMATION OF THE DATABASE IN THE HISTORY OF DEVELOPMENT OF GEODESY AND CARTOGRAPHY SCIENCE (AN EXAMPLE OF MEDIEVAL EAST)

SAFAROV E., UVRAYIMOV S., BEKANOV K.
National University of Uzbekistan, Tashkent, Uzbekistan
e-mail: safarov57@mail.ru, alextemirov32@gmail.com, quwatbay1989@gmail.com

Abstract

In the study of the history of science, scientific activity in the Eastern countries of the Middle Ages emphasized the contribution of foreign thinkers to the development of Geodetic and cartographic Sciences, and the study is one of the topical issues of Science today. The article highlights the role of the Geoinformation database in the history of the development of Geodesy and cartography, the database available in the Middle Ages, their importance on the path of science fiction. In addition, there was an opinion on the use of data and the methods of their processing. In the work, the cartographic scientific work of the Greek scientist Ptolemy and the eastern thinker Al-Khwarizmi was studied separately and the views on science were emphasized on the basis of that. As a result, the differences between the two maps, which are shown below, and in similar aspects, are discussed. In general, there are still many subjects that need to be studied and opened on this topic, as well as research work. And their study from the point of view of Geodesy and cartography remains one of the urgent tasks of specialists in the field today.

Keywords: Beit al-Hikma (House of Wisdom), database, automated cartographic system, Eastern thinkers, scientific library, Ptolemy, Al-Majesty, Muhammad Khwarazmi, geographical work, map.

1 Introduction

It is known from history that in Central Asia for the development of science there are large centers of Science, which include a wide range of information. On their basis, along with Exact Sciences, scientific-practical and fundamental research was carried out in the Natural Sciences. The root of such initial fundamental scientific research is related to the research of scientists from the countries of Greece and Egypt [17], [19], [20]. They created the first scientific ideas, theories, hypotheses on the subject of the Earth and left an indelible mark in the history of science.

It arose on the basis of the world-wide discoveries of the scientists who lived and created in the Eastern countries of the IX-XI centuries, and because the owners of the throne of those times realized that the basis of socio-economic and cultural development was science, as well as a high hormone to science. It is one of such large centers and "House of Wisdom", which is still a topical and multifaceted research topic for historians [5]. It is considered the first database, although it is the first
Figure 1: Scholars at an Abbasid library. Maqamat of al-Hariri Illustration by Yahya al-Wasiti, 1237.

And in the history of Science, the role of the database was played by libraries organized under special scientific centers. The fact that they are constantly provided
with different types of information is mainly done with the help of manual labor [14], [18], [21]. This, in turn, served the emergence of large libraries, that is, the formation of a database.

The accumulation and creative assimilation of knowledge accumulated by scientists of antiquity became a common process for the formation of Science and culture. Their works were translated into Arabic, the ideas of these scholars were enriched and further developed, in addition to thoughtful understanding. In this regard, representatives of the Baghdad Academy "House of Wisdom", which began its activity especially in the IX century, achieved tremendous results [18]. When viewed logically, the translator systematically acquires a certain level of skills when translating any source from one language to another. What if a specialist does this work? In it, a person can also notice and add to the existing shortcomings and achievements in the work

As noted above, "House of Wisdom" not only became the largest scientific center of its time, but also preserved masterpieces written in Greek, Hindi, Persian, Sanskrit and other languages, not only as a "repository" of metadata, but also as a "storehouse" [15]. The favorable conditions created by "House of Wisdom" for scientists and researchers make it possible for many to enjoy the thrill of science there, especially by preserving the unique scientific heritage of antiquity, restoring it and bringing it to the scientists who are coming as a beacon of knowledge in different parts of the world-is one of the main tasks of the center. The boundary of this study covers the Republic of Kazakhstan on the north side, China on the east side and India on the south-east side to Abu Dhabi and Saudi Arabia on the South; Greece on the west side to the Mediterranean; and Georgia on the north-west side to the Black Sea. Bunda is the main center of the research is the countries of Iraq and Syria. From the Middle Ages to the region indicated by these same states, the influence of "House of Wisdom" was felt.

2 Materials and methods

In addition, there was a large library there, information about the total number of books in "House of Wisdom" was not stored. Sometimes modern Arabic researchers describe this library as having all the conveniences, such as those in modern libraries, that is, special rooms and tables, distributed depending on the sciences and languages, sitting and reading devices, keeping the literature in order, servants providing readers with books, excellent subject characteristics (catalogs) and even special rooms for recreation of exhausted readers [1], [21]. While descriptions like these are close to authenticity in some aspects of its own, there may be some exaggerations in some aspects.

Perhaps, in addition to libraries in "House of Wisdom", it is possible to collect, process data, compare them with the scientific theories of their time, there are also scientific discussion rooms, where there are also laboratories with special equipment of individuals that replicate or copy the sources, that is, in words with the current language. Because the world’s leading scientific, scientific and literary manuals were
stored there, they were used at the necessary times, corrective works, research and research were carried out. As a historical scientific estimate of this (perhaps a proof of this), it is possible to cite the research carried out by the al-Khwarazmi and al-Fergani on the basis of critical thinking on astronomical Geodesy and Geographic cartography.

According to the instruction of Al-Ma’mun, the translation into Arabic of the work of Ptolemy (Batlimus) "Al-Majesty" (Almagest or Geography) caused a sharp change in the work of Muslim astronomers. They studied this book with great interest, wrote comments and comments on it. Having accepted some of the views in "Al-Majesty", they expressed reverence to others and tried to re-examine them through their own experiences. In this way, new ideas and discoveries began to appear in their works [1].

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For example, Muhammad Khwarazmi reproduced the work of the prominent scientist of antiquity Claudius Ptolemy, and wrote a new work on geography, entitled Kitab Surat al-Ard (Book of the Description of the Earth), many corrections and additions were made to it. In this work, Muhammad Khwarazmi described the parts of the earth that inhabited humanity known at that time. These data are filled with detailed maps, in which the river, the sea, the ocean, the regions where the important population lives are distributed are indicated, and they are marked with a coordinate
Now, from the work of the famous Greek scientist Ptolemy and the Oriental scientist al-Khwarazmi on Geographic cartography, we can see the maps of the world as an example.

These two large historical cartographic works are considered the Masterpiece scientific monuments of their time, and some differences can be seen on the maps: the first, in the general form of a map of both worlds, when creating and equipping them, did not deviate from the limitations imposed from the point of view of both scientist’s religion that is, with the main map In the northern and southern part of the map there are 5 images, in the western and eastern part there are 1 similar images. The area of the droughts in the main content of the work is shown much larger than the waterfalls. On the map of Al-Khwarazmi you can see the opposite. In particular, when creating a map, cross-cylindrical projection was used, while Ptolemy used a straight tapered projection. Another noteworthy aspect is that on the map of Khwarazmi, the image of any living creature can not be seen. This situation can be called an unusual style of depiction of Eastern cartography. And the image of the droughts looks like hozigi images, and the error on the map of Ptolemy can not be
Figure 4: Similarities in maps of the world compiled by Ptolemy and Al-Khwarazmi

So it turned out that the cartographic work of the Khwarazmi Ptolemy was familiar with The Shape of the world and several approximate theories related to it. It is possible to know from the differences between these world maps that Khorezmi Ptolemy identified some shortcomings in his work. Similar aspects in world maps compiled by Ptolemy and al-Khwarazmi.

Muhammad Khwarazmi, as cited in some sources, may have studied theories related to the Earth in them, in order to gain a general understanding from the scientific works of Greek scientists. He enriched the shortcomings encountered in them with more accurate scientific data, which for his time was considered new. In addition, special scientific trips were organized to the countries of the army with the aim of gathering hands in the periods of al-Mansour, Harun ar-Rashid and al-Ma'amun. The work on the selection of rare handicrafts was attended by the most famous scientists of that time. Most of the books presented were works of Greek scientists. In this respect, the works of Greek scholars for Arabic-language works served as the main source.

3 Results

The reason why we are doing the above comparison work is that it was precisely at that time that the data was studied and analyzed in the IX-XI centuries and the results obtained from them were updated through which methods are considered...
relevant for us. Because, in those times, there was no computer technology as it is now. And it is not possible to think about the software of updating the database in periodic form. But the surprising thing about this study is that even in those times the data were processed. The main reason for this is considered religion. It is known that Islam religion is forbidden to draw the opposite of living beings. Therefore, they used mainly geometrical signs in the creation of cartographic works, through which they discovered an unusual style and theory of cartographic understanding of existence and science. But in cartographic studies conducted in previous European regions, the opposite can be seen. They played a significant role in ensuring the decoration of the cartographic work through the use of images of various legendary personalities, paintings of the Greek gods, known and famous buildings notes, as well as introducing the fine art of that period and the state to the whole world.

In studying the initial conceptual ideas about the historical cartographic database and analyzing them from the point of view of the science of cartography, we can rely on logical assumptions by summarizing the results of the historical cartographic research conducted before us. In particular, in the language of many scholars. "House of Wisdom" is interpreted differently. For this reason, we aimed to consider the conceptual theories and ideas of scientists who lived in the Middle Ages, who made their contribution to the development of science, by creating aspects related to cartography and exactly those aspects, rather than its full activity, on the example of the "Medieval Eastern database" [8], [12]. But here there is such an aspect that it can not be overlooked. In particular, we drew the main attention in the general part of the study to "House of Wisdom", known and popular in the Middle Ages. "House of Wisdom", as well as many of the information that has been taught to him, is an expression of confusion, which causes much more difficulties in finding an answer to it. In particular, it is known that "House of Wisdom" was founded in Baghdad, it was also evident that it initially functioned as a library during the reign of Kharun Ar-Rashid. After that, by his son al-Ma'umun, the center was at the peak of its development, scientists from several countries were invited, special discoveries were made in science, and many more data were passed. But the data on the subject of cartography are poorly analyzed and summarized. This in turn shows that this science has been left aside in the shadow of other sciences. In fact, it is possible to see on the basis of logical concessions that a significant work has been done in the center on this subject. But for some reason they have not reached us yet.

As it turned out, in the study of Earth-related sciences in the center, rare manuscripts written on the basis of scientific research by Greek scientists Geradot, Plato, Aristotle, Hippocrates, Eratosfen, Hippakhr, Ptolemy and other similar mature personalities were brought to the scientific fund of the center, which was first studied and then translated [7], [10], [11]. Then, by re-examining the suspicious results, the uncertain value and the results in them were clarified. Because the authors of revolutionary ideas and theories on science were considered mainly Greeks.

As noted above, the sources brought were considered by special specialists on the basis of critical Conciliation, the results of the measurement in it were re-tested in practice. Ideological theories on geography and cartography are put on scientific
discuss...e of the Earth in the scientific debate - was to determine the shape of the planet Earth. There are also considered ideas of research on the basis of unusual concomitant techniques in the creation of world maps. An example of this can be called "The world map of the Al-Ma‘mun". Since the creation of this map by one person is considered to be the most difficult, it is interpreted that the map was developed in the time of many scientists, that is, under the leadership of 70 close scientists and al-Khwarizmi. But the fact that this map has not reached us yet leads to the fact that the points that are instructive to it are based on more assumptions. True about this many Uzbek scientists, especially H.Hasanov, O.Boriev recorded valuable information and conducted research. But even so, this is due to the fact that there have not been any clear opinions or comments about the existence or disappearance of the map, which leads to the fact that the information about the map is based on assumptions.

4 Discussion and Conclusion

In the place of conclusion, it can be said that scientists living in the Eastern countries, who have created science, have been searching for science fiction on the basis of unusual methods and concessions, have shed light on the fact that the information contained in the sources is correct or incorrect through astronomical, Geodetic observations and measurements. The role of the modern database in the present time was played by large libraries in those times. There, too, the data were initially studied, processed and organized trips to other countries through special caravan routes with the aim of exchanging views. In the study of this topic and in the study of the available data from the point of view of science, more attention was paid to the aspects of their field of study. During the analysis of many sources, it became known that historical aspects related to the sciences of the same field were poorly studied. It should be said that in the study of the history of science, it is precisely the science of Geodesy and cartography that is required to study, to shed light on their importance and to show the necessary ideas. For this, of course, the scientific community and the subject of universally accepted research will be necessary. We think that in the coming days a significant work will also be done on this topic.

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