Data Recording, Data Retrieval and the Big Data Phenomenon: A Quranic Perspective

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ABSTRACT

When we look at the Qur’an (The religious text of the Muslim faith), we find detailed information about every aspect of human life. The Qur’an talks about science, social science, mathematics, psychology, business and many other fields of study. However, in this paper we are going to talk about something we often think has no relation to the Qur’an - modern information technology. If we go through the Qur’an, we can find many verses that relate to various fields of information technology such as security, networks, etc. One such area of information technology is data recording or to use the general term, database. The Qur’an talks about keeping records of various things and the retrieval of that data according to different criteria in many places. So when we think about modern databases, we can actually see that the basic fundamentals of such technology have already been laid down in the Qur’an itself. Therefore, when it comes to the latest phenomenon of ‘Big Data’, it is very much possible to see it from a Quranic perspective as well. The Qur’an, in fact, talks about ‘Big Data’ at a divine scale. This research into the relation between modern data recording, data retrieval, the ‘Big Data’ phenomenon and the Quranic text led us to conclude that the principle ideas behind these modern technologies have already been mentioned in the Qur’an which was revealed over fourteen hundred years ago.

Keywords: Qur’an, Big Data, Islam, Database

1. INTRODUCTION

Islam, the second largest religion in the world is often termed as being backward, violent and non-relevant in today’s modern western society. This opinion is popularly held by those who are either misinformed about Islam (through the western media) or have a personal grudge against the faith. However, all these false accusations have been proved wrong time and again by both Muslim and non-Muslim intellectuals, scholars and academicians.

Islam is very much relevant in today’s modern society and will continue to be relevant till the end of times. The Qur’an actually mentions many scientific facts that were only discovered by scientists only in recent history. Facts about the solar system, the shape of the earth, the light of the moon not being its own are among them. The Qur’an also describes the stages of the development of a fetus in a mother’s womb in explicit detail as well. All these scientific facts were unknown until very recently but the Qur’an talked about them over fourteen hundred years ago. When it comes to the field of Information Technology, the Qur’an seems to have a say about it as well. If we analyze the Quranic text, we will find that the Qur’an discusses various topics related to information technology including database, data management, networks, network security, data security and more. The Qur’an further seems to discuss even relatively new topics like ‘Big Data’. In this paper, we are going to analyze some of the verses of the Qur’an that talk about data recording and data retrieval and we will try and relate them to modern databases. We will further analyze more of the Quranic text and show how it relates to the newer ‘Big Data’ phenomenon.

2. DATABASE MANAGEMENT CONCEPTS IN THE QURAN AND MODERN DATABASE MANAGEMENT

The Qur’an talks about recording data in many places. It talks about data that has already been recorded, data that is being constantly recorded and data that will be recorded in the future. When talking about the data that has already been recorded, the Qur’an mentions: “With Him are the keys of the unseen, the treasures that none knoweth but He. He knoweth whatever there is on the earth and in the sea. Not a leaf doth fall but with His knowledge: there is not a grain in the darkness (or depths) of the earth, nor anything fresh or dry (green or withered), but is (inscribed) in a record clear (to those who can read)” [1].

According to [2], the part of the verse “He knoweth whatever there is on the earth and in the sea” also means that Allah (God) knows what He destroys in the land and in the sea. We can relate this to Allah actually deleting the record of a thing from the database when it is destroyed. The verse mentioned above therefore talks about how Allah has recorded everything that has existed and whatever is going to come to existence in a record or database. This principle is used by many companies who keep records of their existing products in one database and at the same time keep records of plans for the products that they are planning to manufacture in the future while simultaneously deleting the records of obsolete products. Therefore
[1] lays down the basic principles of data management whereby we create, maintain and delete data from a database.

3. DATA RECORDING / MONITORING CONCEPTS IN THE QURAN AND MODERN CCTV SURVEILLANCE SYSTEMS

The Qur’an also talks about real-time recording or continuous recording of data in various places. The Qur’an says: “In whatever business thou mayest be, and whatever portion thou mayest be reciting from the Qur’an,- and whatever deed ye (mankind) may be doing.- We are witnesses thereof when ye are deeply engrossed therein. Nor is hidden from thy Lord (so much as) the weight of an atom on the earth or in heaven. And not the least and not the greatest of these things but are recorded in a clear record” [3].

According to [4], the “clear record” mentioned in the verse above refers to the Preserved Tablet (al-lawh al mahfuẓ). The Preserved Tablet mentioned by [4] can be considered as the database of Allah in which all records are kept. It can be thought of as one centralized database in which everything is recorded.

In the verse above, Allah mentions that actions of the prophet Muhammad (peace be upon him), and by extension of all mankind, are being constantly recorded in a clear record (The Preserved Tablet). We can relate this principle of constant monitoring and recording of our actions to our modern society where the use of CCTV cameras has become common for security purposes. The cameras constantly record the behavior of people at a certain place (such as Banks) and the data is stored in a database.

Therefore we can say that the principles of security through constant monitoring and recording of the behavior of people via CCTV’s are actually discussed in the Qur’an which was revealed more than 1400 years ago when CCTVs didn’t even exist.

4. PAYROLL DATA CONCEPTS IN THE QURAN AND THE MODERN PAYROLL SYSTEMS

The sixth verse of the eleventh chapter of the Qur’an says: “There is no moving creature on earth but its sustenance dependeth on Allah. He knoweth the time and place of its definite abode and its: All is in a clear record” [5]. [6] says the following about this verse: “And there is not a creature which treads in the earth but the sustenance thereof rests on God, [sustenance] which He has undertaken [to provide], out of His bounty, exalted be He. And He knows its habitation, its dwelling-place in this world- or in the loins- and its repository, after death, or in the womb. All, that which is mentioned, is in a manifest, a clear, Book, which is the Preserved Tablet”.

The description given by [6] above tells us that Allah has kept a clear record of the provisions that every living thing will be given in this life, from the moment it is born to the moment it dies. Allah says that He knows where each of his creatures will spend his life and He knows the time of his arrival and passing from this world. Allah also says that he knows exactly the place of all of his creatures after they have passed away from this world. All this, Allah says, is recorded perfectly in the Preserved Tablet.

This clear division of provisions and its recording in the Preserved Tablet can be related to a database that holds the information of all the employees of a company in a payroll system, and holds the amount each employee is to be paid as their salary for each month. The database then generates queries about other factors that affect the salary of each employee, such as adding the pay for working overtime, deducting the pay for taking a day off, employee bonus etc. All this is recorded perfectly in a database. This distribution or dissemination of money (sustenance) is achieved by recording the required information about the employees and their related payment information in a database. This process can thus be said to have been derived from the verse of the Qur’an that was mentioned at the beginning of this section which describes Allah’s distribution of sustenance to each of his creatures whose records are kept perfectly in the Preserved Tablet.

5. DATA RETRIEVAL CONCEPTS IN THE QUR’AN

Apart from the recording of data, as has been discussed in the previous sections, the Qur’an also talks about data retrieval from a book of records which we can think of as a database. The Qur’an says the following about data retrieval: “And the Book (of Deeds) will be placed (before you); and thou wilt see the sinful in great terror because of what is (recorded) therein; they will say, ”Ah! woe to us! What a Book is this! It leaves out nothing small or great, but takes account thereof!” They will find all that they did, placed before them: And not one will thy Lord treat with injustice” [7].

This verse tells us that all the actions of a person that are recorded over the period of his life till his death will be eventually shown to him on the Day of Judgment. Allah says that every action no matter how small or big, will have been recorded (in a database). On that day the person will be given his records (queries) filtered as either good or bad. This is analogous to having a database that contains records about a certain thing and then the records, when need arises, are retrieved in the form of queries from the database and certain filters are applied to retrieve only the data that is needed at that time. Therefore we can safely say that data retrieval from a database is not something confined to just the today’s modern world, when in fact its principles have already been mentioned in the Qur’an.

Another verse that talks about data retrieval says the following: “On the Day when their tongues, their hands, and their feet will bear witness against them as to their actions” [8]. [9] says the following about the verse above: “On the day (yawma is in the
accusative because of the [implicit sense of] ‘permanence’ to which lahum, ‘for them’, is semantically connected) when their tongues and their hands and their feet shall testify against them (read [feminine person] tashhadu or [masculine person] yashhadu, ‘testify’) concerning what they used to do, in terms of speech and action — this [day] is the Day of Resurrection”.

Allah says that on the Day of Judgment, the records of each person will be retrieved and the output medium for them will be the tongue, hands and feet of each person, meaning that the data will be queried from the above mentioned output devices. It might be difficult for us to imagine how that would happen, however, we can certainly relate it to how data is retrieved from databases in our world and is displayed on various output mediums such as our desktop’s screen, projector, PDAs, speakers, smartphones and more.

6. THE ‘BIG DATA’ PHENOMENON AND ITS QURANIC PERSPECTIVE

‘Big Data’ is a term that is widely being discussed today. Major industries are slowly realizing the value of Big Data. Internet giants like Google and Amazon are at the forefront of collecting and utilizing this Big Data. Data is being collected at unprecedented scale. Decisions that previously were based on guesswork, or on painstakingly constructed models of reality, can now be made based on the data itself. Such Big Data analysis now drives nearly every aspect of our modern society, including mobile services, retail, manufacturing, financial services, life sciences, and physical sciences [10].

More and more companies are investing in Big Data. Companies like Amazon, are using Big Data to provide a better service to their customers. If a customer buys a certain product from Amazon, the website would start to suggest other products that the customer might be interested in buying. This is actually achieved by analyzing the shopping behaviors of all the customers that purchased that particular product and then analyzing what other products they bought during that particular shopping session. This ability to derive valuable information from huge amounts of data and predict future trends are few of the benefits of utilizing Big Data.

According to [10], Big Data can prove to be very useful in other areas such as healthcare, business, urban planning, environment modeling, intelligent transport and computational social sciences. A report published by the University of California estimated that enterprise servers processed 9.57 zetta-bytes of data globally in 2008, an amount equivalent to nearly six gigabytes of data daily for every person in the world. The same report suggested that if this information was shared out among all the world’s companies, each would have processed an average of 63 terabytes of data — enough to fill more than 13,000 DVDs [11]. This report gives a pretty clear picture of the massive volume of data that is out there just waiting to be utilized.

However, there are many challenges faced by organizations that are trying to utilize Big Data. Deriving useful information from an enormous amount of data is no easy task. The data analytical tools and methods that we have today are not optimized to generate meaningful information from data of such magnitude. The first major challenge is obviously the sheer volume of the data itself. Within this enormous amount of data, lie issues like the difference in data types used by organizations to store their data, the representation of this data and also its semantic interpretation. Other issues that relate to Big Data include privacy issues and usability of the data itself. As has been discussed above, there are a lot of opportunities that proper utilization of Big Data can offer.

However, there are a lot of challenges that hinder organizations from being able to utilize this data, most of which are technical issues. The Big Data phenomenon is still relatively new and organizations are just starting to work on it and seeing it as a strategic asset. The main purpose of using Big Data is to extract accurate, meaningful and valuable information from it. However, current technology is not capable of fully utilizing this vast amount of data for these aforementioned purposes. If we take “Big Data” in the context of the Qur’an, it would include data about everything that exists, encompassing the whole universe and everything that exists inside of it. The size of the “Big Data” that exists in the form of digital data in our modern world would not even add up to a fraction of the “Big Data” that the Qur’an talks about. One of the verses that we can relate to Big Data mentions: “With Him are the keys of the unseen, the treasures that none knoweth but He. He knoweth whatever there is on the earth and in the sea. Not a leaf doth fall but with His knowledge: there is not a grain in the darkness (or depths) of the earth, nor anything fresh or dry (green or withered), but is (inscribed) in a record clear (to those who can read)” [1]. In this verse, Allah is telling us that He is the owner of knowledge. His knowledge includes of everything that exists, seen or unseen. This can be considered to be “Big Data” at a divine scale. But Allah does not only have this “Big Data” but He also says that He can extract meaningful information from this infinite amount of data. The aforementioned verse goes on to say that, “not a leaf falls, but He knows it”. This shows us that Allah is able to extract specific and meaningful information about a single leaf from this “Big Data”. If we take a moment just to think of the amount of data that is in existence and which includes the whole universe, and then having to extract such a specific piece of information, we can really appreciate the power and might of Allah. Further the verse states, “There is not a grain in the darkness of the earth nor anything fresh or dry, but is written in a Clear Record”. Allah says that everything that exists, seen or unseen is stored in a database called the “Preserved Tablet”. This demonstrates a kind of data structure that cannot be comprehended by the human mind.

The following verse demonstrates how specific information is retrieved swiftly and accurately from this Quranic version of “Big Data”: “And the Book (of Deeds) will be placed (before you); and thou wilt see the sinful in great terror because of what is (recorded) therein; they will say, “Ah! woe to us! What a Book is this! It leaves out nothing small or great, but takes account thereof!” They will find
all that they did, placed before them: And not one will thy Lord treat with injustice” [7].

The verse above clearly states how on the day of judgment, will the records of each individual be retrieved from Allah’s “Big Data” and it also demonstrates the level of accuracy of the data in each individual’s record by stating that the individual on that day will say, “Ah! Woe to us! What a Book is this! It leaves out nothing small or great, but takes account thereof!” This means that every single detail of an individual’s lifetime is recorded which in itself would be considered as “Big Data”, but on top of that, all this data can be retrieved swiftly and accurately without any errors.

7. CONCLUSION

Islam is a comprehensive religion that has stood the test of time and stays relevant since it advent to this day. It is a comprehensive guide to living one’s life in the best manner possible and it provides solutions to every predicament imaginable on this earth. Islam talks about every aspect of human life and provides scientific knowledge about the whole universe and everything in it.

In terms of ICT, the Qur’an talks about various issues which can be related to ICT as we know it today. It talks about network security, data security, data recording, data retrieval and general data management. The Qur’an seems to actually have laid down the principles upon which the above mentioned disciplines were developed. There are dozens of verses in the Qur’an that talk about how the knowledge of Allah encompasses everything in existence and beyond, and how everything is recorded perfectly in a kind of centralized database, which represents the Quranic version of “Big Data” and finally how Allah is able to retrieve specific meaningful information from this infinite amount of data.

Modern technology is facing issues with handling “Big Data” that does not even amount to a fraction of the “Big Data” of the Quranic text. Maybe, scientists, especially of the Muslim faith, need to take a closer look at the Qur’an as it most definitely holds the key to solving this issue and every other issue mankind is facing. Muslim scientists should take a leaf out of the book of early Muslim scientists like Ibn Sina, Ibn Haytham and others, who achieved success in their scientific works only because they referred to the Qur’an for guidance while carrying out their scientific research.

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REFERENCES


