The Development of Science in the Digital Era and Its Influence on Islamic Culture

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ABSTRACT

The development of science in the digital era has had a significant impact on Islamic culture. In this era, the dissemination and access of information has become faster and wider, enabling Muslims throughout the world to interact and share knowledge. Digital technology has facilitated the spread of Islamic teachings through various platforms, such as social media, mobile applications and websites. However, this development also brings challenges. For example, false or misleading information about Islam can easily spread, and this can affect Muslims' religious understanding and practices. Apart from that, the digital era can also influence Islamic cultural values and traditions, because Muslims are increasingly exposed to various other cultures and lifestyles via the internet. However, the digital era also opens up new opportunities for the development of Islamic science and culture. For example, digital technology can be used to preserve and promote Islamic art and culture, such as calligraphy and music. Apart from that, digital platforms can also be used for Islamic education, such as online Al-Qur'an learning. Overall, the development of science in the digital era has a complex and diverse influence on Islamic culture. Therefore, it is important for Muslims to understand and navigate these changes wisely.

Introduction

The digital era has brought significant changes in various aspects of life, including in the fields of science and culture. In this context, Islamic culture is an important topic to discuss. As a religion followed by more than one billion people worldwide, Islam has a rich and diverse culture. This development has had an impact on Islamic culture, which can be seen in various aspects, starting from the dissemination and access of information, interaction and sharing of knowledge, to the spread of Islamic teachings.
The development of information and communication technology in the digital era has brought changes in the way we access and disseminate information. With the internet and social media, information can be spread quickly and widely, reaching a larger and more diverse audience. In the context of Islamic culture, this means that Islamic teachings and values can be spread more widely and more quickly. For example, through social media and mobile applications, Muslims around the world can interact and share knowledge about Islam. This certainly opens up new opportunities for the spread and development of Islamic science and culture.

However, this development also brings challenges. One of the biggest challenges is the spread of false or misleading information about Islam. With the internet, this kind of information can easily spread and influence the understanding and religious practices of Muslims. Therefore, it is important for Muslims to have good digital literacy, so that they can differentiate between true and false information about Islam.

Apart from that, the digital era can also influence Islamic cultural values and traditions. With the internet, Muslims are increasingly exposed to various other cultures and lifestyles. This can certainly influence the way they understand and practice Islamic teachings. However, the digital era also opens up new opportunities for the development of Islamic science and culture. For example, digital technology can be used to preserve and promote Islamic art and culture, such as calligraphy and music. Apart from that, digital platforms can also be used for Islamic education, such as online Al-Qur'an learning.

Overall, the development of science in the digital era has a complex and diverse influence on Islamic culture. Therefore, it is important for Muslims to understand and navigate these changes wisely. In this article, we will discuss further the development of science in the digital era and its influence on Islamic culture, as well as the challenges and opportunities posed by this development.

Method

This study uses a literature study approach with qualitative descriptive methods. The main aim of this writing is to discuss and explain the subject being researched, by collecting secondary data from various sources such as articles and scientific journals that are relevant to the topic being discussed. This data comes from various sources such as previous research, textbooks, and other scientific works related to the material that needs to be presented, as well as views from experts.

Result and Discussion

Understanding Science

Basically, science is knowledge that has been organized systematically and has been tested for truth through scientific methods, and has been declared valid or valid. Meanwhile, knowledge is everything that is known but has not been
organized systematically and has not been tested for truth through scientific methods, and has not been declared valid or valid (Syukri & Rizki, 2021).

Science is the result of humanity's search for new understanding, which arises from the natural human desire to explore and understand. In other words, science is the answer to human needs in facing challenges to survive. Humans have a natural ability to use their minds and thoughts, which serve as a guide in living life (Vera & Hambali, 2021).

Science is a collection of concepts or theories that are interrelated and provide space for critical research using systematic, objective and universal scientific methods. Science is indeed rooted in "everyday knowledge", which is then refined and expanded to achieve certainty and truth, thus enabling humans to approach their desired goals. In other words, science can be defined as knowledge that is structured systematically and the process of achieving it can be accounted for theoretically (Fadli, 2021).

Characteristics of science:

a. Systematic Characteristics Science has systematic characteristics, which means that in an effort to explain theories, science is used as a tool to explain the phenomena of everyday life. These systematic characteristics can be explained as follows:

1) Everyday Perception: This is based on everyday perception of phenomena expressed in everyday language, which is then observed to produce meaning.

2) Observation: To formulate scientific concepts, definitions are needed. This definition will clarify the object to be studied.

3) Hypothesis: Starting from a scientific concept which is a statement that contains information and the two statements are combined into a proposition and the truth of the proposition is tested.

4) Law: This is a hypothesis whose truth has been tested and is called a legal postulate.

5) Theory: This is a whole set of postulates or laws that do not contradict each other and can explain the phenomenon.

b. Accountability Science can be accounted for through the following three systems:

1) Axiomatic System: This system tries to prove the truth of everyday phenomena or symptoms starting from general rules or general formulas to concrete formulas.

2) Empirical System: This system tries to prove the truth of specific phenomena to the general.

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3) Semantic/Linguistic System: Truth in this system is obtained by strictly arranging propositions, usually this method is used in linguistics.

c. Objective or Intersubjective Knowledge is independent or shared by many people. Science is autonomous and independent, not belonging to individuals (subjective) but between the subjects of scientific activity. In other words, science must be supported by the scientific community (Ridwan et al., 2021).

Digital Era

In the digital era or industrial revolution 4.0, digital technology and devices continue to develop and be updated. This wave of change makes humans very dependent on digital products. All aspects of life are increasingly interconnected, transparent and interdependent. Even though there are still clear territorial boundaries and geographic separation, these boundaries are no longer a barrier to interacting, communicating and sharing information freely in the digital world (Amirudin, 2019).

Technological developments have not only made human life easier, but have also created new structures and new space for movement in society. Digital technology has changed social and religious structures from previously conventional or traditional to more digital. The presence of the digital world or online media has pampered people with various facilities. The presence of the digital world or online media makes it seem as if all control is at your fingertips, including in matters of religious life. Currently, many people prefer to study religion through the digital world for various reasons, ranging from ease of access to being a trend. Furthermore, in this context, the existence of conventional religion begins to be questioned. The existence of conventional religion is slowly starting to be eroded. Related to this, many social media users pray through statuses on their social media.

The impact of science and technology is not limited to practical use, but also extends to the socio-cultural aspects of society as a whole. Science and technology are the peak achievements in the history of human culture. The era of globalization, characterized by advances in science and technology, has erased physical boundaries between countries. Nowadays, people can meet, study, exchange ideas and ideologies without having to be in the same location and interact physically. The development of science and technology has not only changed the world of politics or business. However, with the development of science and technology, religious experiences have also changed (Hablun Ilham, 2022).
Islamic culture

Culture is basically a term that refers to all human work related to the expression of form. Culture is the place where human nature develops. There is a close relationship between human nature and self-improvement (culture) which cannot be separated. Culture is often influenced by various factors such as location, time and social conditions in its development, which results in certain cultural forms, such as Islamic culture, Eastern culture and Western culture. (Apiah et al., 2023)

Culture is essentially the values that emerge from the process of interaction between individuals. These cultural values are accepted, either explicitly or implicitly, throughout the interaction. These cultural values often take place in the individual's subconscious and are passed on to the next generation. It is known that religion and culture influence each other, such as the influence of Islam on culture and vice versa. Therefore, the term "Islamization of culture and civilizing Islam" emerged.

Islam has universal and absolute values that apply throughout time, but as a teaching, Islam is not rigid in facing changing times. Islam always shows itself in a flexible form when interacting with societies that have various cultures, customs and traditions. The universality of Islam allows it to remain flexible and develop in various situations and times. As a universal religion that transcends time and space, Islam sometimes encounters diverse local traditions. When Islam meets local traditions, the appearance of Islam differs from one place to another. Islam has teachings that include all the teachings that have been revealed to previous prophets and people and has teachings that relate to various aspects of human life anywhere and at any time. Communication in Islam is built as an Islamic worldview which is the principle of communication in the Qur'an and Hadith which has the concepts of monotheism, knowledge, law, justice, ijma, sharia, and istislah which aims to realize the same universal meaning towards changing Muslim society for the sake of happiness. live in this world and the hereafter (Yadi, 2020).

Development of Science in the Digital Era

The modern era is often referred to as the digital era. In this era, every individual is expected to be able to respond quickly to changes that occur, whether in the fields of government, business, social, education, culture or lifestyle. Especially in terms of lifestyle, technological developments often have negative impacts if not used wisely and positively. Technology, especially the internet and social media, has changed the way users think. Personal activities and personal information that should not be made public, such as on social media, are often used as a place to show off to show one's existence. The complete features available on social media make people dependent, even though the positive impact is that it makes it easier
for people to get and disseminate information, so they can keep up with current developments. However, the negative impact is that people are starting to abandon direct or face-to-face interactions, which of course will cause gaps and imbalances in society's social and cultural processes. “Generation Nunduk” is a term often used to describe the current condition of society. Lifestyle transformation in the digital era must be balanced with education for users, especially ordinary people who are interacting with cyberspace for the first time. As the internet develops, communication and information from around the world can cross national borders very quickly, which also marks the beginning of pressure on local culture. (Wisman & Cukei, 2023)

The digital era has brought significant changes in various aspects of life, including in the field of science. With advances in information and communication technology, access to information and knowledge has become easier and faster. The internet, as the main product of the digital era, has become the main source of information for many people, including researchers and academics.

The development of science in the digital era is marked by various innovations and new discoveries. For example, in the field of medicine, digital technology has enabled the development of new diagnostic and therapeutic techniques that are more effective and efficient. In the field of astronomy, the use of digital technology has enabled researchers to collect and analyze enormous amounts of data, which was previously impossible.

The Influence of the Digital Era on Islamic Culture

Digital technology has profoundly changed the way Muslims interact with their religion. In recent decades, advances in communications technology such as the internet, social media, and mobile devices have resulted in major changes in the way Muslims carry out their daily religious practices.

Digital technology has had a significant positive impact on religious practices in Islam. The following are some of these positive impacts:

a. Information Accessibility

Digital technology, such as the internet, has enabled Muslims around the world to access religious resources and information easily. Now, people can quickly access the Qur'an, tafsir, hadith and works of scholars via websites, applications or other digital platforms. This helps increase understanding of religion and enables individuals to better carry out religious practices.

b. Online Learning

Digital technology has changed the way people learn and acquire religious knowledge. Today, there are many online courses, webinars, and e-learning platforms that provide easily accessible religious education. This allows
individuals to study Islam more flexibly according to their own schedule, without having to be limited to a specific physical location or teacher.

c. Spreading Da'wah Messages

Digital technology has provided a powerful means for spreading da'wah messages and spreading Islamic values. Through social media, videos, podcasts and other communication platforms, Islamic scholars and scholars can reach a wider audience quickly. It helps strengthen religious understanding, promotes tolerance, and provides answers to religious questions.

d. Virtual Community

Digital technology has enabled the formation of virtual Muslim communities throughout the world. Through online discussion forums, social media groups, and messaging apps, individuals can connect with fellow Muslims, share experiences, and provide mutual support. This helps strengthen social and spiritual ties between Muslims, regardless of their geographical location.

e. Communication and Interaction

Digital technology facilitates communication and interaction between Muslims from various parts of the world. Through social media, discussion groups, and messaging apps, Muslims can share thoughts, provide advice, and strengthen their religious beliefs and practices.

f. Implementation of Worship

Digital technology has made the implementation of worship easier for Muslims. For example, there are applications and websites that provide prayer time schedules, Qibla direction, and other worship reminders. Additionally, people can follow Friday sermons live via online streaming, allowing those who cannot be physically present at the mosque to stay connected with the Muslim community.

Thus, digital technology has had a major positive impact on religious practices in Islam. However, it is important to remember that this technology must be used wisely and in accordance with religious teachings, and does not replace the importance of real social and spiritual interaction in the lives of Muslims.

Apart from that, digital technology also allows Muslims to connect and interact virtually. Social media and other digital platforms provide opportunities for Muslims from various parts of the world to communicate, share thoughts, and form mutually supportive online communities. Discussion groups, forums, and messaging applications have become a means for Muslims to give each other advice, share experiences, and strengthen religious beliefs and practices (Gusfiani, n.d.).
Challenges of Islamic Culture in the Digital Era

Technological progress is part of the consequences of modernity and the efforts of human existence on earth. Therefore, the negative impacts that arise as a result of technological progress are a collective obligation for humanity to overcome. With shared consciousness, we are confident that future generations will be smarter and more dignified. (Wisman & Cukei, 2023)

The use of digital technology also has a negative impact. Over-reliance on digital devices can lead a person to distance themselves from direct experiences in religious practices. Individuals who focus too much on electronic devices such as smartphones or tablets may neglect physical presence in the mosque, praying together, or interacting directly with fellow Muslims.

There is a risk of invalid or erroneous information through digital technology. In accessing Islamic information, there is the possibility of incorrect content or wrong understanding. This can mislead Muslims and disturb the correct understanding of religion. Therefore, it is important for individuals to remain critical in verifying information sources and ensuring the truth and accuracy of the Islamic information they consume, such as:

a. Disorders and Dependencies

Digital technology can disrupt religious practices by diverting individuals' attention. Excessive reliance on digital devices, such as smartphones, can result in Muslims moving away from direct experiences in religious practices.

b. Incorrect Content or Misunderstanding

The internet also presents the risk of incorrect information or wrong understanding about Islam. This can mislead Muslims and disturb the correct understanding of religion. It is important to always be critical in verifying information sources and ensuring the truth and accuracy of the Islamic information consumed.

c. Mixing Foreign Cultures and Values

The influence of foreign cultures and values carried by digital technology can influence religious practices in Islam. This mixing of cultures can create challenges in maintaining traditional values and a strong religious identity.

Digital technology has had a significant positive impact on religious practices in Islam. Better information accessibility, online learning, wider dissemination of da’wah messages, connected virtual communities, and ease in carrying out worship are some of the positive impacts that can be felt by Muslims. However, it is important to use this technology wisely and in accordance with religious principles, and not ignore the importance of real social and spiritual interactions in everyday life. (Gusfiani, n.d.)
Opportunities for Islamic Culture in the Digital Era

The development of digital technology in this modern era opens up various opportunities, especially in the context of Islamic culture. Here are some of these opportunities:

1) Promoting a Better Understanding of Islam: Digital technology can be used to promote a better understanding of Islam. For example, through online platforms, individuals can access various learning resources about Islam, such as religious texts, interpretations of the Koran, Hadith, and other Islamic literature. Additionally, online platforms also allow individuals to participate in discussions and dialogues about Islamic teachings, which can help them understand Islam better and more deeply.

2) Connecting Muslim Communities Around the World: Digital technology can also be used to connect Muslim communities around the world. For example, through social media and online communication platforms, Muslims from various parts of the world can interact and share their experiences. This can help strengthen ties between Muslims and promote a sense of brotherhood and solidarity within the Muslim community.

3) Supporting Da'wah and Spreading Islamic Teachings: Digital technology can be used to support da'wah and spreading Islamic teachings. For example, through social media and other digital platforms, individuals and organizations can spread information about Islam and invite others to learn and understand Islamic teachings.

4) Improving Access to Religious Services and Facilities: Digital technology can be used to improve access to religious services and facilities. For example, through apps and online platforms, individuals can access prayer schedules, Qibla direction, and other religious services.

5) Supporting Islamic Education: Digital technology can be used to support Islamic education. For example, through e-learning platforms, individuals can access various courses and learning materials about Islam.

It is important to remember that although digital technology offers a variety of opportunities, its use must always be done wisely and responsibly. The use of digital technology must always be in accordance with Islamic values and teachings.

Examples and Case Studies of Islamic Culture in the Digital Era

Here are some examples and case studies that can illustrate the points above:

a. Religious Learning Application

Before the digital era, religious learning was carried out traditionally using face-to-face methods between teachers and students. The teacher will guide students in studying the Koran and provide explanations about the meaning of
the verses of the Koran. However, this method has limitations in terms of accessibility and efficiency. Students must come to the study site to meet the teacher, which can be time consuming and expensive. Additionally, students can only study at certain times and places, which can limit flexibility and consistency in learning.

In today's digital era, learning religion is very easy, one example of an application that has helped in religious learning is the "Quran Academy" application. The app offers various features such as verse bookmarks, translations in various languages, and audio lessons that help users understand and learn the Qur'an better. The app also allows users to track their progress and set learning goals, which can help increase motivation and consistency in learning.

Several conveniences of the digital Quran have changed Islamic culture. First, the digital Quran application makes it easier for Muslims to read the Quran anytime and anywhere. In today's digital era, Muslims can access the digital Quran via their mobile devices, even when they are on the move. Second, the digital Quran application allows Muslims to read the Quran more easily and efficiently. Several digital Quran applications provide features such as translation, tafsir, and verse search, which make it easier for Muslims to understand the Quran. Third, reading the digital Quran can help Muslims protect the environment. In the digital era, Muslims can read digital Qurans without having to print physical Qurans, which can reduce paper and ink waste.

However, there are also those who oppose reading the digital Quran. Some people argue that reading a digital Quran is not the same as reading a physical Quran. They argue that reading the physical Quran provides a more profound and spiritual experience. Apart from that, reading the physical Quran can also help Muslims memorize the Quran. However, even though there are those who oppose reading the digital Quran, many Muslims still choose to read the digital Quran because of the practicality and convenience it offers.

b. Social Media and Religious Discussion

Before the digital era, discussions about religious topics were conducted face-to-face between Islamic scholars and scholars and their followers. This discussion is usually held in mosques, Islamic boarding schools, or other places that are considered holy.

After the digital era, social media has become an important platform in influencing discussions on religious topics. Many Islamic scholars and scholars are active in sharing their knowledge and insights about Islam through social media such as Twitter and Facebook. This not only helps promote a better
understanding of Islam, but also allows for constructive discussion and dialogue on religious topics.

For example, in 2019, an Indonesian cleric named Abdullah Gymnastiar (Aa Gym) used his Twitter account to share thoughts and insights about Islam. In his tweets, he often discusses topics such as religious life, social life, and family life. Through its tweets, Aa Gym has succeeded in building a large online community and promoting a better understanding of Islam.

Additionally, social media also enables constructive discussion and dialogue on religious topics. For example, in 2018, a Muslim scholar named Reza Aslan held a discussion about Islam on Facebook Live. In the discussion, Reza Aslan discussed topics such as violence in religion, LGBT rights, and the relationship between Islam and Christianity. These discussions allow people from various backgrounds to participate and discuss sensitive religious topics.

Social media can be a very useful tool in promoting a better understanding of Islam and enabling constructive discussion and dialogue on religious topics. However, we must also be careful in using social media for religious discussions, because discussions on social media often include a variety of different opinions and views, which can give rise to challenges and controversy.

c. Prayer Times Application

Before the digital era, Muslims used manual methods to find out prayer schedules and Qibla direction. They used tools such as sundials and compasses to determine prayer times and the direction of the Qibla. However, this method has limitations in terms of accuracy and efficiency.

After the digital era, there are many applications that make it easier to determine the direction of the Qibla, the "Muslim Pro" application is one of the prayer schedule applications that is popular among Muslims. This application offers various features that help users carry out their worship better. Some of the features offered by this application include:

- Prayer schedule: This application provides accurate prayer schedule based on user location. With this feature, users can find out the correct prayer times and not miss prayer times.
- Qibla direction: This application also provides a Qibla direction feature which makes it easier for users to determine the Qibla direction during prayer.
- Digital Al-Qur’an: This application also provides a digital Al-Qur’an which can be accessed by users anytime and anywhere. With this feature, users can read the Koran more easily and efficiently.

The “Muslim Pro” application can help Muslims carry out their worship better.
d. E-Learning Platform

Before the digital era, Muslims could only study Islam through face-to-face methods with teachers or through books. However, this method has limitations in terms of accessibility and efficiency. Muslims must come to the study site to meet with teachers, which can be time consuming and expensive. Additionally, books can only be accessed at certain times and places, which can limit flexibility and consistency in learning.

In this context, e-learning platforms such as "Islamic Online University" can help Muslims study Islam more deeply and comprehensively. This platform offers various courses and learning programs about Islam that can be accessed by Muslims all over the world. Some of the features offered by this platform include:

- Online courses: This platform provides online courses that can be accessed by Muslims all over the world. With this feature, Muslims can study Islam from anywhere and at any time.
- Multimedia content: This platform also provides multimedia content such as video and audio which can help Muslims understand Islam better.
- Virtual classes: The platform also provides virtual classes that enable Muslims to interact with teachers and fellow students online.

For example, “Islamic Online University” offers undergraduate and graduate programs in the field of Islamic studies that are accessible to Muslims all over the world. These programs cover a variety of topics such as Islamic history, Quran studies, and hadith studies. With the features offered by this platform, Muslims can learn Islam more easily and efficiently.

e. Online Discussion Forum

Before the digital era, Muslim women who wanted to share their experiences and challenges in practicing Islamic teachings could only do so face-to-face with their friends or family. Muslim women must meet with their friends or family to share experiences, which can be time consuming and expensive. Additionally, Muslim women may also feel uncomfortable discussing their personal matters openly.

In this context, online discussion forums such as “Muslima” can help Muslim women share their experiences and challenges in practicing Islamic teachings. This forum allows Muslim women to interact with fellow Muslim women from around the world and share their experiences. This not only helps build a supportive community and promotes a better understanding of the role and rights of women in Islam, but also allows Muslim women to feel more comfortable discussing their personal issues.
For example, “Muslima” is an online discussion forum popular among Muslim women. This forum offers various discussion topics such as family life, social life, and religious life. In this forum, Muslim women can interact with fellow Muslim women from all over the world and share their experiences. With the features offered by this forum, Muslim women can feel more comfortable discussing their personal issues and building a supportive community.

Digital technology has transformed Islamic culture to promote a better understanding of Islam and connect Muslim communities around the world. However, it is important to always use this technology wisely and responsibly.

Conclusion

Technological developments in the digital era have had a significant impact on various aspects of life, including religion. In the Islamic context, technology can be used as a tool to deepen understanding of religious teachings. For example, a digital Al-Qur'an application equipped with translations and interpretations can help Muslims understand the contents of the Al-Qur'an better. Social media and other digital platforms can also be used to spread religious da'wah and knowledge. However, on the other hand, technological developments can also have negative impacts. For example, the spread of false or misleading information about Islamic teachings can be faster and wider through social media. Apart from that, technology addiction can also erode moral and ethical values, as well as disrupt worship and religious activities. Therefore, it is very important for Muslims to use technology wisely and in accordance with Islamic teachings. Muslims must be able to sort out right and wrong information, and use technology for good and improving the quality of worship, not the other way around. Apart from that, developing technology that is in accordance with Islamic values is also very important. For example, developing digital applications or platforms specifically designed for the needs of Muslims, such as prayer schedule applications, digital Al-Qur'an applications, zakat applications, and others. Thus, technology can be used to support the religious life of Muslims, not replace the religious values themselves. Thus, although the digital era brings new challenges, with the correct understanding and wise use, technology can be an effective tool to support the religious life of Muslims in this digital era.
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