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Research on the Transformation and Upgrading of News Media based on the Internet of Things era

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Abstract: - The rise of the so-called "Internet of Things" heralds the arrival of innovative improvements in the dissemination technologies that are the basis for the development and improvement of a wide variety of forms of media. It has gone a long way from the early days of digitization and networking, and now it even incorporates intelligence. In the past, it did not have this capability. The widespread adoption of technology based on the Internet of Things will lead to profound shifts in the efficiency of media communication, as well as the transformation and upgrading of communication intelligence, the explosive growth of the communication platform, the emergence of a high degree of integration between "content production" and new communication techniques, and other developments related to these trends. It is generally agreed upon that the Internet of Things will be the primary impetus behind the next age of information technology as well as the expansion of the global economy. It is communicative, modular, and organized when it comes to the transmission of information. The ever-expanding media sector won't be a problem for this roomy facility. People's perspectives on the function of the media will shift as a result of the Internet of Things since it will make it feasible to intelligently update various types of media that are already in existence. Consumers will have access to a broad range of data presented in a number of formats as a direct consequence of the Internet of Things. It is feasible to expand the media applications of the Internet of Things by concentrating on one of these three areas: the development of a new media service system; the production of new media content; or the undertaking of a new media life challenge. This article examines the deconstruction of the primary body of dissemination pertaining to the Internet of Things from five distinct vantage points. Topics covered include the Internet of Things' news dissemination materials as well as dissemination objects. There are a number of different ways in which the framework of news dissemination may be made more effective, including bringing it up to date, enhancing its function, improving its platforms, fortifying its content, and increasing the breadth of its coverage. In terms of rebuilding and reconstruction, talk about the positive and constructive functions that modern information technology plays in the news broadcasting industry. In addition, the purpose of this article is to investigate the impact that the Internet of Things has on the method by which news is disseminated and the media business as a whole, as well as the relationship that exists between the social application of IoT technology and the news media. This article will hopefully widen the breadth of usage for internet of things technology in the news distribution sector by investigating a variety of different techniques. It is anticipated that in addition to accomplishing this goal, this work will also contribute to the proliferation of conventional media.

Keywords: Internet of things; upgrading of news media; transformation of news model, Iot Technology, news broadcasting industry.

1. Introduction

Numerous professionals, academics, and organizations have also offered their own definitions of news communication. According to(Ahmed et al.)[1] the process through which people learn about breaking news from one another and share information with one another is also known as news distribution. After investigation, According to Gilbert, the process of disseminating information is comprised of two stages: the first stage is the announcement, and the second stage is the reception that follows argued by, (Brous et al.)[2] During the process of disseminating news, it is hypothesized that information presented to the public in the form of direction may have an effect that is proportional to the influence it has on the fundamental beliefs held by the people. There are many who believe that the act of passing on information about current events from one individual to another constitutes diffusion of the news, while others disagree.

The three most fundamental elements of news dissemination have evolved into news facts, dissemination media, and news audiences. (Boursianis et al.)[3] Studies have shown that listening to the news on the radio or television is a social activity since it enhances communication between different people. It is a facet of social phenomena that is receiving a great deal of attention, and the importance of it in today's society is coming into focus in an ever-increasing manner as more and more time passes. People's ability to communicate and exchange information with one another is increasingly dependent on the proliferation of new media platforms like as social networking websites, video sharing websites, micro blogging services like Weibo, and other types of self-media. The great

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majority of individuals in today's society get their knowledge of current affairs via various forms of mass media, including newspapers, magazines, radio, television, and the Internet. In Figure 1, the standard media are displayed argued by (Boursianis et al.)[4].

Fig.1. Standard Media

Alongside their own ideas, a wide variety of knowledgeable professionals and academics have discussed the features of the characteristics of news distribution. After (Kumar et al.)[5] research, it should be noted that modern news transmission is multifaceted, effective, accessible to the public, and timely.

(Khanna and Kaur)[6] People have noted that the conventional method of disseminating information has a predetermined structure, but they have also noticed that it has issues, such as having a singular content, limited transmission routes, and inadequate interactivity. In stark contrast to these drawbacks, however, it is abundantly clear that the distribution of current news has developed in the other direction in recent decades.

The research of scholar (Khanna and Kaur)[7] and others have pointed out that the news delivery platforms of today offer a variety of benefits over their forebears, such as interaction that is seamless on several levels and viewpoints.

The landscape of news media has significantly changed and improved in the Internet of Things (IoT) age. IoT integration with news media has produced new opportunities and problems as technology advances at an unprecedented rate. Smart gadgets, sensors, and data analytics can be seamlessly included into the creation and consumption of news in this age of connection and interaction. This study attempts to investigate the effects of the Internet of Things era on news media, looking at how it transforms audience engagement, information delivery, and content development. This study explores the potential advantages and difficulties in an effort to find novel ways for news organizations to adapt and prosper in the IoT-driven environment.

1.1. Literature Review

Transmission mechanisms have evolved from a single linear channel to a networked dispersion in the self-media ecosystem, and tactics for agenda shaping have switched from leading to aggregating. In other words, the self-media ecosystem has undergone a paradigm shift. These two changes took place at the same moment in time. It is only logical to assume that the standard of management and the efficiency of networked news organizations will both increase in tandem with the development of management technology. There is a persistent trend toward the development of new modes of communication, and existing forms of media, such as the Internet, are continuing to collaborate in order to pool their resources. The news source has established itself as a reliable publishing platform as a result of the speed with which it disseminates material and the large number of people who read it. The integration of media into innovation has emerged as a new corporate strategy. This modification may increase the diversity and richness of media operations and may encourage the integration of media institutions' property rights structures. The information subject and receiving terminal will also see a lot of new developments. In terms of the dissemination effect's influence, on the one hand, it has the potential to speed up and broaden the spread of information. Communication content has become more colorful thanks to information technology, and the amount of information has sharply increased. Information content will also have more visual effects and three-dimensionality, and the transmission speed, effectiveness, and level of service capabilities will all significantly improve the improvement. The timeliness and engagement of news can be substantially enhanced by real-time internet broadcasting, rolling refresh at any moment, and its interactive communication elements argued by (Ding et al.)[8].

The media based on IOT is shown in Figure 2.

Fig.2. Media based on the Internet of Things

In recent times, a number of national governments have proposed informatization plans that are associated with the Internet of Things. This is because the Internet of Things has an enormous amount of untapped potential and can be used to a wide variety of domains, including everyday life, the military and emergency preparation. In addition, the Internet of Things has a tremendous amount of untapped potential. The Premier (Chin et al.)[9] of the State Council has made the decision that the National Sensor Network Innovation Demonstration Center should be situated in Wuxi in August 2009 and advocated the creation of a "Perceived China" center. Recently, it has progressively become more visible in the media and quickly gained popularity in the media. It serves as the strategic pivot for the continued growth of the information industry in my nation. The "Internet of Things" possesses all of the features of the Internet. It is the definitive example of the web's dramatic climb to popularity over the last several decades. Every device that can be linked to the internet has the potential to function as a media terminal due to the fact that everything in the current world may be considered to be some kind of media. Over the course of the last few years, there has been an expansion in the selection of sources that provide both news and entertainment. The current phase of "media-based survival" is a direct consequence of the stratospheric climb of the media over the course of the previous few decades.

All of this will have a big impact on how modern media develops. The "Internet of Things" will continue to grow, presenting new difficulties and opportunities for the media industry just as the Internet just started to rise back then. Should we enthusiastically welcome conventional media or do we cry out that it will become "bubbles"? Whoever initially grasped the "Internet of Things" and used it effectively will be able to claim credit for seizing the opportunity presented by the development of new information technologies. Who will have a competitive advantage in the media's future development? Argued by (Zhang et al.)[10]

According to(Liu et al.)[11], The news media sector is only one of several industries that have been significantly impacted by the emergence of the Internet of Things (IoT). This study of the literature intends to examine the research done on the modernization and transformation of news media in the IoT era. This review tries to shed light on the main trends, issues, and opportunities that occur with the incorporation of IoT technologies into the landscape of news media by analyzing the existing literature.

1.2. Primary Findings

1. Convergence of gadgets and Platforms: Thanks to the IoT, news media firms may now reach audiences through a variety of networked gadgets. Because of this convergence, cross-platform delivery of news experiences across numerous IoT-enabled devices has become necessary argued by (Abdel-Basset et al.)[12]

2. IoT technologies enable news organizations to gather enormous amounts of data on customer preferences and habits, facilitating personalized news delivery. This results in increased personalization and user engagement. News organizations can personalize content to individual preferences by evaluating user data, which increases user engagement and happiness argued by (Shi et al.)[13]

3. According to (Usak et al.)[14], Processes for creating and distributing content have been revolutionized by the Internet of Things. Due to linked devices' ability to record and transmit news events as they happen, it has made real-time reporting possible. Furthermore, platforms for IoT-powered information distribution have opened up new avenues for news dissemination, expanding the reach of news media organizations.

4. Privacy and Ethical Issues: The adoption of IoT technology in the news media has brought up privacy and ethical issues. To ensure ethical usage of IoT-enabled news media, issues including data security, consent, and the possibility of manipulation call for strong privacy frameworks argued by (Viriyasitavat et al.)[15]

2. Methodology

2.1. The Affiliation Of The News Dissemination Process With The Internet Of Things

The "net" is still the key, but it now incorporates items in addition to merely connecting people. A larger Internet would be able to satisfy more requirements and give users more information from which to choose. Keep in mind that the Internet of Things is still, at its foundation, merely a network for the exchange of data. Technologies like as sensors and radio frequency identification may gather data in a manner that is analogous to the way in which human hands, feet, eyes, ears, nose, and mouth can do so. Database technology is the brain, while communication technology is the meridian. These innovations connect various body sections like the various organs do in the human body. Information is still being gathered, processed, and disseminated throughout the entire process. The most notable difference is that this approach includes maintaining constant touch. One of the many qualities possessed by the Internet of Things is its capacity for interactive communication. It is difficult to argue against the fact that people are the driving force behind both the traditional Internet and the Internet of Things (IoT). The human-made sensing technology continues to be updated with any new information that is added to the system in any way, shape, or form. The product's features as well as the information that it provides have been arranged in a way that is more conducive to meeting the requirements of the people who will be using it. It is evident that individuals can experience, comprehend, and interact with the self-created Internet of Things. Communication is another word for interaction. It is the research field of communication medium, whether the communication is between people, things, or even objects. System properties are also present in the Internet of Things. An object can serve as an information terminal or source in the Internet of Things world, and the system is required for the object to do both of these things. It is possible that refrigerators may soon be equipped with a sophisticated system that will enable them to monitor their own temperature, time, current, consumption, and other parameters. In addition to the nutritional worth of the food, they could also find out how long specific meals, such as meat, fruit, and other things, would remain edible after being opened. Computers and smart phones, which have traditionally been seen as somewhat ordinary gadgets, have been transformed by the system into powerful tools that promote the fast invention of new types of media. As a result, the technology for transmitting and receiving information is altered by the implantation of systems into other items, which also spurs the development of novel concepts for the media sector.

One of the Internet of Things' infrastructure and core technologies, sensor technology, has advanced along with the Internet of Things' social applications' continued popularization and advancement. "Sensor news" is the consequence of the integration of sensors and news reporting under the influence of media. Figure 3 depicts this novel idea.

2.1.1 Adding value to news sources

The information channels that media professionals formerly used to research news themes and produce news products have been widened by sensor news, which has also improved the information sources utilized in news reports and given media professionals a larger area to work in when developing new products and reports. There are numerous examples of good planning and topic generation using sensor data. It was awarded the Pulitzer Prize in 2013 for the article titled "Speeding Police," which used sensors installed in public buildings in the state of Florida to scan for news signals and expose that members of the state police were speeding during their off-duty hours. The work also utilized sensors in Florida to show this information. The reports that have been produced are terrible. The refuted information highlights the risky aspects of social interaction, preserving public safety. In this collection of data, information such as travel durations and distances, GPS coordinates, and a comparison of

jurisdictions are all computed and evaluated. Additionally, the license plate numbers of police vehicles that utilized the high-speed automated toll station are also included in this collection of records. There were 5,100 instances of cars travelling too fast for the circumstances after many hours had passed. Over half of the instances of speeding did not take place under the supervision of the police, and the fact that 96 percent of the speeds were between 145 and 177 kilometers per hour reveals that law enforcement officials themselves broke traffic regulations and put the safety of the general public in jeopardy. It may be possible to obtain sensor data by using "crowd sourcing" tactics, which include encouraging customers to participate in online surveys; smart wearable devices; and the built-in sensor capabilities of smart phones. This is in addition to the sensors that have already been embedded in the environment and are being used everywhere around the user. New York Public Radio once conducted a study known as "Cicada Insect Tracking," in which they urged listeners to make use of temperature sensors in order to compile a collaborative experimental report detailing the circumstances under which cicadas were seen. To help users comprehend the cicadas' progress, a timeline was created using the data that was gathered. Gaining participation-based knowledge of popular science is another example of sensor news, according to law.
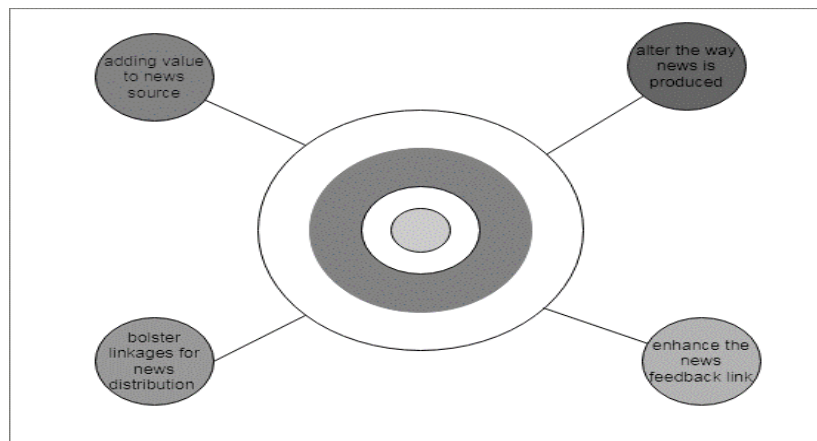

Fig.3. Media concept that is new

2.1.2 Modify the way news is produced

Machines may now process information intelligently in the Internet of Things age, in addition to acting as data collectors. Robot writing has grown in importance as intelligent robots have become more common, contributing to the production of intelligent news. Big data has made it possible for more plentiful materials to be used as the basis for fresh news stories. Robotic writing and publishing have dramatically increased the timeliness of news releases, saving the media valuable time and enabling the publication of predicted news. The computer can increase writing productivity while also relieving more journalists of routine data analysis tasks, giving them more time and energy for more involved reporting operations. Without a question, there is a fantastic chance for development to raise the standard of the media sector as a whole. In order for journalism to prosper in the future, it will take more than just a writer; it will demand reporters who are knowledgeable in sending and coordinating a range of current technologies, as well as editors who have a good grip on the foundations of news transmission. In the future, the field of journalism will have a need for editors that possess a wide range of specialized knowledge in many different areas. The era of the Internet of Things will be characterized by an increasing emphasis on complete data collecting, trustworthy data analysis, flexible information visualization, and high-quality content distribution

2.1.3 Strengthen linkages for news distribution

The current movement toward the growth of media convergence means that the media must meet the informational demands of consumers who consume several forms of media by making various kinds of content accessible on various media and terminals. This is necessary because the media must respond to the current trend toward the expansion of media convergence. More fertile ground for media integration is being created by the rise of more intelligent terminals. A time when "everything is media" is the Internet of Things age. Unimaginably advanced smart terminals are revolutionizing information delivery to users and impacting news reporting, editing, and distribution. Because smart houses and clothing are becoming more popular and because sensor technology is

advancing, there has been an increase in the amount of data collected from people. The algorithm push is more accurate when it is based on user needs as well as scene and terminal medium characteristics. For instance, when a user starts their smart vehicle, they should be reminded to check the road conditions before leaving the home. This should be done before they leave the house. Clearly, the "place of contention" in the next generation of intelligent terminals will be the ability to personalize and take initiative with one's media consumption.

2.1.4 Make the news feedback link stronger

The output of the sensor that was collecting data in the background may include information such as how long a user spends in a certain app or how many times they click to open an article. Other examples of information that can be obtained include how many articles a user clicks to access. In order to quantify the effect of sharing, sensors are required, and the answers that are obtained from sharing will add weight to the process of content production. Already, Bluetooth and the internet make it possible for smart wearable's and smart phones to exchange information and communicate wirelessly with one another. This capability is steadily becoming adopted as the standard. The sensing function of smart wearable's, the amount of time a person spends on a particular interface on their phone, and the user's heart rate are three factors that may more precisely indicate the attractiveness and stimulation of an interface to users. The information that the users submit will, to a considerable extent, be used to identify the demands of the users. Additionally, it will reinforce the feedback loop for dissemination, which will boost the effectiveness of dissemination in practice, therefore assuring personalized news customization and differentiated news distribution. The data provided by users will confer all of these benefits. Figure 4 depicts the results that are projected to occur.
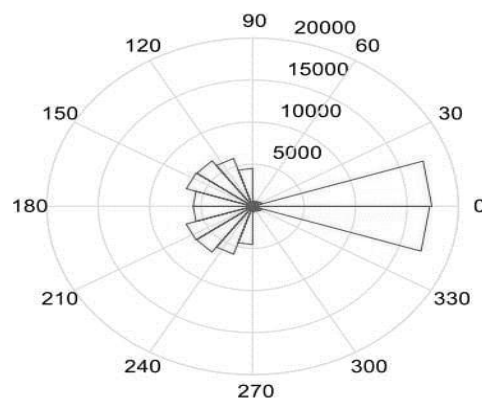

Fig.4. Result Predicted (adopted from (Shi et al.))

2.2. What The Internet Of Things Has Done To News Media

There are two distinct parties involved in the activities that give birth to the distribution of news: the audience for the news and the person who spreads the news. The disseminator is the person who gathers, publishes, and distributes news content. Additionally, they are accountable for reviewing news sources, and via TV, News audiences are the large groups of people who consume news via broadcast, publications, etc. The traditional method of disseminating news follows a single linear path that includes the disseminator, the medium, the audience, and the feedback. News is distributed to audiences through a variety of media, including radio, television, newspapers, and other instruments. Release the information, and the recipient will comprehend, evaluate, and promptly offer feedback. The conventional avenues for providing feedback include letters, phone calls, text messages, etc. The interactivity of conventional news dissemination is drastically reduced by the limited and lag-filled response routes. Modern information technology advancements have made it possible for news to spread more quickly and across more channels. Fundamentally, this phenomenon has been twisted. The initial single linear form of news delivery has been significantly improved by this. Utilizing mobile devices, tablets, and other terminals, news consumers use the Internet to find news, transmit it to their personal network of contacts, and share it with others. The "Six Degrees of Separation Theory" states that there are no more than six persons standing between you and any other person in the world. This system is dependent on the desire of individuals to maintain contact with one another and cultivate connections over the course of time. This indicates that individuals all over the world who read the news have

access, at least in theory, to the same global communication network that is linked. In this infinitely wide interpersonal network, news spreads in a matter of seconds thanks to instant engagement and dissemination. News can be created and published at anytime, anywhere, and it swiftly gathers public opinion and creates hotspots. The prediction is compared in Figure 5.
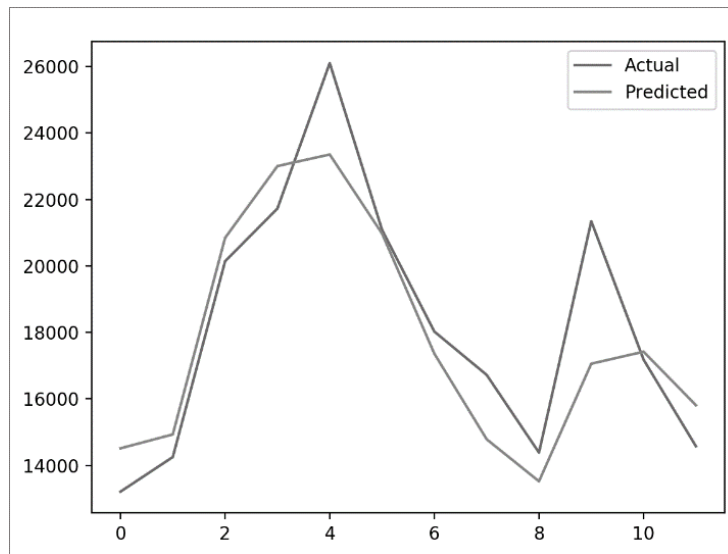

Fig.5. Comparison of Predictions

3. Result and Discussion

The traditional media will pay close attention to any changes in the new media. In light of the characteristics and characteristics of traditional media, what kind of effects will the Internet of Things have on the traditional forms of media? The meteoric rise in the number of devices that can connect to the Internet may be seen in two ways: either as an insurmountable obstacle or as an intriguing prospect. Should we collaborate with one another rather than compete? The media now researches and worries about these concerns.

1. The traditional forms of media will be able to undergo a profound transformation thanks to the Internet of Things:

A significant development in the "Internet of Things" movement involves much more than merely joining and moving things around. Through information technology, the "Internet of Things" broadens the scope of the network's significance and value. Recognize the discourse and communication between objects and people create a network environment that is both widespread and pervasive. The widespread network facilitates easier access to information interaction. It will spark a new wave of media innovation and application and encourage the thoughtful transformation of conventional media. It will be more superior in terms of the amount of data acquired, the pace with which it will be collected, and the validity of the data than conventional media. Even in the event that both natural and man-made catastrophes strike at the same time, it will continue to perform its duties as an efficient early warning system. At this time, the media is choosing to disregard this news. As more and more things become connected to the internet, we are seeing the beginning of a new phase in the development of conventional forms of media. This transformation is being driven by the increasing number of connected devices. Audiovisual and reading are both going through a significant transformation of future creation of media content will more closely match the specifications of modern reading and audiovisual media. The media sector with a close connection to the Internet of Things should closely monitor recent advancements in this field, act quickly to address them, and take advantage of development potential. In Figure 6, the analysis is displayed.
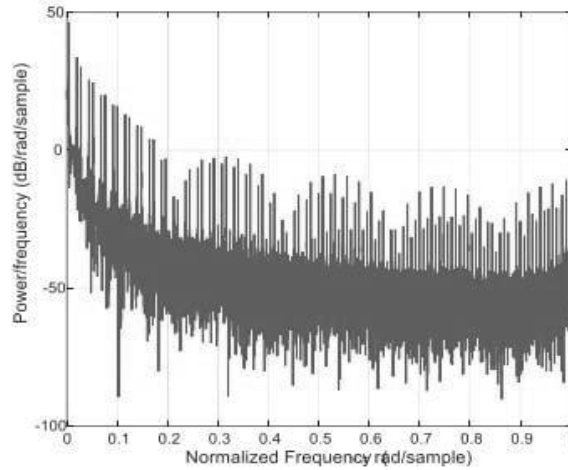
Fig.6. Analysis of Power {adopted from (Boursianis et al.)}

2. People will begin to understand media differently as a result of the Internet of Things:
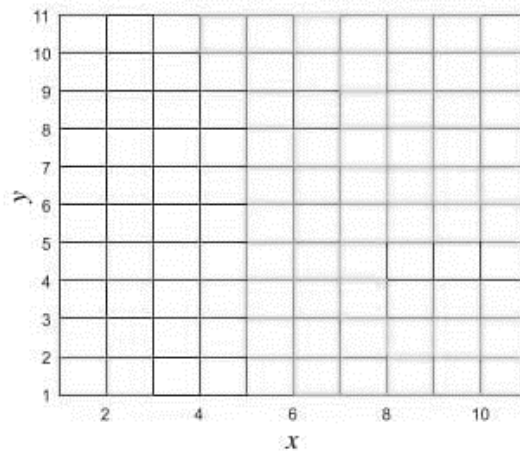
Figures 7 and 8 display y in relation to x

Fig.7. Different y and x {adopted from (Boursianis et al.)}

Throughout its existence, the development of traditional media has depended primarily on the production of fresh "content," and this pattern does not seem likely to change in the near future. When the time comes for media reform, it would be beneficial to the expansion of the media industry to combine the "content" of conventional media with the new communication technology and adapt it to the traditional media. There are a number of real-world instances that point to potentially positive results, and these examples originate from the standpoint of bringing the expansion and development of the Internet to the attention of the media. At the very least, the most recent developments in conventional forms of media have managed to captivate our attention. TV and radio transmissions that are based on the internet, digital newspapers and radio stations can be viewed in TV and radio transmissions on mobile devices too, etc. It is now feasible to "content" objects because to the increasing number of gadgets that are capable of connecting to the internet. Additionally, it creates "content" that advances both the interchange of ideas and information between objects and between people. Although it is challenging to understand, McLuhan published a weird book titled "Understanding the Media" as early as 1964. But it is very hypnotic. It is entirely because he made numerous odd and puzzling cautions, such as "The medium is information" and "The medium is an extension of man." The McLuhan as the forerunner of the electronic age and information society in the era of the Internet, his forecast has come to pass. His "media information theory" appears to have recently been read. And then the new form of Internet of Things communication emerges. Can we assert that "objects are information" to make it have a better breakthrough in communication? We are going to examine everything, regardless of whether it pertains to

more conventional forms of media or the Internet of Things, which is a whole new communication channel that is on the horizon. It is similar to the physical characteristics of the object itself in how the Internet of Things is spreading. Information is unstructured, diffuses, and distributed by nature. Objects will continually "produce" and "reproduce" information. It can even be argued that "objects are media" as a result of this because it significantly reduces our knowledge of the nature of media.

3. An extensive information selection service will be offered by the Internet of Things:

A new media integration platform is the Internet of Things. Connect items to the information network and overcome the limitations of the Internet. On the basis of network ubiquity, apply information dissemination technology to a variety of fields. Including established media genres like print, radio, and television. The reach and depth of traditional media may one day reach "infinite levels" with the assistance of the Internet of Things, and conventional media may one day utilize the Internet of Things to transcend the restrictions of both time and space. There is a not too distant future in which conventional media will have an even bigger influence on the lives of people. It is possible to modify "life circle media" as well. Premier description of "perceiving China" will be presented to us by the conventional media on the Internet of Things platform as they actualize daily life, mobile, and perceptual media use in relation to "perceiving China". Information from traditional media is widely disseminated thanks to the Internet of Things. A variety of information selection services need to be made available to the audience of the media in order to assist them in overcoming the limitations imposed by the channel of a single medium. This platform would speed the process of channel integration in legacy media by making it easier to consolidate the many media platforms that are already in existence. As a consequence of the impact of the Internet of Things, we may be able to achieve new development points in conventional media by using a broad variety of strategies, such as the development of platform technology, connections that serve multiple purposes, and so on. By that time, we are also able to appreciate the depth of traditional media content whenever and wherever we are even little modifications to the media itself. The media's ability to be extended is actually much increased.
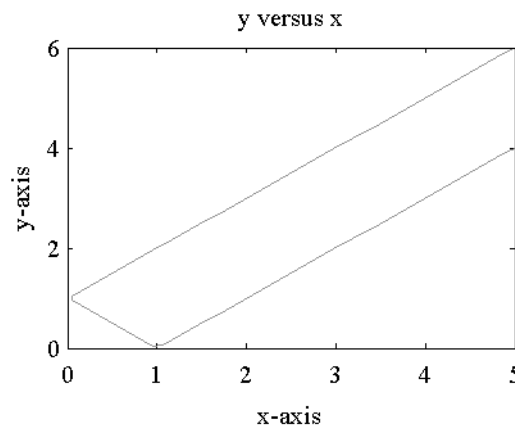

Fig.8. y versus x

4.Conclusions

This essay examines the deconstruction of the primary body of dissemination that the Internet of Things is responsible for, including its news dissemination materials and dissemination objects, from five different perspective points. The framework of news dissemination may be made more effective in a variety of ways, including bringing it up to date, enhancing its function, improving its platforms, fortifying its content, and broadening the scope of its coverage. Describe the ways in which the evolution of new types of information technology has enhanced and changed the process of disseminating news. In this article, we will discuss the ways in which social applications of Internet of Things technology interact with the news media, as well as the influence that the Internet of Things has had on the process of news transmission and the media industry as a whole. In addition to promoting the omnipresence of conventional media, it is intended that this article will expand the range of applications for Internet of Things technology in the news distribution sector and examine potential approaches to doing so. The body of research suggests that news media firms have benefited greatly from the IoT era's

transformation and advancement potential. News media may improve customization, engage audiences, streamline content creation and dissemination, and broaden their reach by utilizing IoT technologies. But addressing ethical and privacy issues is essential for preserving public confidence. Exploring the long-term effects of the IoT on the news media and developing mitigation techniques will require more study.

References

1. Abdel-Basset, Mohamed, et al. "Internet of Things in Smart Education Environment: Supportive Framework in the Decision-Making Process." *Concurrency and Computation: Practice and Experience*, vol. 31, no. 10, 2019, p. e4515. *Wiley Online Library*, https://doi.org/10.1002/cpe.4515.

2. Ahmed, Abdelsalam, et al. "Integrated Triboelectric Nanogenerators in the Era of the Internet of Things." *Advanced Science*, vol. 6, no. 24, 2019, p. 1802230. *Wiley Online Library*, https://doi.org/10.1002/advs.201802230.

3. Boursianis, Achilles D., et al. "Internet of Things (IoT) and Agricultural Unmanned Aerial Vehicles (UAVs) in Smart Farming: A Comprehensive Review." *Internet of Things*, vol. 18, May 2022, p. 100187. *ScienceDirect*, https://doi.org/10.1016/j.iot.2020.100187.

4. Brous, Paul, et al. "The Dual Effects of the Internet of Things (IoT): A Systematic Review of the Benefits and Risks of IoT Adoption by Organizations." *International Journal of Information Management*, vol. 51, Apr. 2020, p. 101952. *ScienceDirect*, https://doi.org/10.1016/j.ijinfomgt.2019.05.008.

5. *CAD_19(S6)_2022_147-157.Pdf*. https://www.cad-journal.net/files/vol_19/CAD_19(S6)_2022_147-157.pdf. Accessed 11 May 2023.

6. Chin, Jeannette, et al. "The Internet-of-Things: Reflections on the Past, Present and Future from a User-Centered and Smart Environment Perspective." *Journal of Ambient Intelligence and Smart Environments*, vol. 11, no. 1, Jan. 2019, pp. 45–69. *content.iospress.com*, https://doi.org/10.3233/AIS-180506.

7. Ding, Yangke, et al. "Smart Logistics Based on the Internet of Things Technology: An Overview." *International Journal of Logistics Research and Applications*, vol. 24, no. 4, July 2021, pp. 323–45. *Taylor and Francis+NEJM*, https://doi.org/10.1080/13675567.2020.1757053.

8. Khanna, Abhishek, and Sanmeet Kaur. "Evolution of Internet of Things (IoT) and Its Significant Impact in the Field of Precision Agriculture." *Computers and Electronics in Agriculture*, vol. 157, Feb. 2019, pp. 218–31. *ScienceDirect*, https://doi.org/10.1016/j.compag.2018.12.039.

9. ---. "Internet of Things (IoT), Applications and Challenges: A Comprehensive Review." *Wireless Personal Communications*, vol. 114, no. 2, Sept. 2020, pp. 1687–762. *Springer Link*, https://doi.org/10.1007/s11277-020-07446-4.

10. Kumar, Sachin, et al. "Internet of Things Is a Revolutionary Approach for Future Technology Enhancement: A Review." *Journal of Big Data*, vol. 6, no. 1, Dec. 2019, p. 111. *Springer Link*, https://doi.org/10.1186/s40537-019-0268-2.

11. Liu, Long, et al. "Promoting Smart Cities into the 5G Era with Multi-Field Internet of Things (IoT) Applications Powered with Advanced Mechanical Energy Harvesters." *Nano Energy*, vol. 88, Oct. 2021, p. 106304. *ScienceDirect*, https://doi.org/10.1016/j.nanoen.2021.106304.

12. Shi, Qiongfeng, et al. "Progress in Wearable Electronics/Photonics—Moving toward the Era of Artificial Intelligence and Internet of Things." *InfoMat*, vol. 2, no. 6, 2020, pp. 1131–62. *Wiley Online Library*, https://doi.org/10.1002/inf2.12122.

13. Usak, Muhammet, et al. "Health Care Service Delivery Based on the Internet of Things: A Systematic and Comprehensive Study." *International Journal of Communication Systems*, vol. 33, no. 2, 2020, p. e4179. *Wiley Online Library*, https://doi.org/10.1002/dac.4179.

14. Viriyasitavat, Wattana, et al. "Blockchain and Internet of Things for Modern Business Process in Digital Economy—the State of the Art." *IEEE Transactions on Computational Social Systems*, vol. 6, no. 6, Dec. 2019, pp. 1420–32. *IEEE Xplore*, https://doi.org/10.1109/TCSS.2019.2919325.

15. Zhang, Yin, et al. "Edge Intelligence in the Cognitive Internet of Things: Improving Sensitivity and Interactivity." *IEEE Network*, vol. 33, no. 3, May 2019, pp. 58–64. *IEEE Xplore*, https://doi.org/10.1109/MNET.2019.1800344.