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Mongolian Online Journalism/News Websites/: Past, Present, and Future

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Abstract

The breakthroughs of the third industrial revolution made the fourth industrial revolution feasible, and processes and technology drive the growth of every industry. Since journalists now perform a wide range of tasks, such as digital data processing, graphic and multimedia preparation, web development, and coding, their jobs today require technology-based knowledge, making them a more challenging profession than they were a century or even ten years ago when journalists' work was limited to writing news articles. As a result, the profession of journalism, which was formerly associated with the social sciences, has been incorporated into the study of information technology and cybernetics.

Information sites have been a new technology-based information medium since the advent of the internet, and they have evolved as an accompaniment to traditional information tools, personal information blogs, etc. However, today's user base, social influence, technological advancements, and information capacity have all changed and have transformed into a leading news medium. Also, the central component of new informational tools has evolved into the primary tool for producing and disseminating expert journalistic news.

In the future, news websites will have more content and information due to the influence of cutting-edge technologies like blockchain, big data, artificial intelligence, and the metaverse. These technologies are near to defining the tone of the journalism and mass communication industries.

Keywords: News websites • Journalism • Cybernetics • Internet • Blockchain • Big data • Artificial intelligence

Introduction

Research rationale and supporting concepts

The study of development of electronic journalism is a comprehensive study of the history, theory, and practice of modern journalism. On the one hand, it is a tool study, and it is an important issue to study the characteristics and development of journalism in the country. In the field of journalism in Mongolia, electronic journalism is developing in a comprehensive way along with news sites and other tools that are integrated with it [1].

The history, theory, and practice of contemporary journalism are all thoroughly examined in the study of the evolution of electronic journalism. On the one hand, it is a study of a tool, and on the other, it is crucial to examine the traits and growth of journalism in the nation. Electronic journalism is expanding significantly in Mongolia's journalism industry, along with news websites and other related tools [2].

Newspapers, television, radio, and numerous other internet-based outlets are all considered media. The hub of contemporary media, which incorporates all of these and can make use of them all to convey information, is a news website. As a result, the news site has evolved into a key tool for information dissemination using each of the contemporary information distribution technologies and platforms by integrating the primary aspects of modern new media, such as links, multimedia, and feedback.

In this regard, "the news site has emerged as the key tool that forecasts the growth of new media."

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Determining the growth of electronic journalism and a new sector in the media business, in our opinion, will require research into the development of informative sites in the Mongolian media industry, as well as its current state and issues. Additionally, we set out to investigate how electronic journalism is currently practiced in Mongolia in relation to a number of variables, including the information society, the electronic transition, new media, and its trends, the axiom that "the tool is the information itself" as its central idea and the advancement of the information preparation tool. "Information society is primarily changed by the increasing power of the tools that produce it, not the content," said Herbert Marshall McLuhan [3].

The theory of new media is connected to the fundamental ideas of electronic journalism. Its main thesis is that "content of any medium is always another medium," according to Marshall McLuhan.

The research took into account the fundamental guide by Marcos Palacios and Javier Daz Noci on how to conduct e-journalism research. Javier Dáz and Marcos Palacios mentioned in their work “Online journalism: Investigation techniques, research methods” that, it is crucial to look at electronic media from the standpoint of social communication models and information technology development.

Some researchers have examined the relationship between the evolution of information communication and the process of reporting on society, politics, and the lives of citizens throughout history. They believe that this relationship will only grow stronger in the age of electronic journalism. This study examines electronic journalism in great depth from the standpoint of social phenomena [4].

According to Tim Harrower, a researcher with expertise in electronic media and newspaper design, suitable linkages, multimedia, and visualization are crucial for the dissemination of information in the media environment and should not be overlooked in studies of the electronic environment.

Research on new media and electronic journalism has been carried out to a certain extent in Mongolia. Professor B. Bold-Erdene wrote a theoretical work and explained the theoretical basis of the website as the main tool of Internet journalism, while Professor M. Zulkafil conducted a comparative study with other countries, and Professor D. Dagiimaa studied the development of e-journalism and its influence on journalism training, Professor S. Amartuvshin examined history from the perspective of social phenomena Dr. B. Iderjargal studied the ethical issues of e-journalism [5].

While Dr. S. Delgermaa, a specialist in electronic journalism, published a dissertation on "Development and stabilization of Mongolian electronic journalism." Dr. B. Chinzorig earned his academic degree by writing a dissertation on "The study of the development of Mongolian news websites."

Literature Review

In this article, we characterize the current condition of electronic journalism by linking it to the technological advancement of information sites, drawing on the research and theoretical ideas of the aforementioned experts as well as historical and reviewed works.

Research approach, methodology, and findings

Our research has established the state of electronic journalism in Mongolia now by taking into account and integrating three important aspects.

- Conduct theoretical and methodological development of the main information media of Mongolian electronic journalism and emerging news sites.
- Analyze the development of electronic publishing in Mongolia using historical examples.
- Using surveys, describe specific technological indicators of information sites, compare them to the actual situation, and evaluate them as part of current scenario research and analysis.

Identifying information sites

Researcher Tim Herrover defined: “News websites combine newspaper design and magazine design, setting them apart from other types of websites more in terms of their visual aesthetic than their informational substance. In addition, the idea of one-color dominance is a design philosophy based on its design qualities when compared to other forms of site design [6].

"Information site is a site that contains entire information of many topics and areas," Dr. B. Bold-Erdene noted. “As a result, this website offers data and content from a variety of publications, writers, and journalists as well as services and communication goods including surveys, suggestions, and research. The content generally has non-commercial operational characteristics.”

Researcher James C. Foust wrote: “A highly complicated link structure makes up an information site, so designing your links carefully is necessary while building an information site. Links are stressed as having a crucial part in the creation of informational websites, as improperly designed links will make it impossible for users to access the site”. Yet, from the perspective of feedback, researcher Tim Barton described “the interactive and varied nature of the information site as its most significant characteristic”.

Our conclusion is that "an information site is a complex and unified interactive communication tool that provides true and quality news that is valuable to users, has hypertext, and has a link structure based on use" as a result of these factors. We conducted our research as a theoretical model based on our definition and the accompanying diagram, which summarizes the development of information production tools known as information sites (Figure 1).

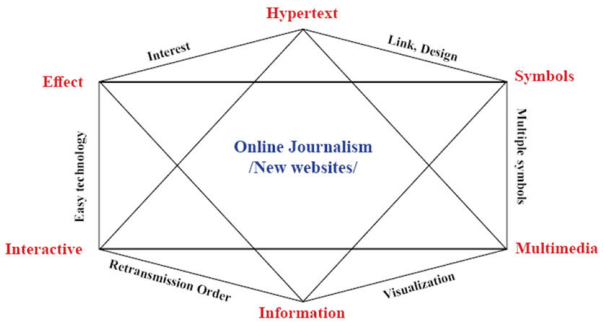

Figure 1. The structure and characteristics of an information site.

The diagram can be used to describe the structure and characteristics of an information site, which is the primary type of electronic journalism. An information site is structured using a combination of six key components, as shown in the diagram: Information, interactivity, effects, hypertext, symbols, and multimedia. Each of these elements is inextricably linked to the others. And each element is interdependent; they all work together to provide the structure and substance of electronic journalism.

Depending on which element is highlighted, different meanings are assigned to each element's function and engagement in the diagram. As an illustration, we chose the symbol as the focal point and provided the following explanation. Multimedia or multi-character environments are created by characters. By visualization, this multimedia creates the content or features of the website. To maintain the participatory nature of the website, this information is shared through rating and retransmission. By piquing the user's attention or establishing a "stimulus-response" relationship, hypertext develops an effective connection and uses simple technologies to improve the effectiveness of interactive communication [7].

The following explanation divides the major six elements into two portions based on their respective duties. Hypertext develops multimedia, and multimedia creates interactive communication, according to the diagram of the triad of hypertext, interactivity, and multimedia. Information can also be communicated to the public through symbols, and then a certain impact can be produced if we arrange information, symbols, and effects in a triangle [8].

The development stage of the information site

The University of Florida's Journalism Department published what is largely regarded as the first online journalism website in 1993, a few months after the release of the first web browser, Mosaic. It was a very simple, static website that featured an image of the Journalism Department's red-brick wall. It was only sporadically updated, taking place on nights and weekends when nobody else was using the 486-25 processor and 4 megabytes of Random Access Memory (RAM). (Introduction: Internet Journalism's Development Andreas Veglis and Eugenia Siapera).

The first website, http://mol.mn/ was launched in Mongolia in November 1996. It was the first news site.

The growth of information sites has been the subject of periodic studies by researchers looking at technology, the information hypertext environment, links, types of information, information format, availability, and features.

Advances in Web technology for new Internet-based media are summarized as follows:

Web 1.0 data/1990-2000/Web

2.0 production/2000-2010/Web

3.0 distribution/since 2006/

Some sources believe that Web 1.0 developed from 1989 to 2005, Web 2.0 from 1999 to 2012, and Web 3.0 from 2006 to the present.

The development of the world site was based on the development of the basic technology of information transmission by American hardware researchers:

- WEB 1.0 or the era of unidirectional sites (1990-2000).
- WEB 2.0 and the era of interactive websites (2000-2010).
- WEB 3.0 or the era of semantic websites (2010-2020).
- It is classified as WEB 4.0 or the era of artificial intelligence websites (after 2020).

Researcher S. Amartuvshin made the first attempt to date the development of new information tools in our country by following the principles of historiography, representing the development of information sites.

- The stage of introduction of new tools to Mongolia (1992-1996).
- The stage of the emergence of Internet journalism and the emergence of electronic publications (1996-2009).
- The transition stage from traditional media to electronic media (since 2009).

The following stages of the evolution of Mongolian information sites were made by researcher B. Chinzorig based on the concept of focusing on the nature of phenomena/tools, based on technology, content, scale, and form of information that has entered the information site.

Stage 1: The age of the single stream news site (1996-2004).

Stage 2: The era of online communities for feedback (2004-2013).

Stage 3: Periodized, similar to the format of multimedia news websites (since 2013)/Chinzorig B. The study of development of Mongolian News websites, 2021, p 17/.

In this article, we used this chronology to consider how major news sites used the capabilities introduced in website technology at each stage and era.

Stage 1: The age of the single stream news site (1996-2004)

At this time, the first website http://mol.mn/ was launched in Mongolia, and independent news sites were created. Also, news sites were developed from electronic versions of traditional media to independent media.

Mongolia was connected to the Internet on January 17, 1996, and Datacom Company established http://mol.mn/ on February 17, 1996, which became the pioneer of electronic media in Mongolia. The first version of http://mol.mn/ was web 1.0, a read-only site with English (http://mol.mn/english/) and Mongolian (http://mol.mn/mongolian/) versions.

There were 11 portal sites with different services launched between 1999 and 2003 as a result of the growth in Internet users and the demand for informational websites. www.tsahimurtuu.com, http://medeelel.mn, http://olloo.mn, and http://www.mglclub.com were a few of them that consistently disseminated news each day. At this point, the newly launched news portal site http://olloo.mn/ achieved independence by producing 8-9 of the 18-20 news items that were typically published each day, or 40-50% of the total, in-house. Moreover, http://mol.mn/ has grown to now feature news from 14 electronic editions of Mongolian newspapers, 3 online magazines, and 7 online newspapers. This expansion signaled the start of the transition from conventional media to electronic media. Moreover, "Elgen nutag Radio" (FM 96.6) began broadcasting internationally online at http://olloo.mn/.

Information site technology has been updated with the times. "Tsakhim urtuu" pioneered the key achievements of the early days of Web 2.0, user-centered content, and shared knowledge creation. Since then, information sites have been able to format HTML text (<b>, <i>, <font>), give text color (<font size=”12” face=” Arial” color=” red”>), create block borders (<frame>) started using zeros. In terms of design, news sites of this era differed from each other in terms of color expression and general design concepts.

Stage 2: The era of online communities for feedback (2004-2013)

In terms of design, technology, and content, Mongolian news sites of this time were distinct from traditional news media, and the advent of a content management system aided in the growth of the industry. This signaled the start of news outlets' diversity. These were the times when feedback ties with several services like https://news.xopom.com/ and https://gogo.mn/ were developed.

A wide variety of elements are added to web pages as web 2.0 sites develop and gain popularity. Between 2004 and 2007, Mongolian news sites underwent changes and updates as a result of the knowledge gained during the previous stage. In addition, a number of new news sites were created, multifaceted services were added to news sites by adhering to Web 2.0 technology standards, and new design and technological advancements were made. The groundwork has been created for the independent development of new media in Mongolia, which will be distinct from traditional media in terms of its color, content, and technological advancements.

The process of integrating traditional news media with news sites has accelerated because of advances in technology and a rise in Internet users. In addition to newspapers and magazines, television has also begun to take on the role of a new media channel for the distribution of information. Under its "Picture News" section, the http://olloo.mn website, for instance, has been airing video news produced by "MM Agency" and "MN25" TV since 2005, marking the first attempt to disseminate video news via a news website. The process of integrating newspapers into electronic media is also speeding up. Since 2004, the http://sonin.mn website has disseminated news from six daily, twelve weekly, seventeen every ten days, and four fortnightly newspapers and grew to be a portal site that distributes the most information per day at that time.

A wide range of services, in addition to news, were made available with the advancement of information site technology. The largest provider of services in Mongolia at the time, www.banjig.net offered about 20 services in 2007 including blogs, business advice, web directories, advertising, postcards, internet radio, multimedia entertainment, online shopping, dictionaries, music, discussion, and chat. An online resource with the www.gogo.mn portal site has also begun offering services including data distribution and content creation. It could host e-mails, blogs, and data through its five different types of websites: www.map.gogo.mn, www.mail.gogo.mn, www.music.gogo.mn, www.mobile.gogo.mn, www.news.gogo.mn.

The layout of news websites underwent numerous alterations over the Web 2.0 era. The increased use of photography is the most significant of these. For instance, between 2004 and 2007, http://olloo.mn created 10,405 pieces of information with photographs, of which 6,453 (or 60%) had 1-2 photographs, 3,453 (or 33%) had more than 2 photographs, and 499 (or 7%) were cartoons and cartoons published with photographs. The development of the information site has undergone a significant alteration in this period. The traditional "T" shape, used on http://olloo.mn's home page and help pages, for instance, has emerged as a new idea in Mongolian website design, which has recently moved away from the strategy of copying newspaper design.

Moreover, it introduced components like column tables, polling standard text formatting, and HTML 4's CSS-based data blocks.

While http://olloo.mn was the first to deploy a search engine based on Google technology, it also pioneered the use of a number of solutions for moving banners and utilized photo JPEG, TIFF line drawing, PNG, and animated image gif formats. introduced. Websites like www.britneyshow.com, www.intomongolia.com, www.intomalaysia.com, www.greatsumo.com, www.infodisease.com, www.beijing2008photo.com, and www.softmining.com that upload news and information in the form of double linking are all included under the www.banjig.net banner. This makes a significant contribution to www.banjig.net's growth as a Mongolian news website.

Information security issues started to emerge as information sites developed. For instance, in 2007, a Turkish hacker going by the alias "Cyber rider" compromised http://olloo.mn and erased all of the data on the server.

Updates to content management programs like WordPress and Joomla at this time led to a significant advancement in site design and management technologies. Internet speeds have grown and costs have decreased due to the growing accessibility of the Internet. It gives viewers the option to access video, audio, and multimedia information via news websites and has grown to be a significant driving force behind the creation of video content on news websites. The development of content management systems for websites has increased the availability of information online and increased site rivalry. As a result, 68 news sites that matched the requirements started operating as of 2012, which encouraged the diversification of news sites. Therefore, at this time were developed different sites diversified by topic. Sites of breaking news http://www.bolod.mn/. http://www.mass.mn/, http://www.gogo.mn/, http://www.news.mn/. http://www olloo.mn/, http://www.ikon.mn/, free news http://www.factnews.mn/, http://www.nuuts.mn/, http://www.fact.mn/, http://www.grandnews.mn/, also the sites for leisure, such as http://www.goolingoo.mn/, http://www.khulangoo.mn/, http://www.emegteichuud.mn/ sites for cognitive information http://www.sanchir.com, http://www.medeelel.com, http://www.world.mn, http://www.xopom.mn/, http://www.caak.mn, http://www.amjilt.com, http://www.aravt.mn, sports information http://www.sport-tsonh.net.mn; culture and entertainment news http://www.urlag.mn http://www.chinigs.mn, health information http://www.emch.mn, http://www.emneleg.mn, economy http://www.uuluurhai.mn, http://www.ord.mn, http://www.barilga.mn, http://www.monicpa.mn and political informationhttp://www.VIP76.mn, http://www.ulstur.mn and so on.

Stage 3: Periodized, similar to the format of multimedia news websites (since 2013)

Since then, multimedia websites with cutting-edge technologies have had a significant impact on technology and model design, visual, audio, and video content have risen to the top of the importance scale for our informational websites, and sites are starting to transition to the Web 3.0 standard. In recent years, the majority of news websites primarily relied on video content and made their character environment the primary method of user attraction. However, starting since 2019, the top news websites in terms of access have moved from the early web 3.0 or multimedia web with semantic search to a new stage of development of artificial intelligence-based web 3.0 and are getting ready to start making preparations for the gradual transition to web 4.0 or symbiotic technologies.

The global standard for web technology has been HTML-5 since 2014, which supports multimedia technology. The capacity to work with the fundamental model regardless of the platform, the ability to transmit video information using 2D and 3D images, "Embeb" codes and links, the ability to connect audio and video information to text, and the ability to transmit audio and video information to the website without using any plug-in in accordance with HTML-5. (filtering), the application and formatting of information visual symbols, the posting of data in the published order, double storage based on the file distribution system, and CSS3 are all examples of CSS3-compliant technologies. Additionally, since then, HTML-5-based web 3.0 technology has emerged. The advancements of social networking, semantic search (deep search), three-dimensional virtual worlds, and media-centric online technologies can therefore be used by news websites. Web 3.0 has brought about a significant transformation in media communication along with technological progress, resulting in a circular feedback cycle. In other words, at the level of new tools, a completely new radiation feedback environment of information is created, involving individual and community, community and individual, individual and individual, journalist and community, individual and journalist, and journalist and journalist.

In Mongolia, 74 new informational websites have been launched since 2013. Nevertheless, despite the seeming proliferation of news websites, the majority of them are controlled by a single owner and feature the same information. At this point, media-specific information, visual elements, and the utilization of social media channels are three examples of improvements in news sites. For instance, the primary components of visual materials—information graphics and information icons—have developed into crucial tools for disseminating audio and video information as well as live broadcast information content. Similarly, the use of social network channels for information dissemination has boosted the multimedia nature of news sites. However, due to technological advancement and the excessive growth of social network use, there have been issues like a decline in public trust in news websites, loss of personal information, dissemination of unethical and false information, poor information processing quality, and simplification of journalism.

The expansion of electronic multimedia information necessitates that journalists develop synthetic abilities that can completely map the essence of the issue based on the situation and apply it in conjunction with conventional writing techniques in addition to their basic skills.

The ability to distribute video content has expanded thanks to Web 3.0 technologies, and the availability of video content online has begun to rise. Under this measure, the majority of recently launched and active news websites in our nation only provide video content. For instance, since 2018, websites devoted to video and audio content have been launched, including http://www.atime.mn, http://www.interview.mn, http://www.leadstyle.mn, http://www.livetv.mn, http://www.npost.mn, http://www.report.mn, http://www.saikkhan.mn, http://www.untsug.mn, http://www.urug.mn, http://www.toperdenet.mn and http://www.tsakhiur.mn.

Advances in technology have enriched the variety of information-visual applications by developing a wide range of possibilities.

The variety of information-visual applications has been enhanced by technological advancements by creating a wide range of options. The http://www.ikon.mn site was the only one using information graphics and information icon types, but starting from 2020, sites such as http://www.gogo.mn, http://www.news.mn, http://www.gereg.mn and http://www.ubn.mn regularly have been using visual information.

In conclusion, news sites have undergone two major developmental transitions since 1996, setting the stage for modern AI and blockchain-based news sites.

Discussion

Current status and challenges of news sites

In terms of form and content, the technological sophistication of Mongolian news websites has been examined. To do this, we surveyed 50 of Mongolia's most popular websites. First, the media-based sociological study was conducted to verify the findings of content, technology, and design research. Questionnaires were used to investigate the affiliation, editorial structure, management system, fundamental technology, and information distribution tools of media sites.

50 percent of the news sites we researched (n=25) have independent editorial offices, 34% (n=17) are part of a particular media group, and 16% (n=9) are governed by joint editorial oversight of many websites.

News websites often employ 5 to 6 specialists to manage their editorial operations. Several websites run in large buildings with ten or more employees. Journalists, photographers, administrators, translators, graphic designers, and content managers all work as news site professionals.

As for the management system of news sites, our news sites use our content management system and Wordpress system. 34 out of 50 sites surveyed use Wordpress. Others were using their content management systems.

Our news websites primarily employ Facebook groups, pages, chatbots, and YouTube for the delivery of content, while other social media networks are rarely used. This suggests that although our news websites are publishing content, there is a problem with distribution and marketing management.

We can conclude that our information sites are dealing with the five sets of problems mentioned below: Technology and design; data processing quality; media ethics; marketing (media economics, political independence) of news sites; and information security.

Problems and solutions in technology and design

Making effective use of web technological advancements can help electronic media build a brand, stand out from the competition, and draw in new readers and customers. The web is now faster to load, more secure, and simpler to use thanks to the recent emergence of numerous content management disciplines. For instance, it is feasible to buy premade designs and develop them from overseas websites like www.themefores.net.

Yet, some news websites are not utilizing it because of a lack of funding. As a result, our news sites have issues with web page links and design related to technological updates. If the link is created flawlessly, there is a probability that the web page will operate successfully; nevertheless, if a tiny error is made, the functionality will fail and the web page will need to be rewritten. Almost 50% of the news websites we provide have some sort of link problem. The three primary strategies for resolving this kind of problem are to thoroughly train competent staff, exercise strict control at every stage of web construction, and collaborate with a reputable organization when creating an information website.

Problems and solutions in data processing quality

Users upload their data and ideas to the entire network, mobile device makers built a sophisticated mechanism for distributing content, and social networks invaded journalism (Bold-Erdene. B, 2019, p. 193). Participatory journalism's (disseminating activities) boundaries have shrunk. People no longer distinguish between information from news websites and information given by regular people online, and the trend has taken hold in various sectors of society. According to worldwide news agencies' experience, the requirements for texts created by news sites are conciseness, clarity, truthfulness, adherence to the sorts of records, regularity of information frequency, and updating of information.

In the past ten years, news websites have tended to lose sight of the importance of processing information in favor of technology growth, and journalism has increasingly been simplified. This is done to condense events that could warrant a lengthy report into brief news, avoid producing the event's news twice with text by simply distributing it as a live video, only producing video news with the source's speech, emphasizing the title and omitting the text-based information processing's content unedited, absence of information transfer. One of the causes of the loss in popularity of electronic media among today's skeptical and information-scrutinizing readers is due to these flaws.

Although this issue and weakness are rarely seen on more established news websites like http://www.ikon.mn, http://www.news.mn, and http://www.gogo.mn they are now a typical occurrence on the majority of news websites. First and foremost, it's critical to establish guidelines and standards for information published online by global norms in order to enable editors to assess the information in light of these standards and to tie it to financial rewards. This will help to eradicate errors on news sites. Moreover, more news websites were popping up, and "news washing," or publishing content created by others without their consent, started happening often. Duplication of content is another result of the proliferation of numerous poor-quality news websites that share the same ownership.

Problems and solutions in media ethics

The bulk of complaints the Mongolian Press Council receives about news websites are because the content is unverified or because it was disseminated unethically.

There are extremely few instances of electronic media purposefully disseminating unreliable, false, or unethical information. However, people spreading false information on social networks under the guise of electronic media and non-professional media outlets using social networks to spread false and unverified information directly to increase their reach spread little else but false, fictitious, and unethical information online. They frequently employ strategies to trick visitors with exotic headlines and to update and disseminate content when constructing fake information sites and disseminating misleading information in the online environment.

Instant sites have recently appeared in the online space to mislead people with fake headlines and spread information that occurred 10 to 20 years ago as though it were recent. For instance, the aforementioned technique is used by websites, like http://www.goylife.mn, http://www.humuus.mn, http://www.lardima.com collaborate with to spread information about the government's monetary policy, welfare programs, politics, economy, and art and culture.

Selective media education courses have been offered in colleges and secondary schools in an effort to combat unethical information and increase people's education in dealing with the media.

Problems and solutions in media marketing

Marketing has a significant role in how well a news website runs. In other words, it has to do with the media's independence and one of its fundamental components, the economy's independence. The following marketing and operational problems affect our news sites. They include employing marketing experts, learning the methodology of marketing research as a team, boosting the influence of management reputation, growing revenue sources, supplying competent staff, and making the most use of social media platforms.

Problems and solutions in media security

"Information security is one of the most important issues of the Mongolian journalism and media industry, which has not received proper attention until today" (Galaarid. B, 2018, p. 147). It has become a global problem. The Mongolian Law on Information Security provides clear instructions on how to guarantee the security of information at the national level in the following articles: Article 3.6.2 of the Concept of National Security, Article 3.6.3 of Data Integrity, and Article 3.6.4 of Confidentiality of Information. But there isn't enough being done to put these rules of articles into practice.

Our research specifically shown that the availability of information and data integrity are not concerns for the government or the private sectors.

Availability of information security includes the ability to obtain the necessary information at any time, while confidentiality includes the protection against unauthorized access and the integrity of the information up-to-date.

The site editors who participated in our study said that 50 newsrooms had an average of 10-12 issues with data privacy and technological security every year.

In addition, yearly expenses for our news websites are high due to technical difficulties. Thus, we think that using blockchain technology is essential for ensuring data privacy.

Information accessibility takes into account whether citizens have the chance to obtain the desired information when necessary. Despite the fact that our nation lacks modern technologies, electronic technology is widely used. "As of June 30, 2022, there are 4.3 million mobile phone users, 3.07 million Internet users, and consumers are using the Internet on average at a speed of 2 to 5 megabytes". Moreover, 178 news websites are operational as of 2022.

From here, it appears that the potential for distributing information to the general population via the Internet is completely developed, but there is still a risk of access because of the lack of Internet connection and mobile phone networks in rural regions.

Integrity is determined by whether the information being disseminated is up-to-date in terms of content and format. While news websites report on significant subjects and concerns more quickly than newspapers do, they focus more on bringing up issues. Modern users are interested in obtaining information that is video, graphic, and icon-based, but very few people create this kind of information. Thus, it is crucial for news websites to convey information in a format that adheres to user preferences in order to ensure integrity.

Future developments and news site trends

Blockchain, big data, artificial intelligence, and metaverse are inextricably linked to how information sites will develop in the future, not just in Mongolia but also globally. It is crucial to fully migrate to WEB 3.0 technology before discussing the creation of new cutting-edge technologies, or WEB 4.0, in order to discuss these issues.

Web 4.0 journalism is ushering in the transformation of journalistic news to a completely non-publicized style that caters to individual tastes rather than the general public and is building a large-scale impact-based communication environment for new media communication.

Web 4.0 technology works symbiotically with artificial intelligence. From April 1st, 2019, when http://www.ikon.mn site introduced Sara, a smart presenter, and began to distribute audio information, it can be said that the transition to artificial intelligence technology with web 4.0 standards has begun among Mongolian sites. One out of every five messages has been sent in audio format since the presenter Sara has first featured on http://www.ikon.mn. Moreover, news websites are attempting to integrate Chimege Systems' smart host, which was announced in 2020, into their operations.

Also, there is a tendency to change the radiation-type feedback relationship created during web 3.0 with web 4.0 technology and start creating a completely new communication environment in new information tools based on the effects for individuals. For example, information sites of "variable" nature with content for each individual may be created.

If the amount of data in the world is huge, the creation of artificial intelligence or "super-intelligent machines" will have a strong impact on information technology, including web technology, and will "change the traditional understanding of the web page, and from 2020 to 2030 it will become a completely new standard web technology called web 4.0." Google, Facebook, and other algorithms may become our proxies (agents) and eventually sovereigns once they become well-known guides (oracles) (For Oracles, 2020).

However, Web 4.0 technology has created requirements for a high level of network security protection. Our news sites are making major technical innovations, but they are not paying attention to data security at a significant level. Yet, since 2018, some of our well-known websites, such http://www.ikon.mn, http://www.gogo.mn have begun to offer the characteristics of a blockchain-based information security system. But, the "transition" is taking a lot of time because new technologies are still being developed.

Conclusion

Information sites are analyzed in terms of development process, structure, content and new information technology and the following conclusions are made:

The information site has evolved into a true representation of the notion that "the tool itself is information" by fusing the fundamental components of modern information tools, such as links, multimedia, and feedback. Also, the evolution and modifications of the content generation tools have influenced the growth of this new information medium.

Taking into account the technological evolution of information sites, their development and maturity can be divided into three stages:

Stage 1: The age of the single stream news site (1996-2004).

Stage 2: The era of online communities for feedback (2004-2013).

Stage 3: The era of multimedia news websites (since 2013).

We think that a certain amount of time has passed. This evolution has led to the information website's technological development into a multimedia form, which is the main maturity of this tool.

As a result, the news sites have been facing new challenges and challenges that emerged every time due to the influence of the electronic revolution and the development of information technology.

However, after summarizing the existence of several problems, 5 types of problems and difficulties faced in the development and maturity of information sites were identified. These issues are related to operations, marketing, data processing quality, media ethics, technology, form design, and information security.

The news website consequently had to deal with ongoing difficulties brought on by the impact of the electronic revolution and the advancement of information technology.

Yet, after summing up the existence of various issues, 5 categories of issues and challenges encountered in the growth and maturity of information sites were discovered: technology and design; data processing quality; media ethics; marketing (media economics, political independence) of news sites; and information security.

The most serious shortcoming is the violation of professional ethics and the resulting decrease in public trust in the media.

As a whole, the media, particularly new media, has undergone many stages of technological development, making it the most intensely developed tool in terms of the shifting power of media. Yet, issues with content have a detrimental impact on social media's growth and make it challenging for it to become a potent tool that sets itself apart from traditional media in any area of journalism and public relations.

In these two senses, the development and maturation of the information site are currently in the stage of arrangement, and after resolving the issues encountered, it is feasible to completely advance in the stage of maturity.

Gratitude

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