BMKG Communication: A Systematic Literature Review

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ABSTRACT

Communication is important in the public sector organization and plays a critical aspect in modern government management. Therefore, the public sector is currently competing to improve appropriate communication strategies as an effort to increase reputation and credibility. This research was prepared using a systematic literature review method regarding communication between public sector agencies of the Meteorology, Climatology and Geophysics Agency (BMKG). The aim of this research is to provide a comprehensive overview of the development of communication research carried out so far with a research focus on agency communication. This research method involves a systematic search in the academic database of national journals via Google Schoolar on 18 articles that have been selected using keywords related to BMKG communication in the period 2018-2023. As a result, the most articles in this journal will be published in 2023 (33%), with qualitative research methods (56%) being the highest, with the highest journal accreditation being Sinta 4 (33%). In conclusion, the writing of scientific studies that focus on the field of communication in the BMKG government agency still needs to be developed further considering that the field of communication is experiencing very rapid development so that this public sector agency really needs to carry out updates in the field of communication which have been carried out in recent years.

Keyword: *systematic review; communication; public sector organization; BMKG*

ABSTRAK

Komunikasi merupakan hal penting dalam organisasi sektor publik serta berperan sebagai aspek kritis dalam pengelolaan pemerintahan modern. Maka dari itu, sektor publik saat ini berlomba-lomba untuk memperbaiki strategi komunikasi yang tepat sebagai upaya peningkatan reputasi dan kredibilitas. Penelitian ini disusun dengan metode tinjauan literatur sistematis mengenai komunikasi instansi sektor publik Badan Meteorologi, Klimatologi dan Geofisika (BMKG). Tujuan penelitian ini adalah untuk memberikan gambaran menyeluruh tentang perkembangan penelitian komunikasi yang dilakukan sejauh ini dengan fokus penelitian pada komunikasi instansi tersebut. Metode penelitian ini melibatkan pencarian sistematis dalam basis data akademik jurnal nasional melalui Google schoolar pada 18 artikel yang telah dipilih menggunakan kata kunci yang terkait dengan komunikasi BMKG dengan rentang tahun 2018-2023. Hasilnya, artikel jurnal tersebut paling banyak terbit pada tahun 2023 (33%), dengan metode penelitian kualitatif (56%) tertinggi, untuk akreditasi jurnal tertinggi yakni Sinta 4 (33%). Kesimpulannya, penulisan kajian ilmiah yang mengusung bidang komunikasi pada instansi pemerintah BMKG masih perlu dikembangkan lebih lanjut mengingat bidang komunikasi mengalami perkembangan sangat pesat sehingga instansi sektor publik ini sangat perlu melakukan pembaruan dalam bidang komunikasi yang sudah terlaksana pada beberapa tahun belakangan ini.

Kata Kunci: t*injauan sistematis, komunikasi, organisasi sektor publik, BMKG*

INTRODUCTION

Public relations plays an important role in supporting the success of an organization, especially helping to create a good reputation for government work in the community. Apart from that, with good communication, the right message delivery strategy, the public can more easily understand what the agency wants to convey, both in normal conditions of agency performance and in times of crisis. One of the interesting things to research is BMKG communication , which uses a lot of scientific language in conveying information. BMKG is a Non-Departmental Government Institution (LPND) which is obliged to provide information in the fields of meteorology, climatology and geophysics to the public, so the ability to manage communications in all aspects is very necessary. Until now, the public is still not fully aware of the big role of the public sector, with all the detailed information always uploaded on social media and the BMKG website. The public only knows a handful of BMKG's roles, for example regarding weather and disaster information, even though the information provided by BMKG is much broader than that. Submission of information is provided via the official BMKG website www.bmkg.go.id which is easy to access, also through television and radio broadcasts, as well as data information via SMS services which are carried out to meet community needs (Rahmawati, Rachmad Kurniawan, 2018).

Definition organization sector public , which is interpreted as organization public , owned and controlled by the government , at the level local , regional, national and international , which supports three pillars of government : " executive " (government), " legislative " (parliament), and " judiciary " and play a role in provision service public about need together (Canel & Luomo, 2018). As organization sector public There is obligation For give information easy public accessible to all layer public in accordance with each other's needs .

Culture is an accumulation of knowledge, experience, beliefs, values, attitudes, meanings, social hierarchies, beliefs, understanding of time, relationships with space, concepts related to the universe, material objects, and possessions that are fought for by a group of people, from various parts of the world from generation to generation Deddy Mulyana said that the meaning of culture is a comprehensive lifestyle. Culture is complex, abstract, and very broad. Many cultural aspects also determine communicative behavior (Abusyairi, 2013). According to the science of Anthropology, culture is a whole system of ideas, actions, and human works in community life obtained by learning (Detikedu.com, 2021).

Communication organizations in the sector public is focus ongoing research growing , because changes in the field This happen from One field administrative to field administrative other . Various communication efforts and strategies government in communicate policy public appeared in the media. Mass media role important in monitor policy government For overcome crisis . Mass media convey information to public about various policy government For convincing public . Mass media must capable operate four tasks : information , education , control social and entertainment , besides communication Mass also has a function economy (Sulistyowati, 2021).

Besides that is , the communication that is carried out sector public in a way appropriate will help increase community empowerment . Knowledge communication own important role For educate and empower public about participation and involvement they to decision government . Sector public naturally have their own communication strategies and levels customized with job and function separately . With so , a lot interested researchers discuss communication strategies sector public , one of which is BMKG.

This literature review research aims to provide an overview of the development of research that has been published in national journals discussing BMKG communication for the 2019-2023 period. From this research, the conceptual network, topic of articles in research journals, methodology used, and geographical distribution of research in the literature will be identified. This review will help researchers and practitioners in the field better understand the scope and direction of ongoing research and identify areas requiring further research. This research methodology involves a systematic search of academic databases via GoogleSchool using the keyword " BMKG's communication ". Selected articles will be analyzed and synthesized using thematic analysis methods to identify common themes, theoretical perspectives and research methodologies in the field. Overall, this systematic literature review provides a foundation and suggestions for future research on BMKG communications and helps shape the direction of scientific research in this area.

METHODS

The method used is library research or literature review. A literature review is a research plan that gathers sources of information related to a topic. The purpose of a literature review is to describe the main content based on the information obtained(Herliandry et al., 2020). Data collection for literature studies is carried out using database search tools as a stage in searching for literature sources. This data collection uses the *Preferred Reporting Items for method Systematic Reviews and Meta Analysis* (PRISMA). Research was carried out by analyzing journals and then making a summary related to the questions and objectives of the research. The procedure for searching journals to become material in this research is to have criteria that are in accordance with the PICOT procedure. The questions used to *review* journals have been adapted to the PICOT method, each question contains P = problem/population. This research uses learning as a problem. I means i implementation or intervention or *exposure*, this research examines the analysis of the development of scientific research regarding BMKG communication. C symbolizes *controls* or comparative intervention, the researcher did not use a comparative intervention or control in the research. Q means *time* or time, researchers conducted research reviewing journals that focused on BMKG communications for the 2018-2023 period which were accessed via *Google scholar*.

Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA)
Literature review research process uses the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) model. The following is the PRISMA flow diagram model in this research.
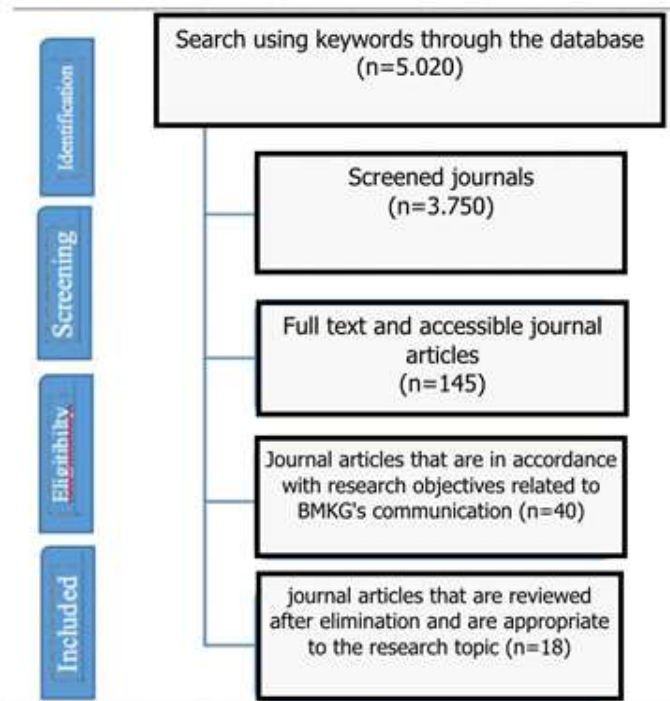
Figure 1.PRISMA flow diagram
Source: Researcher

Use of the keyword " BMKG communication " as step beginning in look for journals from the Google Scholar database. The result was 5,020 journals filtered from results search the. Then step next ie sort to 3,750 journals those that are related with period 2018- 2023. Then sorted again with look for journal that can accessed because no all journal free accessed, 145 articles remained appropriate journal the abstract. Furthermore article journal This sorted Again based on related articles with BMKG agency produced 40 articles. Lastly, journal the be read in a way detailed with focus BMKG communications so 18 articles remain journal for analyzed.

The 18 articles are categorized in a table that explains the author's name, year, article title, journal name, journal accreditation and the number of citations that have been made. The following is the categorization table:

Table 1. List of Published Articles Scientific about BMKG Communications
Source: Researcher

No	Author	Tahun	Year	Journal Accreditation	Citation
1	Rahmawati, Rachmad Kurniawan, Mawaddah; Metode deskriptif kualitatif	2018	Jurnal Peurawi: Media Kajian Komunikasi Islam	Sinta 5	1
2	Maryam, Siti, Pangestu, Arsandra Pinky; Metode kualitatif studi kasus	2020	IKON: Jurnal Ilmiah Ilmu Komunikasi	-	1
3	Siti Chodijah); Metode deskriptif kualitatif	2020	Persepsi : Communication Journal	Sinta 4	1

4	Ariffudin, Purnawarman Musa; Metode kuantitatif deskriptif	2022	Jurnal Meteorologi dan Geofisika;	Sinta 2	0
5	Sherli Safira, Vinda Maya Setianingrum; Metode kualitiatif studi kasus	2023	The Commercium	-	0
6	Mohammad Fadhli, Asriyadi, Irma Salamah, Lindawati; Metode kualitatif deskriptif	2023	JONG-KI: Jurnal Pengabdian Masyarakat	Garuda	0
7	Agus Hidayat; Metode kuantitatif analisis sentimen	2023	Jurnal Teknologi Informasi	Sinta 5	0
8	Prati Cristin Harnita; Metode kuantitatif deskripti	2021	Jurnal Komunikasi Pendidikan	Sinta 3	2
9	Minda Mora Purba;Metode kualitatif deskriptif	2020	Jurnal Sistem Informasi Universitas Suryadarma	Sinta 5	7
10	Silaban, Donna Isra;Metode kualitatif studi kasus.	2023	CoverAge: Journal of Strategic Communication	Sinta 4	1
11	Aliendra D. Nanda Kadun;Metode kuantitatif deskriptif dengan analisis isi	2023	Musamus Journal of Public Administration	Sinta 4	0
12	Djoko Supriatno, Hilman Syah Putra;Metode kualitatif analisis framing	2022	MEDIAKOM: Jurnal Ilmu Komunikasi	Sinta 5	0
13	Tri Istiana, Raksaka Indra A, Budhi Dharmawan, Bowo Prakoso; Metode kuantitatif deskriptif	2020	Elektron Jurnal Ilmiah	Sinta 4	5
14	Ifad Fadlurrahman, I Dewa Ketut Kerta Widana, Wilopo, Admiral Musa Julius, Aida Rahma Savitri; Metode kualitatif studi kasus	2020	NUSANTARA: Jurnal Ilmu Pengetahuan Sosial	Sinta 5	3
15	Dyah Ayu Karunianingsih, Ardian Setio Utomo; Metode kualitatif deskriptif	2019	Journal Heritage	Sinta 4	1
16	Naufal Fakhri Rasyid, Mochamad Rochim; Metode kuantitatif	2022	Bandung Conference Series: Communication Management	Garuda	0
17	Kholil, Aris Setyawan, Nafiah Ariani dan Soehatman Ramli; Metode kuantitatif expert based	2019	Prosiding Seminar Nasional Penelitian & Pengabdian Pada Masyarakat	-	5
18	(Ilham Fannani, Enggar Novianto, Alfin Syarifuddin Syahab); Metode kuantitatif	2023	Inspiration: Jurnal Teknologi Informasi dan Komunikasi	Sinta 4	0

After displayed Table 1 explains about Author name, Year Rise Journal, Journal Name, Index journal and amount citation. Furthermore table 2 below will disclose about title research, results, recommendations and gaps related research BMKG communications. For make it easier analyze the data presented in table 2.

Table 2. List of Results, Recommendations and Gaps Study BMKG Communications
Source : Researcher

No	Article Title	Result	Recommendations	Research Gap
1	Meteorological Agency Communication Strategy Climatology and Geophysics (BMKG) Aceh Dalam Anticipate Aceh Earthquake Hoax News	BMKG Aceh carries out a communication strategy about anticipating hoaxes, the focus is on preparation strategies message. Media selection on social media and online media.	Should intertwine cooperation with agency related for make it easier public get valid information about circulating issues, (one of them Work The same with the Public Relations of the Aceh Regional Secretariat and the Management Agency Aceh Regional Disaster (BPBD) which can also be done become connector information via BMKG Aceh to people in Aceh).	Need exists research advanced remember development from public Aceh Alone about education from current hoax news This it's very worrying public especially those in Aceh especially those who arrived moment This Still have been traumatized psychic on disaster earthquake and tsunami in December ago. So that in the future can become learning about importance sensitivity public to information disseminated must sourced from credible and valid sources, so that later No give rise to misunderstanding on current event or has happen .
2	Management Meteorological Agency Public Relations Crisis Climatology and Geophysics In Maintaining Company Image (Study Case 2018 Palu and Banten Tsunami Early Warning	The crisis at BMKG is divided become two that is because factor humans and factors nature, however factor natural that's what happened dominant. Management BMKG's public relations crisis consists from stage prodomal , stage acute , stage chronicle and stage revolution .	BMKG Public Relations Creates special SOP For face crisis to be more clear What should done, and by whom just have to involved when crisis That come. Increase budget procurement facilities and infrastructure especially sensors for detect earthquake and tsunami, so that the data obtained more fast, precise and accurate. Recruiting influencers related with disaster nature, so that society interested with information presented. BMKG Public Relations did evaluation in a way periodically at each finished handle crisis so that BMKG Public Relations can repair possible error Once done.	Research This focuses on management a crisis occurred, however need exists research advanced about related science communications use the terms in BMKG are easy understood by society.
3	Communication Patterns Counseling BMKG Deliserdang Climate To Farmer ;	Genre information about climate divided two direction namely; First, communication strategy delivery information direct directed to the next section of stakeholders will informed to farmer through method	method effective counseling is with combine a number of method in maintenance something activity counseling. Method counseling used instructor in inform about information climate include: lecture (monologue), discussion (question answer), and observations direct. Combination from third method	Need exists research advanced in evaluate pattern communication counseling climate the

		counseling. Second communication strategy delivery information climate direct directed to farmer with using print and electronic media in spread information about climate.	counseling above can increase involvement tool senses, so can stimulate the change process behavior towards oneself farmer.	
4	System analysis Internet of Things (IoT) Based Data Communication Using Pieces Method in the System Observation Weather Automatically at the Meteorological Agency Analysis of Data Communication Systems Based on the Internet of Things (IoT) Using the Pieces Method	There is six criteria from PIECES shows that something system data communication with MQTT protocol is possible methods increase system data communications from station observation weather until from / to server and server from / to user. Analysis results descriptive the MQTT protocol does not need complex service compared to FTP protocol.	Data communication with The MQTT protocol can increase system communication more weather Good.	Research furthermore use method besides PIECES (*Performance, Information, Economic, Control, Efficiency and Service*)
5	BMKG Juanda Communication Strategy In Management Account @infobmkgjuanda	First, the package theme and content must updated, creative and interesting. Second, the story contains explanation topic raised should simple, no stiff, and no use foreign language for public. Third, title used must close and familiar with public. Their strategy use truly produce results. If you see report social media monitoring monthly on Instagram @infobmkgjuanda, content education uploaded by BMKG Juanda Lots Get engagement, reach, and impressions, with level engagement, reach, and impressions be one the metrics. For determine social media success.	BMKG is necessary For do evaluate and conduct tracking results from content existing education uploaded	Researcher recommendresearchers following For start research in the focus area, namely. social media education. Especially Instagram among government. The reason is the use of Instagram among people government part big only limited for publish and document activity everyday, branding, and building image, though researcher see more social media power Instagram big Again. One of them is channel used for educate society. No there is quantitative data for interesting conclusion about high social media engagement.

6	Socialization Air Quality Monitoring System Using Multi-Hop Communication at BMKG Station Climatology Class I Palembang	First, partners seen enthusiastic follow socialization system monitoring quality air LoRa-based, p this is also visible from response received during activity ongoing. Second, the BMKG Station employees Climatology Class 1 Palembang who participated as well as in activity This give very valuable contribution for development system This in the future, so expected can be one alternative monitoring quality air.	Firstl , it is expected system This can ensure success sending data from sensors with level 100% success , so No there is condition data failed air accepted . Second, system This can developed in the future so that you can used for predict condition weather based on condition parameters atmosphere.	Study This only analyze implementation activity socialization so that more looks like report activity No research that can published through journal.
7	Naive Bayes method for Analysis Sentiment BMKG information	Majority public respond positive against BMKG based on tweets that analyzed. Topic like forecast weather, earthquake earth, and warning early tend own sentiment positive. Some tweets are revealing dissatisfaction related lateness information or accuracy predictions weather.	Increase communication proactive: BMKG can increase communication proactive with community through social media platforms, providing information more weather accurate and responsive question or complaint with fast. Increase accuracy forecast weather: For reduce perception negative to accuracy forecast weather, BMKG can do updates and improvements system forecast weather as well as ensure accuracy more information Good to public. Use sentiment as bait back: Analysis Tweet sentiment can be used as bait come back to BMKG for understand perception audiences and identify areas of need improved. BMKG got it utilise detected emotions for increase service and response public.	Although Naive Bayes algorithm has used in study this, research furthermore can consider use method analysis sentiment others and expand scope analysis to social media other or different topics.
8	Development and Implementation Tsunami Disaster Education Communication	Based on results discussion, then in effort increase awareness disaster, selection of communication medium/channel Proper communication is very necessary. Besides selection of medium, communicator Need need understand who the target audience wants targeted.	Communicator need prepare fill persuasive message with a number of interesting approach in accordance with character willing audience targeted.	In study this time, we observed 4,444 tools attempted communication BMKG uses for approach generation young, one of them through the *Goes to School* program. This program held with leadership active from children school, all over generation young people follow survey

				get training from BMKG and ever experience disaster at least once a year his life, as well Still own clear memory before and after disaster in the area. Future research can investigate more Far evaluation results social this is in another disaster area that has amount respondents more big.
9	System analysis Maintenance Logbook Information at Network Center Communication at BMKG	1. Note taking events and operations system used Still simple and done manually, that is. use accountancy as means reporting that There is problems with the system.2. Because of the process still manual, then processing complaint and action data carry on complaint problematic not enough effective and efficient.3. Complaint data search and old activities require a long time.4 . Needed a long time for create report data become an archive.5. System slow in communicate information to employee when happen problem.	1. Building system information *maintenance logbook* that can be make it easier processing complaint data *trouble* and report data action. 2. Building system information *maintenance logbook* that can be look for old data *history*. 3. Building system information *maintenance logbook* Which be equipped with feature *notification status* so that *user* know There is *updates* latest about information *trouble* and give color for each *levels* moment processing *trouble* carried out by a technician.	Research This focuses on networking system information and communication within BMKG, not in communication BMKG public relations.
10	Effectiveness Dissemination Early Warning in Inner East Flores Case Landslide	Effectiveness dissemination warning early BMKG weather in East Flores Regency case disaster landslide refers to space scope communication possible disaster analyzed with five aspects include: customer focus (focus customer), situational awareness (awareness situational), leadership commitment (commitment leadership), media partnership (media partnership), inclusion of communication in planning and operations (inclusion communication in planning and operations). Effectiveness dissemination warning early	This study give recommendation to BMKG for optimizing socialization information through various social media, expected cooperation government cities, media and groups interest the more strong in spread information warning early BMKG so created convergence and extension communication social and cultural the more increase. attention that makes thought public Act in preparation face disaster, for prevent spread emerging and widespread fraud, which is becoming reason distrust public to information warning early.	Research This focus to communication related disasters carried out by BMKG case warning early in East Flores, research furthermore in focuses on communication disasters in other potential areas disaster.

		BMKG to the community Not yet effective. That matter caused limitations access information, which gives rise to attitude public Become become not enough responsive follow up warning early.		
11	Comparison Communication Government and Society Social Media Disaster	Interestingly, from tweet second account that, second account the not enough optimal role in handling fraud. Function This initially can achieved with handle Misinformation is circulating, however because of the words contained in the second tweet account the No important, function the Not yet can applied in a way maximum.	Work The same second organization required for push optimization practice communication disaster. From the corner look science, research This add understanding about essence communication disaster government-society. Study This can help formulate a new formula for improve communication strategies disaster to be effective.	Focus study this is on social media Twitter, research furthermore Can use social media focus other such as Instagram, TikTok, Facebook and others.
12	Analysis of News Framing Tsunami Potential of 28 Meters on the Coast Pacitan East Java (CNN Indonesia.com and Sindonews.com);	Use Zhongdang Pan and Gerald M. Kosicki Framing device, conclusion from results study This that Framing of second news the tend neutral. No exists alignment from news published by the two online media looks that fill from news that's just it form delivery about results simulations and efforts must be made carried out by the government region and society. However, CNNIndonesia.com is in matter This more play in matter reality to be more interesting for audience	Required affirmative statements and no multiple interpretations in give information to the media for minimize exists misinformation, even though the media has its own framing agenda to cover A issue.	Study furthermore can researched Framing analysis in other media.
13	Development System Dissemination Forecast Weather Use Telegram Bot Application with Webhook Method	From the results research and design Development System Dissemination Forecast Weather Use Telegram Bot application with In this Webhook method, there are 3 BMKG Weather Info menus consisting of from: Forecast Indonesian Weather, Airport Weather and Satellite Images. With the total command you have is	Recommended For implementing @BMKGbot with reliable hosting services in the environment its operations for chase satisfaction user with guaranteed level availability service dissemination forecast weather	Study more carry on required for develop design optimized system to use strengthen effectiveness performance system. V.

		715 commands. The output provided by the bot can be form text and imagery (pictures). No close possibility added necessary BMKG commands and information other. Different response times when testing bots on images satellite information displayed form picture so that need time which are more Lots For displays information the.		
14	The role of BMKG Station Inner Balikpapan Geophysics Support Information Earthquake Donggala 2018;	1) Limited amount seismographs throughout the Kalimantan region; and 2) Problems spread fraud at times crisis earthquake earth, and BMKG Station Balikpapan Geophysics continues do socialization in a way fast and comprehensive before and after disaster via social media.	Need increase amount tool seismograph in the Kalimantan region. The need for a packaging strategy message in condition emergency disaster for broadcast on BMKG social media.	Study furthermore Can carried out at BMKG Station area other for know role station the in support information related earthquake.
15	Public Communication Ethics for Government Public Relations in Using Social Media (Study Cases on @Kemkominfo and @Infobmkg Twitter Accounts)	Analysis results show that choice of words, language, sentences and signs read have relevance strong to application ethics communicate with government public relations based code government public relations ethics, including in communicate on social media namely (1) Realizing admin position as official social media manager the government owns it name / image good and compliant government code ethics government. (2) Pay attention choice and use of words, language, sentences and signs read what is right and what is not touch on feeling web users, (3) Understand the nature and nature of social media the audience ...	1. Necessity understanding return about tasks, functions as well as public relations/media admin position social institutions / institutions government and its position as social media manager official government. 2. Necessity understanding return about code government public relations ethics and ethics communication public using new media including in media social To to public relations/ social media admin institutions / institutions government. 3. For increase skills, expertise and competence of social media operators PR manager/authority, aside increase ability utilization technology , required trainings for example training information media management , management content , incl management and strategy addressed to audience/audience / online audience .	Study furthermore Can focusing on social media besides Twitter.

16	Connection Content Instagram @Infobmkg Information with Preparedness Levels Follower	There is significant relationship between content information in upload Instagram @infoBMKG with preparedness, based mark information, accuracy, clarity, and accessibility.	Research This Can duplicated for other social media BMKG with more samples big	Research This No state time research and data collection as well spread location questionnaire
17	Communication Disasters in Era 4.0: Mitigation Review Disaster Earthquake Earth in Lombok, West Nusa Tenggara Province (Disaster Communication in 4.0 Era: Review of Earthquake Disaster Mitigation in Lombok West Nusa Tenggara	a. Utilization of social media in spread information moment happen disaster earthquake very earth help public for get information, use do action rescue. b. Communication strategy effective disaster management at the moment happen disaster or earthquake earth is with establish center information disaster for ensure Genre information from source official (media) at the time happen disaster.	For avoid duplication, center information disaster share information with assistance from BMKG and BPBD as well government area. For avoid overlapping overlap news with BMKG and BNPB, central information This must involve second institution the for identify source news. Information disaster should communicated to public with right, actually fast and accurate via social media (especially WA). Necessity figure public for communicate information about situation disaster digitally via social media help public take appropriate action when disaster happen.	Method study This using expert based with total of 7 experts, research furthermore for add amount made expert sample study for get more data accurate
18	User Analysis of Info BMKG Application in The Perspective of Human Computer Interaction Using Support Vector Machine Algorithm	Frequent positive words appear are excellent and negative namely the error that indicates complaints at BMKG. Two frequent words appear simultaneously namely, rich is very useful and less accurate, which states user often complained problem related performance application.	Research results This Can used as input and improvements in system INFOBMKG application, based on reviews and reputation on *Google Play Store*.	Review data used in study This Still limited to the most important review categories just because That need developed in research furthermore with use reviews from other categories or review data from period time certain. Method introduction of emoticons with approach based lexicon can used in research furthermore.

RESULT AND DISCUSSION

In study literature This has researched as many as 18 journals with studies about BMKG communication shows results that draft this is very close with other concepts like local government, information, accuracy, need, number, thing, market, case, data and infobmkg. Studies about BMKG communications a lot found in the SINTA 4 database (33.3%) with method study qualitative (56%) is the most common used. The most research carried out in 2023 as much as (33 %).
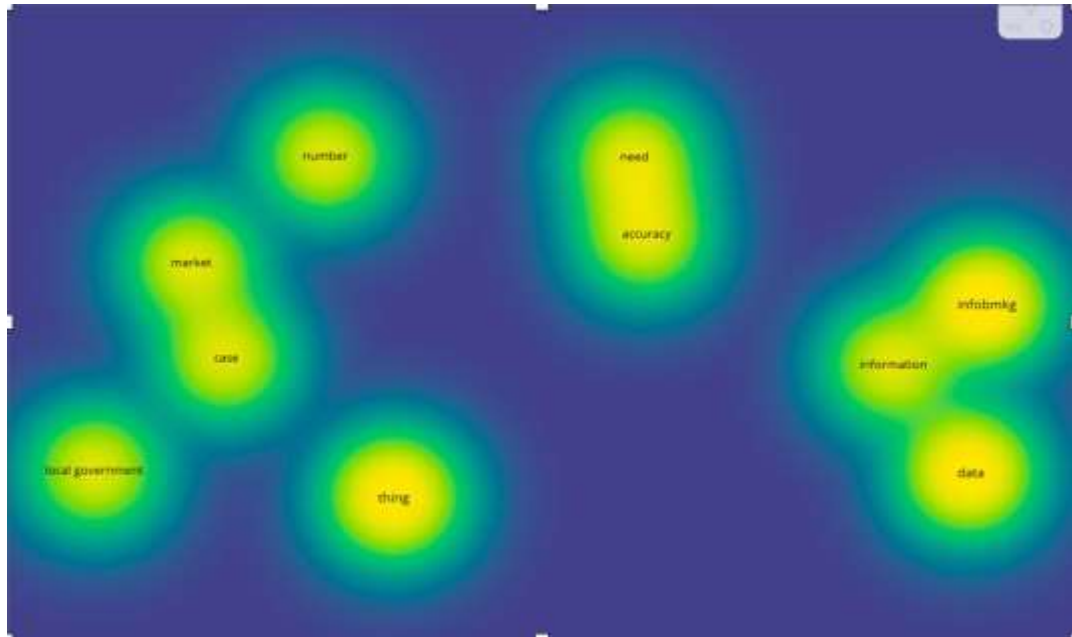
Figure 2 Network Map Frequency emergence topic (*Co-occurrence map by network)*
Source: VOS Viewer

Based on mapping resulting network use VOS Viewer application in figure 3, then can is known that series draft appear in the keywords " BMKG communication " is connected and has very close network with "local government", "case", "market", "number", "thing", "need", "accuracy", "data", "information" and "infobmkg". A number of draft the each other connected However form 3 groups concept and 3 standing concepts Alone.

Figure 3. Category journal based on method study
Source: Researcher

From the results data analysis of 18 articles journal about BMKG communications, obtained results that use design study qualitative (56%) and articles with design study qualitative (44%).

Based on results analysis for 16 articles differentiated journal according to category accreditation ranking Sinta 2, Sinta 3, Sinta 4, Sinta 5, Garuda and not accredited, yes is displayed in diagram form as following
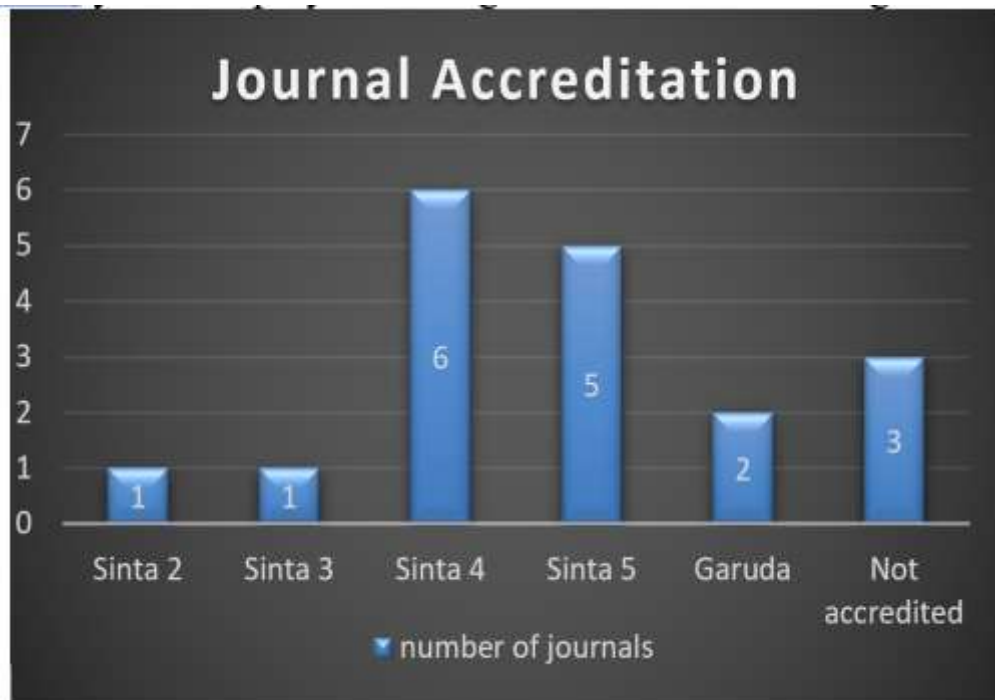
Figure 4. Categories journal based on accreditation journal
Source: Researcher

Mapping year publishing journal can done with gather a number of journal published in the same year and presents it in pie chart shape and number the presentation compared to amount whole journal.

Figure 5 Category journal based on year rise
Source: Researcher

From the results analysis is known that category journal about BMKG communications according to year published the most published in 2023 (33%), in ranking second published in 2020 (28%) , then ranked third published in 2022 (17%). Then the remainder, namely in 2019 (11%), 2021 (6%), 2021 (6%), and 2018 (5%).
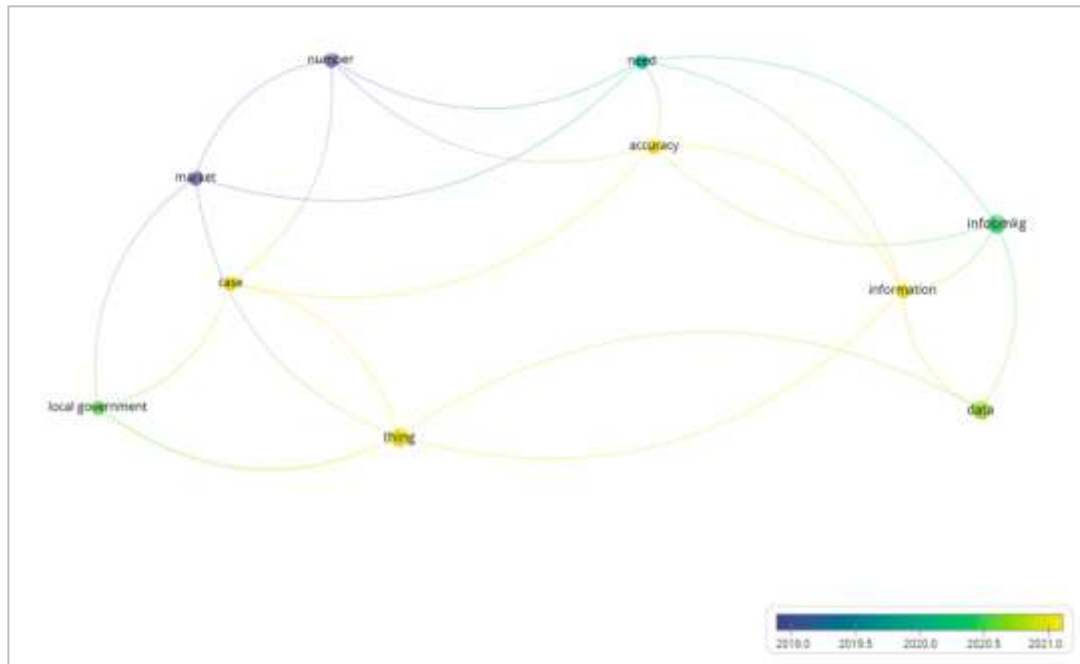
Figure 6 *Overlay Visualization*
Source: VOS viewer

Visualization above describe form spread year study. Color purple show year study the longer that is in 2018. Shifted to color blue and green show that study the the more new. Color yellow show study The latest will be carried out in 2023. From the analysis data above so is known that related number and market topics with draft BMKG communications is topics researched in 2018 so that the visualization colored purple. Color yellow is frequent topic researched in 2023 ie *case, accuracy, thing* and *information.*

From analysis of 18 articles about *BMKG communications* then can is known three article with level citation highest that is:

1) System analysis Information *Maintenance Logbook* in Network Center Communication at BMKG, with citation as much 7 times

2) Development System Dissemination Forecast Weather Use Application *Telegram Bots* with Method *Webhooks*, with citation as much 5 times

3) Disaster Communication in the 4.0 Era: Review of Earthquake Disaster Mitigation in Lombok, West Nusa Tenggara Province (Disaster Communication in 4.0 Era: *Review of Earthquake Disaster Mitigation* in Lombok West Nusa Tenggara, with 5 citations.

Study about BMKG communications from a total of 18 articles were observed, found more Lots appear study with method qualitative compared to with quantitative as well as explored in a way massive in 2023. Method qualitative involve studies References as well as interview for confirm the concept under study. Qualitative strategy can become appropriate approach for get outlook about How something organization communicate with society, how? information delivered, as well how the public responds to that information

Meteorology Climatology and Geophysics Council involve various context like communication risk condition disaster, communication scientific,

and interaction with society, institutions and the media. BMKG is in touch tightly with based information from data and facts in accordance tools monitoring techniques used by BMKG. So that seen from Vos Viewer, linkage tightly contained in the information produced by BMKG is correlated with data and accuracy. People understand BMKG's role as agency sector credible public If speak about information weather and disasters. Most of the The information presented by BMKG is also related with need agency related for example, the data needed like monitoring climate For aviation, fisheries, agriculture, and so on . Besides that, some researchers also discuss regarding communication strategy BMKG crisis for respond case ever occurred at BMKG.

Accuracy Information

Moment This is the world of technology and information the more develop specifically use of media or device application supporter accuracy information. Use second This become need main in frame enhancement performance agency. However unfortunately, from results study Purba, (2020), in the Network Center Section BMKG communication is still ongoing use book big as receptacle recording incident regarding complaint data problem, condition equipment network, and report data action. So that as a result appear constraint in archiving report data as well as data recording for activity evaluation Work. Required something system for make it easier data archiving organized, integrated One each other for simplify and improve capacity employee. According to (Mardi, 2014) characteristics good information is relevant information and not increase doubt use, reliable, complete, precise time, yes understood, as well can verified. Characteristics This be equipped in accurate words (Susanto, 2013). Besides that, research from Ariffudin & Musa, (2022) also recommend strengthening use *internet of* things applied to observation weather in a way automatic for increase accuracy and speed data acquisition.

For make it easier accessibility public to accurate information, in 2016 BMKG officially launch application *mobile* based on Android and IOS. This is step big from BMKG for the more get closer yourself and reach out reputation in society. In the app is also provided Bot or robot features whose functions for interact with user in a way automatic without help man. This matter Of course lighten up burden employees must *standby* respond question user. Bot designed with equipped information basics that can be help answer question user. Study from Istiana, et al (2020) recommend bot improvements and updates using the most popular bots that is *Webhooks* that can walk full for 24 hours because executed through *online* servers and more advanced because can renew script in a way *real time*. This is breakthrough for shorten time and data updates when later will added features *command* information newly published by BMKG.

Next, when a communication strategy new has applied something organization so need done evaluation For measure the performance of the strategy that can be achieved assessed from response users (sentiment) and the information conveyed. One of them study from Fannani et al., (2023) who analyzes sentiment community on the BMKG application via method *Support Vector Machine Algorithm.* From the results study is known that from 3000 reviews users, 239 said good, 211 people said it was very helpful, and 117 people said it was very *updated*. However the rest, revealing that application This own time wait a long time (*loading*), the data not enough accurate, and

application often *error*. From the results This can taken conclusion that something application needs to be *maintained* performance work, updated and evaluated in a way periodically, as well need education community by BMKG public relations that information released sourced from credible tool However Lots causal factors exists potential gaps cause inaccuracy information.

The data is accurate and available accountable later it will too make it easier tasks connection public something agency For Act moment happen situation crisis. Besides that's necessary review budget For add amount tool seismographs are scattered in the included areas into the area vulnerable disaster as well as evaluation back to what role it should be focused to the central BMKG and which one is delegated to stations area Fadlurrahman et al., 2020) For the more make mutual BMKG information integrated research from Fadhli et al., (2023) recommend alternative system *monitoring* quality air use communication integrative *multi hop* based *long range*.

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Communication and Institutional Strategy

Role connection society is very necessary for confirm something information to public or look for solution from problems experienced organization. No only deliverer information, the role of public relations also expands become element strategic supporter implementation of government programs, objectives organization, as well underwriter answer institutional agency . Public relations also works as team packer information, framer news negative become positive, as well straighten out in accordance facts to be balanced and proportional so that public No own perception assumption bad about performance agency (Lubis et al., 2022)

In activity performance agencies, public relations are also capable educate and empower public as well as do persuasion. Activity This done for close gap understanding between public with agencies, as well introduce agency with more nice and simple for can understandable public. Study from Harnita, (2021) find that BMKG has endeavor educate public through a number of matter for example communication education disaster begins since early through activity goes to school to child school with objective increase preparedness public to disaster since early. Can communication is also carried out with technique persuasion and distribution through stare advance or social media. In determine the communication medium about education disaster, necessary understood moreover formerly who the target audience will be influenced. Can get through central route If addressed to the person who has it ability good literacy However For society that is not classified matter the can use method peripherals with upload content emotional and easy intrigued For things that are non- logical in nature. BMKG must ensure that information succeed spread using appropriate media and society understand information received (Silaban, 2023; Nanda & Mt, 2023). Developing information disseminated on social media, creating enhancement news hoaxes are also increasing. So that agency government must the more proactive in do dissemination or spread information in a way breadth and understanding reception message. Deployment information warning early moment That only sourced from whatsapp so that resulting in the dissemination process hampered Because the medium no appropriate. In spread information related warning early government

should involve public for get perspective public Because they not enough understand that condition weather certain impact disaster and despite There is warning early, society not enough Serious in anticipate condition the so that result panic and acceptance incorrect (Rahmawati et al., 2020) information. There are areas that do its people active use technology there are also people who have this condition No own internet facilities available with good.

Next, agencies sector the public also needs it partnerships with various media because one The advantages of media are speed rate the information. However need noticed sometimes the media grabs interest and power pull For the reader with construct little news deviated from the reality. News headlines can also be done constructed with add sign read particular that describes sincerity and distribution strong emotions so that convincing reader. It's here the role of public relations for collaborating with social media Because big role in do construction news. Social media can also be used used as a straightening strategy misinformation in society (Supriatno dan Putra, 2022). However thus, ethics BMKG social media admin communication is considered very good Because slip humor and information that uses standard and precise words target (Utomo, 2019).

In operate task function, BMKG also needs it strengthen institutional especially with related agencies disaster and rescue. Communication strategy disaster effective is form center information disaster as communicator official (Kholil et al., 2019). Furthermore, the public sector must also prepare a crisis communication strategy because crises are something that cannot be avoided in agency operational activities. An organization must be active and responsive in anticipating a crisis before a crisis actually occurs. The increasingly resolved crisis is the point of no return. Appropriate communication strategies are needed to build a strong reputation in society in anticipation of when a crisis actually occurs (Maryam & Pangestu, 2020)). For example, getting closer to the community by providing weather information to farmers and others (Chodijah, 2020).

CONCLUSION

In study literature This has researched as many as 18 journals with studies about BMKG communication shows results that studies This has experience development study for 6 years Lastly, in the form of most related concepts with BMKG communications, year publication, and citation the most. Internal limitations study is only take research in range time 2018 - 2023 and limited to keywords BMKG communications.

Possible recommendations concluded from analysis studies References on is enthusiasm real society Already start understand What the role and function of BMKG. Need more communication strategy wide for example with clustering according to PESO (Paid Media, Earned Media, Shared Media and Owned Media) for know Who actors who can done Work The same and what media should be used targeted for delivery information certain.

Get to know community and determine the target audience that will be aimed at, whether from circles public literacy certain or on the contrary. Furthermore adjust

fill message and key relevant messages used. BMKG should also do it do evaluation in a way periodically about information submitted through social media, online media, and other strategies carried out previously.

In society, social capital is important thing. BMKG is necessary educate society for more can anticipate situation disaster, if need involve figure certain until later role society will strengthen community they. Through relationships and interactions strong society will makes it easier spread information and create pattern fast , accurate and easy communication reachable public other .

Improve institutional with agency certain for example media, academics, agencies government, and community for strengthen deployment strategies information disaster, education community, empowerment community, counseling disaster and preparedness disaster. Lastly, shape team crisis and develop a communication strategy crisis. Things What just what is necessary done in the past crisis until How method restore reputation after the end of the crisis period. In conclusion, the writing of scientific studies that focus on the field of communication in the BMKG government agency still needs to be developed further considering that the field of communication is experiencing very rapid development so that this public sector agency really needs to carry out updates in the field of communication which have been carried out in recent years.

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