

## Knowledge Management: An Approach of Social Media for Crisis Response Management During Pandemic COVID-19

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**Abstract.** This study is set to explore the various fundamentals of KM strategies for social media adoption by organizations in managing crisis. Managing crisis is about managing chaos, therefore, crisis response system needs to quickly provide information and display effective communication content to facilitate control of the situation and coordinate communication among volunteers, formal organizations and government agencies for a more collaborate functions. This study corresponds to findings that social media can be seen as an effective sharing and dissemination of crisis communication and enabling technology for knowledge transfer and knowledge capture. The findings from this study contribute to understanding the potentials of social media use for a larger functions in crisis support.

**Keywords:** Social Media, Crisis Communication, Crisis Response, Knowledge Management, Technology.

### 1 Introduction

Sometime in December 2019, a novel strain of coronavirus disease (COVID-19) was detected, following an outbreak of pneumonia without a clear cause in the city of Wuhan in China. Scientists estimate that each infected person could passed on the disease to more than two others. This report was the early model of disease spread and did not factor in containment efforts. A week after Wuhan announced the period

of lockdown, between 16 and 30 January, scientist discovered the number of infected individuals drop, proves that the containment effort works. Cities that suspended public transports, closed entertainment venues and banned public gatherings reported 37% fewer cases than cities that did not. This shows that early detection and isolation are successful measures that significantly prevented the number of infected cases from increasing. Dozens of countries across the world now introduced the same strategy in the effort to control this pandemic (Maxmen, 2020).

In Malaysian, authorities use social media to publish announcement of movement control order and information & updates about COVID-19. However, despite the government announcement on strictly movement control, the number of people arrested for flouting the MCO as of April 20 is 16,780 people. It was reported that in one of the days arrested 984 people, with 822 of whom were remanded (The Malaysia Reserve, 2020). Communication is extremely important during crisis period as it needed to respond very quickly with communicating clear and honest information to public and organizations. Messages send must create consistency between the expectations of the society and the aims of organizations and necessary with various groups and types (Civelek M, Cemberci M , Eralp N, 2016). Communication during crisis is critical as it will strengthen community resilience and supports broader response network. Communication across response networks facilitates sense-making about the crisis which targets at understanding the authorities effort in mitigating the situation (Hyvarinen J. and Vos M., 2015).

## 2 Problem Statement

Social media platforms and new media tools like mobile applications have massively change traditional broadcasting of newspaper, radio and television through which users create online societies to share information, ideas, personal messages, and other content. Individual use social media to stay in touch with friends and family and while others use it to communicate and network. Social media allows organizations connect with clients to collect feedbacks that can be used to improve products or respond quickly to complaints. Over the years, social media has gained popular use by citizens and first line crisis responder to collaborate during crisis (Bressler George H., Jennex Murray E., Frost Eric G., 2012). Social media plays a vital role in crisis communications plan by improving communication and proved to have contributed to crisis response and mitigating action for example rapid sharing of information to public and crisis responders, extending public help and support, notifying a crisis location, searching for missing people and supporting the function of official crisis responders such as dispatching emergency assistance to crisis location (Jennex, 2010; Harald Hornmoen and Klas Backholm, 2018;Baubion, 2011;Panagiotopoulos P., Barnet J., Bigdeli Alinaghi-Z. and Sams S., October, 2016). Various studies have accessed the efficacy of social media use for crisis response, however, do not indicate the benefit use to organizations as found that it is difficult to confirm the reliability of the shared information and achieved collaboration among response networks (Galvez-Rodriguez, Rosari, Tabuyo and Perez, 2019). Preparin g for modern crises requires

adapting approaches that enable preparation for response to the unknown. There is no doubt that social media offers great potential for people and organizations through its wide network influence. With that, it is important to find the its further potential use and explore the factors for its successful adoption in crisis management.

### **3 Study Purpose and Research Method**

This study reviews various initiatives of Knowledge Management (KM) to access the extent of its implementation in crisis management. The research combines literatures of social media use in crisis and emergency management and previous KM theories and frameworks of adopting social media in crisis response. Although social media has been useful in crisis communication, its application is not fully explored. This study contributes to understanding strategic KM framework in social media applications for a larger response functions in crisis network.

### **4 Social Media Use in Crisis**

A study of a European government during the case of Paris attack in 2015 examined the factors that drive citizen engagement in emergency response. The study discovers that social media communication by the government officials are frequent in the recovery phase (gathered from the conversations or comments in the social media websites) rather than during crisis. The conversations are mostly initiated by the citizens and no respond was given by government officials showing a one-way communication. This finding suggests that the local government could have use social media to improve communication with citizens that could enhance collaboration when during crisis. Government could provide better content in their messages to drive positive interactions that could build community resilience (Galvez-Rodriguez, Rosari, Tabuyo and Perez, 2019).

Hornmoen and Backholm (2018) carried out investigations about how different communicators have used social media to communicate about risks and crises by analyzing data from three different events, the terrorist attack in Norway, central European floods in Austria and West African Ebola outbreak. They interviewed professionals, such as crisis managers, first responders and journalists in Norway using semi-structured interviews on their use of social media during the terror crisis on July 2011. Their analysis indicated that social media could have been used in a more proactive way by the authorities and recommended that social media should be included in emergency services communication. In sharing of public communications, they discover the law enforcement authorities use social media to quickly share information with journalists for public announcement during the crisis. While the hospital uses social media to reach out to public for blood donations.

Hornmoen and Backholm (2018) however, revealed several challenges in social media use for crisis response such as creation of fake social media accounts, pressure to communicate swiftly in emergencies may lead to wrong and misleading postings

and uses of inappropriate tone language in messages. They believe the published communication by key actors with different sectors and agencies involved could be more coordinated if they are more connected.

Gui, Kou, Pine and Chen (2017) set out to investigate the social learning for personal risk assessment and decision making developed from sharing of information and knowledge using social media. The severe health crisis that abrupt from Zika disease outbreak raise concerns among travelers when considering their visits to a country and their decision making are somehow influence by information shared in forums with other travelers from blogs and social media. However, the information gathered is rather limited and getting reliable sources from local country official website does not offer much help too. Travelers seeks information by sharing their concerns about Zika and rely on feedbacks from local responders or travelers with known knowledge about the location to be visited. Information and knowledge that is being shared has mix views and opinions and travelers will have to use their own judgement based on individual risk assessment for their own decision making.

Furthermore, there is ambiguity in the source of information shared via social media making it difficult for travelers to access the risk and require seeking for more reliable source. Knowledge shared by authorities such as public health agencies are too generalized. The public or travelers also have distrust on the information shared and perceived them as incomplete, inaccurate and insufficient for them to make decisions. People is wary of the information shared by the media as believed the details are being exaggerated to attract public's attention. Gui et al. (2017) also point out that social media may be a ready and useful platform to search, acquire and share knowledge but there are weaknesses in the process that need scrutinizing. Although organizations can benefit from social media by capturing shared information and knowledge of users and incorporate these findings in making a better and sound reporting in their website, there is concern by some members of the public that the government may track or invade the privacy of those who decide to help (Galvez-Rodriguez, Rosari, Tabuyo and Perez, 2019).

Panagiotopoulos, Barnet, Bigdeli and Sams (October, 2016) in their study investigate the importance of social media as means of increasing confidence in emergency management. Their investigation on the use of Twitter by local government in the UK during heavy snow of December 2010 and summer riots in August 2011 discovered that social media were dedicated to information about emergency decisions, use of resources and progress of risk assessment activities. The role of social media was use to increase awareness over emerging risk and alerting the public or reduce uncertainty to avoid panic. The resulting affect from social media shows frequent messaging improved citizen adaptability to emerging risk by building an informed community. Their findings from the riots of August 2011 saw an extensive use of social media by all involved parties especially to support councils efforts to mitigate public stress and avoid likely riot escalation. Followed by the retweeting of the public announcement and warning messages it appeared to mitigate the impact of the riots. The rapid information was critical to restore public order and avert panic. The police use social media to appeal to the public to identify suspects proves to be significant in reducing mayhem and reinstating reliance of the authorities. Although they found remarkable benefits of social media use in mitigating

the crises, their study is somewhat limited to how can social media be integrated with back office systems in planning and control.

Baubion (2011) presented that one of the strategic crisis management is the ability of early warning system to detect potential risks and emergency information which then allow emergency measure and plan to be activated. Collaboration between technical and risk management agencies strengthened the capacities to forecast, warn, and activate emergency plans. However, an innovative foresight is possible using crowd sourced information to monitor social networks for early detection before crises happen.

## **5 Crisis Communication and Crisis Management**

Crisis which comes from the Greek word 'krisis' means difficult. Jennex Murray E. & Raman M (2019) define the term 'crisis' as 'synonymous to emergency as majority of literatures uses this term to describe both emergency and disaster management'. Oxford dictionary defines 'crisis' as 'critical time which needs immediate or important decision to be made'. Wikipedia describe 'crisis' as 'any event that is going (or is expected) to lead to an unstable and dangerous situation affecting an individual, group, community, or whole society. Crises are deemed to be negative changes in the security, economic, political, societal, or environmental affairs, especially when they occur abruptly, with little or no warning'. Hence, crisis means handling an abrupt event which is unfamiliar that requires real time respond and making the right decisions is a challenge. There will be no guide in how to manage during this unprecedented circumstances, instead, we will be learning the issues as we go forward, figuring out the best options of how to handle them (Harvard Business School).

Crisis communications is about dealing with human response. In the literatures, many crisis management frameworks investigate and discuss the role of communication within community, volunteers, affiliated organizations and official government. The citizens rely information from experts to help them go through the crisis and make clear how to obtain additional information or help (Hornmoen H and Maseide P, 2019). Crisis communication should convey with facts and accurate information in other words hyper-transparency and explain in clear and simple instructions. This is an important phase as high level of uncertainties can overwhelm individual ability to perceive or process information. People need transparency and guidance for making sense about the crisis. It is an internalization process which people begins to use the information and convert it into understanding (explicit to implicit process) to make rational respond during the uncertainty period. According to authors, crisis management is a set of activities dedicated to perform prevention, preparation, response and recovery (Haddow George D., Bullock Jane A. & Coppola Damon P., 2008) which involves groups of people from different expertise, interest and with high knowledge brought together and will be given authority to make decision. Their responsibilities will be tracking and responding to the issues by going an iterative process (Haddow George D., Bullock Jane A. & Coppola Damon P., 2008) and delegate tasks without missing any important factors. However, the issues are usually overwhelming, and it is difficult to see the priorities that need attention before any decision can be made.

Civelek , Cemberci and Eralp (2016) states ‘because of their unexpected nature, being ready for crisis is hard for organizations, and may result in deterioration of organizational structure along with negative outcomes in employee, products, financial state and organizational fame’.

## **6 Alignment KM Strategies with Crisis Management Strategies**

The earlier KM models for crisis management were presented by Wang & Belardo (2005) and Jennex (2010). Their studies have undertaken to explore the underpinning theories of KM in crisis response using crisis characteristic taxonomy to classify critical knowledge needed for crisis management and KM tools to facilitate the transfer and sharing of knowledge for better communication, collaboration and effective decision making among crisis responders and avoiding from information overload.

It is found that effective crisis management practice is constitutional to organizational learning as crises drives changes in organizational culture and learning behavior. According to Wang Jia (2007), organizational learning is facilitate by a close process of knowledge cycle which uses technology that is suited to crisis response needs. The design and structure of organizational learning must incorporate the principles and practice for action learning and improving decision making that foresee and prevent crises from escalating.

## **7 Challenges for Integrating Crisis Response**

Earlier crisis response that tried to integrate with Information Technology (IT) system and web service discovered flaws in the overall design (Jennex, 2010); (Bressler George H., Jennex Murray E., Frost Eric G., 2012); (Jennex Murray E. & Raman M, 2009). Majority of organizations relies on organization-specific-development and combination of tools and systems rather than on standard system. The lack of common framework of multiple systems fail to integrate with the existing technical infrastructure leads to system inefficiencies making it difficult to facilitate clear communication and collaboration between internal and external organization (Maier, R. and Hädrich, T. (2011). The open source system for Hurricane Katrina for example, created confusion as there were many web sites for survivals to search and post their status and had a security flaw which did not look into victim’s data privacy and fails to capture and use knowledge of survivor’s to better fit of survivor needs (Jennex, E. M. & Murphy, Tim, 2006); (Jennex Murray E. & Raman M, 2009).

Crisis responders are impermanent actors in the crisis network; therefore, training is a key point in crisis and emergency management. Emergency management training requires the support of Information Technologies (IT) tools for preparation and continuous improvement of disaster prevention, emergencies response and post crisis support. The system should capture tacit and explicit knowledge along with lesson learned from responders as they tend to be high turnover transient workforce and the capture knowledge can be used as a strategic aim to guide for future action (Civelek

M, Cemberci M , Eralp N, 2016); (Jennex, 2010) (Jennex, E. M. & Murphy, Tim, 2006).

Therefore, it is significant that KM strategy can aid in a better design for an integrated KM System by establishing a common framework and include policies and procedures for good governance.

## **8 KM Strategy for Social Media Adoption in Crisis Response**

The KM approach for social media use in crisis response focuses on several main factors surrounding the validity of mass information exchanges among public citizens and crisis responders for rapid respond in order to control crisis from escalating. Social media is a web technology services that is compatible with the needs of crisis manager for communication within Crisis Social Network (Toppel M., Bartels M., Nagel C., Hahne M., 2016). This correlates to Jennex (2010) theory that points out social media adoption can improve connectivity and transfer of knowledge among crisis responders however explains must begin with identifying the users and analyze their roles they perform in crisis network. Previous crisis response studies demonstrate challenges in sharing information between authorized organizations and crisis responders prevail that interaction and cooperation is coordinated when there is trust among the community members. By using KM strategy, a summary of user profile display that contains description of personal or organization name and contact along with activities on social media including biodata such as expertise and experience background helps identify the member and build trust. Social profiling is an emerging approach that introduces personalize search concept to meet to user demand in information collection (Bilal M., Gani A., Ikram-Lali M., Malik N., May, 2019). This will also allow organization to map and locate the knowledge resources in the Crisis Social Network. Studies also have shown classification proves to provide high accuracy of real time information by using automated information source and content analysis. The domain driven of content analysis using domain taxonomies and ontologies such as, keyword search, shared content and tagging system help improve systematic filtering and vetting of information for trustworthiness (Purohit H. and Chan J., May, 2017) (Lazreg, 2019) and search retrieval (Jennex, 2010) that can prevent from information overload.

Another main focus in using social media are threats with corresponding risks of sharing sensitive data, information and knowledge on social network sites (Beato F, Kohlweiss M, Wouters K, 2009). So far Facebook has added the capacity for users to define and enforce selective access control policies using encryption protocols that supports basic encryption & decryption, file signing and document verification to keep social network users data confidential. Alternatively, organizations can use GnuPG (GNU Privacy Guard) standard protocol which is a more enterprise level compliance that supports industry standard file protocols, internal collaboration features and robust security settings (PGP vs GPG: What's the Difference, 2019).

As mentioned earlier in this study, the lack of common framework causes difficulties in integrating multi partial crisis response systems, therefore before adopting

social media, it is relevant to conduct an analysis to access the capability of social media in its ability to integrate with the existing technical infrastructure. Adoption of social media should be based on the tangible and intangible values which are not limited to improve transfer of knowledge and communication among crisis network actors but also improve response time and decision-making (Jennex, 2010). Among studies that have tried to classify the approach of selecting tools for crisis management use the meta model of Knowledge Management and Big Data to propose a software model framework based on four essential components. The framework aims to support the preparation and response phase along with the design, monitor and controls of process workflow for coordinated service. The framework must include knowledge base dimension to support management rules for decision making needs (Ruiz Herrera, Sanchez Diaz et al., May, 2019), (Benaben F, Montarnal A, Truptil S, Lauras M, Fertier A, Salatge N and Reberia S, 2017).

KM approach for social media use in crisis response must equipped responders with sufficient information and knowledge for respond and decision making. According to Quiroz-Palam et al. (2019) 'the knowledge acquired in training not only helps people to improve their knowledge but also face emergencies'. They believe that emergency training should be customized for participants involved in different crisis stage and should arrange training content and programmes that can benefit and motivate them. By using KM strategy, training content can be identified according to each different phases (pre-disaster, reponse and post disaster) which accords to earlier finding that stressed organizations need to identify the knowledge needed in order to achieve crisis management objectives (Wang Wei-T., Belardo S, 2005); (Hornmoen H and Maseide P, 2019). The use of social media as KM tool will make it possible to apply evaluation using surveys and after action report as feedback techniques that will refine the use of social media in crisis response (Bressler George H., Jennex Murray E., Frost Eric G., 2012). The answers and comments from the evaluation will identify the knowledge and skill of crisis responders and adjust the training content to address the knowledge gap (Wang Wei-T., Belardo S, 2005).

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evaluation will identify the knowledge and skill of crisis responders and adjust the training content to address the knowledge gap (Wang Wei-T., Belardo S, 2005).

## 9 Discussion

Social media use in crisis management explored clearly shows that there are significant strengths and weaknesses in using social media for crisis response. Based on the findings from theories and previous research, it is obvious adopting social media without proper strategy face challenges. Although knowledge is created from social media use during crisis, there is possible gap that knowledge is not validated or formatted for effective crisis response action. It is important that knowledge follow the whole process for sense making by crisis responders.

Previous studies that investigates the role and task of social media use upholds that there are parallel similarities with crisis communication framework. The strategies for implementing social media as discussed by the authors circle around the design of crisis preparation and response phase and the process work-flow design to prevent information overload. To avoid escalating from information overload, it is necessary to include KM strategy to control shared information by identifying the user from the profile display of the information source. However, it is found that it is still a challenge as a result of the data open space and difficulty in generalizing the domain for content analysis of all crisis phase due to the dynamic and complex of crisis communication network.

Communication and collaboration among crisis network actors can be improve with incorporation of align KM strategies with crisis management goals. Internal and external pressures complicate crisis management, including the need for disparate teams to come together and coordinate how to manage the crisis, as well as working with other stakeholders. Lessons drawn from crisis found social media usage can improved collaboration and strengthen crisis communicators' role in supporting crisis management tasks that leads to effective decision making (Harald Hornmoen and Klas Backholm, 2018).

Demand for clear and rapid communication on social media indicate strong underline for a better coordination between different agencies and emergency service responders for a uniform message on their web page to direct public users. Drawing the insights from COVID-19 crisis in Malaysia, government agencies, Health Ministry and National Safety Council (MKN) use social media to share and disseminate live news and updates on the pandemic status, movement control order, health information guidelines, business operational guidelines and other related information. Using twitter, government agencies shared information with visitors and followers by retweeting posts and twitter quote tweets from MKN that allows to share link to a tweet along with comments. Communication strategies are being used to intensify broadcast information towards awareness and frequent updates to lead public attentions to alerts, warnings and updates. The communication shared comes in variety of multimedia format such as infographic videos proved to display an effective content that not only improve the perceived of information but also reduce psychological impact by building community resilience (Panagiotopoulos P., Barnett J., Bigdeli Alinaghi-Z. and

Sams S., October, 2016). Community resilience is a collective knowledge from dissemination of shared information and knowledge by crisis manager that targets at empowering society (Auferbaeur et al., 2019). It focuses on enhancing citizen day to day health and wellbeing and reduce the negative impact by helping citizens to withstand, manage and recover from the crisis event (Public Health Emergency). Other than sharing communication about the pandemic, MKN also use social media to publish notices on fake news warning to control circulation of scam messages impersonating government and non-government organizations seeking contributions and in fact spreading of hoax stories to scare citizens about the pandemic.

Although social media use can be a potential benefit for improving communication and cross media monitoring, there is a need to establish policies for good governance and managing security of critical and sensitive data, information and knowledge process. This is a highly concern matter and is supported by Duda et al. (2016), whom discovered that there is minimum engagement requested from the legal department in crisis preparedness for social media issue or crisis. Among the top three concerns presented according to the lawyers are improper sharing of confidential information on social media, inflammatory comments on social media regarding company, executives, or its products or services and data breach or hacking. The same concern that can be related to this statement as there is a massive exchange of personal data to manage the movement of the public by the government in their attempt to control the outbreak of COVID-19. This finding calls for greater awareness around social media vigilance and an urgent need to develop policies, guidelines and training programs designed to safeguard, the public interest (Benton Andrian, Coppersmith Glen, Dredze Mark , 2017).

The selection of tools use for social media can be sought by using a software that can integrate with different crisis communicators and actors and fit into the overall technical infrastructure. The innovations required must adapt to new features of crises and are not replacements, but rather complements to, existing capacities, and can be built on them. It is advisable that an analysis of social media capability is accessed to ensure its ability to integrate successfully with the existing infrastructure.

Exercising and training constitutes a key task for preparing crisis. Ruiz and Sanchez (2019) stated that 'emergency response procedures are characterized by being dynamic, highly knowledgeable and unstructured, therefore, they are classified as knowledge-intensive processes. Training should be incorporated in the crisis response planning to strengthen and prepare responders with the use of crisis response system. Knowledge can be explicitly available, but knowledge is difficult to access because it is embedded in human, products and processes. It is a human capital that defines as knowledge, skills and experience that owned by individuals in organizations. Lesson learn from crises should be captured, codified and systematically stored for easy retrieval that can guide crisis responder's in making decisions, help improve preparedness training and refining design of response workflow processes.

Lastly, an area that is worth to look at is the engagement of community in relief efforts during crisis where during COVID-19 saw emergence of unaffiliated volunteering groups and individual volunteers came out to offer help in a form of food distribution and producing protective face mask and medical gowns. Their engagement can be systematically manage using social media that can identify these groups and peo-

ple using community interaction and engagement (CIE) taxonomy classification. Social profiles of volunteers can be display detailing of their past and current involvement and suggest a transaction memory system to manage the workflow of these volunteers by performing links between tasks that are required and skills needed to perform these tasks (Auferbaeur et al., 2019).

## 10 Conclusion

There are various field that contribute to the studies of KM, however, these studies mainly emphasize in managing of structured information, collaboration and sharing of knowledge in solving known issues and questions that are well defined. Managing crisis is about managing chaos, overblown information coming from multi channels of media and communication platforms, dealing with limited resources, overcoming tensions faced by the operation team and providing rapid respond to public & best possible advice to decision makers and leaders. Over the years, organization adopts techniques build upon strategic resource to enhance its capability to react and cope with the increasing global economy and operational challenges. It acknowledges the importance of organization resources and capability as key factors in attaining and maintaining competitive advantage (Nik Ariffin Nik A., Mohd Yunus Alwi, Ahmad Kamal J., Abdul Kadir Irwan K., Abd Rahman Nur L.A., Abdul Aziz S.). The complexities of modern crises demand effective coordination from national authorities to have the right tools and institutional framework for coordinated action. Crisis response system needs to quickly provide information and display effective communication content to facilitate control of the situation. The findings from this study shows that social media are seen as providing a dual function, as an effective crisis communication tool for sharing and dissemination of crisis information and as an enabling KM technology for effective and efficient crisis response system. Crisis response system is a dynamic system where information and knowledge are regularly updated for every stage of crisis response. Integrating social media into crisis response system is beneficial as it can provide real time update and notification during crisis to citizens and coordinate communication among volunteers, formal organizations and government agencies for a more collaborate functions. The insights gained from this study gives new highlights to focus on the security policy of public data and information use especially when mitigating health crisis and future research on how can KM reflect further control of the access when sharing, distributing and disseminating sensitive data and information.

## References

- (n.d.). Retrieved from Public Health Emergency: [www.phe.gov](http://www.phe.gov)
- Auferbaeur et al. (2019). Taxonomy of Community Interaction in Crises and Disasters. *16th ISCRAM Conference*, (pp. 1031-1043). Valencia.
- Barnes, S. J. (2002). *Knowledge Management System: Theory and Practice*. Thomson Learning.

- Baubion, C. (2011). *OECD Risk Management: Strategic Crisis Management*. Organisation for Economic Co-operation and Development (OECD) .
- Beato F, Kohlweiss M, Wouters K. (2009). Enforcing Access Control in Social Network Sites.
- Benaben F, Montarnal A, Truptil S, Lauras M, Fertier A, Salatge N and Rebiera S. (2017). A conceptual framework and a suit of tools to support crisis management. *50th Hawaii International Conference on System Sciences*, (pp. 237-246).
- Benton Andrian, Coppersmith Glen, Dredze Mark . (2017). Ethical Reserach Protocols for Social Media Health Research. *1st Workshop on Ethnics in Natural Languange Processing*, (pp. 94-102). Spain.
- Bilal M., Gani A., Ikram-Lali M., Malik N. (May, 2019). Social Profiling: A Review, Taxonomy and Challenges. *Cyberpsychology, Behavior, and Social Networking*.
- Bratianu, C. (2015). In *Organizational Knowledge Dynamics*. Hershey PA: IGI Global.
- Bressler George H., Jennex Murray E., Frost Eric G. (2012). Exercise 24: Using Social Media for Crisis Response. *World Financial Review*, 77-80.
- Chengalur-Smith, I., Belardo, S. and Pazer, H. (1999). Adopting a Disaster-Management-Based Contingency Model to the Problem of Ad Hoc Forecasting: Toward. *IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT*.
- Civelek M., Cemberci M. & Eralp, N. (2016). The Role of Social Media in Crisis Communication and Crisis Management. *International Journal of Research in Business and Social Science*, vol. 5(3) pp. 111-120.
- Clement, J. (2019, Dec). *Number of monthly active Instagram users 2013-2018*. Retrieved from <https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/>
- Clement, J. (2020, April). *Number of global social network users 2010-2023*. Retrieved from <https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/>
- Davenport, T.H.& Prusack, L. (2000). *Working knowledge: How organizations manage what they know*. Boston, MA: Harvard Business School Press.
- Drucker, P. F. (1999). *Management challenges for the 21st century*. New York: Harper Business.
- Duda, P., Clayton, R., Krejci, D., Machler, L. & Richards, M. (2016). *Social Media's Role in Crisis Management: A Call for Greater Legal Vigilance*. Retrieved from [www.webershandwick.com:https://www.webershandwick.com/uploads/news/files/social-media-crisis-management-report.pdf](http://www.webershandwick.com:https://www.webershandwick.com/uploads/news/files/social-media-crisis-management-report.pdf)
- Galvez-Rodriguez, Rosari, Tabuyo and Perez. (2019). Building online citizen engagement for enhancing emergency management in local European government. *Emerald Insight*, 219-238.
- Gui X, Kou Y, Pine K, Chen Y. (2017). Managing uncertainty using social media for risk assessment during a public health crisis. *ACM*, 4520-4533.
- Haddow George D., Bullock Jane A. & Coppola Damon P. (2008). The Disciplines of Emergency Management: Communications. In *Introduction to Emergency Management* (pp. 227-246). Oxford: Elsevier Inc.
- Harald Hornmoen and Klas Backholm. (2018). *SOCIAL MEDIA USE IN CRISES*

- AND RISKS: AN INTRODUCTION TO THE COLLECTION. Emerald Publishing Limited.
- Hornmoen H and Maseide P. (2019). Social Media in Management of the Terror Crisis in Norway. Experience and Lessons Learned. 85-112.
- Hyvarinen J. and Vos M. (2015). Developing a Conceptual Framework for Investigating Communication Supporting Community Resilience. *Societies*, 583-597.
- Jennex Murray E. & Raman M. (2009). Knowledge Management in Support at Crisis Management. *International Journal of Information Systems for Crisis Response and Management* (pp. 69-83). IGI Global.
- Jennex, E. M. & Murphy, Tim. (2006). Knowledge Management and Hurricane Katrina Response. *International Journal of Knowledge Management*, 52-66.
- Jennex, M. E. (2010). Implementing Social Media in Crisis Response Using Knowledge Management. *International Journal of Information Systems for Crisis Response and Management*, 21-33.
- Lazreg, M. B. (2019). An Iterative Information Retrieval Approach from Social Media in Crisis Situations. *IEEE*.
- Lee, J. & Bui, T. (2000). A Template-based Methodology for Disaster Management Information Systems. *33rd Hawaii International Conference on System Sciences*.
- Maier, R. and Hädrich, T. (2011). Knowledge Management Systems. *IGI Global*, 779-790.
- Maxmen, A. (2020). Scientists exposed to coronavirus wonder: Why weren't we told? *Springer Nature Limited*.
- Nik Ariffin Nik A., Mohd Yunus Alwi, Ahmad Kamal J., Abdul Kadir Irwan K., Abd Rahman Nur L.A., Abdul Aziz S. (n.d.). The relationship of Intellectual Capital with Knowledge Management in Sustaining Organization's Performance. *American Scientific Publishers*.
- Nonaka, I. & Takeuchi, H. (1995). *The Knowledge-creating company: How Japanese companies create the dynamics of innovation*. UK: Oxford University Press.
- Panagiotopoulos P., Barnett J., Bigdeli Alinaghi-Z. and Sams S. (October, 2016). Social Media in Emergency Management: Twitter as a Tool for Communicating Risks to the Public. *Technological Forecasting and Social Change*, 86-96.
- Patton, D. and Flin, R. (1999). Disaster Stress: An Emergency Management Perspective. *Disaster Prevention and Management*, 261-267.
- PGP vs GPG: What's the Difference*. (2019, March 28). Retrieved from [www.goanywhere.com](http://www.goanywhere.com)
- Purohit H. and Chan J. (May, 2017). Classifying User Types on Social Media to inform Who-What-Where Coordination during Crisis Response. *Proceedings of the 14th ISCRAM Conference*, (pp. 656-665). Albi, France.
- Quiroz-Palma et al. (2019). Towards a capability model for emergency training improvement. *16th ISCRAM Conference*, (pp. 566-573). Spain.
- Ruiz Herrera, Sanchez Diaz et al. (May, 2019). Improving Emergency Response through Business Process, Case Management, and Decision Models. *16th ISCRAM Conference*. Valencia, Spain.

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During Pandemic COVID-19

- Toppel M., Bartels M., Nagel C., Hahne M. (2016). A Social Network to Identify Responsibilities and Expertises in Crises Scenarios. *Center for Technology and Society*.
- Wang Wei-T., Belardo S. (2005). Strategic Integration. A Knowledge Management Approach in Crisis Management . *38th Hawaii International Conference on System Sciences*. IEEE.
- Wang, J. (2007). Organizational Learning and Crisis Management.
- Zainuddin Alifah & Azman Nur Hanani. (2020, April 22). The Malaysia Reserve. *SOP needed before allowing students to go home*. The Malaysia Reserve.