Extremism Content in Social Media: A Model of Young Followers Extremism Behavior

Abdulwahab Ali Almazroi^{1†}and Fathey Mohammed^{2†††}

¹College of Computing and Information Technology at Khulais, Department of Information Technology, University of Jeddah, Jeddah, Saudi Arabia

²School of Computing, Universiti Utara Malaysia (UUM), 06010 Sintok, Kedah, Malaysia

Abstract

Recently, a lot of attention has been paid to radicalization which may lead to extremism, more specific with the technology advances which bear a potential for easier communication and networking. Radicals, violent extremists and terrorists are able to reach a wider audience due to their narratives and technologies available such as social media networks. They use such them to extremist ideology, promote radicalized views, and recruit new members worldwide, and young people are especially at risk. Researcher and policymakers increasingly concern on understanding the processes of extremism to be able to control youth violent extremism. Empirical studies have been conducted to address the topic of social media and violent extremism. However, most of the related studies focused on analyzing content on social media to detect extremism using AI and machine learning techniques narratives. Less attention has been given on understanding the extremism behavior of the extremists followers in social media groups, pages and forums. This research aims at proposing a model of extremism behavior among the young followers of radicalism, extremism or terrorism content in social media. By exploring the extremism behavior in the context of social media and revisiting the related theories, an integrated model is proposed to identify the factors influencing young people extremism behavior in the context of social media. The proposed model may promote the general understanding of the extremism behavior among young followers of radical content on social media platforms. It also, may provide new insights for policy makers to create more effective counter-radicalization programs to protect young people being dragged to extremism acts.

Keywords:

Social Media; Extremism Content; Young People; Behaviour; Radicalism; Counter-radicalization

1. Introduction

Nowadays extremism is sensitive issue for a lot of nations around the word. It can be regarded as the process to misguide individual resulting in committing terrorist acts. Terrorist activities performed by extremists have been boosted with internet and social media networks emergence. Individuals can readily express themselves easily using these platforms as its free to use and does not go through a review process. Extremists make the most of the social media

characteristics such as sharing opinions without needing to go through an editorial process, being anonymous and reaching a wider audience. This allows them to misguide others possessing having limited knowledge (especially young adults) and conduct extremist acts. Over the past few years, extremist groups' propaganda tactics and communication strategies on social media have recruited thousands of people from all parts of the world. Consequently, the dissemination of extremism ideologies online has become a serious global issue [1, 2]. The lack of moderation on social media along with the rapid circulation of messages offers extremist groups the ability to effectively disseminate extremism content online. Extremist groups can contact people who they identify as potential recruits to become radicalized through social media without ever having to physically meet [3]. More specific, extremist groups primarily focus on the most vulnerable and active part of society - the young people [4]. According to ŠIŇANSKÁ, et al. [5], young people become an interesting target group for extremists.

Due to the instability situation in many middle east countries more specific starting from 2011, young people encounter difficulties such as financial problems, conflicts with parents, social exclusion, cultural humiliation, feelings of worthlessness, etc. This may push these people to follow extremist groups [6, 7]. In the context of social media, young people are more likely to follow the directions and beliefs of extremists [8, 9]. Young people who have been or feel socially excluded from one group may be tempted to join radicalized and extremist groups [10]. They may engage in more destructive activities and they tend to have more violent behaviour [11]. Adams, et al. [12] and Borum [13] pointed out that young people who have experienced social exclusion, easily may be invited and jointed a radicalized group.

In the Arab world, more specific in Saudi Arabia efforts have been made to prevent extremism

ideologies from spreading to youth. Efforts such as monitoring mosques' speeches, reforming Islamic textbooks, and modifying media content, aimed to eliminate the dissemination of any radical activities. These measures restricted extremist groups from injecting their radical ideologies and circulating their extremism ideas in the traditional way [9, 14]. Moreover, Saudi Arabia is making continuous effort and introducing policies to mitigate radicalization. However, it is very difficult to stop it on a platform that is allows free opinion sharing making the problem challenging. Extremists have successfully used social media networks to plant extremist ideologies and influence public opinion.

Studies have been done to understand propaganda tactics used by radicals and extremists through social media platforms [5, 9, 15-23]. However, there is limited research that have provided evidentiary proof that such a link remains and there is no data that highlights factors influencing young people extremism behavior as potential recruits of extremist groups over social media networks [4, 19, 24, 25].

Although considerable research has been done on understanding extremism, yet limited research has been conducted on proposing frameworks for combating it [26]. Most of the ones available provide a fragmented approach instead of providing a unified framework solution. This study aims at understanding the factors influencing young people extremism behavior on social media by considering different theoretical perspectives including social media context, social influence and personality traits. A conceptual integrated model is proposed to identify the relationships among factors from these different contexts and the behavior of young followers of extremism content on social media.

The research is divided into the following sections. The first section covers the theoretical background of the problem and the studies relevant to the problem highlighted. The second section covers the proposed model to address the problem highlighted. The next section provides a general discussion following up by conclusion and recommendations for future research in the area.

2. Theoretical Background

Technology revolution, more specific social media, has dramatically changed social interaction. Nowadays, many young adults spend a lot of time on

social media platforms [27]. In spite of the benefits of the social media, users are also exploited by extremist groups. Extremist groups use social media to spread extremist ideas and radicalism. According to Awan [28], extremist groups aim at radicalizing and spreading their propaganda and ideology among sympathizers around the world using social media. Extremist groups can acquire members, advocate violence and create international communities through social [27]. More specific these groups target young people because they spend more time online and are therefore more likely to encounter online extremist material. Young people are the most vulnerable group which can react to extremist material in a different way than people of other age groups [29].

In connection, with radicalization and extremism, various predisposing factors, such as depressive tendencies or suicidal thoughts [30], vulnerability [31], feelings of injustice or humiliation [32], have been pointed out. Other authors insist on the concepts of identity and belonging [33-35]. Searching for identity is an important factor for young people entering an extremist group or youth gang [36]. During this period, the need for excitement, testing of their own limits and exposure to potentially dangerous situations, appears in young people. Therefore, they get themselves involved in catastrophic acts such as crime, drug abuse, political extremism or violence [11].

A number of theories and models have been used to study the socio-psychological behavior of social media users in related to extremism content, including Situational Action Theory (SAT), Social Identity Model, Social Identity Model of Deindividuation Effects (SIDE model), Social Influence Model of Violent Extremism, Self-Categorization Theory, and Expectancy Violations Theory.

2.1 Social Identity Model of Deindividuation Effects (SIDE model)

SIDE model that is widely used in disciplines such as human and social psychology and interaction/communication studies. This model covers the effects of anonymity when used on a group of people. The model was developed in response to the need to study how people on the internet can become nobodies, yet their actions can uncivil causing harm to the society [37]. SIDE has two main dimensions, social identity and deindividuation effects. Social identity is concerned with how individuals identify themselves as

part of society or a social group, while deindividuation explains that individuals are likely to show uninhibited behaviors when they are part of a group [15, 19]. This model is among the few models that examines the effects of computer-aided communication on society.

This model is considered to be strong in explaining and understanding the way people behave in group situations [38]. According to Vilanova, et al. [39], SIDE is the most promising framework for analyzing group behavior and explaining the uninhibited behaviors of individuals in the groups. Many researches have been done using SIDE as lenses to understand online group behavior. A study by Mikal, et al. [40] showed that Internet is one possible area in which the group identity is permitted to achieve a salience distinct from the individual, as the SIDE perspective maintains. Accordingly, there would be scope for prosocial and positive identities online, underpinned by the mentality suggested by the SIDE model. For instance, various hashtag movements around the globe have organized themselves into groups on a moral crusade against socio-economic injustices [15].

2.2 Social Influence Model of Violent Extremism

When trying to understand the social influence of radical view on society, one needs to look the capability of social media platform to reach users globally. This is important as it will to understand the users' perception when coming across such content. Moreover, one needs to cater for the difference types of media types through which it is being spread, such as video, audio, text, images, etc. This factors need to be looked into by understanding social media platforms better and how they can be used for such purposes [19, 41].

In this regard, Social Influence Model of Violent Extremism (SIM-VE) aims at capture three types of influences that are usually found in such content. These include social, ideological, and behavioral realms. Understanding these can help us better understanding the thinking process behind a person that compels him to join such a cause and engage in violent extremism [42, 43]. Moreover, these domains and interlinked where the decisions and choices made by a person will also affect near him [44].

According to Forgas and Williams [45], the SIM-VE model projects a person's social influence that is shaped by his influences in various domains (highlight above). Stern [46] highlighted that there are

different stages where a person may be exposed to committing such acts, which can be judge by looking into his person history, the people he sits with and the area where he lives at. Moreover, these social influences affect a person's perception and his behavior towards things. Thus, by seeing such content and due to the social influence they start to accept it changing their values and beliefs and this result in committing violent acts which are social and morally impermissible [44].

2.3 Personality traits

Every person is unique as they have different hobbies, likes, and thinking process. Moreover, every person may express themselves differently as some are introvert while others may be extrovert. Thus, a person is said to have "personality traits", characteristics that defines him and makes him different from others [47]. This is also one of the ways in analyzing people having different traits [48]. It was founded by Allport [49] to explain that people vary from each other according to the strength of their primary trait dimensions. According to this theory, "Personality" is human behavior that is influenced by the amalgamation of psychophysiological patterns that shape a person's thought process, his feelings, behavior and interaction [50, 51]. The differences in people's personality traits can be used to create taxonomies to understand a certain group of people with similar personality traits better [52]. Different situations can be tested to see how people react to them, and one can find patterns that people having similar personality traits to be similar [53].

McCrae and Costa Jr [54] categorized personality traits into five different individual behaviors dimensions. These include agreeableness, neuroticism, extraversion, openness to experience (intellect) and conscientiousness [55, 56]. These categories have been used successfully in judging a person's personality and thus his behavior towards different things [57]. Thus, the model has been validated in being capable of categorizing people based on their behavior by identifying their personality traits [58].

3. Conceptual Proposed Model

Based on SIM-VE the traits belonging to an individual can be used as a factor when judging larger groups, which can be used to judge how the engagement will influence in extremism in online social interactions [41]. Accordingly, we can propose a person's motivation behind it that can help in

understanding why people participate in extremism content on virtual communities. Dholakia, et al. [59] pointed out that the extent to which these motives can be satisfied through participation, the community should exert influence on its members. Moreover, because information relating to personality traits is unavailable online, thus people who are usually engaging in online discussions are more likely to be misguided by such radical content and increase group identity [37]. While the individual traits information is not available, but the group can be judge which can help us understand that the group of people participating are likely to have these set of personality traits. However, some results do suggest that individual factors are more important than group factors online especially when one is dealing with troubling members of the group which [37, 60]. Therefore, personality traits are suggested to have influence on young people extremism behavior through the social influence in the context of social media.

Personality traits include characteristics belonging to an individual who can allow them to communicate with people regarding their interests, and share their perceptions about it. People have different interests and personality traits making two people reacting differently to same people and things [47, 61]. With regards to the research topic, these individual traits can be used to predict the human behavior when the individual is communicating online [62-64].

In addition, social identity allows recognition of the individual traits that makes him to be part of the group [59]. According to Ducol [41], the sociality feature of social media platforms that compels individuals is being an active part of the community by building their identity through participating is a major reason for their influence towards violent extremism. Thus, social media characteristics play a role to constitute the social influence which may predict the young people extremism behavior. These characteristics may include size and extent of use, extent of nonverbal cues, anonymity, type of community [37].

Figure 1 illustrates the integrated proposed model based on social influence, personality traits, and social media platforms characteristics to identify the factors influencing young people extremism behavior.

4. Discussion and Conclusion

Disseminating a culture of moderation and repudiating violence and extremism is an important role of governments and associated institutions. Government affirms on protecting the youth against extremism and radical ideologies, more specific in the electronic open space. Social media networks have become an important asset to these extremist groups to spread their radical ideologies, promote radicalized views, and recruit new members, more specific young people, worldwide. The extremism behavior of young followers of social media ideological contents needs to be controlled. Identifying the factors predicting this behavior is of high significance. This study proposed an integrated model of young extremism behavior in the context of social media.

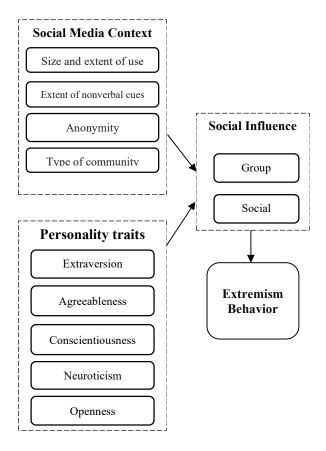


Figure 1: The Research Proposed Model

The proposed model considers the interpersonal perspectives of young followers of ideological contents, context characteristics of social media platforms and problem domain of extremism

behavior. Accordingly, the model was build based on three associated theories; Social Identity Model of Deindividuation Effects, Social Influence Model of Violent Extremism, and personality traits. The social media characteristics such as include size and extent of use, extent of nonverbal cues, anonymity, type of community as well as individual's characteristics such as openness to other people and things, interest in conversation, and openness to perceptions may influence the extremism behavior through group norms and social identity characteristics of social influence. For future research, the measurements of the proposed model's constructs can be used to develop an instrument to empirically examine the impact of the identified factors of the extremism behavior of young followers of ideologies groups' accounts on social media platforms.

This study enriches the literature by providing an integrated model based on solid theoretical foundation of three underpinning theories. In addition, it may enhance researchers and policymakers' understanding of the factors that may influence young people following the extremism content in social media. Furthermore, this study may provide recommendations for policymakers to implement violence and counter-radicalization repudiating programs based on the most critical factors affecting the extremism behavior of social media extremism content followers.

Acknowledgment

This work was funded by the University of Jeddah, Jeddah, Saudi Arabia, under grant No. (UJ-21-IMT-1). The authors, therefore, acknowledge with thanks the University of Jeddah technical and financial support.

References

- [1] J. Melki and M. Jabado, "Mediated public diplomacy of the Islamic State in Iraq and Syria: The synergistic use of terrorism, social media and branding," *Media Communication*, vol. 4, pp. 92-103, 2016.
- [2] F. Alkomah, S. Salati, and X. Ma, "A New Hate Speech Detection System based on Textual and Psychological Features," *International Journal of Advanced Computer Science and Applications (IJACSA)*, vol. 13, 2022.
- [3] G. Blanquart and D. M. Cook, "Twitter influence and cumulative perceptions of extremist support: A case study of Geert Wilders," presented at the 4th Australian Counter Terrorism Conference, Edith Cowan University, Perth, Western Australia, 2013.
- [4] A. I. Abalian, & Bijan, A., "Youth as an object of online extremist propaganda: The case of the IS," *RUDN Journal of Political Science*, vol. 23, pp. 78-96, 2021.
- [5] K. ŠIŇANSKÁ, L. Tothova, and T. ŽIAKOVÁ, "RADICALIZATION AND EXTREMISM AS

- ADOLESCENT RISKY BEHAVIOURS," Ad Alta: Journal of Interdisciplinary Research, vol. 8, 2018.
- [6] S. Sieckelinck, E. Sikkens, M. Van San, S. Kotnis, and M. De Winter, "Transitional journeys into and out of extremism. A biographical approach," *Studies in Conflict Terrorism*, vol. 42, pp. 662-682, 2019.
- [7] A. P. Schmid, "Radicalisation, de-radicalisation, counter-radicalisation: A conceptual discussion and literature review," *ICCT Research Paper*, vol. 97, p. 22, 2013.
- [8] A. Silke, "Holy warriors: Exploring the psychological processes of jihadi radicalization," *European journal of criminology*, vol. 5, pp. 99-123, 2008.
- [9] A. Omar and M. E. Hashem, "An Evaluation of the Automatic Detection of Hate Speech in Social Media Networks," *International Journal of Advanced Computer Science Applications*, vol. 13, 2022.
- [10] A. H. Richmond, "Social exclusion: Belonging and not belonging in the world system," *Refuge*, vol. 21, p. 40, 2002.
- [11] J. Bartlett, J. Birdwell, and M. King, *The edge of violence: A radical approach to extremism*: Demos, 2010.
- [12] B. D. Adams, A. L. Brown, C. R. Flear, and M. L. Thomson, "Understanding the process of radicalization: review of the empirical literature," 2011.
- [13] R. Borum, "Understanding terrorist psychology," in *The psychology of counter-terrorism*, ed: Routledge, 2010, pp. 33-47.
- [14] M. L. Porges, "The Saudi deradicalization experiment," Council on Foreign Relations, Expert Brief, 2010.
- [15] M. M. S. Al Ameri, "UNDERSTANDING RADICALIZATION AND COUNTER-RADICALIZATION COMMUNICATION IN SOCIAL MEDIA: A TWITTER ANALYSIS," PhD, United Arab Emirates University, 2020.
- [16] D. M. Pak, "Social Media Networking: New Challenges and Strategies for Counterterrorism," Dartmouth College, 2018.
- [17] R. Fertakos, "Social Media and Extremist Groups Online: An Examination of Methods of Radicalization and Its Implications," The University of North Carolina at Charlotte, 2019.
- [18] Y. Garcia, "Twitter, Tumblr, and Terrorist: How Terrorists Advanced Through the Use of Cyberspace," Utica College, 2020.
- [19] T. Ahammad, M. K. Uddin, T. Yesmin, A. Karim, S. Halder, and M. M. Hasan, "Identification of Abusive Behavior Towards Religious Beliefs and Practices on Social Media Platforms," *International Journal of Advanced Computer Science and Applications*, vol. 12, 2021.
- [20] A. A. Almazroi, "A fast hybrid algorithm approach for the exact string matching problem via berry ravindran and alpha skip search algorithms," *Journal of Computer Science*, vol. 7, p. 644, 2011.
- [21] A. A. Almazroi, O. A. Mohamed, A. Shamim, and M. Ahsan, "Evaluation of State-of-the-Art Classifiers: A Comparative Study," 2020.
- [22] A. A. Almazroi, F. Mohammed, M. A. Qureshi, A. A. Shah, I. A. T. Hashim, N. H. Al-Kumaim, et al., "A

- Hybrid Algorithm for Pattern Matching: An Integration of Berry-Ravindran and Raita Algorithms," Cham, 2022, pp. 160-172.
- [23] A. A. Almazroi, A. A. Shah, A. A. Almazroi, F. Mohammed, and N. H. Al-Kumaim, "A Survey of the Hybrid Exact String Matching Algorithms," Cham, 2022, pp. 173-189.
- [24] S. Alava, D. Frau-Meigs, and G. Hassan, *Youth and violent extremism on social media: mapping the research*: UNESCO Publishing, 2017.
- [25] T. T. Lin, L. Li, and J. R. Bautista, "Examining how communication and knowledge relate to Singaporean youths' perceived risk of haze and intentions to take preventive behaviors," *Health communication*, vol. 32, pp. 749-758, 2017.
- [26] L. Pauwels, Explaining and understanding the role of exposure to new social media on violent extremism: Academia Press, 2015.
- [27] J. Hawdon, A. Oksanen, and P. Räsänen, "Online Extremism and Online Hate: Exposure among Adolescents and Young Adults in Four Nations," NORDICOM-INFORMATION, p. 29, 2015.
- [28] I. Awan, "Cyber-extremism: Isis and the power of social media," *Society*, vol. 54, pp. 138-149, 2017.
- [29] M. Costello, J. E. Hawdon, and A. Cross, "Virtually standing up or standing by? Correlates of enacting social control online," *International Journal of Criminology* and Sociology, vol. 6, pp. 16-28, 2017.
- [30] A. Merari, "Psychological and social Aspects of Suicide Terrorism, Driven to Death," ed: Oxford and New York: Oxford University Press, 2010.
- [31] A. W. Kruglanski, J. J. Bélanger, M. Gelfand, R. Gunaratna, M. Hettiarachchi, F. Reinares, *et al.*, "Terrorism—A (self) love story: Redirecting the significance quest can end violence," *American Psychologist*, vol. 68, p. 559, 2013.
- [32] J. Victoroff, S. Quota, J. R. Adelman, B. Celinska, N. Stern, R. Wilcox, et al., "Support for religio-political aggression among teenaged boys in Gaza: Part I: psychological findings," Aggressive behavior, vol. 36, pp. 219-231, 2010.
- [33] A. McGilloway, P. Ghosh, and K. Bhui, "A systematic review of pathways to and processes associated with radicalization and extremism amongst Muslims in Western societies," *International review of psychiatry*, vol. 27, pp. 39-50, 2015.
- [34] C. McCauley and S. Scheckter, "What's special about US Muslims? The war on terrorism as seen by Muslims in the United States, Morocco, Egypt, Pakistan, and Indonesia," *Studies in Conflict Terrorism,* vol. 31, pp. 1024-1031, 2008.
- [35] A. W. Kruglanski, X. Chen, M. Dechesne, S. Fishman, and E. Orehek, "Fully committed: Suicide bombers' motivation and the quest for personal significance," *Political psychology*, vol. 30, pp. 331-357, 2009.
- [36] T. Bjørgo and Y. Carlsson, "Early intervention with violent and racist youth groups," *Oslo: NUPI*, 2005.
- [37] S. B. Nicholls and R. E. Rice, "A dual-identity model of responses to deviance in online groups: Integrating social identity theory and expectancy violations theory," *Communication Theory*, vol. 27, pp. 243-268, 2017.

- [38] Z. Wang, "Anonymity effects and implications in the virtual environment: from crowd to computer-mediated communication," *Social Networking*, vol. 7, pp. 45-62, 2017.
- [39] F. Vilanova, F. M. Beria, Â. B. Costa, and S. H. Koller, "Deindividuation: From Le Bon to the social identity model of deindividuation effects," *Cogent Psychology*, vol. 4, p. 1308104, 2017.
- [40] J. P. Mikal, R. E. Rice, R. G. Kent, and B. N. Uchino, "Common voice: Analysis of behavior modification and content convergence in a popular online community," *Computers in Human Behavior*, vol. 35, pp. 506-515, 2014.
- [41] B. Ducol, "A radical sociability: In defense of an online/offline multidimensional approach to radicalization," in *Social networks, terrorism and counter-terrorism*, ed: Routledge, 2015, pp. 82-104.
- [42] C. Archetti, "Terrorism, Communication and New Media: Explaining Radicalization in the Digital Age," Perspectives on Terrorism, vol. 9, pp. 49-59, 2015.
- [43] K. Barrelle, "Pro-integration: disengagement from and life after extremism," *Behavioral sciences of terrorism political aggression*, vol. 7, pp. 129-142, 2015.
- [44] D. Smith and S. Talbot, "How to make enemies and influence people: a Social Influence Model of Violent Extremism (SIM-VE)," *Journal of policing, intelligence counter terrorism*, vol. 14, pp. 99-114, 2019.
- [45] J. P. Forgas and K. D. Williams, *Social influence: Direct and indirect processes*: Psychology Press, 2016.
- [46] J. Stern, "Radicalization to extremism and mobilization to violence: What have we learned and what can we do about it?," The Annals of the American Academy of political social science, vol. 668, pp. 102-117, 2016.
- [47] C.-C. Lee, S. T.-H. Chou, and Y.-R. Huang, "A study on personality traits and social media fatigue-example of Facebook users," *Lecture Notes on Information Theory*, vol. 2, 2014.
- [48] K.-C. Shang, C.-C. Chao, and T.-C. Lirn, "The application of personality traits model on the freight forwarding service industry," *Maritime Business Review*, 2016
- [49] G. W. Allport, "Pattern and growth in personality," 1961.
- [50] J. M. Balmaceda, S. Schiaffino, and D. Godoy, "How do personality traits affect communication among users in online social networks?," *Online Information Review*, 2014.
- [51] O. Ojedokun, "Associations of the five-factor personality traits with environmental citizenship behavior of youth in a Nigerian university community," Management of Environmental Quality: An International Journal, 2018.
- [52] C. Brick and G. J. Lewis, "Unearthing the "green" personality: Core traits predict environmentally friendly behavior," *Environment Behavioral sciences of terrorism political aggression*, vol. 48, pp. 635-658, 2016
- [53] M. H. Bornstein, *The SAGE encyclopedia of lifespan human development*: SAGE Publications, 2018.
- [54] R. R. McCrae and P. T. Costa Jr, "The five-factor theory of personality," in *Handbook of personality: Theory and*

- research, R. W. R. O. P. John, & L. A. Pervin, Ed., ed: Guilford Press, 2008.
- [55] L. Y. Lin, "The relationship of consumer personality trait, brand personality and brand loyalty: an empirical study of toys and video games buyers," *Journal of product brand management*, vol. 19, pp. 4-17, 2010.
- [56] L.-Y. Leong, N. I. Jaafar, and A. Sulaiman, "Understanding impulse purchase in Facebook commerce: does Big Five matter?," *Internet Research*, 2017.
- [57] M. A. W. Kiarie, L. C. Maru, and T. K. Cheruiyot, "Leader personality traits and employee job satisfaction in the media sector, Kenya," *The TQM Journal*, 2017.
- [58] S. F. Salem and A. B. Alanadoly, "Personality traits and social media as drivers of word-of-mouth towards sustainable fashion," *Journal of Fashion Marketing Management: An International Journal*, vol. 25, pp. 24-44, 2020.
- [59] U. M. Dholakia, R. P. Bagozzi, and L. K. Pearo, "A social influence model of consumer participation in network-and small-group-based virtual communities," *International journal of research in marketing*, vol. 21, pp. 241-263, 2004.
- [60] Z. Wang, J. B. Walther, and J. T. Hancock, "Social identification and interpersonal communication in computer-mediated communication: What you do versus who you are in virtual groups," *Human Communication Research*, vol. 35, pp. 59-85, 2009.
- [61] P. T. Costa Jr and R. R. McCrae, *The Revised Neo Personality Inventory (neo-pi-r)*: Sage Publications, Inc, 2008.
- [62] T. Correa, A. W. Hinsley, and H. G. De Zuniga, "Who interacts on the Web?: The intersection of users' personality and social media use," *Computers in human* behavior, vol. 26, pp. 247-253, 2010.
- [63] K. Moore and J. C. McElroy, "The influence of personality on Facebook usage, wall postings, and regret," Computers in human behavior, vol. 28, pp. 267-274, 2012.
- [64] Y. Amichai-Hamburger and G. Vinitzky, "Social network use and personality," *Computers in human behavior*, vol. 26, pp. 1289-1295, 2010.



Abdulwahab Ali Almazroi received the M.Sc. and the Ph.D. in computer science from the University of Science, Malaysia, and Flinders University, Australia, respectively. He is currently serving as an Associate Professor in the Department of Information Technology, College of Computing and Information Technology at Khulais, University of Jeddah, Saudi Arabia.

His research interests include parallel computing, cloud computing, wireless communication, and data mining.



Fathey Muhammad received his B.Sc in Computer Engineering from Esfahan University, Esfahan, Iran in 2003, M.Sc in Information Technology from Tarbiat Modarres, Tehran, Iran in 2005 and Ph.D in Information Systems from Universiti Teknologi Malaysia (UTM), Johor, Malaysia in 2017. His research interests

include cloud computing, technology innovation adoption, information system project management, e-government and e-business. He has authored and co-authored over 40 scientific papers in the area of cloud computing services, technology adoption and impact on the performance of organizations, e-government and e-business and others in highly prestigious journals and international conferences, as well as editing 4 books published by Springer. He also appointed as Program Chair and publication committee chair for a number of international conferences, and guest editor for some Scopus journals. Fathey Mohammed is currently, an international senior lecturer in School of Computing, Universiti Utara Malaysia UUM, Malaysia.