# Fake accounts and social media bots in the era of artificial intelligence in Nigeria

**\*Melchizedec James Onobe, Ph.D. & \*\*Desmond Onyemechi Okocha, Ph.D.**

**Abstract**

Bots on social media platforms is a phenomenon that has become pervasive as the presence and use of digital platforms by netizens. Although statistics is vague on how many bots accounts exist, even more difficult to grapple with is the underlying reason for their existence. Automatic tools have been developed for their detection and elimination, however the way to characterize these accounts and measure their impact is heterogeneous in literature. Even more perplexing in many discourses is the near absence of the cultural underpinnings and dynamics of their existence, particularly in Nigeria. This represents a new frontier of challenge. The study adopts Prospect Theory, Social Exchange Theory and Chatbots Theory, using Focus Group combined with Phenomenology in observation of identity submissions to better understand netizens pattern of behavior on Social Networking Sites. Findings reveal that, although significant confidence is placed on social media platforms, many netizens conceal their real identities. The study found out as well that pseudo identities dominate because sharing certain personal information violates long-standing culture of social identity secrecy entrenched in customary traditions in many parts of Nigeria. It also reveals that many of the multi and pseudo identity alias are existential normative to shield many political activists in response to the unsafe political terrains. Aside acquainting themselves with the overt and covert cultural nuances of social media users, the study concludes that computer software engineers and developers in Nigeria need to develop customized software and re-categorize bots accounts, and chat-bots particularly into the algorithmic template because of the socio-psychological peculiarities of the clime.

**Key Words:** Social Media, Bots Account, Nigeria, Culture, Artificial Intelligence.

## Introduction

All the revolutions, from industrial to the technological, bear the characteristics of man enlisting assistance from things existing or things created. The recent iconic creation of information technology pitched artificial intelligence (AI) that promises to be the best yet, especially with innovations in robotic technologies of various forms, shapes and purpose. Studies (Srinivasan, Nguyen and Tanguturi, 2017) reveal that the technology is rewriting how information, data generation, business, politics and social interactions are carried out. The combo of software and hardware to simulate every day life by intelligent agents promises to do a lot of things ranging from labor work to sophisticated operations, delegated and sublet to chatbots; regarded as intelligent Human-Computer Interaction (HCI) (Adamopoulou and Moussiades, 2020).

In spite of the utility of HCI programs that responds and creates correspondence on a wide range of interactive demands in the world, there is growing suspicion of their integration into human

**About the Authors**

\*    Melchizedec James Onobe, Ph.D., is an Associate Professor in the Department of Mass Communication, Bingham University, Karu, Nasarawa State, Nigeria. He has bias for media and society, digital mediation and representational communication.

\*\*   Desmond Onyemechi Okocha, Ph.D., is an Associate Professor and Dean, Faculty of Communication and Media Studies, Bingham University, Karu, Nasarawa State, Nigeria as well as a Research Fellow, The University of Religions and Denominations, Iran and Member of the Swiss-based Information Panel on the Information Environment (IPIE). His research interests are Media and Society, Emerging Media, Corporate Communication and Digital Journalism.

community as digital entities wired for some assistance to their principals. Although these conversation entities or smart bots, as chatbots are variously referred to, are functionalized too as surrogates in the educational sphere, e-commerce, information retrieval and businesses, the rational for their counterpart existence has become a subject of great debate, stretched dialectics essentially on their ethical sustainability or otherwise (Woolley, 2016; Grimme, Preuss, Adam, & Trautmann, 2017; Assenmacher, Clever, Frischlich, Quandt, Trautmann, and Grimme, 2020). Chat bots are intelligent colloquial computer-cloned tiny robotic army of personal assistants that interphase, interact, simulate human senses and run varied errands on humans behalf to ease array of task, from the very simple to the complex. They are voices and company, always around and anticipating where we desperately need help. As Caldarini, Jaf and McGarry (2022) aver, they mimic with every sense of naturalness, although they are but computer programs.

Much of the concerns surrounding bots, social bots, are their existential status. The grouse in some quarters is exactly how to rationalizing bots identities that mimic humans without a formal declaration of their status. Are they justifiably fake accounts or that is too sweeping a conclusion? Debates regarding bots utility to their creators and others may be pushing hard on the boundary of reconceptualization of fakery, as some scholars argue (Galloway and Swiatek, 2018; Godulla, Bauer, Dietlmeier, Lück, Matzen, & Vaaßen, 2021).

As it is variously experienced, the information age and its many creations is user friendly and have a great sense of adaptability to individuals' needs especially in the social media space. On the face of it, there are palpable replacement fears and concerns. Humans are surreptitiously being replaced (Montal & Reich, 2017; Caswell & Dörr, 2018) and so are their organic ideas and streaks of originality. Surrogatization and double talent display is warmly sluicing into wide acceptability. Heavy and utter dependence on AI is dulling the innate intelligence of individuals, incapacitating organic and rainbow divergence in ingenuity, especially when *Chat gpt* and its innumerable born and unborn ilk provide endless automated options of how to get a task effortlessly accomplished.

In the end mankind, perhaps, may be nearing extinction, productivity wise; endangered by essentially myriad prosthetic creation, the bots. All the same the potentials and the precision of bots make the technology alluring to the reality in the present dispensation of things. Netizens in different parts of the world, with diverse and socio-cultural complexities have explored their freedom to use the innovation and its paraphernalia, including the tribe of social bots, as they please; perhaps in ways that trail off the tangent of convenient opinion of naysayers, particularly in Africa where much of the society is closed and rights are gagged (Gaus, 2017; Thaldar, 2017).

However, how social media are used vary from place to place with dynamics of different realities that stimulate actions and prompts reaction across socio-political realities. The question of uniform rules is problematized (Haller, 2017) when issues of labeling and its imposition is demanded wholesale with defiant disregard of political, social and cultural climate and firmament of realities that nursed their incubation and operation. Therefore, interrogation of certain concerns becomes significant. For example, encryption is required to preserve confidentiality in online communications. In 2001 the Association of Progressive Communication Internet's Right Charter, APC, established the right to use encryption, noting that; "People communicating on the internet must have the right to use tools which encode messages to ensure secure, private and anonymous communication" APC (2001, p.2). Is obfuscation not synonymous with fake account? This seeming nifty contradiction of parallel realities of two political communication economies demands an interrogation.

Other concerns are question of neo-censorship and re-emergence of authoritarianism when such strictures are high and heavily handed down to regulate operations in social transactions particularly in the global South. When the African Declaration on Internet Rights and Freedoms (2013) and APC (2001) uniformly encourage that pseudonym, penname, ought to be used to disguise identity; what does that translate into ethically? Hence, the study thus ask some question to understand the following:

1. Why do many netizens hide their identity under pseudonyms or penname?

2. How do the political underpinnings and dynamics of free speech influence operations of pennames and social bots' popularity in Nigeria?

3. What implication does penname operating accounts have on the proliferation of fake news in Nigeria?

4. How culture-centric are the labeling yardstick used in measuring social accounts?

## Theoretical Background

*Conceptual clarification*
*Chat bots*

Chat bots facilitate "machine conversation with human users via natural conversational language" (Shawar and Atwell, 2005, p. 1) and thus focus on one-to-one communication (Hofeditz *et al.,* 2019) with minimal human intervention (Harringer, 2018); executes commands, responds to messages or performs routine tasks (Godulla, Bauer, Dietlmeier, Lück, Matzen, & Vaaßen, 2021). As a phenomenon of the Internet, bots are computer programs written by humans, which, for example; harvest data independently, depending on the intended utility, broadcast information, communicate and interact with other users (Gumz and Mohabbat Kar, 2016).

There are about 13 types of bots identified in some literature. There could be more, though, as suggested by Adamopoulou and Moussiades, (2020). Perhaps the list for now may remain open depending on evolutionary trajectory of events in the digital plain and the need curve. The types are: web crawlers, monitoring bots, impersonators, messenger bots, scrapers, spammers, hackers, botnets, chat bots, social bots, transaction bots, editing bots and assistant bots (Harringer, 2018). Thus:

a) Web crawlers or search engine spiders are programs that move through the net and websites index them to make them available for search queries. Their main purpose is to collect information

b) Monitoring bots are programs that monitor and control the functionality of software.

c) Impersonators are bots that disguise themselves and collect passwords

d) Messenger bots, are communication modules on messenger platforms and are often seen as a subtype of chat bots.

e) Chat bots are conversational software agents, text-based dialogue systems programmed to imitate human speech. They examine the input of users and provide answers and (re) questions, using routines and rules. One main application area is customer service. They are regarded as computer programs or some artificial intelligence (AI) that conduct conversations through sound or text as an input method. With the improvement in deep learning, machine learning/mimic and artificial intelligence, machines and computers have become simulators regarded generally as chat bots (Sree, Kaushik, Sahitya and Rohan 2019).

f) Scrapers are automated software that collects e-mail addresses from websites

g) Spammers are programs that flood websites with advertising to divert traffic and generate click

h) Hackers; are automated software that attack websites and places malwares

i) Botnets; are large number of computers that have been infected with automated malware and are used centrally controlled for decentralized attacks.

j) Simple social bots monitor the flow of information on platforms in order to then send out ready-made contributions on key terms. Social Bots are algorithms that can perform predefined tasks as (semi) automated agents. They often pretend to be a real person and try to influence the formation of opinion.

k) Transaction bots are Software that interacts with external systems to transfer data from one platform to another. They are used in the automation of business processes.

l) Editing bots were created for Wikipedia and facilitate the work of the platform.

m) Assistant bots are a kind of generic term for bots that combine several tasks in one software and are used for several of the mentioned purposes.

The distinction between these bots are their utility in the human interface, else bots are bots with same potentials, operating in circumstance-specific command. Marcellino, Magnuson, Stickells, Boudreaux. Helmus, Geist and Winkelman, (2020) identified the bots by their duty, namely: Influence bot, Astroturf bots, Noise bots, Smokescreen bots, Disinformation bots, Matchmaker bots, Harassment bots, Harvest bots, Masquerade bots. The table below shows some of these classifications.

| Name | Description |
|---|---|
| Influence bots | they engage with users to influence them in a certain direction, frequently by providing them with information that promotes the cause the bot is designed to support. |
| Astroturf bots | they inflate the statistics or trendiness of a message or user by tweeting, liking, and following within a circle of amplifier bots. |
| Noise bots | they disrupt communication and information being spread by an opposition by diluting opposing content. |
| Smokescreen bots | they try to disrupt a user's action or purpose by misdirecting or distracting an audience from their initial interest using alternative news or information. |
| Disinformation bots | they spread false information widely, leading to false narratives. |
| Matchmaker bots | they increase cooperation and information among users by connecting individuals who share similar interests but have not engaged with each other. |
| Harassment bots | they harass users, forcing them out of a social space. |
| Harvest bots | they engage or friend people to gain access to sensitive information. |
| Masquerade bots | they pretend to be human in an attempt to keep a target user from engaging with actual humans instead. |

Source: Marcellino, Magnuson, Stickells, Boudreaux. Helmus, Geist and Winkelman, (2020, p.10).

The above classifications appear duty tailored, christened to reveal the individual characteristics of bots. The detection and labeling of social bots remains a challenge as it is. Among other things, the configuration and labeling of bots is devoid of cultural specificity. For example, social bots run a significant percentage of accounts on Twitter (Varol, Ferrara, Davis, Menczer and Flammini, 2017; Roth and Harvey, 2018;). However, it does not matter what they do or how proficiently they operate, bots can become casualties of errors. When that happens does it change the essence of the bot or the account? When a bot disguises as human and engages public members, does that make its intervention fake? Is that account fake because the content was midwife by a digital assistance? Is the existence and operation of the account questionable and should its contents be given a chance? How many gaffes are excusable or tolerable for bots before a label of fakery is slammed on it?

A study (Edwards, Autumn, Patric, and Ashleigh, 2014) reveals that an automated account that generated unmanned information and shared on same platforms attracted just as much confidence level as a credible source as a manned account. Another experiment conducted by academics from the University of Turin, was done on a sample of 240 undergraduate students and employed source credibility metrics to rate a mock Centers for Disease Control and Prevention (CDC) on Twitter page. It rationalized that even bots that smack of deviousness, giving reason they could not be trusted by failing to disclose their identity as bots, not humans, while engaging in mundane task like spamming, revealed an incredible degree of success in influencing people. The researchers found "that an untrustworthy individual [a bot] can become very relevant and influential through very simple automated activity" (Aiello, Matrina, Rossano and Giancarlo, 2012, p.37).

Influence bots appear rampant, like the once used by pro-vaccine group, which adopted counter

misinformation spread by anti- vaccine Twitter activists (Subrahmanian, Amos, Skylar, Vadim, Aram, Kristina, Linhong, Emilio, Alessandro, Fillippo, Andrew, Alexander, Shuyang, Tad, Farshad, Yan, Onur, Prashant, Vinod, Qiaozhu, and Tim, 2016).

Authorities, especially politicians like the Venezuelan government, as Forelle, Phil, Adres and Saiph (2015) note, used bots to promote a social cause and for personal gain. A case in point was when they were used to spread messages and counter political broadsides. In related case the Institutional Revolutionary Party in Mexico deployed thousands of bots to promote its message and help it sponsor messages on Twitter's trending topics feed as Orcutt (2012) avers. Russia, similarly, used influence bots - the "Kremlin bots" - to troll opposition and to regularly promote pro-Putin hashtags. Boshmaf, Ildar, Konstantin and Matei (2011).

Bottom line is that the basic algorithmic operating condition for existence in all bots has a mutational gear that could be engaged, overwrite, modified, upgraded etc. Generally, bots for good measure provide a boost as intelligent personal assistants (IPAs). According to Shank, Burns, Rodriguez and Bowen (2020, p.32) the phenomenon has been variously used to label different technologies with different purposes and functions, based on their autonomy, physicality, or sophistication.

*Bot-ethics and IPAs*
Part of the huge concern and consternation is that bots are probably the reality and manifestation of replacement technology, a predictable assumption that hover around many debates in society (Cohen 2015; Montal & Reich, 2017; Caswell & Dörr, 2018). Today, technology has hugely proliferated beyond the wildest imaginations of man and appears roughened on matters of control. Generally, intelligent personal assistants (IPAs) don't know when and how to draw the line between when to wait and be forward. They are the first impressions and face of many organizations, corporate bodies and individuals (Shum et al., 2018).

It is increasingly becoming difficult to tell a bot from a human being because of the assimilation of IPAs into social identity of men. This and other ethical concerns is becoming so pervasive with social bots. The scientific community is calling for decorum and new ethical rules in PR (Roettger and Wiencierz, 2018). Will it hold? Already codes and standards already exist for most areas of public communication (Wiencierz *et al.,* 2017). However, their popularity in terms of adherence is the big doubt as only about 24 percent of companies have formulated standards for digital ethics (PwC, 2020) in developed economies like the US. Agazzi (2019, p.3) submits that,

> The internal logic of technology is that of 'realizing all possibilities' and this is at variance with the logic of ethics that in many cases says, 'this is possible but ought not be done'. No science and no technology have room in their conceptual space for an, 'ought to do', 'ought to be done' in the precise sense of what is a duty to do or not to do. Science and technology tend to consider matters of fact, but not duties and this simply indicates that they fail to have within them criteria for guiding human actions that are specifically the outcome of moral judgment.

This dissonant tendency has many mutations in the evolution of bots that appear to have violated the decorum in society regarding man to man and man to machine relationship. While humans have identities and could identify themselves, machines on the other hand impersonate, troll and leech on people. The labyrinth of this evasiveness stretches to other pinnacles of deceit in development call deep fakes (Kietzmann, Lee, McCarthy and Kietzmann 2020; Dobber, Metoui, Trilling, Helberger, and Vreese 2021) evolution of synthetic media (Stefan, S; Ansgar, Z; Daniel, Z; Sünje, C; and Karen B (2022) and alternative truths. Facts are hardly cardinal to basic conventions and businesses in the new economy of uncertainty because of their evolution into aesthetical logic.

There are three functional levels of media ethics according to Godulla, Bauer, Dietlmeier, Lück, Matzen, & Vaaßen, (2021, p.4). The three functional areas include knowledge, freedom and identity (Beck, 2019). Central to the area of knowledge are practices that are oriented towards the value of truth. The level of identity includes playing with different identities and responsibility for actions on the Internet (Beck, 2019). This is particularly relevant for dealing with bots. The question arises whether users need to be informed that they are not talking to a human, but to a bot. In addition, another central question is who shall ultimately be responsible for the actions of virtual assistants? A challenge in the area of the ethical evaluation of bots is therefore whether bots are

seen as actors in the communication process, or whether they are seen as a medium (Beck, 2019).

*Socio cultural/Political context of bots intervention*

Social bots, the vexed specie of bots, engage and respond like a smart entity when conversed with through text or voice and understands one or more human languages by Natural Language Processing (NLP). Their influences are frequently discussed in the context of political manipulation and disinformation (Bessi & Ferrara, 2016; Ferrara et al., 2016; Kollanyi et al., 2016; Ross et al., 2019). The media (such as Twitter or Facebook) and applications (Alexa, Echo and Siri) where they are most operational the most are invariably the host of their operation and that has a huge implication. The elements that shape these media, it is argued, should shape social bots. Communicative robots are typically 'media in media'. The point is that an investigation into communicative robots implies a need to research the platforms 'upon' which they 'act'.

The socio-cultural nuances of communication prescribe a convention of operation. It is deeply entrenched as an all-time media tradition and a context of evaluation of general acceptability. The parameters of that ambiance should be a spectacle of defining reliability in the humano-cybic interphase, man and machine cooperation. However, a socio-psychological issue is the question of privacy in everyday social context and that dovetails into the realm of politics as well especially the civil concern and dignity of respect for individual space. Hepp (2020, p.1419) wonders where exactly anyone should draw the line between public and private when communicative robots occupy private space to such an extent and accumulate highly private data (Lutz and Tamò, 2018, p. 146, 152), and also the notion of 'responsibility' – whom bears the responsibility for the ways in which communicative robots actually communicate (Gunkel 2018, p. 222)?

Bots, many of the social bots, operate auto-navigationally; meaning they can harvest, arrange and reveal what they chose about personal details of people. Is it convenient for social and cultural exceptions, particularly in Nigeria for example, for bots to run out facts about personalities that have some traditions regarding disclosure? How about rogue bots, can a bot run rogue and if for unintended reason (possibly bot error signals) that happens who should be responsible for its peccadillo? For example, there are cultures in Nigeria that forbid a disclosure of the health status (particularly an ailment) suffered by a king. Bots lack the cautiousness of human and rarely respect traditions of places and people in its operations. Aminu Adamu Mohammed a student of Federal University Dutse posted a message on Twitter in Hausa Language that translate something like, "Mama has embezzled monies meant for the poor" (Khalid,2022). Earlier in the year, (2022) two young TikTok users were fined and flogged in public after a court found them guilty of defaming the governor of the northern state of Kano in a video shared on social media.

David Hundeyin, an independent journalist, in a tweet on Sunday derisively said "When they proposed an "almajiri feeding program," I didn't realize what they meant was that they would feed all the almajiris to Aisha Buhari. Are there any almajiris left" (Oluwasanjo, 2022)? He will not be made to answer for his derisive comments neither the netizens whom have held deeper and more critical comments about their leaders in the West. According to Kalb (2022), the press image of Biden, president of the United States of America, has been whittled down to that of a doddering old man, wobbly on his feet and barely able to articulate a single thought without slurring.

The question is since the "offensive" comment on Aisha Buhari was on Twitter, as the comment of Mr. Hundeyin's, is it possible that social bots sent those messages on their behalves? Both indications should be used with caution, as the evaluation of the underlying tools applied for detection have been found to be not sufficiently precise in distinguishing social (spam) bots from other (human) pseudo-users or humans (Cresci et al., 2017; Grimme et al., 2018). Hence, quantitative statements on social bots— relative or absolute—remain as speculation to some extent (Assenmacher, Clever, Frischlich, Quandt, Trautmann, and Grimme, 2020).

*Intelligence is not rationality*

Machines run on programs, not on emotions. Outcomes are the goal of machine evaluation, devoid of means. Examinations that are assessed using CBT, for example, don't exactly represent the test of a student's intelligence. A student may know the process and procedure to an outcome, but could miss a step and fumble on the last result does not mean the student is dumb. It is saner to evaluate a candidate or anything within the framework of subordinating incontrovertible evidence or efforts, as Scharre (2018, p.11) notes, "Context is everything," and hardly do you talk about operating within social context without rationality. How capable are robots to do that?

The declassification of technology is widening more and more, the things that were hitherto considered, as science fictions are now existential realities that we contend with; from drones to spywares. Many of these things were supervised to regulate their rascality, but as it is there is clamor for increased autonomy of robotics. For example, "the Israeli Harpy drone, have already crossed the line to full autonomy. Unlike the Predator drone, which is controlled by a human, the Harpy can search a wide area for enemy radars and, once it finds one, destroy it without asking permission. It has been sold to a handful of countries and even China has reverse engineered its own variant. The possibility of wider proliferation of such is a given and the Harpy may only be the beginning" Scharre (2018, p.12).

The constitution of these weapons is not different from the existing operating mechanism of bots. Although AI revolution is enabling the *cognitization* of machines, creating machines that are smarter and faster than humans for narrow tasks, how culturally rational can these robots be in decision making? It is unclear at the moment. Bots acclimatize easily, following traditions of man's socialization, hence "their cumulative experiences enable them to develop sentiments – general affective responses – towards the labels and identities of others" as Shank, Burns, Rodriguez and Bowen (2020, p.33) aver; although there are brick walls of values. According to some scholars like Shank (2010) cultures have some common denominators (although the tissue of agreement is not as strong as human concepts) as they have contestable divergent points even in the sphere of technological concepts.

Corporations and tech companies, including AI designers are worried about bots' autonomy in social interaction. For example, Twitter prohibits bots that conduct hashtag spamming (which might include prohibition of dis/information and noise bots). Telegram's restrictions are more limited, but do require bots to self-identify as bots (Marcellino, Magnuson, Stickells, Boudreaux, Helmus, Geist and Winkelman, 2020, p.68). Is this move a signal of intra-censorship and how far can this go?

There is though, a high tech literacy challenge particularly in Africa. Cursory observation reveals that many in Nigeria, exposed to digital Apps; which are by the way run by robots, ascent to the legal conditions before reading the spelt-out terms and conditions. They trust cheaply and easily. A lot are ignorant of the extent and implications of autonomous bots.

However, Basu, Wang, Dominguez, Li, Li,

Varanasi and Gupta (2021, p.1) state that, "One of the challenges of modern ML-based chatbots is the lack of "understanding" of the conversation. Current chatbots learn patterns in data from large corpora and compute a response without having any semantical grounding of the knowledge internally. Meanwhile, there are updates on technologies, new and old, making it difficult to rule out anything. Man created machines, computers, AI, these things appear to be creating man (Dignum and Mols, 2021). There are those that think that no matter the technological advancement, the digital technologies ought to consider the socio-political environment it is operating in.

**Theoretical assumptions**
The study is anchored on Prospect Theory, Social Exchange Theory and Chatbot Theory.

*Prospect theory*
The Prospect theory is a decision-based theory under perceived condition of risk upon which decisions are based. Judgments are predicated on surveillance of the environment following previous conditions and situations. Those uncertainty pointers trigger desperations of choice and plans that will encapsulate the prospect, especially where clarity of consequences are in doubt. Prospect theory addresses how these choices are framed and analysed in the decision making process. It is spawned from rational theories. Kahneman and Tversky formulated the theory in 1979 according to Levy (1992).

Prospect theory posits that individuals evaluate outcomes with respect to deviations from a reference point rather than with respect to net asset levels; that their identification of this reference point is a critical variable, that they give more weight to losses than comparable gains and that they are generally risk averse with respect to gains and risk acceptance with respect to losses. The hypothesized pattern of loss aversion and the importance of framing have received tentative confirmation by a series of diverse and robust experimental tests that are now well-known in the literature on behavioral decision theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1986; Fishbur & Kochenberger, 1979; Schoemaker, 1980).

In relation to the uncertainty of the political concern in Nigeria, under a repressive regime, an individual may choose an account with code names on any of the social media platforms to

conceal true identity. The fear and uncertainty of being compromised is strong in the face of autocracy or quasi democracy. Out of conflicting dilemma of choices, assistance could be sort from Artificial Intelligence bot to further camouflage the identity. Patronage of AI took shoot starting from the wee days of rule-based system such as ELIZA and PARRY, flowered to the recent open domain.

The theory may be relevant in determining people's dependence on bots because of the quest for inerrancy, accuracy and the prize and gratification that goes with exactitude. The prospect of engaging the assistance of bots in Nigeria is predictably high because of the hunch and observation that there is a high tendency to bid for top place as only high mark earners in fields of endeavor enjoy adulation and accolades.

*Social Exchange Theory*
Social exchange theory is a social psychological and sociological perspective that explains social exchange and stability as a process of negotiated exchanges between parties. The theory posits that human relationships are formed by the use of a subjective cost-benefit analyses and the comparison of alternatives. The theory was developed in 1958, by the sociologist George Homans. He defined social exchange as the exchange of activity, tangible or intangible and more or less rewarding or costly, between at least two people.

After the development of the theory, two other theorists; Peter Blau and Richard Emerson continued to write about it. Blau focused on economic and utilitarian perspective while Richard focused on reinforcement principals that believe individual base their next social move on past experiences. Algorithms that are used in social correspondence, in any case, depend on intelligence and past experiences gleaned by personal data generating devices linked to personal avatars of people's habits.

Thus, "for many Internet advocates the social media provides an electronic agora to allow for alternative issues to be raised; framed and effectively debated. It is contended that citizens may enjoy a real-time interactive access with one another to transmit ideas, by-pass authorities, challenge autocracies and affect greater forms of expression against state power" (Iosifidis and Wheeler, 2015 p. 1). Bottom line, experiences in the digital era are scales and shells of familiar personalities that line easily with peoples digital footprints and DNA.

They measure our pedometer, the character of our actions and become decisively predictable about much of our reactions with near accuracy, all because of the bank and reserves of our experiences surreptitiously made vulnerable as a result of casual permission granted to machines to access our profiles. Homans summarized the system of social exchange theory into three propositions:
1. Success proposition – when a person is rewarded for his or her actions, he or she tends to repeat the action.
2. Stimulus proposition – the more often a particular stimuli has resulted in a reward in the past, the more likely it is that a person will respond to it.
3. Deprivation – the more often in the recent past a person has received a particular reward, the less valuable any further unit of that reward becomes.

The theory will be relevant to this study because its indices could be used as a measuring stick to analyse reason penname is used by netizens.

*Chatbot Theory*
The theory was proposed by Marcondes, Almeida and Novias (2013). Chatbots exist to primarily create a mechanical function and behavior; hence they are considered a Turing Machine. Enhanced within the dialogue domain, chatbots could operate a mechanically narrow dialogue strip as those used for telemarketing. Thus, the responsibility of how to creates and hold an illusion of human conversation through mechanical procedure is the concern of the theory. Invariably, that proficiency as a dialogue manager is significant in personnel management resource.

The operation of the dialogue manager is one of mapping function through a deterministic or statistical procedure. "Roughly, on the deterministic approach, all possible mappings are defined a priori by a set of rules resulting in a behavior. On the statistical approach, first, a dataset is turned into a dictionary of words and probability relations among them; when an input is received it then determines the probability of the next word. Deterministic approaches perform a straightforward mapping while statistical approaches a probabilistic one. On the edge, where an input-sentence matches perfect proximity (equals '1.0'), it tends to work as a deterministic chatbot" (Marcondes, Almeida and Novias ,2013 p.2).

The composition of a dialogue manager

requires certain concerns to be handled, ranging from operation to behaviour related issues (an operation is a behaviour declaration and behaviour is an operation realization. The theory provides an underlying support for the treatment and discussions of all those concerns. In other words, a full chatbot must address all those concerns grounded in a theory that supports it.

**Method of Study**
The study adopts the qualitative research approach, phenomenology. The method was used because as Lester (1999, p.1) avers, "Phenomenological methods are particularly effective at bringing to the fore the experiences and perceptions of individuals from their own perspectives, and therefore at challenging structural or normative assumptions." The method is "good at surfacing deep issues and making

voices heard" (p.4) as it focuses on obtaining data through open-ended and conversational communication. Data was generated using primary sources. Using the purposive sampling technique, 32 discussants were selected for six different focus group discussion on the subject matter that held on WhatsApp. A distant passive observation style and criteria was used in selecting participants, particularly those that have pseudonym (penname) as IP address. The concern of the study essentially, is to interrogate the use of social bots in social media platforms and evaluate the characterization used in their labeling particularly, the cultural underpinnings and dynamics of their existence in Nigeria. Discussions were collated and narratively analyzed while the demographic distribution of the respondents was manually tabulated in a frequency distribution table.

**Results**

*Table 1.* Distribution of Discussants by sex.

| Characteristics | Frequency | Percentage |
| --- | --- | --- |
| Male | 15 | 47% |
| Female | 17 | 53% |
| Others | 0 | 0.% |
| Total | 32 | 100% |

Table 1 indicates that 15 participants representing 47% were Male, while 17, representing 53% were female.

*Table 2. Distribution of Discussants by age*

| Characteristics | Frequency | Percentage |
| --- | --- | --- |
| 20-25 | 12 | 37.5% |
| 26-30 | 16 | 50% |
| 31-36 | 4 | 12.5% |
| Total | 32 | 100% |

Table 2 reveals that people between the ages of 26-30 (50%) were more than other age brackets among the discussants, this was followed by those

within the rank of 20-25, (37.5%) the least were those listed under the category of 30-35 (12.5%).

*Table 3. Distribution of Discussants by occupation.*

| Characteristics | Frequency | Percentage |
| --- | --- | --- |
| Employed | 19 | 59.37% |
| Self-employed | 7 | 21.87% |
| Students | 5 | 15.62% |
| Unemployed | 1 | 3.12.% |
| Total | 32 | 100% |

Table 3 shows that 19 of the discussants, representing 59.37% were employed, 7 participants representing 21.87% were self-employed, 5 participants representing 15.32%

were students, while 1 person representing 3.12 % was unemployed.

**Q1.**Why do many netizens hide their identity under pseudonyms or penname?

Majority of the discussants said penname or pseudonyms is street wisdom for personal safety and security. "If you must feel secure to be yourself, adopt a 'business' name. If the business becomes bankrupt your skin can be safe," according to discussant 22. The same sentiment is shared by most in all the focus groups. According to Discussant 10, "Scapegoat is a normalcy, you only get lucky not to run into trouble for what you say if you are active online. People originate thoughts and people tag along the common thoughts trend and down the journey; it becomes very complicated and critical. The penname is a good invisibility". For Dissusant 16, "It is psychological, though, to consider or believe one is truly invincible. That rationalization makes you to try to be normal not formal, as they want us to live. There is no absolute freedom of speech in Nigeria."

**Q**2: How do the political underpinnings and dynamics of free speech influence operation of penname and social bots' popularity in Nigeria?

The discussants argued that the operational apparatus of State's overbearing tendencies, will and might still exist. The purpose of that existence favors conditions of unevenness inimical to the masses. According to Discussant 1, "in Nigeria for instance, if you observe and find the law biting a person that is not well-off then it is an action taken seriously to punish a member of the opposition." Expanding further, Discussant 4 said, "The poor and masses are slyly considered as being in perpetual opposition to the interest of the rich. They are patronized as fields that must be ploughed for the interest of power sustenance and validation of conquest by the political class. If the ruling class, on the other hand, observes submission from the masses, a patch of subsistent ration is released to encourage further subservience. A critical posture to the interest of the political class is collectively crushed with the weight of executive fiat." The discussants variously underscored the fact that the rich in opposite political class are never permanent rivals, only convenient political athletes with structured scripts outlined for self-entertainment and amusement. Dissention is a spiral of silence with scanty attendants that numerically makes them vulnerable and disadvantaged even to sympathy.

**Q** 3. What implication does penname operating accounts have on the proliferation of fake news in Nigeria?

The discussants appear to have divergent opinion on the matter. In each of the groups there were individuals that believe that some accounts with penname have flagged off fake news. Discussants 13 said, "It will be typical to expect that accounts that reported fake news are likely to have a profile of adopted name other than their real identity." This position is similar to that of Discussant 24; "Those intent on peddling falsehood have a strong tendency to disguise their intention by hiding their identity from the start." Some other Discussants are of a contrary position. Discussant 18 said, "There are other accounts that have verified profiles, which have spread fake news. An example is Senator Dino Melaye that told Nigerians and the world, through his account that COVID-19 has a connection with 5-G Network. Think about all the conspiracy theories and those that were behind them. Many of them wore no mask, they used their real names and details; not veiled profiles, real." A great many of the discussants say that misinformation's spread needs to be differentiated along lines of accidents and intent. Discussant 29 said, "There are those that have exercised notoriety in peddling falsehood. They either do it for the sake of mischief, to distract and divert attention or some other reason, maybe political. Then there are those that regrettably misinformed people and their correction was not given as much publicity as the mistakes. For me, honest mistake should not be qualified as dishonest intent. It doesn't matter if an account has a penname or the real name. Perhaps we should factor in the tradition behind penname or pseudonym. It was a fad, and for most, it still is without strings of malice or mischief."

**Q** 4. How culture-centric are the labeling yardstick used in measuring social accounts?

Many discussants say that the present arrangement, that is detection mechanisms, are configured using yardsticks that have no cue on society-specific culture. According to Discussant 31, "Nigeria, as far as I know, borrowed the existing algorithm of bots operation. We never originated any." For Discussant 2, " We have no national value priority and prerogative to spur us into setting standards on the product we design to reflect our identity or what will work for us as Nigerians and Africans." For Discussant 1, " Our social identity and mannerisms are not represented in the labeling category of the West, from whom we borrowed the technology. Although the social media and AI is measurably flexible to allow for competition, the rule of reach and relevance is measured by numbers and popularity. We run a

tradition rich in the profession of banters. It is everywhere though, but most entertaining and formal in Nigeria; I must say. We even now have comedians all over. If there is a stretch of that artistry to the digital platform, I fear that the red flag of scam alert will scream "fake" on the account that propagates the contents. Clearly, we need monitors, more socio-cultural-sensitive digital umpires that recognizes our social peculiarities and can finely delineate pure, natural fun-fantasies from fake"

## Discussion

There is a struggle between disclosure and being open. Generally, people hide their identities sometimes, because of the complexities and circumstantial situations. In many dictatorial societies it is common traditions for people to feel gagged. As the present investigation showed, many netizens adopt pseudonym, or hide behind social bots, to shield themselves from being targets of state persecution. It is self-preservation to be circumspect about any information shared. Fresh in the mind of Nigerians was the protest against the proposed, to borrow, what Guertin (2009) alludes to as, proverbial 800-pound Gorilla Bill intended to punish free comment and criticism of government functionaries on social media. Typical and justifiable, under Charters of internet free speech, is the argument and justification for netizens to hide their identity as a way of the prospect's existential shield for self-preservation that such alibi permits under the smart technology of chatbot (African Declaration on Internet Rights and Freedoms ,2013; APC, 2001). It is about netizens evaluating their risk factor, maximizing the opportunity, hypothesized loss aversion, in order to thrive in a strait circumstance; all conditions that are necessary precursors for chat theory (Marcondes, Almeida and Novias (2013) and Prospect theory, (Kahneman & Tversky, 1979; Tversky & Kahneman, 1986; Fishbur & Kochenberger, 1979; Schoemaker, 1980). As La Rue states, "Anonymity of communications is one of the most important advances enabled by the internet, and allows individuals to express themselves freely without fear of retribution or condemnation."

The embryo of socio-political action is conditioned by the reality of political communication. It is an agenda phenomenal to behavioral pattern (Gurevitch, Bennett, Curan and Woollacott, 1982). As the discussants have variously expressed, the posture of authority shrinks the public space of dialogue and people have to resort to the social enclaves. The slimmer the political space of free conversation and intellectual graze land the more the alternative haven of social conversation and dialogue widens. This is consistent with Herbamas public sphere testament (Kellner, 2013). It is therefore as Iosifidis and Wheeler, (2015) submit, "For many Internet advocates, the social media provides an electronic agora to allow for alternative issues to be raised; framed and effectively debated. It is contended citizens may enjoy a real-time interactive access with one another to transmit ideas, by-pass authorities, challenge autocracies and affect greater forms of expression against state power" (p.8). This is also consistent with the social exchange theory where netizens use subjective cost-benefit analyses and the comparison of alternatives to survive a strait course of existence.

The problem of fake account and consequent fake news on social networks, however, is that the existential condition looks much like a feat of survival. When authority is economical with release of truth on sundry issues, reaction can sometimes be erratic and convulsive, spiraling to other areas of secondary or tertiary consequences. Sometimes rumors and fake news are corresponding reactions of what government did or did not do. Fake news is lucrative to some because there are gaps in the supply of real news. Although some netizens use penname to deceive or mislead people, the existence of the veil identity transcends the recent dysfunctional relationship to fakery. For many people, the phenomenon is entrenched in the pre-digital era correspondence tradition and fad and should be seen in its purest form. The use of penname is not synonymous with fake news or fake account for that matter.

As a matter of fact, studies have shown (Marcellino, Magnuson, Stickells, Boudreaux, Helmus, Geist and Winkelman, 2020) that there are more bots troll in the service of States that are contending to either over run dissonant public opinion or create favorable imageries on premises of falsehood using propaganda machineries and strategies under the control of many governments. The first to cry foul is usually the States and their operatives over misinformation streams that they directly control or influence in some way (Dignum and Mols, 2021). Bots that are common to everyday folks and most netizens perform simple task of correspondence and business Wikis (assistance), (Basu, Wang, Dominguez, Li, Li, Varanasi and Gupta 2021; Um, Kim and Chung, 2020). Many of the bots that are configured to

mislead and deceive sophisticatedly are; arguably, under States' control programmes (Marcellino, Magnuson, Stickells, Boudreaux. Helmus, Geist and Winkelman, 2020).

Under generic consideration it seems bots account have a fault line in labeling. There are no culture bias and sensitivity to the peculiarities of societies that are considered to be standing on the weak curve of socio-political equation (Shank, 2010; Shank, Burns, Rodriguez and Bowen, 2020) like Nigeria and Africa. The bots, often times, are configured to adopt minimal socialites within certain parameters. Outside that, they are trained to scream foul and fake. The implication of this limited customization of what is acceptable within the syntax and idiolect of bots is error alert for even innocuous accounts. Many times, the bots or program acting as sentries to simple task as mail will deny access to some messages because it thinks they might be harmful to one's device. It comes in only after one manually authorizes. While that is sometimes an error diagnosis by the bots on a conservative scale of 3 out of 10, there may also be incontrovertible correct analysis by the bots as they do their jobs. Nonetheless, as Basu, Wang, Dominguez, Li, Li, Varanasi and Gupta (2021, p.1) state, "One of the challenges of modern ML-based chatbots is the lack of "understanding." That understanding can be derived from ethnographic adaptation leading to ingenious invention of a technology that is friendly to appreciate the peculiar circumstances of netizens in Nigeria.

## Conclusion

Characterization problem is a notorious challenge especially because of the new technology in machine-human advancement relationship. People's behavioral peculiarities particularly Nigerians, and netizens from the Global South, have made them victims of distortion for far too long. The bot technology, though improving human activities generally, has not been able to accommodate the socio-psychological peculiarities of people's behavioral pattern. Not all bots accounts, with veiled identity, pass as fake. It is imperative for technology to capture the peculiarities of a wider spectrum of people with different background and why they do what they do in order not to incorrectly label them. Until that is done, the psychology of bots mannerism and logic of humanoids will remain deficient of global outlook and appeal.

## References

Adamopoulou, E and Moussiades, L. (2020). An Overview of Chatbot Technology in I. Maglogiannis et al. (Eds.): AIAI 2020, IFIP AICT 584, pp. 373–383, 2020. https://doi.org/10.1007/978-3-030-49186-4_31

African Declaration on Internet Rights and Freedoms (2013). africaninternetrights.org/declaration-container/declaration

Agazzi, E. (2019). Technological development and ethics (editorial). ScienceDirect. www.sciencedirect.com

Aiello, L. M., Matrina, D., Rossano S., and Giancarlo R. (2012). "People Are Strange When You're a Stranger: Impact and Influence of Bots on Social Networks," *Proceedings of the Sixth International AAAI Conference on Weblogs and Social Media,* Menlo Park, Calif.: Association for the Advancement of Artificial Intelligence, 2012. https://www.aaai.org/ocs/index.php/ICWSM/ICWSM12/paper/viewFile/ 4523/4961

APC. (2001). Section 5.3: Right to encryption. *Internet Rights Charter.* https://www.apc.org/node/5677#5

Assenmacher, D Clever, L., Frischlich, L., Quandt, T., Trautmann, H., and Grimme, C. (2020). Demystifying Social Bots: On the Intelligence of Automated Social Media Actors. journals.sagepub.com/home/sms DOI: 10.1177/2056305120939264

Basu, K., Wang, H., Dominguez, N., Li, X., Li, F., Varanasi S and Gupta, G. (2021). CASPR: A Commonsense Reasoning-based Conversational Socialbot, arxiv:2110.05387v1 [cs.AI] 11 Oct 2021

Bessi, A., & Ferrara, E. (2016). Social bots distort the 2016 US presidential election online discussion. *First Monday, 21(11).* https://doi.org/10.5210/fm.v21i11.7090

Boshmaf, Y., Ildar M., Konstantin B., and Matei R. (2011). "The Socialbot Network: When Bots Socialize for Fame and Money," *Proceedings of the Twenty-Seventh Annual Computer Security Applications Conference,* New York: Association for Computing Machinery http://lersse-dl.ece.ubc.ca/record/264/files/264.pdf

Caldarini, G., Jaf, S., and McGarry, K. (2022). A literature survey of recent advances in Chatbots. MDPI https://doi.org/10.3390/info13010041

Caswell, D., & Dörr, K. (2018). Automated Journalism 2.0: Event-driven narratives. From simple descriptions to real stories. Journalism Practice, 12(4), 477-496. https://tandfonline.com/doi/full/10.1080/17512786.2017.1320773

Cohen, N. S. (2015, may 15). Pink Slips to Pink Slime: Transforming Media Labor in a Digital Age. The Communication Review. doi:10.1080/10714421.2015.1031996

Couper, M.P. (2000). Web Survey: a review of issues and approaches. Public Opinion Quarterly, 64 464-494.

Dignum, V., and Mols, B (2021). The role of humans in the digital society www.digitalfuturesociety.com

Dobber, T., Metoui, N., Trilling, D., Helberger, N and

de Vreese, C. (2021). Do (Microtargeted) Deepfakes Have Real Effects on Political Attitudes? International Journal of Press and Politics. Vol.26 (1) 69-91

Edwards, C, Autumn E, Patric S, and Ashleigh S, (2014). Is that a Robot running the social media feed? Testing the differences in perceptions of communication quality for a human agent and a bot agent on Twitter, *Computers in Human Behavior, 33*, pp. 372–376.

Forelle, M., Phil, H., Adres M, and Saiph S. (2015). *Political Bots and the Manipulation of Public Opinion in Venezuela* https://ssrn.com/abstract=2635800

Ferrara, E., Varol, O., Davis, C., Menczer, F., and Flammini, A. (2016), "The rise of social bots", *Communications of the ACM, 59(7),* pp. 96–104. https://doi.org/10.1145/2818717

Fishburn, P. C., & Kochenberger,G. A. (1979). Two-piece Von Neumann-Morgensternutility functions. Decision Sciences, 10, 503-518.

Gaus, G. (2017). The open society and Its friends with friends like these, who needs enemies? *The Critique* January/February 2017 Issue 1 www.critique.com

Godulla, A., Bauer, M., Dietlmeier, J., Lück, A., Matzen, M., & Vaaßen, F. (2021).Good bot vs. bad bot: Opportunities and consequences of using automated software in corporate communications. Leipzig. https://nbn-resolving.org/ urn:nbn:de: 0168-ssoar-71669-4

Grimme, C., Preuss, M., Adam, L., & Trautmann, H. (2017). Social bots: Human-like by means of human control? *Big Data, 5(4),* 279–293.

Guertin, B. (2009). The 800-Pound Gorilla of Sales: How to Dominate Your Market 1st edition Wiley;

Gumz, J.D. and Mohabbat Kar, R. (2016), "Social Bots", available at: https://www.oeffentliche-it.de/-/social-bots

Gunkel D (2018) Ars ex machina: rethinking responsibility in the age of creative machines. In:Guzman A (ed.) *Human-Machine Communication.* New York: Peter Lang, pp. 221–236.

Haller, A. (2017). *Der Wahlkampf im Netz: Twitter, Facebook, Social Bots, Fake News und die Folgen.*

Harringer, C. (2018). "Good Bot, Bad Bot"? *Information - Wissenschaft & Praxis* , Vol. 69 No. 5, pp. 257–264.

Hofeditz, L., Ehnis, C., Bunker, D., Brachten, F., and Stieglitz, S. (2019), Meaningful use of social bots? Possible applications in crisis communication during disasters. In *27th European conf on information systems (ECIS).*

Iosifidis, P., and Wheeler, M. (2015). The Public Sphere and Network Democracy: Social movements and Political Change? Global Media Journal. 13. 25 pp.1-17

Kahneman, Daniel, & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47, 263-291.

Kalb, M. (2022). Press 'bothsideism' has failed Biden and America https://www.brookings. edu/blog/fixgov/2022/07/21/

Kellner, D.(2013). Habermas, the Public Sphere, and Democracy: A Critical Intervention (http://www.gseis.ucla.edu/faculty/kellner/)

Khalid, I. (2022). Nigerian student Aminu Adamu Mohammed accused of defaming Aisha Buhari. BBC Africa live. Updates around the world. November 30th 2022. https://www.bbc.com/news/world-africa-63805455

Kietzmann, J., Lee, L. W., McCarthy, I. P., and Kietzmann, T. C., (2020). Deepfake: Tricks or Treat? Sciencedirect https://doi.org/10.1016/j. bushor.2019.11.006

Kollanyi, B., Howard, P. N., & Woolley, S. C. (2016). *Bots and auto- mation over Twitter during the U.S. election* (Technical Report Data Memo 2016.4). Oxford, UK: Project on Computational Propaganda.

Lester, S (1999) 'An introduction to phenomenological research,' Taunton UK, Stan Lester Developments (www.sld.demon.co.uk/resmethy.pdf, accessed [date])

Levy, J.S (1992). An Introduction to Prospect Theory. Political Psychology, Vol. 13, No. 2, Special Issue: Prospect Theory and Political Psychology, (Jun., 1992), pp. 171-186

Lutz C and Tamò A (2018) Communicating with robots. In: Guzman A (ed.) *Human-Machine Communication.* New York: Peter Lang, pp. 145–165.

(Marcellino, W., Magnuson, M., Stickells, A., Boudreaux, B., Helmus, T.C., Geist, E. and Winkelman, 2020, p.68).Counter-radicalization bots research: using bots to fight violent extrememism. Support RAND

Marcondes, F.S., Almeida, J. J. and Novias, P. (2013).Chatbot Theory: a naïve and elementary theory for dialogue management. http://algoritmi.uminho.pt/

Montal, T., & Reich, Z. (2017). I, Robot. You, Journalist. Who is the Author? Digital journalism, 5(7), 829-849. https://tandfonline.com/doi/full/10.1080/21670811. 2016.1209083

Oluwasanjo, A. (2022). Nigerians knock first lady Aisha Buhari, SSS for jailing critic Peoples Gazette November 29th 2022 https://gazettengr.com/nigerians-knock-first-lady-aisha-buhari-sss-for-jailing-critic/

Orcutt, M, (2012). "Twitter Mischief Plagues Mexico's Election," *MIT Technology Review,* June 21.https://w w w.technolog yreview.com/2012/06/21/185262/t witter-mischief-plagues -mexicos-election/

Price water house Coopers GmbH Wirtschaftsprüfungsgesellschaft (PwC) (Ed.).

(2020), "Digitale Ethik. Orientierung, Werte und Haltung für eine digitale Welt" available at: https://www.pwc.de/de/managementberatung/risk/digitale-ethik.html.

Roettger, U. and Wiencierz, P. (2018), "Die PR braucht neue Regeln", available at: https://www.pressesprecher.com/nachrichten/big-data-neue-regeln-fuer-die-pr- 708667037 (accessed 7 June 2020).

Ross, B., Pilz, L., Cabrera, B., Brachten, F., Neubaum, G., & Stieglitz, S. (2019). Are social bots a real threat? An agent- based model of the spiral of silence to analyse the impact of manipulative actors in social networks. *European Journal of Information Systems, 28,* 394–412.

Roth, Y., & Harvey, D. (2018). *How Twitter is fighting spam and malicious automation* [Technical report]. Stanford, CA: Twitter.

Scharre, P. (2018). *Army of none: autonomous weapons and the future of war.* www. Norton & Company

Shank, Daniel B. 2010. "An Affect Control Theory of Technology." Current Research in Social Psychology 15(10):1-13.

Shank, D. B., Burns, A., Rodriguez, S. and Bowen, M. (2020). Software Program, Bot, or Artificial Intelligence? Affective Sentiments across General Technology Labels. Current Research in Social Psychology http://www.uiowa.edu/-grpproc/crisp/crisp.html

Shum, H., He, X., and Li, D. (2018), "From Eliza to XiaoIce: Challenges and opportunities with social chatbots", *Frontiers of Information Technology & Electronic Engineering,* Vol. 19 No. 1, pp. 10–26.

Srinivasan, K.,Nguyen, C., and Tanguturi, P. (2017). Chatbots Are Here to Stay.So What are you Waiting for? www.accenture.com.

Stefan, S; Ansgar, Z; Daniel, Z; Sünje, C; and Karen B (2022). Communications trend radar 2022. Language awareness, closed communication, gigification, synthetic media & cybersecurity. *Communication Insights, No. 14*, Academic Society for Management & Communication, Leipzig.

Subrahmanian, V. S., Amos A, Skylar D, Vadim K, Aram G, Kristina L, Linhong Z, Emilio F, Alessandro F, Fillippo M, Andrew S, Alexander D, Shuyang G, Tad H, Farshad K, Yan L, Onur V, Prashant S, Vinod V, Qiaozhu M, and Tim H, (2016). "The DARPA Twitter Bot Challenge," *Computer,* 49, 6, https://arxiv.org/abs/1601.05140

Thaldar, B. (2017). The open society: What does it really mean? https://www.researchgate.net/publication/323938223

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. Journal of Business, 59 (no. 4, pt. 2), S251-S278.

Um, T., Kim, T., and Chung, N. (2020). How does an Intelligence Chatbot Affect Customers Compared with Self-Service Technology for Sustainable Services? *12,* 5119; doi:10.3390/su12125119 *www.mdpi.com/journal/sustainability*

Varol, O., Ferrara, E., Davis, C. A., Menczer, F., & Flammini, A. (2017). Online human-bot interactions: Detection, estima- tion, and characterization. In: *Proceedings of the Eleventh International AAAI Conference on Web and Social Media* (pp. 280–289). Association for the Advancement of Artificial Intelligence.

Wiencierz, C., Berger, K., Roettger, U. and Wietholt, C. (2017), "Startklar für Big Data. Chancen, Voraussetzungen und Anwendungen für die Kommunikation, Communication Insights" No. 4, Akademische Gesellschaft für Unternehmensführung & Kommunikation, Leipzig.

Woolley, S. (2016). Automating power: Social bot interference in global politics. *First Monday, 21(4).* https://doi.org/10.5210/ fm.v21i4.6161 Symbolic reasoning for heathstone.www.radar.gsa.ac.uk