

# Barun ICT

## 2019. 9 September **ENG** newsletter

Barun ICT Research Center conducts research on various ICT issues to explore socially desirable solutions.  
Barun ICT Research Center aims to contribute to healthy and ethical ICT society.

## BARUN ICT Event

### Asia Privacy Bridge Forum, Fall 2019



The poster for the Asia Privacy Bridge Forum Fall 2019 features a blue background with a silhouette of a suspension bridge and a city skyline. At the top, logos for Yonsei University Graduate School of Information, Barun ICT Research Center, and Asia Privacy Bridge Forum are displayed. The main title 'Asia Privacy Bridge Forum Fall 2019' is in large white font, with the subtitle 'Human-Centered and Trustworthy AI Technology' below it. The event schedule is listed at the bottom left, and a QR code is on the bottom right.

**September 5, 2019 (Thu) 13:30~17:00**  
Kim Soon-Jeon Hall, The Lounge, Yonsei University

**September 6, 2019 (Fri) 09:00~17:00**  
New Millennium Hall, Yonsei University

On the theme, “Human-Centered and Trustworthy AI Technology,” the 8th Asia Privacy Bridge Forum will be hosted by Yonsei University during two consecutive days—from September 5th to 6th. Along with the Ministry of the Interior and Safety and the Korea Internet & Security Agency (KISA), it will be organized by Barun ICT Research Center of Yonsei University and the Yonsei Graduate School of Information. Privacy experts from Japan, Taiwan, India, and other Asian countries will participate in the event.

From September 5th at 1 p.m., the personal information experts’ discussion will take place in Yonsei University’s Kim Soon-Jeon Hall. The experts will discuss privacy policies of key Asian countries in the era of AI and big data, as well as ratify and improve upon the Cross-border Information Request/ Collaboration (CIR) Toolkit, particularly on countermeasures in the case of privacy breaches.

The second day of the APB Forum will be co-organized by the Information Systems Audit and Control Association Korea (ISACA Korea) at Yonsei’s New Millennium Hall. In addition to sharing the AI policies of international companies such as Facebook, the APB Forum will also discuss privacy protection cases of Asian countries and the transfer and protection of personal information across borders through the Asia-Pacific Economic Cooperation (APEC) CBPR.

The APB Forum endeavors to provide insight into privacy issues and trends in the age of AI and big data. Applications to participate and further details on the event can be found at the APB homepage (<http://apbforum.org>), and registration on-site will also be available. 

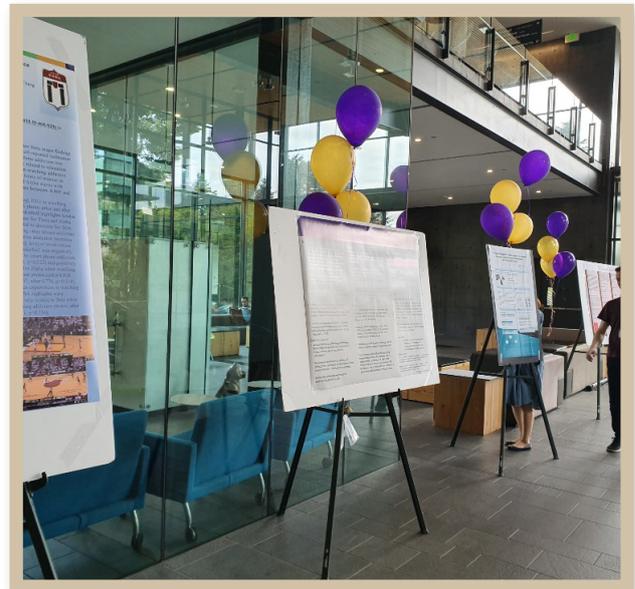
## What Causes Addictive Consumption Behavior?

Miyea Kim, Jeongsoo Han, Mina Jun (2019). The Roots of Maladaptive Consumption in Social Media: Focusing on the Consumers' Powerlessness and Online Fake Identity. *2019 SCP Boutique Conference in Seattle, August 23-24, 2019, Seattle, Washington.*

**Miyea KIM**

Research Professor, Barun ICT Research Center, Yonsei University

### *Society for Consumer Psychology Conference*



After the WHO's decision to classify game addiction as a disease, attention towards it has increased rapidly. Maladaptive consumption commonly includes all types of addiction related to alcohol, drugs, gambling, shopping, smoking, food, internet and technology, that not only damages individuals but also makes government pay a price physically, socially, and financially. Considering its wide ranging and serious implications, it must be further studied. The Society for Consumer Psychology (SCP) held a conference, "Addiction and Maladaptive Consumption" at the University of Washington from August 23rd-24th. Scholars shared factors that come from consumer addiction, maladaptive consumption, and psychological process of consumption related to addictive behaviors.

Miyea Kim, a research professor at Barun ICT Research Center, Yonsei University attended the SCP conference and presented a study, "The Relationship between Social Media and Addiction Consumers' Powerlessness". This study shows that the main source of consumers' maladaptive behavior such as exposing one's distorted self or content (e.g. fake profile) could be manifestations of consumers' powerlessness. By distorting oneself they are escaping from socially or economically oppressed negative sentiment (powerlessness) and causing maladaptive behavior such as sharing a fake-self to reduce their psychological anxiety. 🌈

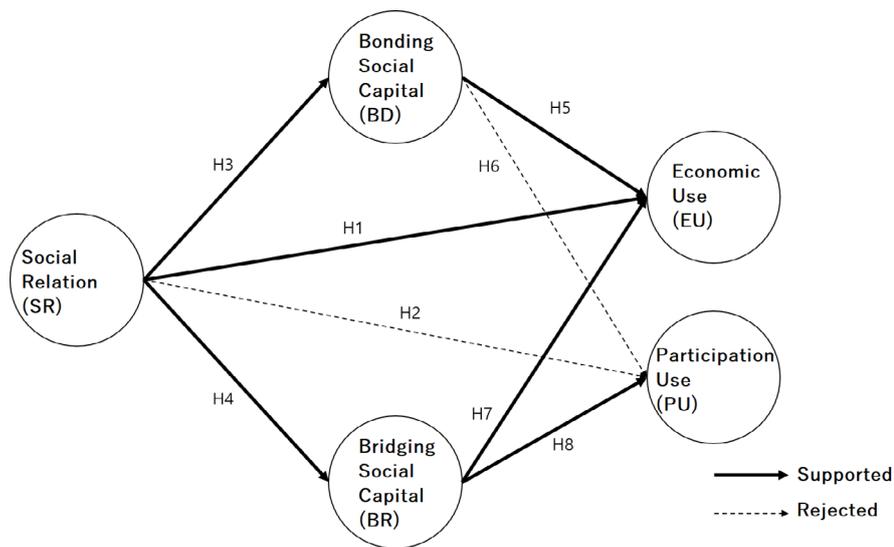
# Role of Social Relations and Social Capital for the Economic and Social Participatory Use of Internet

Yunmo Koo & Joohyun Oh (2019).

Effect of Social Relations on Digital Device Usage: A Social Relations Perspective. *Information Systems Review*, 21(3), 131-149.

**Yunmo KOO and Joohyun OH**

Research Professor, Barun ICT Research Center, Yonsei University



While traditional theoretical discussions on the digital divide focused on accessibility, the widespread distribution of digital devices such as smartphones and tablets have expanded the focus to include the effective use, active production, and sharing of information. A social discussion on this issue is paramount, given that individual digital device usage behavior can directly influence human and physical networking and as a result may lead to a reproduction or even worsening of structures that contribute to social inequality.

Using the two types of social capital (bonding and bridging), suggested by existing research, this study examined the effects of an individual’s social relations on the economic and social participatory usage of digital devices. According to the results of an empirical analysis of 740 cases of survey data collected by a professional research firm, both bonding and bridging social capital were found to increase in the case of individuals with more horizontal social relations. However, an individual’s social relations was shown to influence the two types of digital device usage (economic, social participatory) indirectly through social capital, rather than directly. In particular, mediated effects were evident in both types of digital device usage in the case of bridging social capital. On the other hand, bonding social capital was shown to have mediated effects only on economic digital device usage.

These results suggest that rather than simply focusing on accessibility to digital devices, it is important to consider horizontal social relations when drawing up policies to reduce the digital divide. Furthermore, the results imply that when social capital is formed within horizontal social relations, it may lead to economic and social participatory digital device usage that can be of benefit to both individuals and society. 🤖

### Chey Institute for Advanced Studies' Science Innovation Conference: The AI Paradigm Shift and its Future Social Outlook

Yunmo KOO

Research Professor, Barun ICT Research Center, Yonsei University



 [https://www.youtube.com/channel/UClqxHMQZneFQ\\_vXGrmW1cMA/about?disable\\_polymer=1](https://www.youtube.com/channel/UClqxHMQZneFQ_vXGrmW1cMA/about?disable_polymer=1)

On the theme, “The Realistic Future of Human Life,” the first Chey Institute for Advanced Studies (CIAS) Science Innovation Conference was held from July 31st to August 1st at the Korea Foundation for Advanced Studies Conference Hall. Founded on the 20th anniversary of SK Group Chairman Jong-hyun Chey’s appointment, CIAS is an academic group that endeavors to provide a forum to analyze the opportunities and challenges of the development of future sciences and technology, as well as prepare for a better future. Specifically, the conference began with presentations from Paul Alivisatos, Professor of Chemistry and Materials Science & Engineering and Executive Vice Chancellor and Provost at UC Berkeley (who presented on the topic of nanomaterials), and Stephen Boyd, Professor and Chair of Electrical Engineering at Stanford University (who discussed AI and machine learning), subsequently followed by sessions on artificial intelligence, life science, neuroscience, quantum science and technology, and more.

In particular, the first session, “Artificial Intelligence,” was comprised of presentations from Professor Takeo Kanade of Carnegie Mellon University, Professor Byoung-Tak Zhang of Seoul National University, and Professor Mingoo Seok of Columbia University. The first presenter, Professor Kanade, pointed out that advances in computer vision and robotics are accelerating through linkages with new sensor technologies and powerful learning algorithms. In the following presentation, Professor Zhang argued that the new paradigm of artificial intelligence is evolving into Cognitive AI (3rd generation) based on Autonomous Learning through Symbolic AI (1st generation) and Connectionist AI (2nd generation). Last, Professor Seok introduced a new chip architecture that will perform deep learning more efficiently than before.

While participating in this conference, Research Professor Yunmo Koo explored the latest research trends in the field of artificial intelligence, shared research ideas, and established academic networks with domestic and international scholars. 



### 5G Technologies Made Hologram Meeting Possible in Movies

[SKT Insight SKT 5GX ICT Column] 19.07.15

How has commercialized 5G service benefited customers in Korea? Compared to 4G (LTE), 5G has a 10 times faster latency. Latency is the time spent when servers and users exchange data. This has made it possible to have remote medical examinations and operations or hologram meetings similar to what we have seen in movies. Another characteristic of 5G, super-connectedness, means all digital devices are connected to 5G networks and help to make smart environments such as smart offices, smart factories, and smart cities. For example, the 5G research center Columbia University and Verizon collaborate on has established a platform which makes remote physical therapy possible. All these are based on IoT such as Samsung’s SmartThings, and LG’s TingQ. Without any doubt, 5G will offer more and better benefits towards users. However, negative aspects still exist as development of technology, products, and services are taking place simultaneously.

Source: <https://www.sktinsight.com/116792>

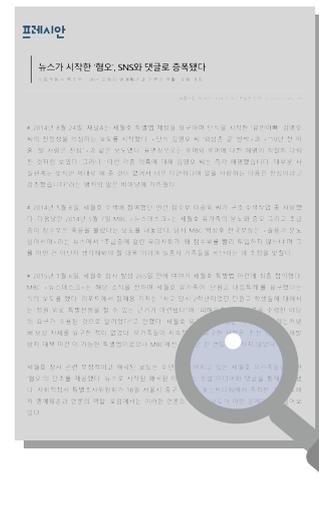


### News Spreading Hate; Social Media and Comments Make It Worse

[Pressian] 19.07.19

Distorted stories that start from the news usually worsen through social media and their comments. The Social Disasters Commission held a forum, “Defamation and the role of the press” on July 18th to better consider the problems caused by distorted news. Huh Yoon, Chief Defense Counsel of the Korean Bar Association, gave Sewol Ferry related news as an example of such distorted pieces creating hate towards victims. Consequently in order to protect victims strict standards must be applied to punish those who create and spread distorted information. Dukjin Kim, assistant director of the Korea Insight research center said that the press takes a crucial role in “hatred networks”, and the news articles and comments are delivered to users as content. Spreading false information through comments has become a serious issue. Baruch ICT research center analysis indicated that one of every four people think comments have an effect and ultimately change their minds after reading them. This proves that comments are powerful as a new media channel.

Source: <http://www.pressian.com/news/article/?no=249695>



### How to Respond to Fake News

[SKT Insight SKT 5GX ICT Column] 19.08.02

What makes fakes news spread so quickly? In terms of production and proliferation, increased use of social media could be one reason. Thanks to social media, anyone can create content, but decreasing reliability among news channels is the main reason of the recent proliferation of fake news. It usually intensifies regional and social polarization and could ultimately contribute to social unrest as a result. Despite this, the public does not have enough capacity or time to look for the source of the news or credibility of material that builds it.

Research is ongoing using AI to differentiate fake from real news. For example, the fake news detection project, one of the medium and long-term research projects at the Barun ICT Research Center, is led by Professor Miyoung Cha. The fake news checklist that Barun ICT and Dong-A Ilbo developed together is another example that uses AI and assists the public in making right decisions when consuming news. However, individuals are the ones who decide whether to believe such content or traditional and established sources. Consequently, it is imperative to recognize the danger of fake news and to ascertain its sources.

Source: <https://www.sktinsight.com/117112>



## Construction Sites Without People, Smart Construction Using 5G

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Sources: freepik

Having moved past the 4G (LTE) era, it would not be an overstatement to claim that we are now living in the 5G era. While smartphones are the most common type of 5G device in our daily lives, 5G is also being used and developed across various areas such as virtual and augmented reality and smart cities. In particular, it is currently being used in construction and architecture. For instance, construction equipment companies have recently teamed up with telecommunications companies to provide 5G solutions.

At this year's Bauma, the world's largest international trade fair for construction machinery, Doosan Infracore and LG U+ gave a joint exhibition of 5G remote control technologies. They controlled an excavator in Incheon, located 8500 km away from the control center set up at the exhibition center in Munich, Germany. Simultaneously they were also able to demonstrate the 3D Machine Guide solution which uses sensors installed on the excavator to precisely measure the wideness and depth of a construction site in 3D [1].

Hyundai Construction Equipment also attended the event to showcase their Live Caster technology which makes it possible to broadcast ultra-high-definition footage of a construction site in real time. Last December, Hyundai Construction signed an agreement with SK Telecom and Trimble to develop 5G Smart Construction Solution and promote business [2]. 5G Smart Construction Solution is a technology that implements 5G and ICT technologies to enhance construction efficiency in civil engineering and construction sites. This technology helps improve construction efficiency at construction sites with smart construction equipment. It also increases equipment operation time and reduces maintenance costs by utilizing 5G communications network and sensors to make real-time construction site safety management, fault diagnosis, and remote control possible. The three companies are planning to maximize construction site operation management efficiency by implementing AI solutions.

If 5G Smart Construction Solution can become a reality, AI robots will carry out precise operations such as estimation, surveying, and design accurately and quickly.

Moreover, smart equipment that is connected through 5G communication networks will operate without a human behind the wheel in dangerous situations, while drones with cameras will monitor everything in real-time. However, smart construction is still only in the technology demonstration stages. Time and investment is required to construct 5G networks, secure automation equipment, etc. before unmanned 5G excavators, AI robots, or drones can be used in construction sites [3].

Unfortunately, the commercialization of smart construction solutions comes with certain problems. Namely, the possible unemployment of construction workers caused by the automation of construction equipment and use of robots and drones, stands as one of the biggest concerns of the industry. There are already predictions that 15-30% of all workers will lose their jobs due to automation. However, there are those who predict that new jobs will be created as the form of work changes. Thanks to technological developments, machines will be put in charge of physically demanding, complicated jobs while human beings will take care of new jobs that machines cannot carry out. Drivers of unmanned construction equipment and construction equipment safety managers are good examples of this change [4].

5G is being implemented in various fields to enhance efficiency and create new value. 5G based smart construction should strive not only to improve site management efficiency, but also to create a safe and enjoyable work environment and to develop a well-rounded solution that can promote customer values. 🤖

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# Examining the Current State of ICT through the Korean Boycott of Japanese Products

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BOYCOTT JAPAN  
'가지 않습니다'  
'사지 않습니다'

Boycotts of Japanese products have been spreading like wildfire in South Korea. The boycotts, which began as a backlash to Japan's announcement to remove Korea from its whitelist of favored trade partners, have caused quite a stir in South Korea and have since gained significant support [1]. The gist of the problem in Japan's decision was the restriction on semi-conductors. Japan laid restrictions on essential parts needed for the production of semiconductors. Consequently, Korean businesses are attempting to reduce their dependency on Japanese products. Samsung has decided to replace all Japanese products that go in the semiconductor production process with products from Korea, Europe, the US, and elsewhere. A "Japan-less" production principle has been established which will exclude Japanese materials from the production process to reduce the risks of any setbacks in semiconductor production [2].

Such a "Japan-less" trend must be sought after not just in hardware production, but also in the technical areas. ICT relies on interwoven and complex global supply chains and just-in-time inventory across the overall industry [3]. As such, international cooperation is critical. However, with regard to the troubles created by Japan's trade restrictions, we must seek to turn this crisis into an opportunity.

Japan's ICT industry far exceeds Korea's in terms of quantity. According to a report from the Korean IT market research firm KRG, Japan's ICT market is more than four times larger than the Korean ICT market. Japan boasts the 4th largest ICT market in the world, while the Korean market stands at 10th. In other words, Japan has a larger domestic demand market and sufficient human resources.

However, such a difference in quantity can be overcome through quality. In terms of qualitative improvements, Korea's potential is greater than Japan's. According to the 2017 ICT Development Index (IDI) announced by International Telecommunications Union (ITU), Korea ranked 2nd while Japan was 10th. More specifically, Korea topped the list in ICT readiness, ICT use, and ICT capability, surpassing Japan in terms of ICT application and usage.

It is true that cooperation is imperative in the ICT industry and working with Japan to improve our technological capacities is no different. That being said, it is equally important to establish independent technological capacities in case of any further political strain with Japan. For that to be possible, social awareness of copyright and security is absolutely necessary. In 2017, piracy rates in Japan were at 16%, while Korea's reached 32%. These statistics lay bare Korea's pressing need to improve social awareness on ICT usage [4]. A balanced development in production power, technology, and social awareness is critical in building an independent environment that is not overly dependent on Japan and other nations. 

Source: [1] Moon, S. (2019, August 13). Decours overseas and refining within the country- Current status of "Japan-less" semiconductors. Ilyo newspaper.. Retrieved from [http://ilyo.co.kr/?ac=article\\_view&entry\\_id=344345](http://ilyo.co.kr/?ac=article_view&entry_id=344345)

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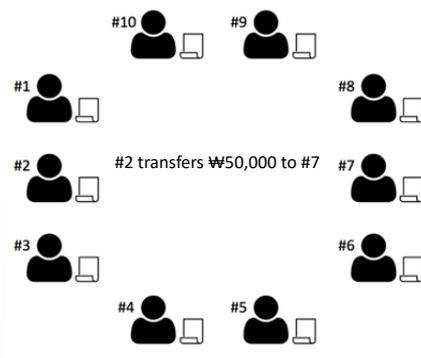
## Facebook's Libra: A Currency Gamechanger?

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Facebook, the world's largest social media group, announced last June that it will be venturing into a new market by issuing its very own cryptocurrency named Libra in 2020 [1]. Major waves are expected in global finance if Facebook, a giant of the tech industry but not a financial company, issues Libra. Then what is cryptocurrency and why is Facebook issuing their own so controversial?



Source: Understanding Bitcoin blockchain without extraterrestrial language

Libra is by no means the first cryptocurrency. Bitcoin was issued in 2009 and numerous others such as Ethereum soon followed. Cryptocurrency was the first technology to implement blockchain technology extensively and it attracted much attention as it enabled efficient transactions that did not require a centralized establishment and numerous intermediaries as banks do.

The current financial architecture revolves around a centralized system of banks as establishments recognized by the government. Blockchain however guarantees credibility by distributing a collective ledger to all participants of the system and having them record transactional information at the same time. Therefore, as the transactions are based on a collective record available

to all, centralized establishments such as banks and intermediaries are no longer necessary. Cryptocurrency was the first case to extensively utilize this feature of blockchain technology.

As individuals could carry out transactions without intermediaries, it soon gained many followers. However, the excessive price volatility made it impossible for cryptocurrency to shake off its speculative image. What's more, the amount of transactions it could handle at once was too few compared to existing systems like VISA, which is why it was thought to be unfit to adequately perform [2][3]. One of the cryptocurrencies developed to solve this issue is Libra, a stablecoin. Stablecoin refers to cryptocurrency that seeks price stability by pegging its value to actual assets such as a dollar, gold, bonds, etc. Existing cryptocurrency prices can fluctuate wildly depending on the size of a platform and the value of a company but the value of a stablecoin demonstrates higher price stability. This is because its value is linked to legal tender that is actually in use. Consequently stablecoin, unlike previous cryptocurrencies, has the potential to act as a method of payment in real life. Facebook has revealed that it would maintain Libra's intrinsic value by tying in bank deposits and short-term government securities as reserve assets every time Libra is produced [2]. Furthermore, Libra is said to be able to process around a thousand transactions per second. It is still less than VISA, which can process 3000 transactions per second, but it is a complete revolution compared to Bitcoin and Ethereum, which can only process an average of seven and thirteen transactions per second, respectively [4].

Then what sort of changes might be expected in the

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global financial sector once Libra is issued? Facebook stated that it developed Libra to offer an easily accessible financial infrastructure for the 1.7 billion financially underserved people across the world who do not possess a bank account [2]. In the existing financial market, the financially vulnerable had to bear the burden of a fee to use financial services. However, using cryptocurrency can exponentially reduce transaction fees and since financial services will be readily accessible without having to rely on complicated financial institutions, the entry barrier will be considerably lower than before. As of June 2019, Facebook has 2.4 billion users across the globe and has shown determination to venture into the financial market by having numerous partners including Visa, Mastercard, PayPal, Vodafone, Uber, and Ebay for the issuing of Libra [5].

But Facebook will have to overcome a number of challenges before it can actually issue Libra. As Libra could potentially be a game changer for the entire finance industry that is under the control of the government, US authorities have ordered to delay the issuing of Libra until relevant rules and regulations are finalized. A currency is money that is issued by the government and given value by the law. The authorities are worried that if Facebook, which possesses an immense network, were to issue currency independently, the central financial organization may collapse as a result. Ironically, although the idea of decentralization lies at the core of the background in which blockchain was developed, the system did not fully take root. As a result, power shifted to businesses such as Facebook. The business which advocated decentralization and criticized the inefficiency of a centralized institution had ironically become one. This created a situation where the business that advocated centralization and criticized the inefficiency of a centralized institution ended up becoming exactly that. Moreover, Facebook's repeated negligence of personal data protection (e.g. the Cambridge Analytica data scandal) has drawn their announcement to issue Libra considerable scrutiny.

Facebook founded a subsidiary called Calibra to focus

on issuing Libra, but has not been able to properly answer US authorities on why an IT company should carry out the role of issuing currencies. It even stated in a quarterly report submitted to the U.S. Securities and Exchange Commission that "... there can be no assurance that Libra or our associated products and services will be made available in a timely manner, or at all" [6].

Blockchain and cryptocurrency are most definitely technologies with the potential to change societies all over the world. As such, perhaps it is inevitable that an influential company such as Facebook develops blockchain products for the technology to take root among the public. But if the existing order were to collapse due to a blind faith in blockchain, it will stray from the ideals of decentralization and consequently lead to an even stronger centralized institution in the form of a company that operates under the pretense of decentralization. Therefore, every government and individuals must reflect upon the changes that cryptocurrency will bring to our society, so that we do not end up simply chasing after the pot of gold at the rainbow's end. 🌈

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## The Rise of Social Media in Electoral Politics: Strengthening Democracy or a Threat to Democratic Principles?

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It was expected that the advent of ICT and its platforms like social media sites would reinforce the democratic system of governance and engage citizens at all levels in the mainstream political discourse. Technology was meant to empower citizens and foster effective, accountable governance by strengthening the core principles of democracy—in particular, the “participation of people in the governance” [1]. To a greater extent, this phenomenon seems to be happening across the globe; with the rapid development in ICT infrastructure in developing countries and the increased penetration of mobile phones and internet facilities, this democratic principle is becoming possible [2]. Now, people who were previously excluded from mainstream media can execute their rights through the usage of social media which helps democratize the access to information and provide platforms for them to advocate their opinions on issues of public interest. However, the digital divide debate should not be ignored even in this aspect of political freedom [3]. Nevertheless, it is unprecedented in history to see such widespread engagement in democratic politics, made possible through the liberating technologies [4].

The other side of this boon is the increasing threats of social media sites when autocratic governments use these technologies to repress public protests and target dissenters. Not only are the authoritarian regimes at fault, but also governments in democratic countries have exploited the internet and its applications to suppress the opposition through new legislations and sedition charges [5]. The right to protest against the incumbent government has been strongly curtailed. Turkey and India have witnessed such incidents in the recent past, and if such crackdowns continue, the legend of the “Arab Spring” (which was hailed as the greatest gift of social media in the quest of democracy), will soon be forgotten.

The rise of populism and neo-fascism in the age of the Internet has been very prevalent as Ronald Deibert, a political scientist at the University of Toronto wrote in his essay: “It seems undeniable that social media must bear some of the blame for the descent into neo-fascism” [6]. The massive disinformation campaign on WhatsApp during the presidential election campaign in Brazil, election manipulation and destabilization of democracies abroad by some elements from China and Russia, sharing of junk news on Twitter by Trump’s followers, patriotic trolling in the Philippines and India are some of the cases that show how social media is used at the forefront of democratic politics and manipulated to polarize citizens prior to elections [7]. This is not limited to simply political interests related to elections, but also to issues like targeted hate crimes, fake news, jingoism, mob-lynching, moral policing, etc. [8]. According to a report on the abuse of social media in 48 countries published by the University of Oxford, “Social Media have gone beyond a platform for sharing collective grievances and coordinating civil engagements to being a manipulative tool to undermine the health of democratic regimes by politicians in democracies and dictatorships alike” [7].

The question that now arises is: are social media platforms the right tools for strengthening democracies and if they are, how can they be made more accountable, inclusive, and effective? The question of policing social media content is still debatable. If excessive policing is done, it would prevent the people’s participation in governance. Do civil societies and the advocates of democracy need to move forward and make this system more accountable? How will governments regulate the Internet and formulate policies to ensure the right usage of liberation technologies? These are open questions that are vital discussions for our times. The utility of such platforms should not be undermined. At the same time, however, there is also a need to re-define the role of the Internet in strengthening the democratic system and revising the role of individuals and other related stakeholders as safeguards of the emerging paradigm of democratic governance and values while mitigating the negative repercussions of technology in the foundations of democracy. 🌐



- Sources: [1] Stockholm University (2013). Building participatory democracy through ICT. Swedish Program for ICT in Developing Regions. Retrieved from [https://spidercenter.org/wp-content/blogs.dir/362/files/2016/11/SIF\\_Background\\_paper\\_Spider\\_May\\_2013.pdf](https://spidercenter.org/wp-content/blogs.dir/362/files/2016/11/SIF_Background_paper_Spider_May_2013.pdf)
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## Digital Divide in the ICT Laboral Area in Peru

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In Peru, the education sector continues to increase its focus on improving and increasing the number of teachers trained in ICT. At the same time, universities are training professionals capable of facing new labor demands in the light of technological development in ever higher numbers. However, this interest is not enough to face the new needs of the future. Peruvian universities are increasing the demand in careers related to computers and computer systems. In order to continue attracting the attention of a larger number of students, discussion forums and academic events are organized as well. For example, the Pontificia Catolica University of Peru takes the lead regarding such activities by planning the EDUTECH XXII this year. Despite the greater number of interested students, such efforts are more inclined towards the area of business administration rather than technology itself [1].

Additionally, the telephone foundation is also incurring training programs in seven Peruvian provinces so that professionals in education have the opportunity to experience and train specifically on the digital skills unique to their personal and work level. Such training programs have helped foster a greater number of Peruvian students to learn in an enhanced educational environment and in innovative ways. It remains hopeful that these young people will become future professionals with greater knowledge and familiarity in the area of ICT.

However, according to the newspaper CIO PERU, Peru will have a gap of 31% in ICT professionals by 2019 [2]. This study analyzes the availability of professionals with ICT technology in 10 countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Peru, etc.) from 2015 to 2019. As for Peru, the gap reached 38% in 2015 (an equivalent to 15,531 jobs) and it is estimated that by 2019 the gap will be 31%, (17,148 jobs). For that year, an overwhelming 94% of the gap will be composed of new, emerging technologies.

The Peruvian government is pursuing a variety of activities to change this situation, but it still requires more time, effort and investment to meet these new future demands [2]. Equally as important is that the Peruvian youth is more informed about job opportunities in the IT and technology sector. To achieve this goal, it is necessary to incur the support of public and private entities as well as the active participation of the government, particularly through the Ministry of Education. 

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## A Step to Prevent Fake News

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The Internet is a medium that has no boundaries, with unfettered usage possible for anyone. Consequently, a modern-day problem is that there is no way to stop the spread of fake news. However, though there is no way to prevent its spread, it does not mean that it should be neglected entirely. Last year, a study conducted by Cambridge University yielded positive results in that it discovered a method which could prevent people from believing and spreading fake news[1].

A game called “Bad News” was created for this study which works as a social media simulation[2]. Players were first introduced to propaganda strategies with which they would spread fear, hate, and anger through various strategies such as Twitter bots or Photoshop. They could even steal someone’s identity or fabricate any scandal. The more manipulation they used to wreak havoc, the more badges they subsequently earned. In addition, players were given different headlines or tweets each time they started and ended the game, through which they had to rate its reliability.

From the game’s results, the researchers could analyse how players’ rating changed from before and after the game; so far, the results indicate that players improved their ability to spot and resist misinformation after playing the game. “When you go to a magic show you may be duped by the trick because you don't know how it works, but once you know how it works you won't be fooled again,” said Van der Linden, one of the researchers. The more the player becomes familiar with it, the easier they could recognize fake news the next time.

Preventing fake news from spreading like a wildfire is impossible to do. However, what we can do is educate people not to solely believe every statement or piece of news based on an online source, especially since people tend to easily believe something if it is in their favor. The effort to educate people such as what had been done by the “Bad News” research study should gain more publicity and recognition particularly as more people use the Internet in their daily life and as their main source of information. 🌐

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Barun ICT Research Center awards the Best Essay Prize about ICT issues monthly.  
This series publishes the winning student essays each month.

## The Fourth “Inequality” Revolution

**Written By** Juwon LEE  
English Language & Literature

“The Fourth Industrial Revolution is an opportunity to help everyone...to harness converging technologies in order to create an inclusive, human-centred future” [1]. Optimists believe that as technology evolves, it will create a better future for everyone. However, I was skeptical of this and instead speculated about the challenges or problems that our society will face due to the 4th Industrial Revolution. Is the future of the Fourth Industrial Revolution truly equal, “inclusive,” and “human-centred,” or will it make the uneven playing field even worse, further polarizing the socioeconomic classes? In answering these questions, I examined three articles, “The Fourth Industrial Revolution Threatens More Global Inequalities?” by Paresh Soni, “Artificial Intelligence (AI) and the Evolution of Digital Divides” by Andres Lombana Bermudez, and “More Technology Doesn’t Mean Less Inequality” by Aim Sinpeng.

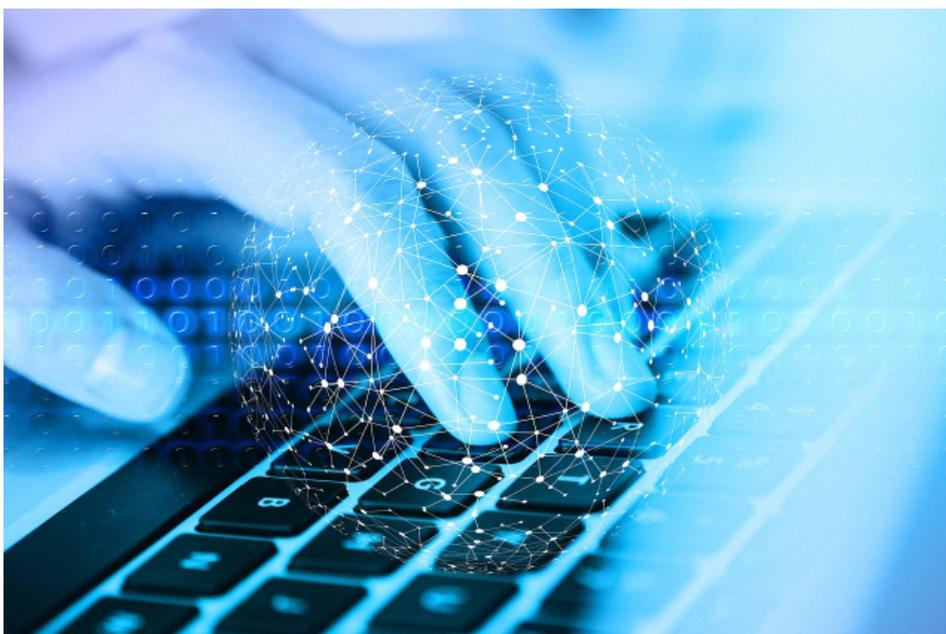
Soni, Bermudez, and Sinpeng unitedly agree that the development of technology, combined with unevenly distributed social assets, can exacerbate socioeconomic divides among social classes. While they all concede that technology access alone isn’t the main factor of the divide, Sinpeng in particular displays a highly critical opinion of the access-centric approach that failed to close the digital gap. I agree with the three authors’ concerns about technology diffusion reproducing or intensifying the divide between social classes. Furthermore, I find Bermudez’s attempt to apply the digital gap problem in the context of AI technology very relevant, as I believe the up-and-coming development of AI will accelerate the Fourth Industrial Revolution and will make or break this dilemma.



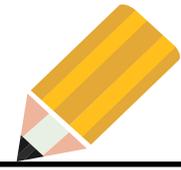
## BARUN ICT Events

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Firstly, all three authors have similar concerns regarding the combination of an unbalanced social structure and technological advancements adding to the unequal status quo. Soni criticizes that while technologies grow and expand, certain groups of people are “more or less privileged in accessing and using” them. He mentions statistics that demonstrate how many of the world’s population still aren’t connected to the Internet, and how these groups retain “specific demographic, social, economic, racial, ethnic, gender, and political characteristics” [2] that lead to their digital exclusion. Similar to Soni, Bermudez cites studies that show how access disparities in developed countries also correspond with “age, race...gender, education, and income,” complementing Soni’s apprehension over the correlation of one’s socioeconomic status and their lack of digital connectivity. However, Bermudez takes this issue further by explaining that digital inequality evolves and changes with technological progress, which results in not only imbalance of access, but differences in online practices and outcomes from technology use as well. Adding onto this, Sinpeng examines specific situations where socioeconomic differences are reinforced by digital inequalities, showing that a large portion of developing economies isn’t connected digitally. In conclusion, all authors have identical claims that technological progress may be to blame for heightening social divides.



All three authors also share the idea that digital inaccessibility, while important, isn’t the only element causing this divide. Soni claims that access to technology by itself can’t ensure equal benefits. He posits that Internet users without universal digital connection and proper regulations, such as in developing nations, are restricted in adding value to, and gaining full benefits from, ICTs. Bermudez agrees that the digital gap isn’t limited to physical access. While acknowledging that the “unevenness of technology access” to computers or the Internet plays a role in digital disparities, Likewise, Sinpeng states that “digital inequality cannot be reduced...to a binary view of access” and endorses for focusing on “five dimensions of inequality” among users: technical access, autonomy of use, digital literacy, social support, and purpose of Internet use [3]. Thus, all authors recognize that access inequality on a physical level on its own isn’t responsible for the digital, and consequently social gap.



I concur with the authors' collective opinion that technological advancements may propel the socioeconomic gap between the privileged and the underprivileged. I sympathize with Soni's apprehension over the persistent gap between those highly skilled enough to "make use" of evolving technology and those who aren't able to. Moreover, I believe the growth speed of the gap between classes will even accelerate since better-off people who possess quality access, information, and techniques can use technology to their fullest advantage, as Bermudez predicts, while the rest are left behind in the fast-paced digital revolution. In addition, I agree with Sinpeng in that the interrelated nature between the digital divide and established social inequalities is the main obstacle in bridging the gap. The digital era demands high-level skillsets such as digital autonomy or digital literacy, which only a few are entitled to. The result is that technology development inevitably expands and reinforces the growing social divide between the two groups.

However, I find Bermudez's concerns of AI technology's critical influence on the digital divide most crucial, considering that AI is the leading frontier of the Fourth Industrial Revolution. Artificial intelligence technology is a powerful force weaving its way into every aspect of society. Although many anticipate AI technology to push society into the next phase of a worldwide revolution, I, along with Bermudez, expect it to be the driving force behind the deepening chasm of worldwide polarization instead. AI technology's use of complex machinations will certainly invigorate the development process, but it also leads to a demand for more advanced skillsets for AI deployment than was required for previous ICTs [4]. This makes AI technology neither affordable nor accessible to the public, further widening the split between the "haves" and "have-nots" [2]. Those that have not yet successfully bridged the previous gaps won't be able to match the speed of AI development and will only further lag behind. In the end, AI technology will repeat the same discriminatory paths of previous social divides, with a select number of people monopolizing the benefits.

In short, I concur with the three authors that technology dispersion in the Fourth Industrial Revolution will inevitably have a negative effect on society's persisting inequalities. While I'd like to believe the Fourth Industrial Revolution can construct an "inclusive, human-centred" society [1] as optimists do, it's clear that without curing the world's perpetual affliction of social exclusion and uneven resource distribution, not everyone will be a part of its transformation. The Fourth Industrial Revolution promises many things, but when a so-called "revolution" is exclusive for the privileged, we have to ask: a revolution for whom? 🤖

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