Analyzing the Plausible Alternatives in Contracting the Societal Fissure Caused by Digital Divide in Sri Lanka

Manuela Nayantara Jeyaraj

Abstract—'Digital Divide' is a concept that has existed in this paradigm ever since the discovery of the first-generation technologies. Before the turn of the century, it was basically used to describe the gap between those with telephone communication access and those without it. At present, it is plainly descriptive in itself to illustrate the cavity among those with Internet access and those without. Though the concept of digital divide has been merely lying in sight for as long as time itself, the friction it caused has not yet been fully realized to solve major crisis situations. Unlike well-developed countries, Sri Lanka is still in the verge of moving farther away from a developing country in the race towards reaching a developed state. Access to technological resources varies from region to region, even within the island itself, with one region having a considerable percentage of its community exposed to the Internet and its related technologies, and the other unaware of such. Thus, this paper intends to analyze the roots for the still-extant gap instigated based on the concept of 'Digital Divide' and explores the plausible potentials that could be brought about by narrowing this prevailing percentage among the population, specifically entrenching the advantages reaped towards an economic augmentation and culture or lifestyle revolution on the path towards development.

Keywords—Communication, digital divide, society, Sri Lanka.

I. INTRODUCTION

DIGITAL divide is a term that can be used interchangeably depending on varying instances and stakeholders involved in it. This concept was reconnoitered in parallel with changing technologies. As a very basic and plainly stated illustration of what *'Digital Divide'* is used to mean is the gap or division among the community in demographic patterns on those having access to *technology.*

Technology, in general, is a very vast area that deserves its own definition. Here, we are constricting the definition that we will be providing for technology with regard to Digital Divide. Since the term *'Digital Divide'* came into popular use, starting from the early 1990s, the technologies that were in common use at that time until now can be pooled together here.

In the present fast moving world, day to day tasks are being automated by the minute, forcing society to move forth and resort to digital and virtual aid, whether they like it or not. In this ever so changing digitized process, there still exists a considerable portion of the society that has little or no access to digitized technologies. One example of this instance can be

Manuela Nayantara Jeyaraj is with the Sri Lanka Institute of Information Technology (SLIIT) (phone: 0094-77-3265306; e-mail: nayantara_94@yahoo.com).

observed in Sri Lanka, which is still on the verge of moving towards a developed country from its current developing stage.

Though, we often do not realize what significant effect this gap could pose on an important level, this paper intends to reveal *'Digital Divide'* as a base and prioritized factor that serves as the root cause for several economic and societal setbacks that exist in Sri Lanka. By drilling down and identifying the specificities of the concept's effects within the Sri Lankan context, it is expected to propose plausible solutions that could be feasible implementations towards overcoming the *'Digital Divide'*.

II. DIGITAL DIVIDE: AN OVERALL CONTEMPLATION

A. Definition

'Digital Divide' refers to the level of gap or split between *demographic groups* based on those having *access* to *technology rendered information* and those who do not have access to such digitized information and data. In this definition, there are three major phrases that need to be drilled down further to give the term *'Digital* Divide', a broader context in its meaning.

The first phrase is *'Demographic Groups'*. *Demographic* solely means the structural organization based on statistical metrics of the population [1]. But within the context of Digital Divide, it should be considered as the structural organization of a digitally augmenting population and the metrics used in this regard need to be correlated with the information access based metrics as well.

The second phrase is *'Access'*. While this term might tend to be misunderstood as having permission to read and only read information from technological sources, considering it in a broader scope, *access* refers to retrieving, receiving, modifying, traversing through and moving digitized information within communication channels. It encapsulates the entire idea of having full access permissions equivalent to owning authorized digital data.

The most crucial part of the definition is *'Technology rendered information'*. In the present decade, it is without saying that digital information is more valuable than personal assets. Cyber-crimes are raging through the web at an alarming rate with the increased exposure and connectivity that the Internet age has brought about. So, understanding the implications of exposing oneself without care on the Internet and hence taking responsible measures to refrain from such

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threats is presently vital.

B. Scope of Digital Divide

The scope of Digital Divide is a concept that requires discussion under two major categories.

1) Technological Scope

Since this buzz-word is merely based on the access to technological resources energy, the progressive shift of technology from the past decade to the present also influenced the scope within which this was defined.

Before the 1990s, Digital Divide was used to illustrate the difference between those with access to telephone communication. During the latter part of the 20th century, this gradually evolved to describe the gap between those who had access to the internet and those without access to the web based technologies. [2]

2) Demographic Scope

The demographic scope in its entirety defines the entire population without restriction. But adding the concept of digital divide on top of this layer will redefine it.

Primarily, digital divide is constricted to indicate the gap between Internet access within cities and rural areas. Though this overview is true to a viable extent, a split within city demographics exists as well. This split is grounded upon the fact of the population's literacy, financial status and lifestyle.

C. Should We Ignore the Digital Divide?

This might be a controversial topic at present. Though we speak of *Digital Divide* as a threat on many different levels, it can also be argued that it helps balance out life as it is. Let us expand further on this statement. Imagine having a world where all human beings have resorted to digital assistance in one way or another. Even in this current age, starting from teenagers to middle aged and early senior adults find it hard to stay away from browsing the Internet, updating their social status and interacting with acquaintances on social networks. In studies concerning the social network and technology obsession of the present generation, it reveals the adverse effects of being too addicted to the Internet.

The crucial focus of concern, considering the *Digital Divide,* is on finding the optimal level of attachment and access to technology, specifically speaking, the Internet. Hence digital divide cannot be completely ignored. It needs to be balanced out to an appropriate level.

D. Stakeholders

Here, stakeholders depict the various classes of a population that are affected by this concept, both directly and indirectly. The various types of the population falling under these two classes are interwoven and affected by each other.

1) Direct Stakeholders

An existent end-user without access to Internet technologies can be categorized under this class. The reason for specifying this class of user as an existent end-user is to imply that even someone who possess the technical credentials to navigate through the web and has been a user of the Internet, but at the moment is disconnected or externalized from accessing these web services for a prolonged period, can be considered as someone who has been penalized by the digital divide. This class of stakeholders may or may not realize the extent to which they have been reprimanded by the digital divide since a considerable proportion of the participants under this class, are either those who have never had access to the Internet and have learned to fulfill their information needs manually, or those who have had their digital information needs satisfied by others.

2) Secondary Stakeholders

There tends to be a common misconception that those having full and unlimited access to web based services and technologies are not victimized by the digital divide, though they are an active end component in the definition of Digital Divide. But, according to this study, the secondary stakeholders are identified as victims, under specified terms and conditions.

The secondary stakeholders, as defined, have full access to digitized technologies. But their sustainability depends on the proportion of the population that their digital status is networked upon. This can be explained via a trivial comprehensible example.

Let us consider the currently trending social networks such as Facebook, Twitter and Google. When a user actively participates on these sites, the network platform makes a profit. Though we register for free, the site makes revenue for each user. This is measured by a metric called the Average revenue per user (ARPU). Each social network earns different revenue per user (Fig. 1). [3]
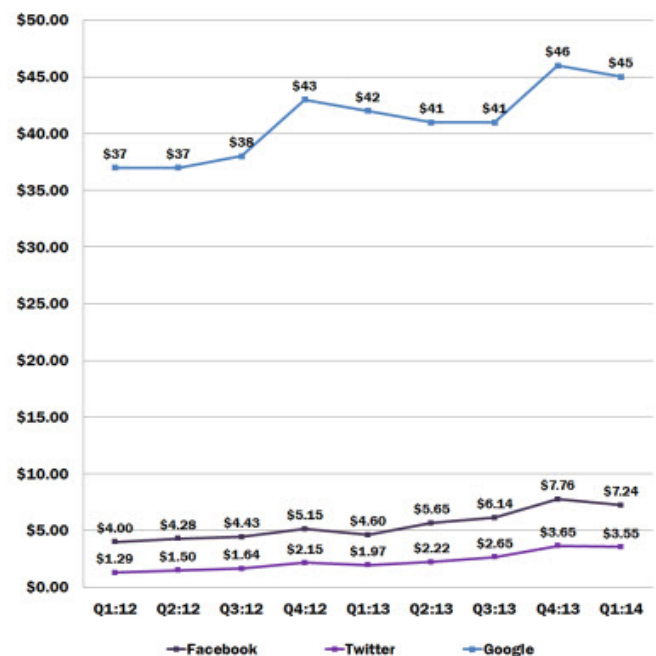

Fig. 1 Average revenue per user at Google, Facebook and Twitter

When we discuss about the revenue that each *Site* or *Social network* makes, it decides the profit earned by the developers

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and employees of that social network. So, when there are more people accessing their site, they make more revenue which is the whole point of maintaining the site. So, though the developers and employees of these social networks have vivid access to technology and web services, with the existence of the *digital divide,* which infers that there is a substantial proportion of the population that does not have access to Internet services, these social networks (developers and employees: Secondary stakeholders) are missing out on their number of users which might affect their sustainability both physically and financially. Hence, secondary stakeholders are also equally affected by the digital divide.

When we consider the stakeholders, the entire set of stakeholders including both the direct and secondary stakeholders, make up the entire population without exception (Fig. 2).
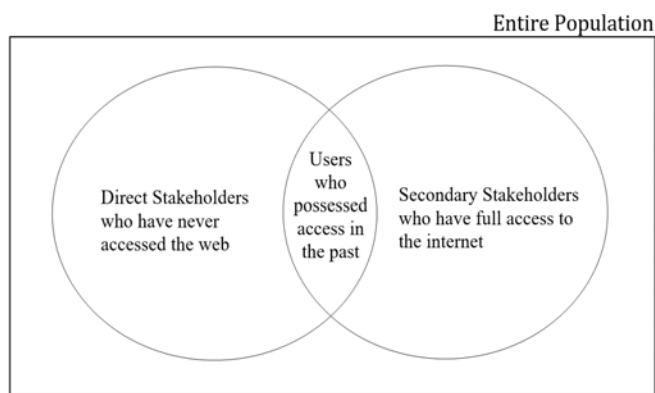

Fig. 2 Encapsulation of the Stakeholder classes by the population

E. Importance of Constricting Digital Divide

As discussed throughout this paper, digital divide brings upon both direct and indirect effects upon stakeholders who collectively form the entire nation. Considering the area within the Sri Lankan context, the importance is contemplated based on several factors that are closely knit with the fact that Sri Lanka is still a developing country.

a) Redefining the Literacy Rate

Sri Lanka is a country with an outstanding literacy rate of 92.63%, as reported by the UNESCO Institute of Statistics [4]. This is higher than an expected 3rd world developing country and is also the highest in South Asia and one of the highest in all of Asia. The actual question in this case is why is Sri Lanka still in the list of developing countries? A viable answer to this could be linked to the digital divide. Though the literacy rate is high, it is used to indicate all kinds of intellectual resources and abilities and does not plainly stick to the milieu of technology and digital access. So, in-spite of having highly qualified intellectuals, the reason that most of them are not adopted to the digital age in order to contribute towards the nation's development could be holding back Sri Lanka from being a developed country.

b) Connect Societies on a Common Ground

Due to the digital explosion, new terms and techniques have merged into lifestyles. As a result, it has created a gap between the society in understanding each other and conversing on the same level. Accumulation of this situation of not being able to comprehend each other brings about major clique partitions. This spans out to cause hindrance to development as one unit.

c) Break the Confinement

The Internet is a priceless store of information that gets updated each second. Staying in sync with relevant happenings around the world is a decisive factor in ensuring connectivity across borders. With a certain proportion of the nation not having access to the web, it is difficult to ensure this overseas network towards creating a single global network where each and every terminal or user has an equally active participatory rate. Hence, it is important to break this confinement and establish connections across borders by diminishing the digital divide.

F. Statistical Data on Non- Internet Users in Sri Lanka

Sri Lanka is currently placed at the lower 0.2% out of all the Internet users in the world (Table I) [5]. This statistic clearly states the issues discussed so far by ranking Sri Lanka in the lower percentage of Internet users which implies that the digital divide is still prime in Sri Lanka with a considerable proportion of the population not being exposed to Internet technologies.

TABLE I
SRI LANKAN NON-INTERNET USERS

Year	Internet Users	Penetration (% of Pop)	Total Population	Non-Users (Internet-less)
2016	6,087,164	29.3 %	20,810,816	14,723,652
2015	5,839,905	28.2 %	20,715,010	14,875,105
2014	5,319,700	25.8 %	20,618,991	15,299,291
2013	4,494,309	21.9 %	20,521,959	16,027,650
2012	3,734,219	18.3 %	20,421,862	16,687,643
2011	3,047,351	15 %	20,315,673	17,268,322
2010	2,424,157	12 %	20,201,312	17,777,155

III. KEYS TO THINNING DOWN THE DIGITAL DIVIDE

There are several ways in compressing the split created by the digital divide. But identifying the most suitable and applicable solutions that are implementable in Sri Lanka is a crucial step due to the susceptibility of the community to reject and stay hesitant towards accepting resolution structures that do not work in the first attempt itself.

A. One Laptop per Child (OLPC)

The OLPC system was launched in Sri Lanka in 2009 [6]. But this system was not followed through under regulated principles to circulate laptops annually. And the scope covered by the project was limited to selected school children and the regions identified to be direct stakeholders were often included as recipients of the OLPC service. So, in order to bridge the digital divide, identifying suitable regions and stakeholders, and then proceeding on with the OLPC system within those regions on an annual basis according to strict legislative regulations, could be presented as one of the viable solutions.

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B. Association for Progressive Communication (APC)

APC is an organization and an international network working towards ensuring that the Internet is provided at an affordable and openly accessible manner to everyone without inequality [7]. There are several member countries in this organization, but Sri Lanka is not yet in this list. Hence, taking an initiative to be included as a member country of APC could aid in diminishing the digital divide gap in Sri Lanka.

C. Automating General Tasks

Tasks such as bill payments, ticket bookings and reservations, self-search information centers are a few examples that could be stated as the feasible tasks to be automated. Though these already exist extensively in developed countries, Sri Lanka has not yet fully implemented all manual inefficient tasks and made it available to all regions without impartiality. In the case of automating common tasks, it is expected to get the public to use these services by force for an observable period during which they would become accustomed to accessing digital computerized services without guidance-on their own.

D. Identifying the Different Classes of Stakeholders

The most vital and viable first step towards thinning down the digital gap in Sri Lanka, is to correctly identify the existing classes of stakeholders and categorizing them as *direct* and *secondary stakeholders.*

In the process of diluting the fissure between the different stakeholders to reduce the digital divide, the methods to be applied for each class of stakeholders vary. So, holding valid data with regard to this difference would be useful when it comes to taking crucial decisions such as the regions that require the most attention when it comes to introducing information technology services, the methodologies that need to be applied in various regions and the reach of these pragmatic approaches.

E. Awareness Programs and Training Sessions

The key reason that many of the Sri Lankan communities fall under the direct stakeholder class is the lack of awareness of this vivid technological advancement that is currently taking place at different levels around the island.

Using the data collected regarding the spread of population categorized into stakeholder classes, Information Technology (IT) introductions and awareness programs can be conducted among the different regions.

The level at which IT and the Internet could be injected into a society strongly depends on the scale at which they stand.

F. Financial Assistance

Sri Lanka is a developing country with a majority of its population falling under the middle class of lifestyle and financial status. The financial status of a livelihood affects the purchasing of digital technologies that are introduced at higher rates and diminish only after a considerable period in years. Hence, drafting financial schemes towards the enhancement and awareness of IT and the Internet related principles in Sri Lanka would encourage the population to get involved in accessing these digital services with the provided financial assistance.

G. Legislative Regulations with Regard to Digital Divide

The lack of proper and strict legislative regulations that govern the way in which digital divide should be handled can be mentioned as a root cause for the minimal attention given towards contracting this fissure.

Drafting out legislations that enforce strict principles to be followed such as regulations with regard to OLPC (One Laptop per Child), APC (Association for Progressive Communication) Membership and digitization of public services could aid in reducing the digital divide split.

H. Focus Researches towards Digital Divide

Diverting more attention towards research on the digital divide in order to identify the provinces and regions that are vastly affected by this concept and testing viable hypothesis on the selected target groups to ensure the selected and tested principle's feasibility in being applied to the entire nation provides a context with regard to the scope of digital divide that needs to be handled in Sri Lanka.

IV. CONCLUSION

Digital divide is a concept that affects almost the entire nation when present at considerable levels. Sri Lanka, being a country falling under grasp of the digital divide, needs to refocus its intent towards diminishing the gap caused in its communities, in order to march forth as a developed country.

In bringing the entire population to a balanced level to provide access to IT and specifically, the Internet, focus needs to be turned on towards the current constraints that hold back the nation from implementing principles that ensure the reduction of the gap. It is also important to draft out a system to ensure the sustainability once the digital divide has been brought under acceptable levels.

REFERENCES

[1] https://en.oxforddictionaries.com/definition/demographic (Accessed 02 December 2016)
[2] http://whatis.techtarget.com/definition/digital-divide (Accessed 02 December 2016)
[3] http://www.digitalstrategyconsulting.com/intelligence/2014/06/ad_revenue_per_user_google_facebook_twitter.php (Accessed 03 December 2016)
[4] www.uis.unesco.org/literacy/Documents/fs32-2015-literacy.pdf (Accessed 03 December 2016)
[5] http://www.internetlivestats.com/internet-users/sri-lanka/ (Accessed 05 December 2016)
[6] http://blogs.worldbank.org/edutech/evaluating-the-one-laptop-per-child-initiative-in-sri-lanka-0 (Accessed 05 December 2016)
[7] https://www.apc.org (Accessed 07 December 2016)

Manuela N. Jeyaraj (M'15). This author became a Member of World Academy of Science, Engineering and Technology in 2015. The author was born in Sri Lanka in 1994-10-05. Following the Biological Science stream for the Advanced Levels, the author then pursued onto Software Engineering for the undergraduate phase of the higher studies. This author's degree which reads as 'Bachelor of Science (Hons.) in information technology specializing in software engineering' is offered by the author's affiliated university which is the Sri Lankan Institute of Information Technology (SLIIT). The author has

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been a 3- time consecutive Dean's List Student and a multiple full scholarships winner in recognition of her academic performance.

During her academic course, she was accepted as a Complex Event Processing Developer, for her internship that commenced in May of 2016, at WSO2, an Open Source technology company providing service oriented architecture (SOA) middleware.

Ms. Jeyaraj is a member of IEEE and the British Computer Society (BCS), the Chartered Institute for IT.