Behavior Dynamics of SMS Gangs

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Abstract — *This paper discuss about short message services and its usages and the dynamical behaviors of the people who use this services. The report starts with an introduction about how the SMS system is working and what are the backbones. There are four fundamental categories of usage. They are emergency services, commercial uses, business uses, and worldwide usages. There are so many advantages of SMS and as well as disadvantages. One of the main advantages we specifically discussed is the mobile learning through SMS. Other than advantages and disadvantages SMS created a new culture in the emerging society. The social networking in is becoming the other inevitable technology that starts to lead the world's culture. SMS plays a major role in social networking .The communication style and language culture used in SMS also seems to show a new dynamical behavior among the people. Finally this report covers the Sri Lankan environment of SMS users and their behaviors.*

Index Terms — **control channel, e-learning, SMS gateway, mobile learning**

I. SMS: AN INTRODUCTION

The first question which arises in our mind is what the meaning of the topic 'Behavior dynamics of SMS gangs'. Intend to understand that, we have to know what is meant by SMS (Short Message Services). According to Wikipedia [1], Short Message Service (SMS) is a text messaging service component of a phone, web, or mobile communication system that allows the exchange of short text messages between fixed lines or mobile phone devices. But how do SMS messages actually get to your phone and how you send it?

Even if you are not using your cell phone, your phone is constantly sending and receiving information. It is talking to its cell phone tower over a pathway called a control channel. The reason for this communication to take place is to allow the control system to know in which cell the phone is, and so that your phone can change cells as you move around. Every so often, your phone and the tower will exchange a packet of data that lets both of them know that everything is OK.

Your phone also uses the control channel for call setup. When someone tries to call you, the tower sends your phone a message over the control channel that tells your phone to play its ringtone. The tower also gives your phone a pair of voice channel frequencies to use for the call.

The control channel also provides the pathway for SMS messages. When a friend sends you an SMS message, the message flows through the SMSC (Short Message Service Center) which does the storing and forwarding process of the mobile network, then to the tower, and the tower sends the message to your phone as a little packet of data on the control channel. In the same way, when you send a message, your phone sends it to the tower on the control channel and it goes from the tower to the SMSC and from there to its destination. [1]

The actual data format for the message includes things like the length of the message, a time stamp, the destination phone number, the format, etc.

According to statistics, SMS text messaging is the most widely used data application in the world, with 2.4 billion active users, or 74% of all mobile phone subscribers. In 2010, 6.1 trillion SMS text messages were sent. This translates into 192000 SMS per second [1]. That is a considerably huge amount and it proves that how much popular is this technology. As this technology allows us to send some information without giving a call, it saves communication cost and time. That is the major reason for this great popularity of SMS.

II. WHAT ARE THE WAYS PEOPLE USE SMS?

The privacy and inexpensiveness are the desirable features of text messaging which motivate the people to use it. In addition to that, the ability to include and send pictures and videos with the emerging new technologies makes the text messaging very famous among mobile users. We can categorize the uses of SMS under the followings according to Wikipedia. [2]

A. Emergency services

Text messaging is recently used for message passing in emergency situations where the signal is weak for voice call and for the use of disable peoples.

B. Commercial uses:

It introduces short codes for addressing commercial applications. Another use in commercial site is the SMS gateway providing. That means connecting commercial services through mobile SMSs. Delivering digital contents such as news alerts, financial information, logos and ringtones is another main use of SMS in commercial field.

C. Business uses:

i.   Collaborative applications, and real-time messaging such as SMS, instant messaging, and mobile communications make a competitive environment on business world.

ii.   Some practical uses of text messaging include the use of SMS for confirming delivery, instant

communication between a service provider and a client, and sending alerts. Several universities already have implemented a system of group messaging and alerting among students.

iii. Mission critical industries such as financial, health are getting the benefit of security aspects of SMS.

iv. Various other businesses can use SMS for time-critical alerts, updates and reminders, mobile campaigns, content and entertainment applications.

D. Worldwide uses:

This section clarifies the uses of SMS by some major countries such as Europe, United States, Finland, Japan, and China.

III. ADVANTAGES OF SMS

In today's world, the use of SMS among mobile users is very high due to various factors. Basically, SMS helps to make our day today activities more convenient. As an example, we execute marketing campaigns using SMS. Because SMS is so popular, we can use it to inform about an offer we provide. In addition, using SMS to get news alerts, accessing social networks, scheduling day today activities using reminders, channeling doctors through SMS are some other benefits we gain from SMS technology. Day by day people identify many potentially clever improvements in applying SMS in various situations and applications which helps to make the life more easy [3].

When we are talking about the behavior of dynamics SMS gangs, we have to focus on the younger generation, who use SMS technology and how they try to dynamically interact with it. It is a much known fact that today's world, most of the young generation have their own mobile phones which they can connect to the culture of SMS. They tend to use SMS for various different purposes rather than sending messages among each other's.

There is a huge trend of using SMS to chat with friends or a unique group of friends. The younger people use totally different language to chat or text, different names for their identity etc. in chatting with friends or the chatting group via SMS. Among this small community of friends, they share experiences, knowledge, education related stuff, entertaining resources etc. Ultimately this creates a SMS based social network of younger generation.[3]

There are advantages and disadvantages of this group culture among the youth which was built through the use of SMS. In addition, there are so many behavioral aspects we have to talk about these groups of SMS.

With the intervention of SMS, the society is awarded with many benefits. It is mainly adopted by the people who are very busy with their schedule and who are reluctant to have face to face communication [4]. SMS has created social networks among people who prefer texting and so called SMS circles in [4] helped to develop social relationships.

In general, SMS helps to reduce the communication cost via mobile phones and if allows communicate the same idea using SMS rather than using expensive voice communication. In addition to that it gives the chance of modifying the messages and shortens the English words.

Due to the vast spread of mobile phone among youth and children, the researchers have tried out various applications that could use SMS as a learning mechanism..

During day to day life face-to-face conversations might lead to conflicts. Therefore SMS can be used as a tool that contributes positively to the relationship's creation and stability. [6]. SMS helps to maintain relationship even relations are far away from you. Nevertheless, in a case of misunderstanding SMS receiver can keep quiet rather than fighting in face-to-face conversation. It also helps to double check the message you are going to send [6]. Nowadays mainly teenage boys and girls prefer SMS rather than voice feelings and thoughts [6]. SMS also plays a role of moderator that minimizes the risk of embarrassment of life due to face-to-face conversations that might lead to conflicts. Therefore SMS can be used as a tool that contributes positively to the relationship's creation and stability. [6]. SMS helps to maintain relationship even if relatives are far away from you.

SMS messages also help to ensure privacy of the communication. Any 3rd party person cannot receive the messages and messages can be accessible only from terminals [6]. The above statement considered that mobile phone is a private property and users apply necessary protection methods (e.g.: passwords, and do not let others to access information in phone) for protection.

IV. USE OF SMS FOR MOBILE LEARNING

Short message service can be used for the academic purposes in universities, various educational institutes and schools and that is one of the major advantages of SMS. So we will discuss about it as a major topic.

Being able to exchange work and applications through SMS, students, instructors, teachers, lecturers in universities, colleges or schools can create a community in which they can work together, share knowledge, inspire each other, and interact. There is a huge trend of using SMS for various academic related stuff like, alerting about lecture schedule, interacting with lecturers, enrolling for courses and important message passing among batch mates etc. Especially SMS is becoming more popular among university students because of the impact of perceived usefulness, perceived ease of use and usability of the system and frequent use of mobile phones.

Due to the use of SMS based mobile learning system, there is a transformation of educational system from teacher centered to learner-centered education. Education is now being transformed by the use of wireless mobile technologies into m-learning because organizations look for flexible methods, which are not bounded by space and time, to deliver learning materials to reach learners.

Mobile learning is a subset of e-learning system. It is a way of enhancing traditional classroom based teaching, noting that

there are several ways in which mobile phones can be used to enhance teaching [7]. Use of SMS sets the first building block for the next generation of learning, which is the movement from distance learning and web-based learning to mobile learning (M-learning). In modern world, it is hard to find a student who does not use mobile phones or SMS. Thus it is more efficient to use mobile learning system for academic purposes as it is more convenient for students and the lecturers or instructors to keep in touch with academic stuff and to interact with each other.

The majority of students in universities, educational institutes responded that they strongly agreed that the use of the mobile device to access the course materials was useful and provided both flexibility and convenience. They are able to access courses and other academic related materials etc. while even commuting and it shows that the wireless mobile technology afforded them freedom to access the course from anywhere at any time [8].

Use of mobile devices in university learning, such as the use of SMS messages for alerts, the availability of pod casts for lectures, and using the SMS for asking questions anonymously in class are some other beneficial aspects [8]. Quick reminders and alerts, updating practical or lecture schedules, surveys, group formations of students, short quizzes, daily tips, glossary information, searching for specific information within a topic and course registration are the functionalities which can be supported by a SMS based mobile learning system.

Moreover, short message service can be used to remind students of upcoming lectures or deadlines, time management, allow students to interact with each other to discuss aspects of the course using forum postings, to remind the principles discussed in lectures and to help in tutorials etc., broaden their knowledge beyond lecture material, or conduct animated 'virtual practical classes' etc.[7]. For example, during lectures and practical classes there is the students can be allowed to interact with the teacher in real time to ask questions, to give feedback on the lecture or current practical session, discussing the difficulties or problems faced, sharing solutions, or to indicate which topic to move onto next.

Many researchers have tried out many applications and new implementations to improve mobile learning. 'Study Link' is a good example for that. Laura Naismith (2007) from the University of Birmingham was able to develop this text messaging service that supports administrative communication in higher education. From this service, the staff members were able to pass messages to students about notices of changes and cancellations (e.g., class cancellations), reminders to submit and collect assignments, notices of relevant lectures/activities, individual administration (e.g., warning messages to absentees), instructional messages (e.g., instructions for submitting assignments), and greeting/courteous messages.

Considering about learning environment "TXT-2-LRN" and "PLS TXT UR Thoughts" are two projects that worked on this area. Through these systems, teachers were able to take the students' comments on lectures, answers for MCQ tests even after the class time. In addition to that Bollen, Eimler, and Hoppe (2004) have invented a system that enables PDA devices to send SMS and maintain discussion forums.

Researchers found out that the language learning at any place at any time is highly desirable for busy learners like Japanese. Thornton and Houser (2001, 2005) invented a system to teach English by sending five words per week through SMS intend to achieve this target.

Mobile learning concept was introduced to after class activities such as puzzle games. For example Martinez-Torres et. al. (2007) proposed a system for laboratory environment, Goh and Hooper (2007) introduced a system for puzzle games.

All the above invented applications evident that SMS based learning can be considered as a more "Convenient Education" among the youth [7].

V. DISADVANTAGES OF SMS USE

Research papers do not provide many discouraging ideas. However people who are addicted to SMS waste their valuable time with carefully editing text messages [4] and with the introduction of short codes, people do not care much about the grammar rules of the languages.

There are some other several disadvantages of using SMS for mobile learning. The main disadvantage is that, there is a huge risk of spreading bogus messages. It may create a huge mess among public, academic activities, day today activities and the entire system might go wrong. These bogus messages can be used to mislead students, hack user accounts, launch phishing attacks for e-banking services, and panic people by spreading fake news alerts etc.

There is another disadvantage of using SMS for mobile learning purposes. That is the less real time interaction with lectures or students. There can be vulnerabilities too in using SMS for short quizzes or course registrations, results updating etc [7] [8]. Another huge problem associated with this kind of SMS learning systems is, when several number of people try to submit responses at the same time, the message relay service would be unable to connect to the server's script.

Yet another major issue that must be considered is the effect of the SMS and related interactive messaging systems to the syntactic aspect of the language. Generally the short message service (SMS) is restricted in both technically and practically. Taking the Kenyan society as an example, it only allows 160 characters per message. Thus as a result, short messaging does not often follow the standards of usage of and correct grammar and language. This is a serious issue when considering the long term effects. Mostly the SMS users in a society belong to younger generation. Then the education is a major part in their lives because the young age is the stage of life where people get to learn many more things including technical, non-technical and also cultural stuff. Therefore it is a huge concern because at the age of learning, youth tend to use their language incorrectly because of the use of SMS. It is obvious because everyone tries to send their message in the shortest form they can because of the technical restrictions and the amount of money that they have to pay for each additional message. Most of the time, especially students tend to use this

short code style of language in educational activities like report writing, taking down notes etc. That is a very bad practice and the languages get spoiled due to that.

A research which was done based on university students says that 'Data was collected from 40 University/college students who make up the primary group utilizing text messages through a questionnaire. The goal was to collect text messages that would reflect language (syntactic) variation in SMS' [9]. A syntactic component of grammar involves the aspect of generating grammatical structures in a language using syntactic rules [9] Syntactic variations were found in text messages as reflected in the following ways: omission of pronouns and auxiliary verbs, omission of objects, omission of articles, omission of two infinitive, grammatical agreements, contractions and different word orders. Syntactic variation is systematically influenced by a range of factors such as the technical aspects of the SMS and related interactive messaging systems to the syntactic aspect of the language.

Attributes of the mobile phone and shared background or context of the situation [9] there are many instances of omissions of words phrases and usage of corrupted data. e.g.:

M.1 Callin u aint picking up. Pls sms me tha eck address & details Gdevenin.

(Iam calling you and you are not picking up. Please text me the Electoral Commission of Kenya address and details. Good evening.)

M.2 Eva known a fln smootha thn sheets of silk? eva flt the caress of silver feathers. miss u.

(Have you ever known a feeling smoother than sheets of silk? Have you ever felt the caress of silver feathers? I miss you.) [9]

So it is clear that how far the usage of language is affected by the usage of SMS (in Kenyan society). This can lead to a major issue in the social aspect of language usage of a society.

VI. THE CULTURE AND BEHAVIOR AMONG THE USERS OF SMS

A. SMS language

As usual the article starts with wiki-definition for SMS language as follows "SMS language or textese (also known as txt-speak, txtese, chatspeak, txt, txtspk, txtk, txto, texting language, txt lingo, SMSish, txtslang,or txt talk) is a term for the abbreviations and slang most commonly used due to the necessary brevity of mobile phone text messaging, in particular the widespread SMS (short message service) communication protocol." [10]

In addition this article is a very small reference that content is very interesting and useful for our topic of "Behavioral dynamics of SMS gangs".

A new trend is emerging between SMS users about the language they type in mobile phones and chatting. It is formed by abbreviations and slang most commonly used due to the necessary between SMS users about the language they type in mobile phones and chatting. It is formed by abbreviations and slang most commonly used due to the necessity of brief expressions of mobile phone text messaging.

There are many categories how this language is formed. Some of them pointed out by this Wikipedia article are:

- Single letters can replace words (be becomes b)
- Single digits can replace words (won or one becomes 1)
- A single letter or digit can replace a syllable or phoneme (to or too becomes -today becomes 2day)

Combinations of the above can shorten a single or multiple words (your and you're become ur). By typing in this manner time and cost of the SMS is significantly reduced. However one major effect identified is some students specifically children use this language in school at exam times also.

B. SMS Gangs

In today's world and everyone is connected. If you have a mobile phone, you can have a meeting you can talk with a friend who lives far away. Using SMS, we can do many things. There are so many systems and applications which use SMS to give different kind of service to its users.

How to find and discover what your friends are doing? A good way is through text messages, Example application for do this is Twitter. [11] People can update their current status using SMS. They can say what they are doing.

There are plenty of services that will provided with SMS rather than just sending a "Hello" or "Where are you?" SMS to another person. SMS allow you to tell people where you are, what you are doing, find people near you and make plans to meet.

Using group SMS groups services provided by organizations, you could create any type of group and define the characteristics which are unique to that group and then use those characteristics to create subgroups. You can create a group of students for a school and use the grades, sex etc. to form subgroups or anything you like. Therefore the people can join these groups and they can identify new fiends, they can increase their contacts. There are systems andweb sites dedicated to do this work.

There are news websites which provides you news though SMS. For example CNN, BBC, Ada Derana etc. Thus people can get news, people can comment on them. Another use of SMS is Widgets from other sites that people know; we can position them in Groovr or Blogger sidebar. [11] There are chat applications which use SMS s communication method. So people can connect to these and talk with anyone who is inside it. Likewise there are so many ways which creates a social network though the SMS.

SMS has created a different culture within the society. It created people so called "Texters" [4] (people who prefer SMS over voice calls).

Most of the "Texters" are who willing to participate in groups and who have experienced difficulties with face-to-face communication. They think too much about editing and writing messages carefully [4]. Because of their carefulness, they were able to reduce the phone bill, compared to "Talkers" (people who prefer voice over text messages) [4].

Another fact that researchers Donna and Fraser found was "Texters" always try to keep a closer relationship with ones

whom texting frequently. Among circles they were able to able to make much closer relationships.

Not many disadvantages have pointed out in researches by Donna and Fraser in [4], but there are some conclusions we can get from their research. "Texters" (people who prefer SMS over voice calls) waste their time in carefully editing SMS's. Although they were able to build friendships with whom they texts most, "Texters" experiences difficulties in face-to-face communication.

In the article [12] writers found out that SMS has influenced youth in different ways. Some of them are not related to mobile phones. Cultural phenomenon, like attachment, happiness, attitude, and so on, due to SMS have highlighted changes. In addition to that, records implies that more than 100 billion SMS messages were sent worldwide in a single year [12] and in US, more than half of the 2.1 billion SMSs that are circulated are among the users between 19-34 years of age[12].

VII. SITUATION IN SRI LANKA

In 1989, the mobile phone was introduced to Sri Lanka and since then it became the most popular communication method in Sri Lanka. According to the statistics of TRCSL, the counts of mobile phones have grown 70 times more than the count at the early days. That is a good indication of mobile phone popularity in Sri Lanka [13]. Considering the present situation, there are many mobile service providers exist and they give many services to their customers. One of the value added service which they provide is SMS. Sri Lanka gets the SMS technology within first four years it was introduced commercially to the world. After the introduction of this technology 80% of phone users use SMS including fixed phone line users, and it has become the most popular communication method in Sri Lanka. According to the statistics of TRCSL the amount of mobile phones have been grow 70 times more than the amount at the early days. That is a good indication of mobile phones popularity in Sri Lanka. [13] There are many reasons to the popularity of SMS. One of them is the low cost. Sri Lankan mobile service providers provide you very low charge for SMS. Thus people use SMS frequently. People can say what they want using SMS in short from without getting a call. One of the other major reasons for SMS popularity is the services which are combining with SMS. They are missed call alerts, news alerts, E-Channeling etc. SMS is very easy thing popularity of SMS. One is the cost, Sri Lankan mobile service providers gives you very low charge for SMS. So people use SMS frequently. People can say what they want using SMS in short from without getting a call. One of the other major reasons for SMS popularity is the services which are combining with SMS. They are missed call alerts, news alerts, E-Channeling etc. Thus SMS is very easy thing to use. Each and every kind of person can use it.

Because of these factors SMS has become a major communication method in Sri Lanka. Consider the youth generation; they are the people who use the SMS facility most. Because of that, there are groups and cultures have been performed. For example, it is a common sight to see young people on streets using their mobile phones. Most of the time younger people waste their time for sending SMS, or for chatting among friends. They use this service to communicate with a particular group of friends. Sending messages, Tweets, chatting using SMS are the frequent activities that those younger people are involved with. Because of that they have developed their own new language. For example TC, GN, BTW, CY, BS, and HM etc. all these abbreviation have meanings in the SMS culture of youths. That is the situation now.

Due to these factors, SMS has become a major communication method in Sri Lanka. Likewise now youths use SMS more and more in Sri Lanka.

VIII. CONCLUSION

This paper discussed the various aspects of SMS and how each level in the society affected by that technology. SMS is a new emerging technology which allows people to exchange text among others. There are so many ways of usages of these services. When we talk usages there are advantages and disadvantages which are inevitable. But some advantages of SMS we have discussed here are very useful for society especially like mobile learning, ease of communication. In addition to that we have pointed out some special advantages of using SMS technology and how people implemented systems that get the benefits of SMS systems. A SMS gang is the key topic of this paper and we have discussed their dynamical behavior over the past decade. Also we have looked at finally we presented the cultural changes that took place as the result of this technology in Sri Lanka and the rest of the world.

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