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Social Sustainability of Online Instant Messaging Platform- WhatsApp

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1. Introduction

The Internet has ushered an era of connectivity that we could never have imagined. Many online social platforms have become hugely popular in recent years for sharing information with one another. Unfortunately, an increasing tendency regarding misuse and manipulation of these communication platforms by vested interests has also come into notice. The accuracy and reliability of the content on these Internet platforms are getting increasingly questioned which has threatened the social sustainability of these platforms. A very good example is the spread of fake news, rumors and sinister messages around India using Whatsapp. In the month of April 2018, following the false rumors about child kidnappers, over 22 people were assaulted and killed in India [16, 17]. Messages are being shared on Whatsapp to develop tension between religious communities. Fake pre-election poll purportedly sponsored by the BBC, are being extensively circulated to influence voters in India [18]. WhatsApp has taken some measures like limiting the number of forwards to contain the misuse of the platform [19]. Government of India has also engaged with the various tech companies to prevent social trouble in the country [20], [21]. The department of Telecom had to take steps to get Telecom operators to act under the Section 69A of IT Act for blocking of public access to any information [23]. Although, these popular online communication platforms are fulfilling an important social need, their unintended and malicious use cannot sustain the positive social impact of these technologies.

In this research, the authors focus on analyzing the social sustainability of the online mobile instant messaging (IM) platform –WhatsApp, which was built as a replacement to short messaging service (SMS). As of Feb, 2018, India has more than 200 million monthly active users of WhatsApp [24], [2]. Users in India prefer WhatsApp over other social networking applications such as Twitter, Facebook, Google+, email, or traditional SMS [1]. Sadly, however, IM platforms have caused significant personal and social issues of concern in the society such as fake news,

rumour-mongering, addiction to these platforms etc. This greatly affects, not just an individual, but also the people around them [4].

This paper aims to find answers to the following research questions:

- What are the factors that affect the social sustainability of instant messaging platforms (WhatsApp in current context)?
- How do these factors influence our online communication?

Research Background

Numerous studies have been done on applications such as WhatsApp on account of their soaring popularity in recent times. These studies have focused on the advantages, disadvantages of these systems and made attempt to analytically comprehend the behavior, experiences, and activities of users on social media [5],[6],[3]. Existing research has looked into the various features of these applications and their effect on the user experience of these platforms [7]. Studies have also juxtaposed varied social media platforms such as Instagram, Facebook, WhatsApp and the traditional SMS [2],[8],[9]. Researchers have established eight recurring themes in patterns of usage of WhatsApp and have tried to draw inferences about these patterns of usage [8]. However, little research has been done to identify and analyze the various factors for the sustainable usage of WhatsApp in the context of Indian users. Today, it has become utmost important to ensure the sustenance of a healthy and livable social community over the internet [10].

Chosen approach

The authors studied the Social Sustainability of online communication platforms in the context of Human-Computer Interaction and identified the various gaps, problems and issues. The research focus was narrowed down to WhatsApp, the most popular IM platform in India. Problems and issues specific to WhatsApp was found from a literature review. Moreover, literature related to the state of art definition of social sustainability in the context of HCI was also found. Thereafter, a formal definition for a socially sustainable online communication system was derived from the study. A semi-structured qualitative study with the WhatsApp users of varied demographics across India was conducted and authors found out about the experiences of users of WhatsApp. The relevant user statements that reflect on the quantity and quality of usage of WhatsApp were identified. Relevant codes were assigned to these quantum of data and a list of factors that influenced the WhatsApp usage of a user favorably or otherwise was generated. The factors were mirrored onto the communication model - Gulf of Execution and Evaluation [22] as proposed by Don Norman in his book 'Design of Everyday Things'. The model was modified to create a design framework relevant to our study. The factor groups were assigned to the various stages of the modified framework based on how they affected the usage of the system or the user experience. The frequency of reoccurrence of the

stated factor groups was quantified at every stage to identify the factor groups that significantly affect the usage of the system.

2. Literature Review

HCI community has overlooked large yet marginalized sections of the society. For example, little attention has been given to the relationship women have with technology or how technology impacts the disenfranchised [11]. Researchers believe that people across various societies are very different and they belong to places that are culturally distinct [11]. There is also a need to evaluate the role of gender equity in social media and identify how to modify the designs of these systems in order to make the internet a healthy place to interact with our fellow beings [12].

Rakhshanda Khan [14] talks about the wide range of themes and patterns in social sustainability by analyzing and studying the various other formal definitions for the same in the relevant literature. Social Sustainability in the context of HCI has received special attention from the CHI community [10]. It pays special emphasis on a definition of Social Sustainability proposed by the Western Australia Council of Social Services (WACOSS) - "*Social sustainability occurs when the formal and informal processes; systems; structures and relationships actively support the capacity of current and future generations to create healthy and livable communities. Socially sustainable communities are equitable, diverse, connected, and democratic and they provide a good quality of life*". The universal needs of human beings have also been studied by researchers and they have talked about how the stated needs should be salient within individuals' most satisfying experiences. Researchers contend and the fulfillment of these needs should promote psychological thriving of humans, as assessed through the experience of a positive effect [2]. After studying the various existing definitions and explanations, we propose a definition of a Socially Sustainable System as follows: "*A socially sustainable system is a set of interconnected and interdependent tangible artifacts which support the capacity of current generations to create and be part of a healthy and livable community without compromising the ability of future generations to do so*".

3. Research Methodology

Interviews

The authors carried out an indepth qualitative user study over a period of around 3 months. The objective was to learn about the WhatsApp usage of individuals and identify factors that influence its usage positively or negatively. A total of 18 regular users of WhatsApp from India (9 male and 9 female) were interviewed. An approach of purposeful sampling with maximum variation was used to select the

participants [25]. The participants were aged between 7 and 69 yrs (median age 38 yrs). The participants were drawn from a range of diverse occupational backgrounds and income levels. They also varied in their geographical and ethnic belongingness within India, spread over various states. For each participant, a semi-structured interview was conducted which comprised both open-ended and closed-ended questions. Inspired by [3], [2], the questionnaire for the study was designed to explore the following variables:

1. **Demographics**- Gender, age, native place, and profession.
2. **Appropriation**- Usage of WhatsApp.
3. **Incorporation**- Time spent on WhatsApp. General intent of usage. Type and person with whom communicated. Kind of information shared and received. Etc.
4. **Objectification**- What is WhatsApp for them? Recent satisfying or unsatisfying experience through WhatsApp. Etc.
5. **Conversion**- Problems faced. Preference and usage of other platforms.

Data Analysis

All interviews were audio recorded to complement and support the notes taken during the interview sessions during the user study with prior permission of the participants. The recorded interviews were then transcribed into a text document. This enabled the authors to revisit the data collected in terms of the answers of the participants. In vivo and descriptive coding was performed. On identifying a fragment of text, where any reason for a variation in WhatsApp usage could be observed, it was highlighted and was allocated a code that described the chosen fragment. In another iteration of coding of the fragments of identified text, the codes whose meaning was redundant were assigned a single uniform code. These codes were then grouped together to form 'factors'. These factors were defined as aspects that affected the 'capacity' of usage of Whatsapp. Capacity was defined ability to engage with the platform in a way that is meaningful and positive. There was absolute freedom in the type of codes/factors being identified which ranged from 'emotional' factors to 'technical' factors or design features. The number of times a code repeated was identified and the frequency was clearly recorded. Thus a group of factors was derived that affected the 'capacity' of usage by a user and their degree of effect, based on the frequency. Each factor was clearly defined and named.

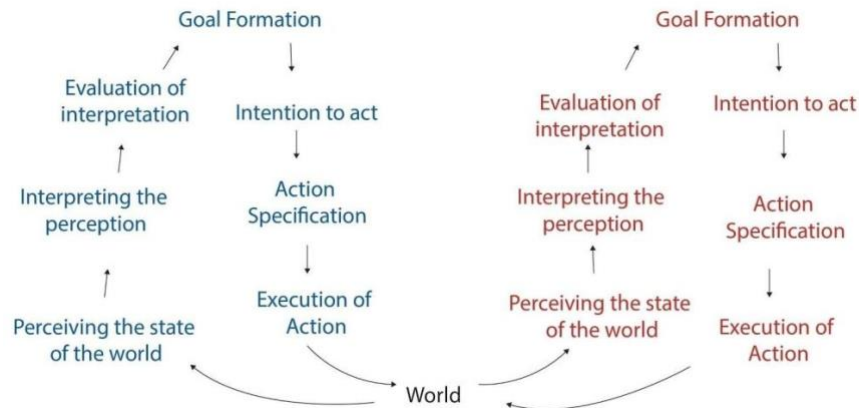


Fig. 1. Model of Gulf of Evaluation and Execution adapted from The design of everyday things, Norman, D. (2013) [22].

Next, a framework was designed using the communication model of Gulf of Evaluation and Execution as proposed by Don Norman [22]. Norman suggests that any action has two parts to it- executing the action and evaluating the results. Both execution and evaluation affect the mental state of a user and thus the “capacity” of the user. He has divided the cycle of an action from execution to evaluation in 7 stages namely plan, specify, perform, perceive, interpret, compare and goal. The effect of each factor was analyzed with respect to the stages of this framework and the factors were assigned to the stage in the model that they affected. Then the results were organized in a spreadsheet clearly marking the stage of the framework, the factors, the codes from where the factors originated and the frequency of each of these factors.

4. Findings and Results

As mentioned in the ‘Methodology’ section, after identifying parts of the transcribed text, the authors came up with a list of factors that influenced the WhatsApp usage of users as shown in Table 2. A total of 57 factors were identified. There was a large variance in the frequency of each factor, some of which were mentioned only once and others of which were mentioned more than 20 times.

Table 2. List of factors that influenced the usage of Whatsapp for interviewed users

Factors	Frequency	Definition
Physical Distance	14	It is the inability to meet because of being far away.
Desire to stay connected- Personal	20	It is the desire to stay connected with people and learn about their lives.

Magnitude of Closeness	19	It is the closeness of the relationship amongst two individuals.
Events in life	11	These represent the significant events happening in our lives or that of others.
Social Influence	16	It is the influence of other people on our social communication
Quickness of Connection	12	It is the ability to deliver the information quickly to the other person.
Respect of Opinion	7	It is the value and importance given to the message you delivered
Curiosity	7	It is the curious nature of humans affecting usage of the platform
Anxiety	6	It is the anxious nature of humans affecting usage of the platform
Desire to know about other's activities	22	It is the desire to know about the other person's activity in their lives and response to our message.
Commonalities	9	It is the similarities we have with other people in our life in the present.
Cost	7	It is the amount of money it takes to connect over the platform
Relevance of received Information	27	It is the relevance of information exchanged over the platform
Authenticity of Information	7	It is the authenticity of information exchanged over the platform

Desire to stay connected- Professional	10	It is the desire and ability to stay updated in our professional lives
Informative- Surroundings	8	It is the desire to be aware of our surroundings.
Perceived Expectations	10	It is the expectations one has from the person he is connected with on a platform
Privacy of Personal Information/Control over Privacy	8	It is the desire to keep personal information(also about life activities) private amongst a group of people.
Tech Savvy/Ease of Learning	11	It is the technical knowledge(also how to use information) that one possesses
Frequency of use by others	10	It is the usage frequency of a platform that I want to connect with
Real Life connection	11	It is the desire to connect in person with someone
Network Reach	6	It is the strength and constraints over a network that connects us.
Time to socialize	14	It is the time available with a person to connect with other people.
Ability to Connect with anyone	20	It is the ease of connecting or sharing information with a person one desires to connect with.
Expected use of a platform	15	It is the perceived/expected use of a certain platform by the user

Use of other platforms	13	It is the use of other social media communication platforms available.
Contacting techniques	13	It is the techniques one can use to exchange information on a platform
Ease of expression	12	It is the ease of expressing what you wish to convey to a person.

Beside the Factors listed above, some more with much lower frequency were also found. These factors were not perceived as important by more than 2 interviewees. However, if a broader and larger cross section study is to be undertaken, these may find more importance.

Table 2. List of factors with low frequency that influenced the usage of Whatsapp for interviewed users

Factors	Factors	Factors
Familiarity with the interface	Fear of Judgement	Freedom of Speech
Relevance of group with time	Quality of connection	Maturity
Number of People	Insecurities	Mutual friends/Connections
Ease of hardware control	Cultural Customisation	Ability to keep Records
Centralised group controls	Ease of sharing (from other platforms)	Ease of media management
Sharing Limits	Length of text	Ease of Multitasking
Acceptance of change	Effect on health	Technical errors
Memory Storage	Control over one's info (that others possess)	System Prompts
Strength of Internet Connectivity	New features	Feedback on ability to respond
Ease of Navigation	Efficiency of technology	

The effects of these factors on the various stages of the proposed framework was analyzed and their frequency of recurrence was clearly marked.

It was noted that the perceived importance of 'Goal Formation' was the maximum, followed by 'Action Specification', 'Evaluation', 'Perception' and 'Intention'. 'Execution' and 'Interpretation' were perceived low in importance. This suggests that the users believe that 'Goal Formation' is the most important activity in terms of the factors of social sustainability listed above. A designer thus must lay special

emphasis on the factors contained under 'Goal Formation' followed by the rest of the stages.

1. Discussion

The study is a preliminary study performed with a sample size of 18 participants. All interviews were semi structured qualitative interviews with duration of 30-50 min each, thus yielding rich and thorough data. The authors have taken care to diversify the demographics of the participants to obtain a generic view using a purposeful sampling approach. The results however, may not be exhaustive and may not be representative of the population. These results should be seen as preliminary results and the study can be extended to a bigger sample of population to obtain more robust results. This study was performed with limited resources and hence recruiting a larger population for the user study was out of the scope of this study. The authors have generated a list of 57 factors that influence the WhatsApp usage by individuals. These factors have been distributed based on the stage of the framework they affected. This indicates the relative importance of each stage. A designer may refer to the factors to analyze his designs in greater depth and ultimately work stage-wise to create a system with higher degree of socially sustainability. This study gives the designers of online messaging platforms, a list of factors to consider while making design decisions. This shall ultimately help the designers to consider all dimensions of research and evaluation to build systems that result in a healthy and livable community without compromising the ability of future generations to do so (as we mentioned in our definition of a socially sustainable system).

With the now gained knowledge about the usage of WhatsApp, it is believed the effect of these factors on social sustainability shall be highly dependent on the time, space, nature, mood etc of an individual and may vary in various contexts. The methodology of this research can be used to conduct similar research across various other demographics and platforms such as a different county or a different online messaging platform. Researchers may also choose to follow other methods that make up for the limitations of an interview (Example of a limitation is- Users may perceive their usage differently than it actually is) such as observation. Further, the independent variable in this research-"the factors", can be manipulated to observe the change in the dependent variable-"capacity of usage" further resulting in the change of the "social sustainability" of the platform.

2. Conclusion

This paper analyses what factors affect the social sustainability of online instant messaging platforms and how. A list of factors that affect the social sustainability

of WhatsApp has been derived and their effect has been analyzed on a slightly modified framework of the Gulf of Evaluation and Execution. The impact of these factors on each stage of interaction in the context of social sustainability is indicated through the frequency of recurrence of these factors within a stage. This paper does not cover whether the factors shall affect the social sustainability positively or otherwise. The designers will have to assess the impact of these factors through each stage of the interaction framework. The ultimate aim is to ensure that the hugely popular online mobile communication systems remain a socially sustainable medium for internet users.

We argue that in today's age, social well-being of the society greatly depends on the online social networks used by the society. By creating a sense of place by making community contributions and by offering community security and stability, the Social networks handle a great responsibility for the benefit of the society.

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