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SOCIO TECHNOLOGICAL APPROACH TO USER ACCEPTANCE OF SPEECH TO TEXT TECHNOLOGY: A TAMIL PERSPECTIVE

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Abstract

Technology has made considerable advancements.in certain parts of the world; there is a disconnect between social system and technology which could influence the user acceptance of the latter, partly because it was designed givinglittle importance to the culture, way of life and attitude of the people in that region. This paper aims to introduce socio-technological approach to user acceptance of certain technologies with primary focus on speech-to-text technology in Tamil language.

Keywords: Tamil; speech to text; technology; Tamil Nadu; Socio technological approach

1. Introduction

The concept of inter disciplinary research has been existing for quite some time. In the context of technology adoption, (Guan &Lio, 2014) societal receptiveness and social factors are quite often neglected to pave way for technological advancements. (Garud&Rappa 1994) proposed three basic definitions of technology: technology as (1) beliefs, (2) artifacts, and (3) evaluation routine, and it is felt that in the present scenario, they are quite relevant to the native Tamil speakers. While there is much ongoing research related to Tamil in technology, there are very few researches that consider the social element while developing a product in a language.

2. Related Work

(Rao &Troshani, 2007) in their work on conceptual framework and propositions for the acceptance of mobile service, have discussed almost all the existing theoretical models of innovation acceptance and adoption. In adoption model for mobile services, they argue that the socio- cognitive concept has attracted a lot of attention. (Amarasingam, 2008) in his research on 'Religion and Ethnicity among Sri Lankan Tamil youth in Ontario' has found that although 92% of the respondents felt that Tamil language was crucial for their ethnic identity, only about 20% were able to fully understand, read, write and speak the language. (Rudisill, 2012) brings out the code-mixing culture amongst the native Tamil speakers especially the Brahmins through her work on 'Everyday flamboyancy in Chennai's Sabha theatre'. It suggests that the code mixing culture, particularly amongst the Brahmin Tamils, has been existing for decades which is now quite visible amongst Tamil speakers of other religious faiths as well. (Das, 2008) in her research on 'Reformatting language purism in the Montreal Tamil Diasporas' mentions that a Montreal Tamil language teacher has devised an unconventional course for Indian Tamil in Romanised script rather than the traditional Tamil script. In her qualitative research, the participants attribute 'code mixing' Tamil and English as a sense of 'prestige'. There have been language-specific user acceptance researches in the past. For instance (Lu, Wang &Shou, 2009)

have used the theory of planned behavior (TPB) and the Technology Acceptance Model (TAM) to examine the Chinese users' acceptance of instant messaging products (IM). (Mathieson, 1991) presents a comparison between the technology acceptance model and the theory of planned behaviour in predicting user intentions and concludes that there is very little on empirical grounds to suggest that one is better than the other. While both take into account to certain extent the social influences and control issues, it is opined that it doesn't form the basis to evaluate technology acceptance for certain social groups. (Brown et al., 2002) in their work on 'Do I really have to? user acceptance of mandated technology' lay emphasis on the theory of planned behaviour but argue that attitude, subjective norm, and perceived behaviour control capture an individual's behaviour intention. (Sun and Zhang, 2006) cite Venkatesh's integrated model which we consider slightly more relevant in determining the user acceptance.

3. Qualitative experiment design

In order to gain a deeper understanding on how social setting, culture, education and government policies influence the acceptance of technology, a qualitative experiment was conducted to understand if they are 'factors' that need definite consideration while determining user acceptance of technology and more specifically in the Tamil scenario.

A. Location and selection of participants

The experiment was carried out in an engineering college in Tamil Nadu state within the Indian Union. The reason for Tamil Nadu as a choice was based on the fact that it is home to over 70 million native Tamil speakers and within a federal setup, Tamil is the only official language of the state. The participants were introduced to the research and were asked to participate if they wished to. The intention was to encourage as many interested participants as possible. Therefore, purely from a management perspective, it was decided to restrict the number of participants to twenty. These twenty participants were from diverse socio-economic background and religious faiths with Hindus forming an overwhelming majority. Most of them were from semi urban areas and had their primary and secondary educations in an institution where the medium of instruction was Tamil. The age of the participants ranged from 18 to 24. The participants were made to sign a confidentiality and ethics statement.

B. Prelimnary observation

- It was ensured that the participants were comfortable. As an effort to make them feel more comfortable, they were encouraged to drink or eat light snacks whenever they felt like, however, most institutions in Tamil Nadu have extremely stringent rules which makes it almost impossible for them to eat, drink or even talk to the opposite sex.

- Most participants expressed their interest to voluntarily participate in the qualitative research but on some occasions, it was felt that their 'opinion' or 'experience' were being judged either directly or indirectly by others present which, to an extent, discouraged a few who honestly narrated their experience or gave their opinions on a subject.

- Participants were uncomfortable both in proper English and in proper Tamil. Most of them communicated their feelings and spoke in a code mixed version which they refer to as *'Tanglish'*.

- There was no apparent urban- rural divide in the case of English language proficiency as the participants who were educated in English medium schools spoke English no better than the participants whose medium of instruction was Tamil.

C. Basis of focus group

The focus group was based on the results of a previously conducted quantitative questionnaire that identified a few areas that could be critical factors in determining the user acceptance of speech to text technology by the native Tamil speakers. Some of the factors that were focussedonfrom a speech-to-text perspective were: the ability to correctly pronounce the syllables, the ability to speak the language without the effect of code-mixing. It is opined that one needs to be able to speak the language properly in order to use applications such as speech-to-text as it exists in other languages such as English. Tamil is a syllabic language, therefore the basic pronunciation of a syllable, regardless of the accent or slang, is the same and consistent throughout. However quite a few experiments and anecdotal evidences suggest that it is not the case in reality. Therefore, pilot experiments and anecdotal evidences suggest that in order to evaluate the user acceptance of voice-to-text technology in Tamil language by the native Tamil speakers, a very strong social element needs to be considered which could not only help in evaluating the user acceptance of such technologies by the native speakers, but also serve as a feasibility study while attempting to develop a speech-to-text application in Tamil. Factors such as mother tongue, medium of instruction at school and university, government policy towards Tamil in Tamil Nadu and its implementation, attitude of the native Tamil speakers towards their mother tongue and using the same in daily lives and in technology were given more emphasis in addition to their prior experience and exposure to speech-to-text application in particular and their ability and exposure of using technology in general.

D. Focus group discussion and findings

Initially, it was decided that the focus group should consist only of those whose mother tongue was Tamil. But, at some point, it was felt that perhaps considering non-Tamils, especially Malayalis from Kerala - who speak a language called Malayalam - could present a wider picture and perhaps justify the social approach in determining the user acceptance of voice-to-text technology within the Tamil context.

The syllables 'ழ, ள, ல' (zha, LLa, la) , ability to speak Tamil without the effect of code mixing, and the respondents' attitude towards Tamil and using the language in technology were the focus as previous studies suggest that a vast majority of native Tamil speakers for some reason do not pronounce these syllables correctly. And these three syllables can be found in Malayalam language- a modern Indian language that branched off from Classical Tamil.

Almost 100% of the Tamil participants could not pronounce ழ the way it should be pronounced, contrary to the Malayali participants whose pronunciation in Malayalam was almost perfect. To a question on how much importance they gave to pronunciation in their normal conversation:

Tamil participant:

"We aren't really bothered about pronunciations. As long as the other person is able to get what I am saying, the purpose is met."

Malayalam participant:

"To us pronunciation is important because that is how Malayalam is spoken"

From the discussion amongst the Tamil and Malayalam speakers, it was apparentthat the Tamil speakers, because of their inability to pronounce ழ and ன, seem to pass a wrong notion to other speakers that those sounds don't 'exist' in Tamil language.

"No one in Tamil Nadu except maybe the Brahmins are able to pronounce ழ properly." opined one of the participants.

To a question on why the basic syllables are incorrectly pronounced, the participants had the following response:

Tamil participant:

"We weren't taught at school by our Tamil teachers on how to differentiate ன,ல and how to pronounce ழ . In fact, many of the Tamil teachers themselves did not pronounce it properly for us to learn!"

Malayalam participant

"Every time we make a mistake in those syllables, people around correct us. My mom used to correct me. Incorrect pronunciation in Malayalam is quite often not accepted and tolerated by Malayalis."

The focus group had a good mix of participants whose language of instruction at school were Tamil, Malayalam, and English, respectively. From the discussion between the two groups, it seemed like the Malayali families take more responsibility and are conscious about their pronunciation than their Tamil counterparts who passed the blame to the teachers or the learning environment.

But both the groups were unable to speak their respective languages without the effect of code mixing. But the effect of code mixing was seen to be on the higher end with the Tamil participants than the Malayalam participants. The Tamil participants favoured the use of 'Tanglish' - Tamil mixed into English in Roman script than the traditional Tamil script.

To a question on the friend's reaction if someone spoke in proper Tamil without the effect of code mixing, the participant responded:

"The person is bound to be made fun of. In most cases, speaking Tamil means the person is less educated. Therefore, for the sake of society and also to command respect, code mixing is inevitable"

Majority of the Malayalam participants were optimistic about using Malayalam language with their Malayalam friends if such a technology were made available in Malayalam but majority of Tamil participants, although they welcomed the technology, were skeptical about its acceptance by them and by the Tamil community at large.

The Tamil participants are of the opinion that Tamil language has little commercial value in Tamil Nadu and world over, therefore the need to learn the language even as a second language at school is reducing drastically. The attitude towards using Tamil language actively in all spheres was largely negative but they exhibited a sense of pride in the Tamil identity and a sense of shame and regret at the same time for the inability to pronounce basic syllables of the language.

"Where is the demand and opportunity to use Tamil in our daily lives? I know this is Tamil Nadu but the reality is you go to a decent restaurant, you will be greeted in English, the companies here don't interview you in Tamil nor we get a job because we are able to speak Tamil"

A question of a Tamil participant from semi-urban Tamil Nadu suggests that the opportunity to use a language is vital in order to reinforce its use in daily activities.

The integrated model for user acceptance of technology as proposed by Venkatesh, does take into account moderating factors such as individual factors further subdivided into intellectual capability and cultural background, the others being technology factors and organisational factors. The qualitative experiment suggests that in this case, the culture and language should be the starting point for investigation for technology and applications that involves language skills such as the speech to text technology.

Conclusion

The focus group study suggests that although there are different techniques by which one could determine the user acceptance of technology: TAM, Theory of planned behaviour, theory of reasoned action to name a few, it is seen that the social and cultural element perhaps has an important role to play when it comes to user acceptance since, the behaviour intention to use a technology in that language is reflective in their attitude towards that language within a social setting.

The focus group findings have a gender bias which is again a social constraint specific to that region. 100% of the focus group participants were male. Owing to cultural differences, it was increasingly difficult to get male and female participants together in the first place and because of this, a discussion was out of scope.

It could be said that technology and technological application is an extension of social habits and collective social attitude. (Sun& Zhang, 2006) in their paper on human computer studies have referred to the integrated model where cultural background was only one of the 'moderating' factors in user technology acceptance but based on the studies and findings, we argue and propose that social and cultural background should form the base for user technology acceptance for certain technologies such as speech-to-text technology. Based on the findings so far, it is felt that indicators of various models such as subjective norm, perceived usefulness, and behaviour intention to use a particular technology is irrelevant if the linguistic group lacks the aptitude to use their language in technology.

We therefore are of the opinion that a socio technological approach could result in a more accurate prediction of user acceptance of voice-to-text technology in general and especially for the Tamil language. Although there are numerous factors that need to be considered for a more accurate user acceptance prediction, it must be borne in mind that in some cases such as this one, social and cultural differences impede in conducting more neutral, fair and controlled

experiments. The qualitative focus study to an extent justifies the social approach for technology acceptance.

Further scope

While this study has given a detailed insight about the impact social elements could have on technology acceptance, we acknowledge that some of the aspects such as gender bias, environment, and aspects of religion need to be taken into account as well. The idea of considering the influence of religion on attitude, use, and its influence on Tamil language emerged from a participant's opinion that Tamil Brahmins alone can properly pronounce almost all Tamil syllables properly which every native Tamil speaker is expected to get the syllables correct.

References

i. Amarasingam, A., 2008. Religion and Ethnicity Among Sri Lankan Youth in Ontario. *Canadian Ethnic Studies*, 40(2), 149-169.

ii. Brown, S. A., Massey, A. P., Montoya-Weiss, M. M.&Burkman, J. R., 2002. Do I Really Have To? User Acceptance of Mandated Technology. *European Journal of Information System*, 11(4), pp. 283-295.

iii. Das, S. N., 2008. Between Convergence and Divergence: Reformatting Language Purism in the Montreal Tamil Diasporas. *Journal of Linguistic Anthropology*, 18(1), pp. 1-23.

iv. Das, S. N., 2011. Rewriting The Past and Reimagining The Future: The Social Life of Tamil Heritage Language Industry. *American Ethnologist*, 38(4), pp. 774-789.

v. Garud, R.&Rappa, M. A., 1994 . A Socio-Cognitive Model of Technology Evolution: The Case of Cochlear Implants. *Organization Science*, 5(3), pp. 355-362.

vi. Mathieson, K., 1991. Predicting User Intentions: Comparing the Technology Acceptance Model with The Theory of Planned Behavior. *Information System Research*, 2(3), pp. 173-191.

vii. Rao, S. &Troshani, I., 2007. A Conceptual Framework and Propositions for the Acceptance of Mobile Services. *Journal of Theoritical and Applied Electronic Commerce Research*, 2(2), pp. 61-73.

viii. Rudisill, K., 2012. Everyday Flamboyancy in Chennai's “Sabha”Theatre. *Asian Theatre Journal*, 29(1), pp. 277-289.

ix. Sun, H. &Zhang, P., 2006. The Role of Moderating Factors in User Technology Acceptance. *International Journal of Human- Computer Studies*, 64(2), pp. 53-78.