

Developing an Indigenous Cultural Values Based Emoji Messaging System: A Socio-Technical Systems Innovation Approach

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ABSTRACT

Digital divide remains a major concern among indigenous people despite the rapid increase in mobile phone penetration. Beyond the appalling participatory gaps, the devaluing of humanity in the digital era is seen as a much bigger threat. This paper addresses the emerging challenges that are putting indigenous communities at a great disadvantage. The use of emoji in social media and its prominence as a visual language for delivering emotional expressions, gestures and action in a speedy manner is fast becoming a way of life. The universality of emoji poses a major problem to the sustainability of the indigenous cultural values as it imposes western cultural and social behaviour hegemony on the indigenous society. Interactions with remote rural communities in Borneo over the past twenty years have revealed the devastating effect that such an outside-in communication medium has on their cultural resilience. Diversifying the emoji design in adopting a local cultural flavour alone, as described in current literature, will not address the issue effectively. Without considering the whole socio-technical system at a macro-level, the dangers relating to the aggravated disconnect to their rich traditional way of life cannot be averted. We posit a holistic socio-technical systems innovation approach with the participatory involvement of the indigenous community. In this paper, we demonstrate the modeling of complex systems that embed the socio-cultural context without compromising cultural values.

CCS CONCEPTS

• Human-centered computing; • Interaction design; • Systems and tools for interaction design;

KEYWORDS

Emoji, Co-Design, Socio-Technical Innovation System, Indigenous Communication System

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1 INTRODUCTION

The use of instant messaging is now pervasively covering all aspects of our daily life. Emoji has become the prominent visual language in delivering emotional expression, gesture and action in a speedy nonverbal and non-text endeavour. Emoji are capable of avoiding misunderstanding of the text message content while directing attention to optimum and improved communication among speakers. However, the use of the universal pictograph standard, designed using Unicode, poses problems of ambiguity when it comes to users from different geography, language and cultural backgrounds. As a result, people from a distinct cultural background may interpret the same emoji differently and use it differently in contrast to the original meaning of its design.

2 THE CHALLENGES OF EMOJI USE IN SOCIAL MEDIA

In recent years, the use of mobile phones and instant messaging service (IMS) within indigenous community has been on the increase. The challenges posed by social media to the sustainability of the indigenous cultural identity can be described along the following multi-dimensional perspectives:

2.1 Ambiguity

The problem of ambiguity in using the standard Unicode emoji is getting more attention due to the isolation of the indigenous community from the outside world, on top of the varied backgrounds within the community. The visual cue provided in the standard emoji looks promising due to its nonverbal and non-text nature. Yet, it can be at times incompatible owing to the missing gesture, human action and emotional expressions according to specific cultural intent. As discovered by Ekman [[5]] from his famous study with the Papua New Guinea indigenous group who were never exposed to the modern culture, some facial expressions are universal, while there are other emotions that are culturally determined. His findings showed that: Fear, Disgust, Anger, Sadness, Enjoyment are universal emotions, while pride, guilt and respect, are mainly

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Table 1: Oroo' Visual Symbol




| Actual Image of Oroo Language Symbol | Vector Image | Graphic Symbol | Meaning |
|---|---|---|--|
|  |  |  | <p>I am going to the old hut which can be found as you walk along this direction</p> |

Image courtesy of Franklin George.

culturally determined. This indicates that the current core emoji is insufficient to represent all the emotional expressions of human beings; there is a strong need to discover and code the specifics for an indigenous group.

2.2 Natural Language

Emoji resembles the form of communication typical of a natural language. Indigenous communities traditionally rely on the visual symbolism as a means of communication. Marcel Danesi [[3]] associated this form of communication to prehistoric art. Prehistoric pictographs as found in cave drawings, is an intuitive form of communication and expression of human emotions. The natural pictographic and visual symbolic form of emoji allows it to be easily adapted to remote rural communities of indigenous people, particularly if it has been aligned with their cultural values.

Similarly, symbolic languages have been used by remote nomadic communities living in the rain forest of Borneo. Penans are one such nomadic community living in the Malaysian Borneo state of Sarawak who are still holding on to their sign language called Oroo' [[18]]. The on-going research work carried out by the Institute of Social Informatics and Technological Innovation [[19]] with a community of Penans who have been settled in the village of Long Lamai has unlocked the tremendous potential for rediscovering the indigenous knowledge relating to this dynamic form of visual communication. Oroo' is therefore seen to be representative of the age-old know-how [[15]] of this indigenous community. They construct Oroo' visual signs using twigs, leaves and other natural resources, and are able to effectively communicate within the challenged settings of the vast rainforests. The diverse range of messaging, that includes storytelling constructs, makes Oroo' a powerful medium that could be the basis for a future symbolic messaging service. Table 1 shows an example of an Oroo' visual symbol which comes from our Penan Legacy Symbol Archives [[10]]. The Oroo' sign also has an inherent meaning which says that, "You are invited to put up a night in this hut."

The use of the natural symbolic visual language of such indigenous communities is becoming challenged as the use of mobile phones and global instant messaging service (IMS) proliferates. The universal code of emoji represents the invasion of foreign visual symbolic language upon these indigenous communities, especially the younger generation who are attracted to the use of electronic devices such as mobile phone and tablets. Current efforts to map the historical past and cultural heritage of the Penan community

has revealed the potential devastation the community will suffer when the roots of their indigenous knowledge become threatened.

2.3 Universal Emoji Code

The universal form of emoji code tends to pose a challenge in sustaining local cultural identity. It puts an argument of "Who created the emoji? Who is the targeted user?". It has been associated with the issue of western imperialism against the minorities, or what has been described by Rampley [[12]] as a process of visuality of popular culture from the western world. This has also raised the question of indigenous group unconsciously (through the influence of popular culture) being persuaded to adapt and learn to communicate the way modern people do. Efforts are therefore needed to conserve cultural identities allowing the natural way of communication via the use of a culturally sensitive emoji, which they share and understand.

2.4 Shifting Indigenous Identity

While there are many positive aspects to this rapid development, universal emoji code can also lead to intergenerational tensions as young people explore new patterns of behaviour, and older people come to terms with new cultural challenges. The study by Kral [[7]] on the indigenous youth in Western Australia discovered that there are significant identity and perception shifts across generations. This shift is seen to be intertwined with the use of new media communication technologies, where the younger generation is embracing a global digital culture in exploring the generativity of multimodal forms of communication and meaning-making in the new media platform. At the same time, these developments pose a generation divide between the young and older generation of the indigenous community whereby the youths are dislocating the routine, their roles in social interaction and challenging the authority of elders. The notion of indigenous communication which enables the indigenous knowledge transmitted from generation to generation is also being tested.

This has posed a contradiction from a systematic innovation point of view whereby, on the one hand, the youths become fascinated by the use of new media communication technology which provides an opportunity for them to learn new knowledge in the realm of ICT4D to bridge the gap of digital divide. On the other hand, this leads to an identity shift for the indigenous community.

Table 2: Five Forms of Indigenous Communication

| Forms of Indigenous Communication | Function | Knowledge |
|---|-------------------|---|
| 1. Folk Media | Storytelling | Folklores, plays, dance, song, festival celebration. |
| 2. Indigenous Organisation | Discussion | Organisation activities of religion group, tribe gathering, tribe leader meeting. |
| 3. Economic Relationship and Service Supplier | Share information | Farming activities, hunting activities, trading, healer sharing information about diseases. |
| 4. Deliberate Instruction | Instruction | Tribe leader and elderly’s instruction. Parenting, how to eat, how to cook, how to behave. |
| 5. Unstructured Channel | Chatting | Spontaneous and informal conversation about hobbies, entertainment, gossip. |

The development of the new indigenous ‘cultural values’ based emoji messaging system should look into the problem in these multiple dimensions and the complex integration of the problem by embracing a socio-technical system approach rather than adopting a single dimension as most researchers have done previously.

3 INDIGENOUS COMMUNICATION SYSTEM

The development of the Indigenous ‘Cultural Values’ Based Emoji Messaging System needs to be seen both as a social as well as a technical process. The methodology used should enable the analyst to understand the culture and values of the people who are likely to use the system and to design the system so that it matches their needs [[17]]. The five forms of indigenous communication as posited by Mundy [[9]] include: (1) Folk media, (2) Indigenous Organization, (3) Economic Relationship and Service Supplier, (4) Deliberate Instruction, (5) Unstructured Channel. The details presented in Table 2 allow the modeling of contextual complexities within the community setting.

Indigenous communication is evolutionary in its design. Knowledge embedded is preserved, handed down, and shared. It is an aspect of culture which can only be appreciated by its people who are the insiders in a social research context. A designer who is an outsider would have a problem in developing a computer-mediated communication system which imitates the indigenous knowledge communication system as can be seen in most ICT4D research. This imposed the issues of *etic*, *emic* and *pseudo-etic* as described in social-cultural system studies [[6]]. As first introduced by Kenneth Pike [[11]] in 1967, *Etic* refers to the approach in the study of the indigenous communication system from outside the cultural system. In contrast, the *emic* refers to the perspective as used for the study of an indigenous communication system within the cultural system by the local community member. *Pseudo-etic* [[16]] then describes the use of concept and system initially developed in another context and assumed to be relevant to the indigenous community. This can however be problematic as the system developed does not share the same basic values, knowledge and communication as the indigenous people.

Etic and *emic* approaches can be regarded as complementary, or a continuum [[2]; [4]] with respect to each other if it is applied cohesively with the involvement of both the designer and the indigenous group. Figure 1 demonstrates the development of the new indigenous *cultural values based emoji messaging system* taking

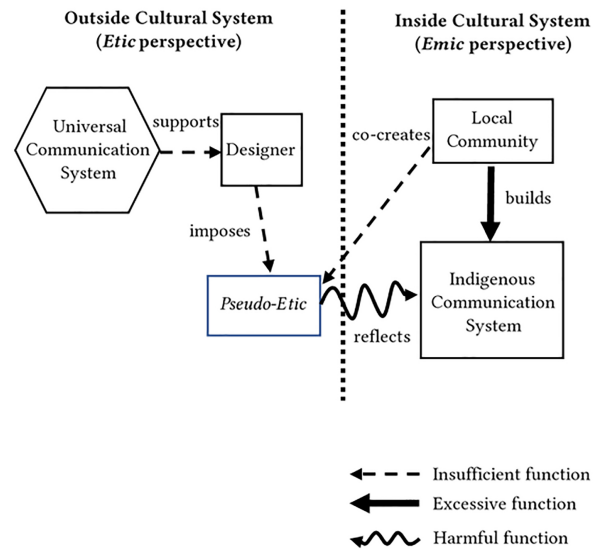


Figure 1: Functioning Model of Etic, Emic and Pseudo-Etic Relationship

into account the involvement of the insider who has the role of making the design decision in a co-design process. Participation and collaboration of stakeholders in a socio-technical innovative system is crucial.

4 CULTURAL VALUES BASED EMOJI MESSAGING SYSTEM

Adopting the socio-technical systems innovation approach in creating the *cultural values based emoji messaging system* provides a holistic solution to the complex problem of indigenous communication in the local society with the use of emoji as a vital element in social media technology. As mentioned in the earlier section, the complex problem of localised cultural design alone cannot be the best solution for this problem. Hence, there should be a holistic approach which is able to integrate the social and technical development of the indigenous community while sustaining cultural values at the same time. The proposed socio-technical systems can provide the right solution in this matter. We have adapted a systems

structuring paradigm based on the Theory of Inventive Problem Solving (TRIZ) [[14]] in our modelling of socio-technical systems. The four critical components of a minimal socio-technical systems model will thereby be shaped as (1) Control System, (2) Systems Resources, (3) Transmission, and (4) Working Unit. The adaptation of the TRIZ model has been the basis for the socio-technical systems innovation approach as described below:

4.1 Design Principles for Control

The design principles for control will determine the parameters to be controlled for the macro system that we are proposing. The design parameters characterize the shared cultural values based on co-creation model. The identification of local cultural values and the formulation of design principles involve all stakeholders, whereby, the designer plays the role as a facilitator instead of a creator. This will allow a participatory process where “creativity designers and non-designers work together” [[13]]. The designer, as the holder of knowledge and expertise, facilitates the indigenous people to identify and formulate design principles in a local context according to social needs.

4.2 System Resources

The system resources component provides “fuel” to the system. Three essential resources in the system being identified are emoji dialogue structure, communication protocol and the Oroo’ symbols. It will provide the structure and contents to the new cultural values based emoji system. Archiving and digitalisation of these resources such as the Oroo’ symbols require the full commitment of the Penan elders who are experts in the area. Adopted from the earlier research in a similar area [[18]], Oroo’ visual language symbols and the communication protocol will be analysed and re-structured to make it feasible for the proposed cultural values based emoji system. In the innovation perspective, this shows a paradigm shift from the traditional top-down innovation, which involved the designer and researcher in developing an innovative system to a bottom-up innovation [[8]]. This ensures that all the stakeholders are committed to participating in the process of innovation system development, and the design decision made is no longer an individual top-down approach but a collective accomplishment especially from the Penan elders as resource person.

4.3 Transmission/Flow

The way the emoji is being used in instant messaging service (IMS) play an important role in this component. Gestures, navigation cues, values-based interaction and storytelling constructs allow the transmission of the Oroo’ symbols to serve as the cultural values based emoji. Values play an important role in this socio-technical system, in determining the decisions to be made in a system development [[1]]. The intangible form of value might be hard to measure and detect, but it can be brought within the design and development process by involving the indigenous people in design decision making and testing of the prototype which would subliminally be determined by their own value. These cultural values will transmit through the use of the cultural values based emoji.

4.4 Working Unit

The main interaction component, the working unit, would be the cultural values based emoji system. An indigenous visual symbolic language that is co-created by the Penans, provides a sense of ownership and responsibility through the interactions to sustain their cultural value and way of living. At the same time it also provides them with an opportunity to communicate effectively through social media the way the rest of the world does. The working unit then provides support for future interaction models.

The design of engineering system model for a socio-technical system therefore connects the capacity of the community to dynamically build a knowledge-based, culturally sensitive resources as building blocks, flows coherently to empower the natural interaction language that is managed by the community.

5 CONCLUSION

In this article, we have drawn attention to the hegemonic problem of universal Unicode emoji design and its challenge to the sustainability of the indigenous cultural values. Current research approaches tend to be inadequate in addressing the complex social problem of indigenous communication. A socio-technical systems innovation model has been presented as a holistic approach that would be able to provide a space for the indigenous people to self-create, own and use the emoji system to sustain their cultural value and identity from generation to generation.

This approach goes in line with the ICT4D 3.0 world view by breaking the monopolisation of emoji creation and selection through the dynamic homegrown bottom-up emoji approach. In this way, the agenda of shaping technologies can be in accordance with cultural values and needs as opposed to allowing technologies to shape humans.

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