Inventive Design Solutions for the Complex Socio-technical Problems in Preserving Indigenous Symbolic Visual Communication

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Abstract. Visual symbolic communication systems such as emojis are increasingly important to facilitate casual communications and spontaneous information exchange in our daily lives. However, the use of such systems poses dangers to the preservation of local visual symbolic languages as practised by many indigenous and culturally rich local communities. This research aims at developing a local cultural value-based visual communication system for indigenous people in the Malaysian Borneo states of Sabah and Sarawak. The design of such systems requires systematic analysis and identifying the core issue in solving complex socio-technical system problems. Meaningful engagement with different community levels, the sustainability of local knowledge, and cultural values were the primary considerations in designing a culture-preserving model. By utilising the Law of System Completeness of TRIZ, and the engagement of the interaction of supersystems, a conceptual model that can map and analyse indigenous symbolic visual communication systems was developed. This modelling approach has provided numerous insightful ideas for transforming global communication approaches to be sensitive to the cultural needs of indigenous communities.

Keywords: Indigenous Knowledge Communication System (IKCS) · TRIZ · Law of System Completeness · Information Communication Technology for Development (ICT4D)

1 Introduction

The instant messaging system (IMS) in mobile phones is prevalent in our daily lives. Symbolic visual communication systems such as emojis have become a popular way of communication across mobile platforms to deliver emotional expression, gesture and action in a nonverbal and non-text manner. Emojis fill the need for adding non-verbal cues in digital communication about the intent and emotion behind a message. However, there is a further depth to emoji usage as language, suggesting that we are returning

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language to an earlier stage of human communication [1]. Emoji resembles the form of communication typical of a natural language. One can trace it back to find its similarity with prehistoric pictographic found in cave drawings. It is an intuitive communication and expression of human emotions [2]. Similarly, the indigenous communities have used symbolic language, relying on visual symbolism to communicate for many years, far before the invention of emoji.

The use of mobile phones and instant messaging services (IMS) in the indigenous community have increased recently. The universality of emojis poses a significant problem to the sustainability of the indigenous cultural values as it imposes western cultural and social behaviour hegemony on the indigenous society. The younger generation is inclined to use digital devices and learn to communicate as modern people do on social media. This development poses a generational divide between the younger and older generation of the indigenous community. Youths are dislocating the routine and their roles in social interaction in the community. The standardised emoji is also incompatible with expressing the specific gesture, human action, and emotional expression in the specific cultural intent of the indigenous people. Interactions with remote rural communities in Borneo over the years have revealed the devastating effect of such an outside-in communication medium on the cultural resilience of the indigenous communities. The traditional way of cultural communication among the indigenous people in the natural environment and the inheritance of indigenous knowledge from the older generation to the younger generation is under threat.

Sarawak and Sabah are the eastern states of Malaysia, located on Borneo Island. It has big groups of multi ethnic indigenous communities such as the Kenyah, Kayan, Kedayan, Murut, Punan, Bisayah, Kelabit, Berawan and Penan. Many indigenous groups live in the interior of Sabah and Sarawak. They use symbolic visual language to communicate and share their unique indigenous knowledge. Visual symbols constructed using twigs, leaves, and other natural resources are an effective way of communication in the rainforest. Such a communication method is used to convey the message of indigenous people and pass their unique knowledge about the natural environment and climate change. The loss of their indigenous knowledge communication signifies the loss of their precious cultural heritage and their knowledge about the rainforest and climate change.

The efforts of Information and Communication Technology for Development (ICT4D) would bring positive aspects of development to the community while sustaining indigenous knowledge. However, the traditional way of ICT4D must be practised cautiously by directly implementing and developing ICT applications for indigenous people with modern technology. The linear mechanistic notion of intervention in the indigenous community cause problems when a technology is introduced from outside the local context.

Based on the above factors, the authors initialled a research project aiming to develop a local cultural value-based visual communication system for indigenous people through a co-creation initiative with the indigenous community. In order to solve the complex socio-cultural and technical problems, TRIZ methods were adapted in the systematic modelling of the indigenous knowledge communication systems. This article presents the initial part of this ongoing project which uses the TRIZ Law of Completeness to map and analyse the indigenous symbolic visual languages in identifying the essential components in the systems.

2 Indigenous Knowledge Communication Systems

Indigenous knowledge is a way of knowing, and the knowledge is generated and accumulated over generations of living in an environment. It allows communities to make sense of their living world [3]. Indigenous knowledge differs from the modern world's international or "exogenous" knowledge in a number of ways. As opposed to the universal "exogenous" knowledge [4], such as science and history in modern educational institutions like we learned in schools and universities, indigenous knowledge emerges naturally and intuitively in the natural environment. The indigenous knowledge systems involve observing natural processes and constructing knowledge carefully by adapting natural resources such as plants, animals and other natural materials in their living environment. Therefore, indigenous knowledge is location-specific, value-laden, and closely linked to the local culture of a specific indigenous group. Indigenous knowledge consists of a vast repository of indigenous "know-how" and experience regarding their way of living, understanding of nature and environment, social interaction, and spiritual beliefs. It is transmitted among the community members to inform, educate, and entertain them through overt and covert communicative practices known as indigenous knowledge communication systems (IKCS) [3, 5]. Each Indigenous communication system is distinctive to a specific indigenous group. It functions to generate, transfer and share knowledge and cultural values within the indigenous social system. The communication system is self-constructed, locally owned and controlled. It is a crucial factor in the sustainability of indigenous cultural heritage, values and identity.

IKCS are unique and operate within and outside modernity [3]. Direct application of modern technologies and research models into the study of indigenous communication systems is inappropriate, and it could jeopardies the idea of cultural sustainability of the indigenous values and heritage. Through our observation and the review in the related literature [3, 5–8], the IKCS have the following common characteristic attributes, which some modern researchers have ignored.

2.1 The Indigenous Knowledge Communication Systems are Dynamic

The traditional ways of looking at indigenous knowledge as static and frozen in time and space, which can be captured, digitalised and preserved as artefacts, must be reconsidered. This approach overlooked the dynamism of culture itself, as culture is malleable, shifting, contextual, and a situational set of meanings and ideas that can change according to perspectives [9]. Therefore, the IKCS supporting the process of producing and exchanging indigenous knowledge are dynamic and not static. A modelling tool that can capture the systems' dynamism is essential.

2.2 The Indigenous Knowledge Communication Systems are Self-sustained

Indigenous communities make decisions based on their existing knowledge and experience. For outsiders, indigenous knowledge may look inconsistent and seen to be based on superstition. However, the indigenous communities see it as logical in their worldview perspective, valuable and practical to their living needs. Rhoades and Bebbington [8] observed how local farmers in Peru generate new knowledge every day through trial-and-error to develop new techniques and adaptations to suit a changing economic and biophysical environment. Similar things happen to the indigenous people, whereby their knowledge constantly evolves and adapts to their living environment changes. Their knowledge of climate change is a shred of living evidence of this. The design of indigenous communication systems is always self-construct, self-regulated and self-controlled in supporting the sustainability of their knowledge.

2.3 The Indigenous Knowledge Communication Systems are Complex

Indigenous knowledge involves knowledge–practice–belief complexity [10], including knowledge about local land, animals, and plants. It also includes the foundations of rules and norms about interacting with the natural environment. Nevertheless, it includes a worldview which denotes how the person or group interacts with the world. How the indigenous sees shapes how people make observations, make sense of them, and learn. It is a multi-layered and multi-dimensional holistic worldview [6]. Communication systems that perform specific social functions within the IKCS encompass language, naming and classification systems, resource use practices, ritual, spirituality and worldview [11]. It carries the complex attributes of the indigenous knowledge system. Indigenous study scholars [10, 12] refer to holism as the key characteristic of indigenous knowledge. The examination of indigenous knowledge needs to view it as one continuum of knowledge whose distinct characteristics are only observable under different contexts. Contextualisation is essential in the study of IKCS [3]. It is inadequate to study indigenous knowledge communication by looking at a single perspective as practised by many modern researchers. It should be treated holistically; the whole is more than the sum of its parts, or a completeness approach, as bestowed in the TRIZ Law of Completeness.

3 Indigenous Symbolic Visual Communication Systems in Sabah and Sarawak

Languages are a significant element in the IKCS. Besides oral and written languages, some indigenous groups use visual symbols to communicate. Aboriginals in Australia use message sticks and rock painting as a means of their communication systems. Similarly, in the Sabah and Sarawak states of Malaysia in Borneo, indigenous groups use symbolic visual languages to conduct asynchronous communication in the rainforest. Two significant indigenous groups' symbolic visual languages were identified as the subject of study in this research project. It is the visual language called *Tatanda* of the Murut people in Sabah and the *Oroo'* of Penan people in Sarawak. Both symbolic visual languages of *Tatanda* and *Oroo'* use message stick to convey the message. They share some similarities in constructing the message stick using natural materials available in the rainforest. A message stick is a vertical stick made of a tree branch with a height of one to three meters which acts as a placeholder for various symbols made from carved twigs, barks and leaves representing information and messages the indigenous groups communicate in the forest. The message stick is usually placed beside the jungle track for easy visibility by the indigenous travelling in the forest.

Clefts are cut in the stick to hold various symbols and arranged in different sequences and combinations to represent different narratives. However, the *Tatanda* and *Oroo'* are different in the contexts of usage. The Murut *Tatanda* is used for hunting successes, land claims and boundary rights, warning of traps and other hazards and notice of feasts and weddings and also represent communications to the spirits on graves and altars [13]. *Oroo'* is used in forest travelling or *Toro*. *Toro* refers to the journey to the forest, and most of the time, it is carried out by two indigenous groups. Travelling in the forest could be a hunting trip, food gathering or migration. The first group always consists of the young and stronger man who will lead and explore the forest, followed by women and children in the second group. *Oroo'*s sign language is used as a way to communicate among these two groups.

4 Information Communication Technology for Development (ICT4D)

IKCS can operate parallelly with the exogenous communication system. They can form the information environment for both exogenous and indigenous communities [5]. It is always the objective of the works in ICT4D to preserve and promote indigenous knowledge while narrowing the digital gaps between the indigenous and exogenous communities. This objective can only be achieved by introducing information communication technology to the indigenous communities. However, implementing and developing ICT applications must be vigilant, attentive, and respectful of indigenous wisdom. The linear mechanistic notion of top-down intervention in the indigenous community should be avoided. It could cause a social change in a deterministic way [14]. Anna Bon [7, 15] suggested that a new version of ICT4D 3.0 would be implemented to sustain the indigenous cultural values. ICT4D 3.0 should move beyond the traditional technology-centric thinking toward more participation of the stakeholders. ICT4D 3.0 is an open-ended process and not centrally controlled. The best practice could be a co-creation approach involving the local indigenous community. The designer would act as a facilitator to guide the local community in constructing and contextualising the action and its actual meaning, cooperating to solve a real-world problem in their specific context.

5 TRIZ for Complex Socio-technical Problems

TRIZ was initially developed as pure engineering science based on the statistical research of patents and other sources of technical information. However, there are also many research and publications in the non-technical area in recent years that indicate the competence of TRIZ in providing innovative solutions to the area outside of the engineering and technical domain. Analysis conducted by Zlotin [16] on research and projects in the non-technical area identified the following two approaches where TRIZ can be applied in the non-technical studies:

- Transfer TRIZ patterns, problem-solving tools and algorithms into non-technical areas, identifying their applicability and adapting them to the new area.
- Transfer patterns from other areas into TRIZ, identifying their applicability and adapting them to TRIZ.

Souchkov [17] proposed that the similar thinking patterns used in the technical system can be applied in business, arts or social systems. Both Mann [18] and Souchkov [19] demonstrated that the TRIZ technical system is viable for non-technical systems. TRIZ even was used in the efforts for cultural heritage preservations as carried out by Fiorineschi [20] to provide a short and non-representative overview of the possible support that the systematic design methodologies can provide in cultural heritage tasks. Kulathuramaiyer [14] highlights the possibility of contextualising and adapting patent or even new patentable ideas by applying the TRIZ inventive principles systematically across domains of study. TRIZ has therefore demonstrated the potential for solving complex problems in a structured manner through its systematic modelling.

6 The Law of System Completeness

Altshuller introduced the Law of System Completeness in 1979. In the classical TRIZ model, a complete technical system must consist of four key components: (1) Engine, (2) Transmission, (3) Control Unit and (4) Working Unit. Each of these components must provide a relevant function and must be combined into a system. As defined in the Glossary of TRIZ by MATRIZ 2018 [21], the engine unit converts energy to a specific type required to operate a working unit. The working unit refers to the function acting on a product for which the technical system has been developed. The control unit controls the energy supply to the other parts of the technical system and coordinates their operation. The transmission relates to a flow of energy required to operate a working unit which is the output area of the systems. The completeness in TRIZ law requires that all components are present in the system and integrate and function as one continuum. “If any component is missing, the technical system does not exist; if any component fails, the system does not survive”, as quoted by Darrell Mann [22]. This ideality perspective of TRIZ is parallel with the holistic perspective of IKCS. It provides the foundation for developing the conceptual model in this research project.

6.1 The Whole is More Than the Sum of Its Parts

Theoretically, Gräbe [23] pointed out, “Man is the only creative productive force; it must be and remain the subject of development. Therefore, the concept of full automation, according to which the human is to be eliminated from the process gradually, misses the point!” as he argues about the law of displacement of humans from technical systems. He further highlighted that the problem of the concept of full automation would trigger an ecological crisis in the planetary dimension. His view of engineering system design should be embedded into the world of technical systems as he quoted the idiom of “The whole is more than the sum of its parts”, which was well accepted in this project. Hence, a technical system is a way of a socio-technical system. A similar argument and proposition of solving a complex problem in TRIZ should move to a broader perspective of "a whole" rather than a single dimension of the technical system from Czinki [24]. These go in line with our view in this project. We believe there is no distinction between the earlier models developed in our prior time. A socio-technical system was also involved, but the social components have been subdued to a large extent and not brought forward in the point of attention. In the technical systems of TRIZ, the human was never a separated component. It means that the engagement of the local community and the interaction with supersystems needs to be explicitly formulated.

6.2 The Law of Supersystem Completeness

Valeri Souchkov's proposition of expanding the new TRIZ law called The Laws of Supersystem Completeness [25] provides a promising direction for our project: develop a conceptual model with a direct engagement with socio-technical systems and direct interaction with human components with the indigenous communities. The new law is based on the Law of System Completeness which is the subset in the categories of Law of Statics. Souchkov [25] argued that the complete technical system described in the classical TRIZ does not exist alone. A higher system must be involved that utilises the technical system's function. The engine receives the energy source from an outer supersystem, and the product of the working unit provides a proper function to a specific target. Supersystems are involved in utilising the function of a complete technical system.

Souchkov's [25] proposal defines a supersystem as "a system which interacts (through physical or informational links) with a technical system at each phase of the technical system's lifecycle". It indicates that multiple supersystems exist in a technical system and interact with each component to facilitate its function. Such supersystems should not be confused with the term environment. Gräbe [23] further elaborated that it is a specific system with its own language and logic, and the relationship of the supersystem-system is similar to the relationship system component. Any supersystem also acts functionally in the system's perspective, and "a supersystem is nothing more than a special kind of component, a neighbouring component."

Souchkov [25] postulated that the engagement of the supersystem in the technical system would make the technical system more "complete" and avoid problems like a mismatch between a product with its supersystem and the immaturity of the supersystem concerning the system's target and use. Gräbe [23] further echoed that the supersystem would be a complement of the "totality of the world" as his proposition of a technical system is, in a way, a socio-technical system, as discussed in the early section.

The above proposition sheds light on our proposed conceptual model, which is able to map and analyse the indigenous symbolic visual languages. Therefore, the engagement of supersystems with various resources interacting with the proposed technical system is crucial. It provides a unique supersystem-system relationship in a "complete" socio-technical system.

7 Conceptual Modelling for the Indigenous Symbolic Visual Communication Systems

Mundy [5] postulated some parallels between indigenous and exogenous communication based on the source-message-channel-receiver model. Manyozo [3] drew a theoretical framework of IKCS and its capacity to integrate with exogenous knowledge systems. In this project, we intend to map and analyse the different components and attributes of the complex IKCS via the powerful tools of TRIZ. Furthermore, we can understand how the indigenous symbolic visual communication systems function in a systematic order as provided by the TRIZ tools. This path is the way to help us develop future indigenous symbolic visual communication systems that demonstrate the parallel co-existent indigenous and exogenous communication systems.

The function model of Shannon & Weaver's [26] basic communication model, which is a well-received basic communication model for most of the exogenous communication studies, was first adopted and used as a comparison to the IKCS function model (see Fig. 1). The TRIZ function model was then used as a means to elaborate on the actual interactions. The IKCS function model (see Fig. 2) shows the importance of indigenous knowledge and contextualisation parameters in determining the definition and interpretation of indigenous communication messages.

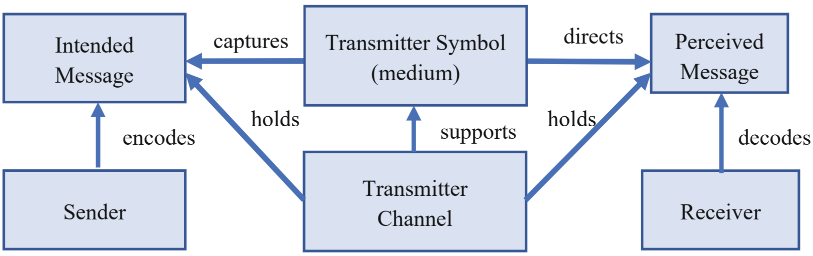

Fig. 1. Shannon & Weaver's basic communication function model

Based on the Laws of System Completeness, a conceptual model for the indigenous symbolic visual communication system was developed (See Fig. 3). The technical system demonstrated the interaction of the technical system components with the outer supersystems. There are internal sub-systems within the components, which are the ingredients [25] in the components. Components of the model were adapted from Ronald Stamper's [27] semiotic ladder theory, which is an extension of the traditional semiotic components of syntactic, semantics and pragmatics. The additional components of the social, physical, and empirics are essential to represent the human and material per-spectate of sign and symbol construction. This approach helps develop our model as cultural aspects, and material use is crucial in the indigenous symbolic visual language construct. Cultural components replaced the social world component in this context. Table 1 shows the adaptation of Stamper's Ladder Theory as components of the indigenous communication system we are developing.

The developed conceptual model (see Fig. 3) of the Indigenous Symbolic Visual Communication Systems adapted from the TRIZ technical systems has four components

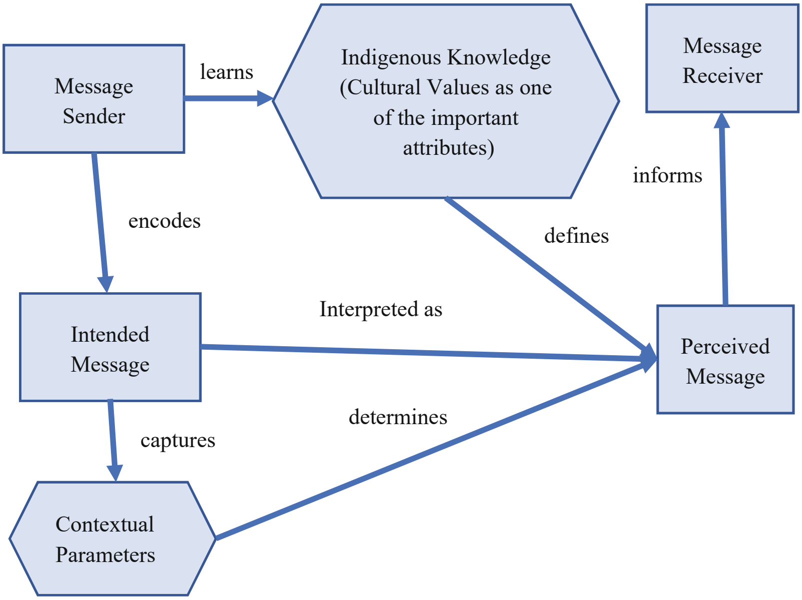

Fig. 2. Indigenous knowledge communication systems function model

Table 1. Adaptation of Stamper's ladder theory in the indigenous communication system

Traditional semiotic divisions	Stamper's semiotic ladder theory	Adaptation of Stamper's ladder theory as components of the indigenous communication system
	Physical	Physical aspect
	Empirical	Statistical properties
Syntactic		Message structure
Semantic		Message meaning
Pragmatic		Message usage
	Social	Cultural values

of the conceptual model, which are: (1) System Control, (2) Intended Message, (3) Transmitter, and (4) Perceived Message. Four supersystems respectively support the system, and they are (1) Indigenous Knowledge, (2) System Resource, (3) Living Space, and (4) Target Audience. The inventory of the developed model is shown in Table 2.

7.1 System Control

This system control determines the system's parameters and governs the whole indigenous communication process. Cultural values and contextual parameters control how the

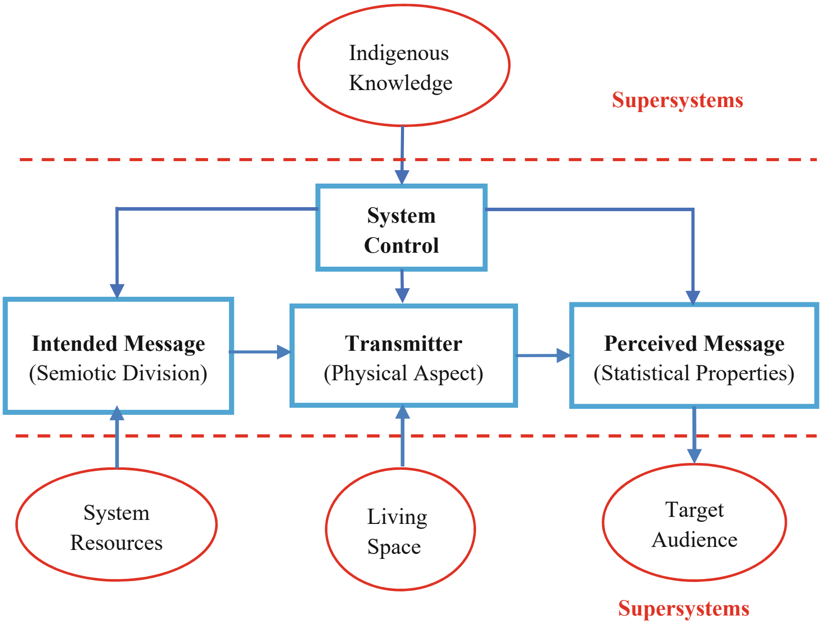

Fig. 3. Conceptual model for the indigenous symbolic visual communication systems

whole process of indigenous symbolic communication occurs effectively. In our earlier finding [28], we discovered that ambiguity is one of the problems in symbol and emoji interpretation due to different cultural coding and values. The same sign forms may be used in different places, but they have different meanings depending on the context and cultural background. The component has two sub-systems: (1) Indigenous Cultural Values and (2) Contextual Parameters. It will involve the integration with the indigenous knowledge as the supersystem.

7.2 Intended Message

The key components in the system will be the intended message adapted from the engine components of the TRIZ technical systems. It represents the original message the indigenous message sender intended to communicate. It encompasses the encoded information of events, news, and instructions they want to convey to others in the community. It gets the energy source from the supersystems, the system resource consisting of the social and cultural activities of the community.

7.3 Transmitter

The transmitter component of the indigenous communication system is unique as it represents the transmission process of the intended message to the perceived message through the special transmitter channels as used by the indigenous message sender, which is the symbolic visual language construction using natural materials. They gather natural

Table 2. The inventory of the developed conceptual model

System	System components in TRIZ technical system	Indigenous communication system components (adapted from TRIZ)	Sub-systems	Supersystems
Indigenous symbolic visual communication design systems	Control unit	System control	1. Cultural aspect	Indigenous knowledge
			1.1 Indigenous cultural value	
			1.2 Contextual parameters	
	Engine	Intended message	1. Semiotic division of indigenous communication	System resource
			1.1 Syntactic (structure)	
			1.2 Semantic (meaning)	
			1.3 Pragmatic (usage)	
	Transmission	Transmitter	1. Physical aspect	Living space
			1. 1 Natural material used	
			1. 2 Message stick construct	
	Working unit	Perceived message	1. Statistical properties	Target audience

materials found in the forest to construct messaging symbols. It could be in the form of a folded leaf, tree branches, twigs and animal parts as practised by the indigenous group of Penan and Murut people in Sabah and Sarawak. The extended semiotic component of the physical aspect with the sub-systems of natural material used and the sequence of message stick construct is identified as parallel with the transmission component of the original TRIZ technical systems. The Living space as the supersystem refers to the natural living environment of the indigenous people where they gather the materials to construct the communication symbols in the forest.

7.4 Perceived Message

The perceived message in the conceptual model parallels the working unit in TRIZ technical systems. It refers to the message perceived and interpreted by the other end of the indigenous communication, the receiving side, and how the symbolic message is decoded. The message decoding process's effectiveness depends on the shared cultural values and contextual parameters that govern the indigenous communication. The end message receiver is the supersystem of the indigenous or target audience in the conceptual model.

8 Snapshots of *Tatanda* and *Oroo'* Symbolic Visual Language

We studied both the indigenous symbolic visual languages in our project. It consists of *Tatanda* symbolic language of the Murut and *Oroo'* symbolic visual language of the Penan. Figure 4 shows the wedding message stick used by the Murut, and Fig. 5 shows the forest navigation symbolic visual message used by the Penan.

The Murut wedding message stick is a practice carried out by the Murut indigenous in Sabah to provide information regarding weddings in the community. It is at the forest track entrance leading to the wedding celebration. The message stick has multiple clefts which hold multiple symbols to give a narrative of the wedding event. It informs the targeted audience about the type of food served, the amount of food served, and the wedding present. It also has empty clefts at the bottom of the stick to allow wedding-attended families to provide their family symbols as the 'signature' of their attendance at the wedding.

The *Oroo'* symbol message in the figure represents a single message of forest navigation activities which tells the narrative of "I am going to the old hut which can be found as you walk this direction". Both symbolic languages may not represent a parallel communication genre and meaning. However, it provides a snapshot demonstrating

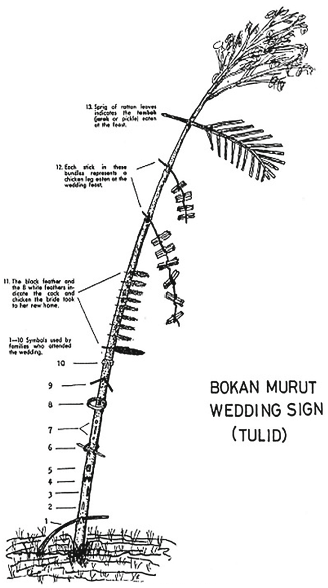

Fig. 4. Murut *Tatanda* wedding message stick. (Image source from Burrough [13])

that the developed conceptual model adapted via the TRIZ technical system is viable in providing a systematic analysis and mapping of the IKCS. The details of mapping both languages' snapshots based on the developed conceptual model are shown in Table 3.

Fig. 5. Penan *Oroo'* forest navigation symbol. (Image courtesy of Franklin George)

Table 3. Snapshots of *Tatanda* and *Oroo'* symbolic visual language mapping

Adaptation of Stamper's ladder theory in the indigenous Comm. system	Musrut Tatanda Sabah		Penan Oroo' Sarawak
Physical aspect	Material used	Twigs, rattan leaves, sticks, chicken feathers, family identity symbols	Leaves, stick
	Message stick construct	Non-linear Sequence	Non-linear sequence
Statistical properties	Baukan Murut, central region of Sabah		Nomadic Penan communities, Sarawak
Message structure and relationship	Intuitiveness, representation, familiarity		Intuitiveness, representation, familiarity
Message meaning	1. Tradition pickle (tamboh) eaten in the feast		I am going to the old hut, which can be found as you walk in this direction
	2. Amount of chicken eaten		

(*continued*)

Table 3. (*continued*)

Adaptation of Stamper's ladder theory in the indigenous Comm. system	Musrut Tatanda Sabah	Penan Oroo' Sarawak
	3. Amount of chicken brought by the bride to the new home	
	4. Families "sign" to show which family attended the wedding	
Message usage	Wedding announcement	Jungle navigation
Cultural values	Benefit to all, sharing	Immediacy

9 Insightful Ideas

This article provided insightful ideas on how the inventive design solution of TRIZ is viable in transforming global communication approaches to be sensitive to the cultural needs of indigenous communities. These could set the path for future endeavours to use TRIZ in non-technical and cultural heritage preservation research projects. Following are the finding ideas from our practice:

- The technical system thinking pattern of TRIZ can be applied in non-technical systems with some adaptation of the systems model.
- A higher system, the supersystem, must be involved to govern the technical system's function.
- The idea of 'completeness' in TRIZ Law of System Completeness parallels indigenous knowledge's holistic perspective. It is theoretical viable and practically applicable.

10 Conclusion

The conceptual model developed has provided substantial results in mapping and analysing the essential components of an indigenous symbolic visual language. We identified the components of Murut's *Tatanda* and Pena's *Oroo'* symbolic visual language. It further set the path for our primary research process of developing a local cultural value-based visual communication system for indigenous people in the Malaysian Borneo state of Sarawak. It also demonstrated that the proposition of Souchkov's Law of Supersystem Completeness is viable in providing an inventive solution for complex socio-technical problems. Although the technical aspect of the socio-technical system has been highlighted as similar to the technical system, in reality, one cannot deny the involvement of the human component, which most of the time subsists in the supersystems. The human component is an essential element to consider in developing the TRIZ technical system in the context of solving problems for complex socio-technical systems. This new approach contributes to the resilience and revitalisation of indigenous symbolic visual language. The research is significant in the sustainability of indigenous knowledge and cultural value.

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