# Ubiquitous Cultural World

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Globalization

New breed of globalization, I hear about, that differs from the one spread Coca Cola and Pokemon around the world. In the small world, not only information, which moves across the globe, also people move from one location to another. Various people gather at a specific location with different cultural backgrounds, and are able to understand and enjoy the regional culture.

Sumo, Japanese traditional wrestling, is a typical case. Half of the upper ranked sumo wresters are foreign born, Mongolia, Russia, Bulgaria, and so on. "Sumo, Japan's national sport has become an international tradition," a head of state exclaimed. I have a different view from him. It is doubtful to think of sumo wrestling with the traditional hairstyle of *mage* spreading around the world. Sumo culture has not spread across the globe, but the people who appreciate the excitement of sumo have increased in number regardless of where they live and have started to support sumo. Regional indigenous cultural traditions can be preserved by people with various cultural backgrounds. Japanese do not have to preserve the sumo tradition alone anymore.
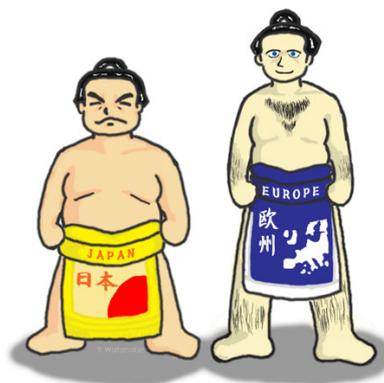

This phenomenon seems to be called *glocalization*. Languages spoken in such situations are various [1]. Though promoting English as a common language may be important, the effort to understand different languages should be valued to understand cultures. But, hundreds of languages are spoken around the world. It is simply too much to tackle this challenge all by ourselves. Will machine translation be helpful in this effort?

Multilingual Cultural Agent

Spending quite some time on this subject and tried several approaches to date, we believe that

translation errors are quite serious [2]. Machine translation systems developed for written texts are not good at translating spoken languages. Machine translation research seems to have taken the transparent channel as metaphor: one end of the channel says "Hello," and the other end hears "Moshi Moshi." It is natural that the noise ratio of the channel became an evaluation measure, and the improvement of translation quality has been the dominant research goal. However, from time to time, the level of error is not acceptable, and the user is forced to rephrase the input text message. Unfortunately, the user does not know how to rephrase the text in order to get a good translation. To solve such *grounding problems*, why doesn't the translation system simply say, "I can't translate it"?

What if a kid who understands several languages joins a multi-national team. Will this kid be a useful resource for the team? Even the accuracy of translation is not perfect, if a kid recognizes this limitation, and is able to point out the words to rephrase, he/she may be a useful resource for the team. This is the human interpreter metaphor. What if we replace *accuracy* as the evaluation measure of machine translators with their *interactivity*? Interactivity includes the ability to state "I don't understand," or "please rephrase this sentence." The key of interactivity lies in the meta-level architecture: "*To know that we know what we know, and to know that we do not know what we do not know, that is true knowledge.*" This ability will allow interaction between users and machine translators to improve *grounding* and *negotiation of meaning*.
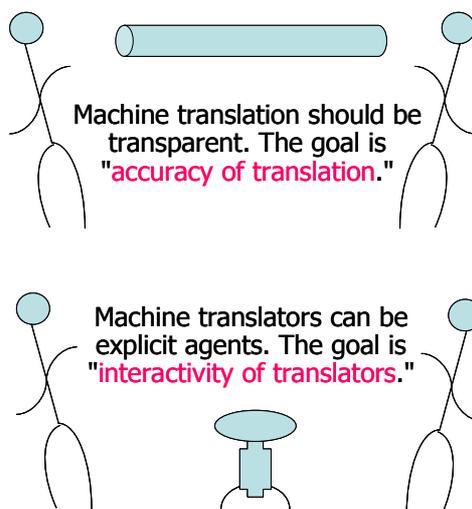
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Online communication systems have been developed, such as online chat rooms and BBS. In the age of glocalization, people also move freely, therefore face to face interactions will become critical. Culturally situated conversational agents to assist foreigners will be valued. Not just for translation, will it be possible to create such intelligent agents? On 1987, intelligent software agent *Phil* appeared in Apple concept videos showcasing the idea of *Knowledge Navigator*. Though some of the visions of Knowledge Navigator have been fulfilled by the Internet and the World Wide Web, the almighty agent has yet to arrive. In 1998, using a simpler bartender agent,

Hayes-Roth showed that de facto roles shape successful interactions [3]. When agents are given the role of a bartender, conversations between a user and the bartender agent were naturally constrained. For software agents with limited intelligence, her approach makes conversations easier. Given this assessment, what if all objects can participate in conversations in the ubiquitous environment?

Once upon a time, Alice walked into a wonderland and talked with a rabbit, mouse and playing cards: "*Would it be of any use, now, to speak to this mouse? Everything is so out-of-the-way down here that I should think very likely it can talk.*" Alice tomorrow will talk with her refrigerator and dishwasher as well as vending machines. "Hum….Who are you?" "I am called Pocari Sweat." "Oh, do Japanese drink sweat?" "How dear, I am the most famous soft drink beverage in Japan!" As these conversations take place, it will ease the feelings of alienation from the foreign culture. Creating single functioned conversational agents is easier. The challenge then is how to control and manage many agents which have the ability to speak. Just as Alice did, it may be necessary to say "*Nobody asked YOUR opinion!*"

Summarizing what I have said here, single functioned agents with meta-level architecture need to be created for the ubiquitous cultural world. By moving from metaphors such as transparent translation channels or super-intelligent agents, will it be possible to create simple conversational agents, which may make errors yet recognize their expected role? By accomplishing this objective, intercultural experiences will be a lot more enjoyable and many may feel that we shall preserve the various unique cultures currently existing around the world.

[1] J. Paolillo, D. Pimienta, D. Prado, et al., *Measuring Linguistic Diversity on the Internet*. World Summit on the Information Society, UNESCO, 2005.

[2] T. Ishida. Language Grid: An Infrastructure for Intercultural Collaboration. *IEEE/IPSJ Symposium on Applications and the Internet (SAINT-06)*, keynote paper, pp. 96-100, 2006.

[3] B. Hayes-Roth and P. Doyle. Animate Characters. *Autonomous Agents and Multi-Agent Systems*, Vol. 1, No. 2, pp. 195-230, 1998.