The internationalization of businesses, driven by the phenomenon of globalization, is affecting a vast number of organizations which have an ever increasing need to communicate across cultures. Companies are starting to realize that messages conceived in the West are not equally perceived in different cultural contexts and are thus faced with the novel and crucial challenge to communicate effectively to culturally diverse audiences. In the field of corporate and organizational communication still few theories and insights are available to shed light on the phenomenon (for notable exceptions see: Sriramesh, Grunig, & Dozier, 1996; Sriramesh & Verčič, 2003). Scholars are thus incorporating theories from different fields, including anthropology and psychology, which however need to be translated and adapted to the specificities of business communication.

Organizational communication is primarily textual or verbal, yet we see an increasing use of visualization to contrast information overload, trigger emotional reactions and increase recall of the presented information. Verbal information is sequential, while human thoughts are believed to be associative and interconnected. Visual mapping offers a closer approximation to the way the brain works, by showing the “big picture” (Mengis & Eppler, 2008), relationships and associations.

Often visualizations used in organizational setting are primarily created and conveyed through PowerPoint slides. Yet there are a number of other suitable tools and methods for developing and presenting information visually.

Images and diagrams are considered valuable communication instruments: visualization is widely used in advertising to trigger emotions, for educational purposes to explain phenomena and to enhance recall. The advantages of visualization are by no means limited to these applications. Visualizing knowledge and concepts can enhance human cognitive and emotional abilities. Bar charts, diagrams and mind maps are
examples of visualizations often used in the business context. Organizations can enhance the effectiveness of their communications by mapping concepts visually. Visual mapping (also called knowledge visualization or conceptual visualization) refers to mapping concepts graphically, by structuring text and visuals in a meaningful way; examples include conceptual diagrams, knowledge maps, visual metaphors and sketches. Visual mapping is deployed in organizations to enhance comprehension (Tversky, 2005) and positive attitude (Huff, 1990).

Visualization, which is often considered a universal language, can offer benefits for communicating across cultures. In fact, visual communication is particularly useful in inter-cultural contexts for its ability to overcome linguistic barriers, leveraging the universal meaning of symbols, pictures and metaphors. A notable example is the use of pictograms in airports, which aims to be universally understandable. In cross-cultural communication, visualizing ideas can be especially useful to externalize knowledge. Visual representations are increasingly used worldwide in educational and organizational settings, also thanks to recent development in Information and Communication Technologies which simplify the task of creating visual representations. In spite of relatively universal visualization principles, and the fact that visualization is often considered a global language, there is evidence of dissimilarities in the interpretation of visualizations across cultures (Segall, Campbell, & Herskovits, 1966; Nisbett, 2003). These cultural differences are a consequence of traditions, education and argumentative style. Culture influences the very interpretation of visualizations: as MacEacheren (2004, S. 329) states “the meaning of a map is not absolute but a product of the society and its culture”.

The aim of this contribution is to provide a first conceptualization of “why” and “how” visual mapping can be useful for organizational communication across cultures. The following Section offers a review of the benefits of visual mapping for organizational communication. In the second Section a conceptualization of the advantages of visual mapping for cross-cultural communication is proposed. The argumentation follows a comparative research approach, aiming to discern the universal and the culturally-specific characteristics that make visualization effective. The third Section focuses on the “how” question, providing a first proposal of translation of theories of cross-cultural differences (Nisbett, 2003; Pattanaik, 2008) to the realm of visualization. The following Section reports on an experimental study conducted to test the proposed approach, and the results of over three hundred professionals
in Europe and Asia which provide evidence of its validity. It finds that visual mapping is more effective than textual information alone, for organizational communication in all cultures. When a visual representation is culturally appropriate, its effectiveness is higher. The results suggest that visualization is a useful tool for enhancing organizational communication in diverse cultures, especially when cultural differences are taken into account.

1. Visual Mapping in Organizations

Mapping concepts visually can support readers in understanding concepts better, by structuring information and providing multiple retrieval paths. According to dual coding theory, our brain decodes information through two channels: the visual and the verbal/textual channels: when processing a visual map, the brain processes both types of information, thus both channels are used and the effects on understanding and recall are enhanced (Paivio, 1969).

A visual format is more engaging than plain text, which helps to grab attention: for this reason most presenters deploy a large number of images in their presentations, to engage listeners. Beyond pie charts and colorful slides, visualization is far more than providing decoration and pleasant images: it is about insight (Bertschi et al., 2012). Visualizing knowledge supports cognitive abilities in making comparisons, seeing the big picture and the details simultaneously, and thus being able to draw causal inferences.

A notable and historical example of the benefits of visualization for causal inference is provided by Dr. John Snow’s map of London, in which he plotted the Cholera epidemic and understood the causes of the disease. As illustrated by Tufte (1986) a cholera epidemic broke out in central London in 1854. Dr. Snow designed a map identifying the location of the deaths from cholera. The visualization showed “a close link between cholera and the Broad Street [water] pump” (Tufte, 1986, p. 28). He informed the authorities about his findings and convinced them to close the water pump, and the epidemic soon ended. Mapping information visually supported Dr. Snow’s causal inference process in identifying the cause of the epidemic. The entity of the discovery, facilitated by visualization, is massive: “Snow’s explanation replaced previously held beliefs that cholera spread through the air or by some other means” (Tufte, 1986, p. 29).
The advantages of visual mapping are not limited to geographical maps; Larkin and Simon (1987, p. 98), in their article “Why a diagram is (sometimes) worth ten thousand words”, describe three advantages of diagrams, compared to verbal descriptions: diagrams can (1) group together information “thus avoiding large amounts of search for the elements needed to make a problem-solving inference”, (2) “use location to group information about a single element, avoiding the need to match symbolic labels”, and (3) “support a large number of perceptual inferences”. This notion that the human brain is wired to understand visual and spatial information is proposed and supported by several other scholars (Kosslyn, 2006; Tversky, 2005).

In the present business context, the popularity of mind mapping (Buzan, 1996) in the business world seems to support the idea that humans feel comfortable with a medium that is based on holistic rather than linear thinking. In a mind map, the main concept is placed in the center of the paper; secondary concepts branch out from the central idea in an outward form. This visualization form is radial and hierarchical: it facilitates reasoning with to the organic relations among the concepts. Mind maps are used for multiple purposes: for individual reasoning, for communicating hierarchical concepts and for facilitating group collaboration (i.e., facilitating a focus group).

In addition to diagrams and maps, visual metaphors are a valuable method to combine visual and textual information. We use metaphors in our everyday life often without acknowledging it: an example is the computer’s “Desktop” metaphor. There is a natural association between the concepts, which facilitates the transfer of knowledge from a known domain to a new domain, and this is precisely the benefits of deploying metaphors.

These examples show how knowledge can be represented visually to improve communication and understanding. In contrast with pictorial images and drawings, visual mapping entails both text and visualization: the visual is an integral and fundamental part, defining the spatial mapping of the text.
2. **Visual Mapping Across Cultures: a Glocal Approach**

Due to the ever increasing internationalization of the business world, organizations have a strong need to communicate effectively across cultures. Visual mapping promises to be a useful communication tool in particular in a cross-cultural setting, for its presumed universality. Surprisingly, the potential benefits of conceptual visualization for cross-cultural communication have not yet been addressed by the academic community. This contribution aims to start filling this research gap by proposing a framework of the global benefits and of the local specificities of using visual mapping for organizational communication. This approach is in line with the comparative research paradigm (Adler & Graham, 1989), accounting and differentiating universal attributes and local differences. Firstly the main benefits of visualization for cross-cultural communication are conceptualized into five factors (global effects); then cross-cultural differences in the interpretation of visualization are reviewed (local effects).

### 2.1. Global Effects

The benefits of visual mapping for cross-cultural communication can be summarized in the following five factors:

1. *Overcoming linguistic barriers.* Visual explanations are useful to communicate concepts and instructions to illiterates and to people that are not familiar with the language. A notable example is the use of pictograms in airports, which aim to be universally understandable when passengers do not know the local language.

2. *Providing double cues.* Visual mapping is by definition the simultaneous use of text and visual information: when cultural and linguistic barriers exist, this dual modality (Paivio, 1969) is particularly useful to have more than one cue (or element) for understanding and for cross-checking the correctness of the information acquired. When the verbal or textual information is not clear, the visual element can support elaborations and understanding. Visualizing concepts offers tangible elements that can be used to follow the discussion flow.

3. *Seeing the big picture and the relations.* Mapping ideas forces to provide links between the contributions, to show the relationships within the whole discourse (Mengis & Eppler, 2008). In presence of cultural differences, this explicitation is useful to convey ideas more clearly.
In addition, in the context of a collaborative setting, the mapping of ideas makes it easier for the discussants to offer a contribution by linking it to existing (already visualized) concepts, physically pointing to the concept on the visualization (called deixis; Eppler & Pfister, 2010).

4. **Surface misunderstanding.** Because visualizations are more tangible than text, they make concepts more concrete. Fuzzy vague ideas in our mind become very specific when drawn: this specific property of visualization is defined overdeterminism (Shimojima, 1999). Intercultural communication is problematic because when communicating we make a number of assumptions, which are often subconscious and not explicitated: these wrong assumptions are the main cause of intercultural misunderstanding. Visualization, thanks to its concreteness, can help to surface assumptions and misunderstandings by triggering an open discussion.

5. **Prevent personal conflict.** In collaborative settings, where visual mapping is used to moderate a discussion, visualization has proven useful to shift conflict from the person to the task (Mengis & Eppler, 2008). With a tangible visualization, participants can express their disagreement by referencing the idea visualized, rather than the person who proposed it. This advantage of visual mapping can be particularly useful in intercultural meetings in which the Power Distance (Hofstede, 2001) of the participants’ culture is largely different. For instance, in intercultural meetings with Westerners (low Power Distance) and East Asians (high Power Distance) it is common to have communication issues, with Asians perceiving Westerners as arrogant because they openly oppose ideas of others (Adler & Gundersen, 2007). In East Asia the issue of “face” and respect, is very relevant; it is expected that discussants do not openly contradict others, especially if higher in rank. Although visualization cannot provide a complete solution to the Power Distance issue, it can contribute to alleviate the problem by shifting the focus of criticism to the visualization, thus preventing the discussants to lose face. In addition, visual mapping can help increasing the number and the quality of contributions, especially in cultures with high Power Distance (Tan, Wei, Watson, & Walczuch, 1998). Specific visual techniques can be used to provide anonymity of the contributions, thus increasing participation and the range of ideas proposed: typical techniques are post-it notes or electronic anonymous Group Support Systems (GSS).
After reviewing the main advantages of deploying visual mapping for cross-cultural organizational communication, it is necessary to focus on the cultural differences that leverage the effectiveness of visualization in diverse cultural contexts.

2.2. Local Effects

In the Western World, mind maps and flowcharts are possibly the most popular forms of knowledge visualization, while India has a long tradition of using images and visual storytelling: examples include representations of the Ramayana and other Hindu myths (Pattanaik, 2008). Similarly, in Confucian Asia storytelling has been widely used for explaining and educating. Although visualization is assumed to be universally understandable, research evidence shows that there are cultural preferences and differences in the way humans see and interpret visual information, which are often overlooked (Segall et al., 1966; MacEacheren, 2004; Eppler & Ge, 2008).

A framework has been proposed with seven main factors, conceptualizing the effect of culture on the reception of visual communication (Bresciani & Eppler, 2010).

1. **Color.** The meaning of colors is culturally dependent: even the conventional red and green have opposite meaning in China; in particular, red signifies danger and love in Western countries, while it symbolizes luck in China and communism in several cultures. For an extended description of the meaning of colors across cultures see (McCandless, 2009).

2. **Direction.** In Arabic and in traditional Chinese language information is read from right to left, on the contrary to the Western habit of reading from left to right.

3. **Icons and symbols.** A dog might symbolize the positive quality of loyalty, but in certain cultures, as for example for Muslims, the dog is considered a “dirty” animal thus has negative associations. A fork and a knife symbolize food in the West but are perceived as an exotic symbol in Asia where it is common to eat with sticks or with hands.

4. **Humor.** Visual humor is a source of cross-cultural differences in the interpretation of visualization: the intercultural incident related to the humorous cartoons representing the Arab prophet Mohammed in the Netherlands and Denmark provides a notable example.
5. *Visual metaphors.* The metaphor of heaven and hell is often non-known in non-Christian countries, while the metaphor of the mandala (as the metaphor of the three converging rivers) is not understandable for most non-Asians.

6. *Focus of attention.* Deep differences are found between Confucian Asia and the rest of the world, with Westerners focusing on the main central objects at the expenses of the background, and Asians focusing equally on the background as on the foreground (Nisbett, 2003).

7. *Nature of thought.* The difference in thinking style is the most crucial cross-cultural difference which impacts on the very interpretation of any visualization and of the world in general: there is evidence that Westerns tend to engage in analytic, sequential and logical thinking, while Asians are more inclined toward holistic and associative thinking (Nisbett, 2003).

### 3. Translating Theories Into Specifications for Visual Mapping

With the aim to understand how organizational communication across cultures could be improved through the use of visual mapping, relevant concepts and theories from diverse fields have been reviewed and classified. However the literature does not provide specific concrete guidelines to help communicators and designers creating effective visualizations for specific cultures: how can culturally appropriate visualizations be designed?

To provide a first research step in this direction, the concepts described above have been used to develop visualizations suitable for different cultures: then the effectiveness of the resulting visualizations is tested through an experimental study. This “translation” from the theories to design recommendations is not straightforward and further research is needed to provide solid guidelines for practitioners.

From a theoretical point of view, the frameworks proposed in the previous section can be tested by comparing visualizations created according to the factors outlines. This type of research, in addition to start validating the framework, contributes also to test the boundaries of these theories by extending them to visual mapping in organizational context.

Regarding the cultural context, it seems valuable to compare two very diverse regions: the East and the West, which permits to apply and test the theory of the geography of thought (Nisbett, 2003). Thus the aim is
to develop one visual map suitable for East Asia and one suitable for Westerners. According to the literature, visual maps should be useful in any cultural context, and yet culturally appropriate visualizations should be more effective.

The content of the visual maps is selected within the organizational communication domain: a typical corporate strategy is visualized. Strategy communication is a relevant communication task in organizations: a clear understanding and commitment to the strategy can have important effects on the performances of the organization. The content of the strategy is derived from a real organizational strategy and adapted for the general public, in order to develop a realistic and understandable corporate strategy. The content consists of one major goal, two sub-goals with a number of elements, barriers and success factors, for a total of 21 information units (corresponding to short sentences or keywords).

This content needs to be mapped according to visualizations suitable for the East and the West, respectively. To develop suitable visualizations, the framework of cross-cultural differences in the reception of visualization is deployed.

- **Colour:** red is a special color with particular meanings in China, symbolizing good luck, Chinese New Year and the emperor; in the West it is typically associate with danger and love. Since its meaning is nearly opposite in the two cultures, it should be avoided.
- **Direction:** Westerners read from left to right and from top to bottom. Although the same is true for modern (mainland) Chinese, traditional Chinese is written in vertical columns, and reading starts from the first column on the right side of the page.
- **Icons and symbols:** symbols with arbitrary meaning should be avoided, because their interpretation depends on culture and education; symbols relating to nature or common human activities are most suitable. When portraying persons, different somatic traits should be included, not only Western faces.
- **Humor:** sense of humor is culturally dependent, thus the safest option is to avoid it.
- **Visual metaphors:** the metaphors deployed need to be understandable by the respective cultures. A pre-test with Chinese showed that they were not familiar with the metaphor of the iceberg (i.e., the meaning of above/below the water level). Typical metaphors used in Easter cultures are: bridge; (merging)
rivers; war (i.e. “the art of war” by Sun Tzu); paths, mountain trail, etc. In particular, storytelling also through visual metaphors and analogies seems nowadays most common in Asia than in West. Confucius emphasized storytelling as the most suitable method for education and providing explanations. He also preached against abstraction: things should be considered only in their context (therefore abstraction of principles is to be avoided); these ideas are still believed and practiced in East Asia at the expense of logical argumentation (Fang & Faure, 2011).

- **Focus of attention:** according to the geography of thought East Asians focus equally on the background as on the foreground and emphasize relationships, while Westerners focus only on the main central item (Nisbett, 2003).
- **Nature of thought:** East Asians favor holistic and associative thinking rather than abstract thinking. Westerners are more inclined to analytic and sequential reasoning, applying logic and abstraction (Nisbett, 2003).

After having outlined, based on the framework, the different needs and expectations regarding visualization between East Asians and Westerners, the next step is to examine the spectrum of conceptual visualizations available, to evaluate and select them according to the framework. Existing classifications of visualizations for the business context (Tegarden, 1999; Eppler & Burkhard, 2007) provide a valuable list of visual mapping techniques. While Tegarden (1999) provides a review of quantitative visualizations only, Eppler and Burkhard (2007) discuss specifically conceptual visualizations formats, which are classified in: (1) Structured text and tables, (2) Heuristic sketches, (3) Conceptual diagrams, (4) Visual metaphors, (5) Knowledge maps and (6) Interactive visualizations and animations.

Based on this classification, a list of visualizations is compiled for each category: The aim is to find one visual map most suitable for Westerners and one most suitable for East Asians, and to maximize their difference. Both visualizations will then be tested with both East Asians and Westerners, to assess if the “translation” from theories to visual design has been effective.

The list of visualizations has been created and discussed by a team of researchers composed of Westerners (from Europe) and East Asians (from China, Singapore, and South Korea), in order to avoid a cultural bias in the selection of the visualizations.
As a result of this intercultural collaborative effort, a list of visual maps is outlined, which included “Asian Visualization” such as the mandala, the metaphor of three merging rivers, and the chakra, among others. Each visualization is then ranked according to the framework’s seven criteria outlined above. The outcome resulted to be a linear abstract diagram for Europeans and a holistic visual metaphor for East Asians: Asians are more familiar and comfortable with visual storytelling and visual metaphors, while Westerners should favor analytic diagrams and sequential visualizations like diagrams.

In particular the linear diagram suitable for Westerners is rendered in the form of a sequential timeline of steps, with two parallel tracks for the two sub-goals (Fig. 1). According to the framework criteria, the visualization supports analytic thinking, it focuses the attention on the main goal, it does not deploy humor, it reads from left to right and it does not make use of culturally sensitive colors.

For East Asians a mountain trail visual metaphor is developed (Fig. 2). The image is holistic (not sequential) and less abstract than a diagram: it fosters associative thinking through the metaphor, and the concept of reaching the peak as a goal is possibly universally understandable. The metaphor of the mountain trail is widely used to convey the meaning of reaching a goal, at the top of the mountain, through hard work - symbolized by the path that leads to the top.

4. Experimental Evidence

In order to test the proposed translation of theoretical concepts into concrete guidelines for the design of visualizations, an experiment is conducted, contrasting the results of Westerners and East Asians exposed to both visualizations (Fig. 1 and Fig. 2).

If the propositions are appropriate, the results of the experiment should show that Westerners perform better when exposed to the strategy visualized with the linear diagram (Fig. 1), while East Asians should perform better when exposed to the mountain visual metaphor (Fig. 2).
In addition, a control condition with text only is introduced (without any visual map or visual icon), to test if visual mapping is more effective than text in different cultural contexts. In other words, the model to be tested predicts a moderating effect of culture on the effectiveness of representation modality (text and visual).

The experimental manipulation consists of exposing the subjects to one of three conditions. All three representations contain exactly the same content: a corporate strategy. In the control condition only the text is provided, while in the visual treatments, a visual background and icons are added and the text is mapped according to the background visualization. The participants to the study receive only one of the representations and are not aware that more than one representation of the same content exists. They receive a questionnaire containing questions on the dependent variables (attitude, commitment, etc.), culture and on demographic information (to assess potential confounding effects).

The results of 360 graduate students with work experience in Europe and Asia provide full validation of the proposed hypotheses. There is a significant positive effect of visual representations on attitude and behavioral intention. Thus, a visual representation of strategy, compared to text, strengthen the positive attitude and the intention to implement the strategy. Considering culture, visualization is more beneficial than text in all cultures, and when a culturally appropriate visualization is used, its effects are enhanced (for more details on the results see: Bresciani, Tan, & Eppler, 2011). As predicted, European had the best performances when exposed to the linear diagram, followed by the visual metaphor and only lastly with the textual format. In contrast, East Asians had better results when they viewed the mountain visual metaphors.

The results are relevant at theoretical level, showing that knowledge visualization can increase the effectiveness of the message compared to text, and that these benefits are found across different cultures, especially when a culturally appropriate visualization is deployed. These findings offer insights for practitioners, are particularly relevant as a growing number of organizations are operating internationally, and have to communicate their knowledge and strategy across different cultures.
5. Conclusion and Future Research

This contribution can be considered an initial step toward the systematic cross-cultural assessment of practices for effective organizational communication. Five major advantages of the use of visual mapping for organizational communication in diverse cultures have been outlined. Furthermore, culturally specific aspects of visualizations are considered, according to a framework of seven factors, and two culturally appropriate visualizations are developed accordingly. The resulting visual maps are tested through an experimental study: the positive results seem to suggest the appropriateness of this approach toward disentangling generic from culture-specific factors affecting organizational communication.

The present study is a first step toward the understanding of the effects of culture on visual organizational communication. Further research is needed to validate the framework and its applications. Future research could explore the validity of the framework and guideline on diverse content and in different cultural contexts (i.e., BRIC countries). A more context-rich and qualitative approach could be implemented as complementary methodology. In addition different communication outcomes could be considered, studying their interaction with culture with the aim to disentangle general and universal principles, from cultural specificities.

The results offer a first empirical validation of the proposed theoretical perspective of intercultural visual communication, which goes beyond dimensional approaches (e.g. Hall, 1976; Hofstede, 2001) and adopts the concept of the geography of thought to describe cultural differences. They also provide evidence of the appropriateness of deploying a comparative research approach (Adler & Graham, 1989).
References


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