HUMAN AND CULTURAL IMPACTS ON PROJECT WORK
DRAFT PAPER (March 28, 2020) *

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Successful international cooperation and globalization in projects is based on effective communication. National and cultural differences (like language, norms, habits, taboos, and world view) create obstacles and misunderstandings. In this paper we describe several current models for describing forms and consequences of the (apparent and hidden) impacts on behavior, believes and attitude and their effect on project work. We discuss insights and approaches for successfully handling resulting obstacles.

For this session of IDIMT 2020 we invite submission of contributions containing theoretical and practical views and experiences of cultural influences on projects and human cooperation.

1 Cultural Differences

Globalization and international cooperation have brought about a much stronger and diversified contacts of more nd more people. When travelling to foreign countries or meeting people from other countries we often experience surprise, or even a 'cultural shock' by observing their behavior and hearing their arguments. This includes simple things like counting on one's fingers, basic conventions of how to perform business transactions, and ultimately deep-seated believes, e.g. about women's role in society (fig. 1). We understand culture as the shared complex system of language, value system, norms, religion, myths, beliefs, manners, behavior, and structure which is characteristic of a society or part of it.

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𝓕: cult-diff-e,nls-pitfall.jpg

Abbildung 1: Cultural differences

2 Layers of Communication and Cooperation

Every communication between humans usually involves several layers, some obvious, some hidden, some easy to change, some deeply imbedded in the human nature. One can distinguish 7 layers of human communication with increasing cultural dependency and sensitivity [Chroust-08b] as shown in fig. 2.

𝓕: cscw-e,local-layer3a.jpg

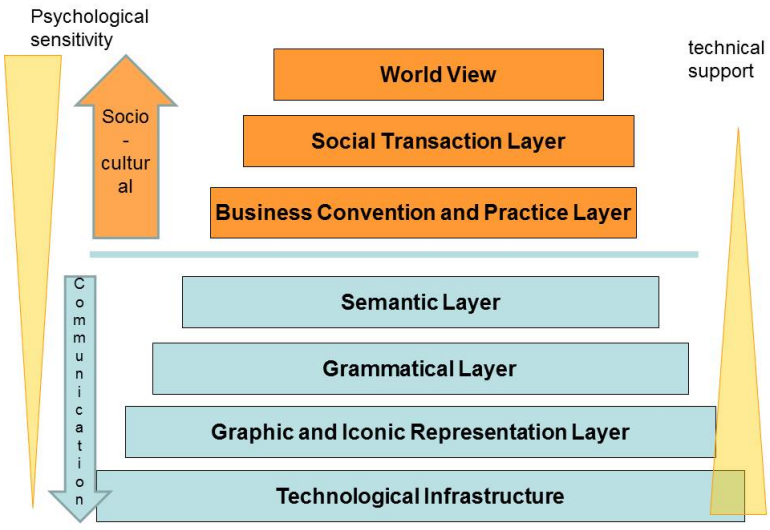

Abbildung 2: Layers of communication/cooperation

Technological Infrastructure Layer : It provides the technical basis for communication (te-

lefone, e-mail, internet, ...). Most of it is invisible to the users, but provide the basis for connecting people: representation of characters (including national differences and one-byte/two-byte characters [Adams-93],), reading direction (left-to-right, right to left) [He-02, Kim-99, Trager-06], providing sufficient storage space for data, sorting algorithms, applying the *locale* which defines the proper representation of date, currency, time, etc. [He-02, Herden-06, Kubota-03, Trager-06].

Graphic and Iconic Representation Layer : Increasingly software products rely on graphical representations in panels, demos, and animations. The correct symbolic meanings off signs, colors with appropriate meanings etc. has to be taken care of. When showing persons then the body language(!) and local and private setting is very critical. Human viewers are highly sensitive to mismatch and discrepancy.

Grammatical Layer : Text created by a computer programs (be at original or a translation) must be correct including jargon, local habits, and idiosyncrasies. Even within one language there are differences resulting from different social standing, educations, etc.

Semantic Layer : Here the meaning of words and sentences, ambiguity, hight-context vs. low-context culture etc. have to be handled, also the difference between technical versus common language, expressiveness of languages, abbreviations and jargon.

Business Conventions and Practices Layer : This layer comprises issues like leadership approach, organizational structure, jurisdiction, deadlines and commitments, overtime, relation of business and private relationships, performance measures, etc. Discrepancies may cause misunderstanding, mistrust, alienation, and loss of business opportunities.

Social and Communication Layer : What are the forms and styles of communication, politeness, answering a customer, answering a user, expressing critique [Meyer-16], gender-adequate language, ways to express 'no', metaphors puns, jargon, humor,

World View Layer : This layer summaries deep-seated beliefs and feeling like meaning and purpose of ones's life, religion, social classes, social positioning, position of women (fig. 1, racism, taboos, etc.

The last three layers are very intimately associated with cultural aspects. In order to understand their implications and background one has to understand basic dimensions of cultural preferences in different nations. Different ways to classify cultural differences are discussed in section 4.

3 Modelling Cultural Differences

Serious attempts to map and understand cultural differences started after World Wide II in parallel with international trade and cooperation [Hofstede-10]. G. Hofstede coins the term 'mental programming' for the cultural influences on one's life.

Numerous models have been used in the past to analyze the cultural behaviors of persons We identify 3 different basic modelling methods (fig. 3)

The factorizing approach identifies several (usually 4 to 9) different basic dimensions. The different combinations of the scores with respect to these dimensions characterizes a certain (large !) segment of the total world population. One expects that the chosen dimensions are more or less orthogonal to one another and thus one dimension does not imply the value for

another dimension. Only [Hofstede-10] explicitly discusses the orthogonality of the dimensions by showing that each binary combination of scores for a dimension a population exists for which it is true. For the factorizing approach we distinguish

quantitative models assign numerical values ('score') to each dimension allowing numerical comparison (e.g. in GLOBE).

qualitative (relative) models specify only a *relative* ordering between individual nations with respect to their suspected scores

The holistic (phenomenological) approach Based on a judgement of the basic behavior one identifies certain distinct groups and their properties and behavior.

𝓕: cult-diff-e,cult-diff-2-dim.jpg

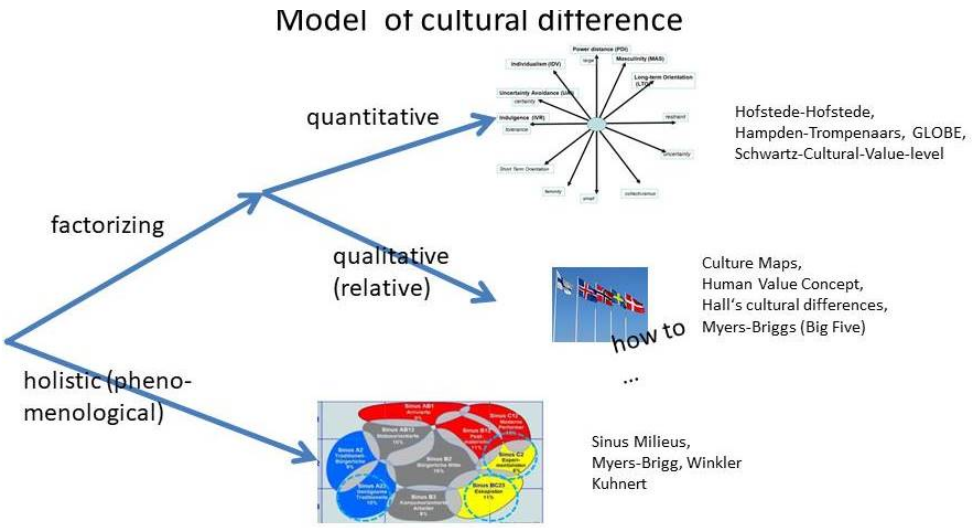

Abbildung 3: Differing descriptive Models

3.1 Warnings and Caveats

There are 3 issues to be understood in order to avoid misuse us of the values

- Humans take part in different social groups and often play different roles. Depending on the role people might show different behavior : the brutal boss might be a most loving father at home.
- No matter into how many different groups combination the regions will be divided (GLOBE theoretically defines 2**9 (=500!) different types), there will always be a huge number of persons that group. For example if we speak of the behavior of Han-Chinese, we speak of a group of approx. 1.3 billion persons. There must be considerable differences within this group.
- The data give just an *average* and should not be understood as a *stereotype* for a group of people. One can expect that the scores discussed are distributed in a distribution curve most likely a Gaussian distribution.

4 Overview over Classical Cultural Models

From 1970 onward computer networks and electronic mail gradually provided easy communication with other nationals and also started to influence business and commerce. As a consequence cultural differences became apparent and roused also scientific interest. Since that different numerous model were offered as a means to describe and explain cultural differences.

⟹ *The paper will contain details about the models discussed below*

𝓕: cult-diff-e,hofstede-dimensions.jpg

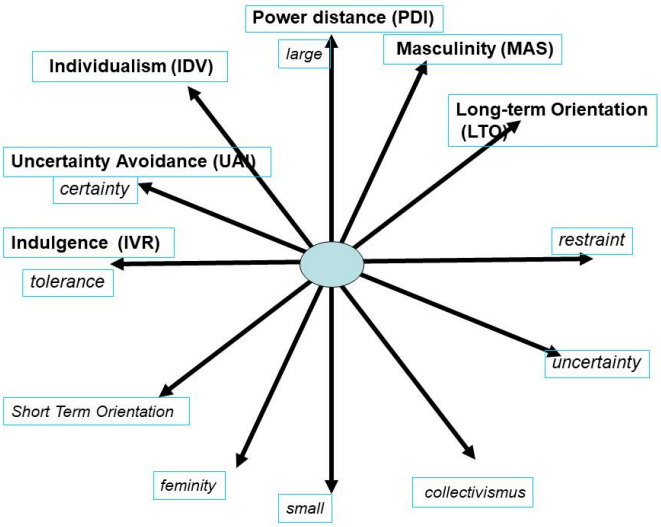

Abbildung 4: Hofstede's 6 cultural dimensions

Starting with 4 dimensions, Hofstede finally (2010) at 6 dimensions, as shown in fig. 4. Excect for 'Indugence/restraint' they all found their way into the GLOBE-model. The semantic of these dimensions will therefore be discussed in section 4.3.

4.1 Hofstede-Hofstede

4.2 Hampden-Trompenaars

Hampden-Trompenaars base their model on similar date like Hofstede but deduced 7 largely different dimensions.

universalism-particularism Universalism is about finding broad and general rules. Particularism is about judging the case on its own merits,

individualism-communitarianism Individualism is about the rights of the individual, while Communitarianism is about the rights of the group or society.

specificity-diffusion Focussing on the specific role of a person or situation or thing versus looking at them holistically.

achieved status - ascribed status Achieved status is about gaining status through performance while ascribed status is about gaining status through other means, such as seniority or birth.

inner direction-outer direction Inner-directed is about thinking and personal judgement 'in our heads'. Outer-directed is seeking data and information in the outer world.

sequential time-synchronous time Time as sequence sees events as separate items in time, sequenced one after another. Time as synchronization sees events in parallel, synchronized together.

4.3 The GLOBE Model

The GLOBE Model ('Global Leadership and Organizational Behavior Effectiveness', 1994-2014) was lead by Robert J. House who at first focused on leadership, but soon the study branched out into other aspects of national and organizational cultures and includes essentially the models from Hofstede-Hofstede and Hampden-Trompenaars

𝓕: cult-diff-e,globe-9dim-text.tex

Globe Dimension	Source	One Extreme	Other Extreme
Uncertainty avoidance	HH, HT	Need for established social norms, rituals, and practices	Comfortable with ambiguity and predictability
Power distance	HH	Egalitarian and nonhierarchal	Hierarchy, authority, disparity in status and wealth
Institutional collectivism	HH HT *note-1*	Collective actions and sharing of resources encouraged	Individual actions and goals are encouraged
In-group collectivism	HH HT *note-1*	Expressions of pride, loyalty, and cohesion	Noncohesiveness, loyal to oneself and one's needs
Gender egalitarianism	HH *note-2*	Nurture, care, relationships, sharing	Ambition, assertiveness, control
Assertiveness	HH *note-2*	Assertive, confrontational, and aggressive in social relationships	Timid, submissive, and tender in social relationships
Future orientation	HH	Planning, investing, and delays of individual or collective gratification	Spontaneity, enjoying the present
Performance orientation	new	Encourages and rewards group performance and excellence	No rewards and encouragement for goals; more relaxed in terms of achievement
Humane Orientation	new	Encourages and rewards individuals for being fair, altruistic, friendly, generous caring	Concerns for self, not sensitive not encouraging of social supports na d community values
	note 1	common source: individualism	
	note 2	common source: masculinity	
	note 3	not used (HH): Indulgence vs. Restraint	
	note 4	not used (HT): Universalism, Achieved Status, Inner direction, Sequential Time	

Abbildung 5: 9 dimensions of the Globe Model [House-04]

4.4 Meyer - Cultural Map

$\Longrightarrow$ *Text will be supplied in the final paper*

𝓕: cult-diff-e,meyer-8-dimensions.jpg

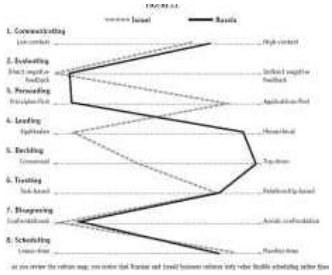

Abbildung 6: Culture Map

4.5 Sinus Milieu

Sinus Milieu chooses a different approach: starting with the total ('holistic') world view of a person. The models identifies 11 different milieus, see fig. 8

𝓕: cult-diff-e,sinus-milieu-struktur.tex

social situation **lower middle class / lower class**

Middle middle class

Upper class / upper middle class

Basic orientation **tradition** : (hold on) (preserve).

Modern individualization (having & enjoying), (being & changing).

Reorientationization : (doing & experiencing) (overcoming borders).

Abbildung 7:

𝒯: cult-diff-e,sinus-milieu-chart.jpg

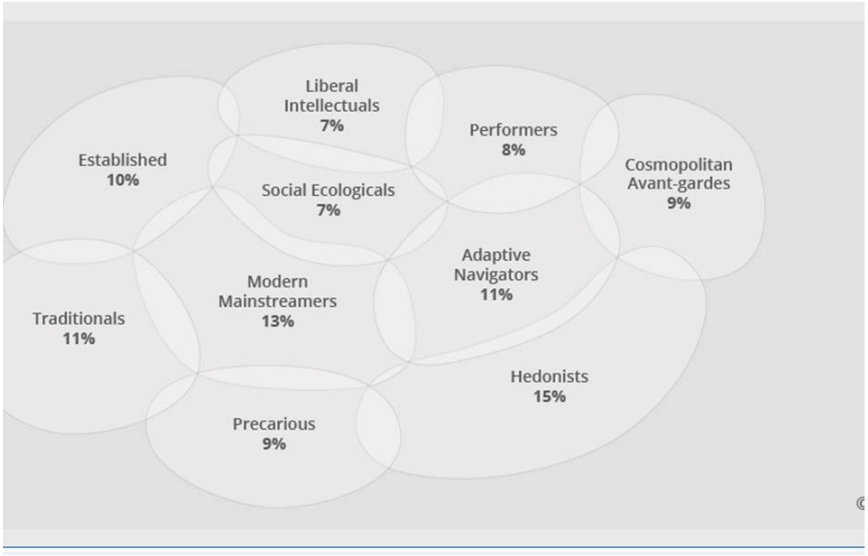

Abbildung 8:

5 Consequences for Project Cooperation

Due to globalization the cooperation between different nations is getting more and more intensive. Cooperation with persons from other cultures create difficulties and misunderstanding: They create frustration and anger and may be detrimental to the projet success.

The actual content and form of the Message is only part of all communication. Body language plays a major role in face-to-face situations [Decker-92, Molcho-06, Morris-94] but also in man-machine communication.

Two persons who communicated expect a certain (culturally dependent!) code of behavior and also needs a certain amount of a common World view Basis. What is said is always interpreted with in the cultural context of the individual person. Most of it is unconscious, especially if both partners belong to the same cultural environment.

In many situations (especially in private area) one expects a seamless adaptation to the individual culture and environment [Chroust-07d] : ("one cannot not communicate" [Watzlawick-00c] par

The higher up in the hierarchy of fig 2/eva is involved the more apparent cultures are felt and the more difficult it is to bridge them.

A certain level of Cultural Proficiency can avoid such situations and is a prerequisite in the cooperation . with people from other cultures.

level	human behaviour	software-intensive-system design
Cultural destructiveness	see the difference, stomp it out, eliminate other people's cultures.	force users to follow the prescribed communication and concepts even if contrary to their cultural expectation or pre-condition
Cultural incapacity	see the difference, handle it wrongly, belief in the superiority of one's own culture and behaviour that dis-empowers another's culture.	'correct' or 'improve' on culturally relevant interactions
Cultural blindness	see the difference, act like you don't, act as if cultural differences you see do not matter, or not recognizing that there are differences among and between cultures.	believe that you 'know' how to include cultural variation, but just use traditional cliches and ignore any discrepancy
Cultural precompetence	see the difference, respond inadequately. Awareness of the limitations of one's skills or an organization's practices when interacting with other cultural groups.	provide certain cultural parameters which the user is encouraged to change, but the support it inadequately
Cultural competence	see the difference, understand the difference that difference makes.	all relevant parameters of cultural difference are adjustible and flexible, the responses are adequate
Cultural proficiency	see the differences and respond positively and affirmingly. esteem culture, learn about individual and organizational culture, and interact effectively.	It is doubtful whether a system would/could reach this level. It would mean interactively recognizing cultural aspects to adapt and learn.

Abbildung 9: Cultural Proficiency and Software-intensive Systems, following [Lindsay-03],

6 Outsourcing

$\Longrightarrow$ *Text will be supplied in the final paper*

Outsourcing of software production, especially in Asian countries, does that international co-operation and communication across national / cultural borders necessary. Problems can arise both when designing the products and when the development process [Kobayashi-05b] [Kobayashi-05a] [Krishna-04].

7 Localization

Global sales efforts have the difficulty that the show people in their 'natural environment', but this is highly culturally dependent . The growing sophistication of computer interacting (thanks to artificial Intelligence) has the effect, that software interfaces are enriched by more and more human-like features [Barbour-96, Chroust-00g]. The users intuitively attribute to these interfaces some human properties - and expect the software to behave consistent according to their cultural expectation (their cultural background!). Or as [Chroust-07d] states , it should behave like a 'courteous, understanding butler'.

This does not only concern their language but also Gestik and facial expression of the avatars acting on the screen.

If the (culturally dependent!) body language does not convey the right message, the spoken word will not be believed and the message taken notice of: 'you have to be believed to be heard' [Decker-92].

An added consideration concern which part of the whole corpus of texts need Localization. We speak 'localization' :"the process of adapting a product to reflect the local standards, culture and language of another market. "

When considering Localization one has to consider the different documents necessary for the operation and usage. Not all of them need localization: typically maintenance documents in English might not need Localization, since pure technical documents are in most cases culturally independent, in additional one can (often) expect English language competence.

Some of the documents to be considered are: Planning documents for the project,, Installation Instructions, Operating/Handling Procedures, Instructions for adaptation and minor modification, Maintenance Instructions (?), Customizing Instructions, End-user Manual

7.1 Language Translation

Several methods exist for Language Translation.

- n Human translators, if their mother tongue is the target language are obviously a viable solution, which usually avoids many of the smaller and larger pitfalls, but might create problems in technical areas. And it is also costly and error prone.
- Automatic commercial translation tools (e.g. Google Translate)
- AI-administration tools which are able to store fragments of translations (source + target) for use in later translations (especially in technical environment many texts carry over to the next release.
- AI–based learning algorithms which generate new translations from phrase-pairs of previous transactions.

A typical set-up for a large translation shop is shown in fig. 10.

Important decisions are

- Choice of needed target languages ,
- Which port5ion of the original texts have to be translated and which not. Typically operator instructions of an English original might not need translation, since the operators are expected to have sufficient command of English.
- Packaging and Charges: Delivering one source product with all available language option or delivering individual language products. This includes decisions on the charging strategy.

F: cult-diff-e,overall-translation.jpg

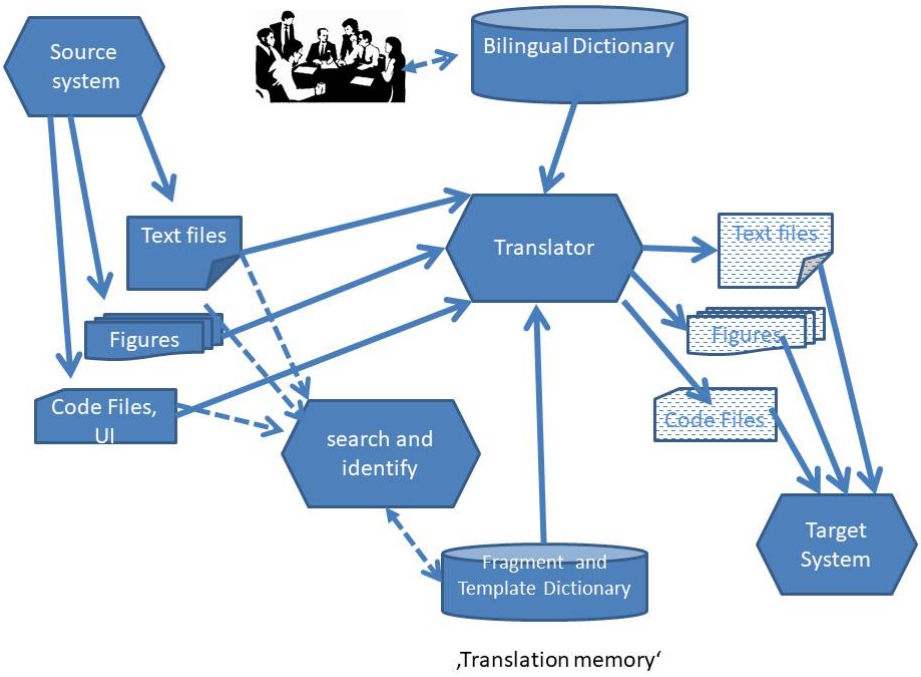

Abbildung 10: The overall translation process

8 Summary

⟹ *Text will be supplied in the final paper*

Literatur

[Adams-93] ADAMS, G. *Internationalization and character set standards* StandardView, 1(1):31–39.

[Barbour-96] BARBOUR, R. H. , A. YEO *Bilingual/Multi-Lingual Business Software: the Spreadsheet* in: *Proc. 1996 Information Systems Conf. of New Zealand (ISCNZ'96)*, pp. 63–71.

[Chroust-00g] CHROUST, G. *Internationalization is more than Language Translation!* in: *Hofer, S., Beneder, M. (eds.): IDIMT-2000, 8th Interdisciplinary Information Management Talks, Verlag Trauner, Linz*, pp. 431–440.

[Chroust-07d] CHROUST, G. *Software like a courteous butler - Issues of Localization under Cultural Diversity* in: *ISSS 2007. The 51th Annual meeting and Conference for the System Sciences. Tokyo, Japan, August 5-10, 2007* Curran Associates, Inc. (Mar 2008).

[Chroust-08b] CHROUST, G. *Localization, Culture and Global Communication* in: PUTNIK, GORAN D. , M. M. CUNHA, (eds.): *Encyclopedia of Networked and Virtual Organizations, vol II*, pp. 829–837 Information Science reference, IGI Global, Hershey USA 2008.

[Decker-92] DECKER, B. *You've got to be Believed to be Heard* St. Martin Press, New York 1992.

[He-02] HE, Z., D. W. BUSTARD , X. LIU *Software internationalisation and localisation: practice and evolution* in: *PPPJ '02: Inaugural conference on the Principles and Practice of programming, 2002*, pp. 89–94, Maynooth, County Kildare, Ireland National University of Ireland.

[Herden-06] HERDEN, J. *Experiences from the KDE localization process in Cambodia* KDE Cross Cultural 2006: http://conference2006.kde.org/conference/ slides/kde_cross_culture_akademy2006.pdf [June 2006].

[Hofstede-10] HOFSTEDE, G., G. J. HOFSTEDE , M. MINKOV *Cultures and Organizations - Software of the Mind, 3rd edition* McGraw-Hill, NY 2010.

[House-04] HOUSE, R.J, P. HANGES, , M. JAVIDAN, D. P.W. , V. GUPTA *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* Sage Publ. Calif., 2004.

[Kim-99] KIM, K. *Standardizing Romanization of Korean Hangeujl and Hanmal* Computer Standards and Interfaces, vol. 21 (1999), no. 5, pp. 441–459.

[Kobayashi-05a] KOBAYASHI-HILLARY, M. *A Passage to India - Pitfalls that the outsourcing vendor forgot to mention* Quality Assurance, vol. 3 (2005), No. 1, also: http://www.acmqueue.org/modules.php?name=Content&pa=showpage &pid=283&page=3, pp. 7.

[Kobayashi-05b] KOBAYASHI-HILLARY, M. *Outsourcing to India. The Offshore Advantage* Springer Berlin 2005.

[Krishna-04] KRISHNA, S., S. SAHAY , G. WALSHAM *Managing cross-cultural issues in global software outsourcing* Comm. ACM, 47(4):62–66.

[Kubota-03] KUBOTA, T. *Introduction to i18n* http://www.debian.org/doc/manuals/intro-i18n/, [Feb. 2003].

[Lindsay-03] LINDSEY, R. B., K. N. ROBINS , R. D. TERRELL *Cultural Proficiency: A Manual for School Leaders* Corwin Press 2003.

[Meyer-16] MEYER, E. *The Culture Map : Decoding How People Think, Lead, and Get Things Done Across Cultures* Public-Affairs 2016, Kindle Edition.

[Molcho-06] MOLCHO, S. *ABC der Körpersprache* H. Hugendubel Verlag, Kreuzlingen/München 2006.

[Morris-94] MORRIS, D. *The Human Animal* BBC Books, London 1994.

[Trager-06] TRAGER, E.H. *International Text Layout and Typography : The Big And Future Picture* Gnome Live, Boston, October 2006 - Text Layout Summit, http://www.unifont.org/textlayout/TheBigPicture.pdf [Oct. 2006].

[Watzlawick-00c] WATZLAWICK, P., J. BEAVIN , D. D. JACKSON *Menschliche Kommunikation. Formen, Störungen, Paradoxien* Huber, Bern 2000.