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# Handling Interpretation and Representation in Multilingual Research: A Meta-study of Pragmatic Issues Resulting from the Use of Multiple Languages in a Qualitative Information Systems Research Work

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## Handling Interpretation and Representation in Multilingual Research: A Meta-study of Pragmatic Issues Resulting from the Use of Multiple Languages in a Qualitative Information Systems Research Work

### Abstract

Although the number of multilingual qualitative research studies appears to be growing, investigations concerned with methodological issues arising from the use of several languages within a single research are still very scarce. Most of these seem to deal exclusively with issues related to the use of interpreters and translators in qualitative research (e.g., Temple & Edwards, 2002; Temple, Edwards & Alexander, 2006; Edwards, 1998; Temple & Young 2004). Methodological investigations going beyond pure translation dilemmas in qualitative research are, however, almost non-existent. The reason for this seems to be simple: the situation where the researcher possesses mother-tongue fluency in all or most of the languages used in a particular study – and, thus, is in a position to probe interpretational and representational problematics related to the multilingual character of this study with an adequate depth – is very rare. The author of this paper has used her recent qualitative research work in the area of Information Systems as the basis for a meta-study in which she investigates selected methodological issues resulting from the use of five different languages within the frame of a single research work. This paper specifically focuses on challenges encountered and observations made concerning three different issues, namely, how to choose the interview languages in a situation where the prospective interviewees have very diverse ethnic backgrounds, which languages to use for the data analysis in a situation where the data has been collected in several different languages, and how to determine the most appropriate stage of the research for transitioning from the languages used to collect and analyze the data to the language of the final research product. Although this meta-study is based on an Information Systems research work and is, thus, specifically addressing qualitative Information Systems researchers conducting multilingual research and encountering language-related issues in their work, this study might also be of interest to any researcher using qualitative research methodologies and employing more than one language to collect data, conduct data analysis, and craft the final research product.

### Keywords

Multilingual Research, Inquiry Language, Source Language, Target Language, Mediating Language

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## **Handling Interpretation and Representation in Multilingual Research: A Meta-study of Pragmatic Issues Resulting from the Use of Multiple Languages in a Qualitative Information Systems Research Work**

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*Although the number of multilingual qualitative research studies appears to be growing, investigations concerned with methodological issues arising from the use of several languages within a single research are still very scarce. Most of these seem to deal exclusively with issues related to the use of interpreters and translators in qualitative research (e.g., Temple & Edwards, 2002; Temple, Edwards & Alexander, 2006; Edwards, 1998; Temple & Young 2004). Methodological investigations going beyond pure translation dilemmas in qualitative research are, however, almost non-existent. The reason for this seems to be simple: the situation where the researcher possesses mother-tongue fluency in all or most of the languages used in a particular study – and, thus, is in a position to probe interpretational and representational problematics related to the multilingual character of this study with an adequate depth – is very rare. The author of this paper has used her recent qualitative research work in the area of Information Systems as the basis for a meta-study<sup>1</sup> in which she investigates selected methodological issues resulting from the use of five different languages within the frame of a single research work. This paper specifically focuses on challenges encountered and observations made concerning three different issues, namely, how to choose the interview languages in a situation where the prospective interviewees have very diverse ethnic backgrounds, which languages to use for the data analysis in a situation where the data has been collected in several different languages, and how to determine the most appropriate stage of the research for transitioning from the languages used to collect and analyze the data to the language of the final research product. Although this meta-study is based on an Information Systems research work and is, thus, specifically addressing qualitative Information Systems researchers conducting multilingual research and encountering language-related issues in their work, this study might also be of interest to any researcher using qualitative research methodologies and employing more than one language to collect data, conduct data analysis, and craft the final*

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<sup>1</sup> While the Information Systems studies providing the empirical basis for this paper were on specific IT methodologies, the “overlying” study (reported in this paper) was rather carried out at a “meta-level” – observing and analyzing the process of interviews carried out in the original studies and the role of the language in this process. In this sense, the author of this paper is following the original Greek meaning of the prefix “meta”, namely “about” – “study about a study”.

*research product. Keywords: Multilingual Research, Inquiry Language, Source Language, Target Language, Mediating Language*

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Within the past few decades, the forces of globalization have clearly augmented the need for qualitative research work which adequately represents study participants coming from diverse ethnic and cultural backgrounds. A natural expectation, thus, would be that, firstly, the number of qualitative research studies involving more than one language would have steadily increased over the past years, and, secondly, the methodology handling the specifics of multilingual qualitative research would be very mature at this point in time.

While the number of qualitative studies and inquiries using more than one language within a single research piece appears to be rising, a review of the research work conducted in the corresponding methodological space points only to an extremely limited number of studies which attempt to shed some light on some of the pragmatic and methodological issues that arise from the use of multiple languages within a qualitative research work (e.g., Fryer, Mackintosh, Stanley & Crichton, 2012; Harzing, 2005, 2006). Almost all of those scarce methodological studies seem to deal exclusively with the issue of translations, particularly with the problematic use of interpreters and translators in the course of a qualitative inquiry. As expressed by Temple and Young (2004, p. 161), this methodological research is principally “concerned with qualitative research studies where data are collected in more than one language and the research process, at whatever stage(s), involves acts of translation between languages.” Moreover, most of the methodological studies examining the translation problematics in qualitative research are language-specific – i.e., they examine the translation issues from the perspective of the English language instead of investigating this at a language-neutral meta-level. Interestingly, many of those methodological studies are coming from the qualitative health research space (e.g., Esposito 2001; Kapborg & Berterö, 2002; Larkin, de Casterlé, & Schotsmans, 2007; Temple, 2002).

Methodological studies going beyond the pure translation dilemmas in qualitative research are, however, almost non-existent. The reason for this seems to be obvious – a methodological meta-study of issues inherent in multilingual research implies a very special positioning of the researcher: namely, the researcher needs to have a considerable fluency in all languages used in the particular research work to have the ability to make meaningful observations and meaningful conclusions. However, as formulated by Temple and Young (2004, p. 168), “... the situation where the researcher is fluent in the language of communities ... [where the particular research is conducted] ... is rare.”

In the course of my recent qualitative research work conducted in the field of Information Systems I have encountered multiple issues which arose from the use of several languages. My mother-tongue-like fluency in most of the languages used in the study put me in a position to examine and to probe some of the methodological language-related issues arising in the course of this research with considerable depth and nuance. Selected insights of this meta-investigation will be reported in this paper.

## Multilingual Research in the Information Systems Field

There is, without any doubt, an abundance of Information Systems research which involves the use of several languages. Many different scenarios are possible – ranging from very informal multilinguality within of a research project (e.g., several researchers of different mother tongues conducting a joint research) to a formal multilingual nature of the research (e.g., data collection procedures are carried out using a language which is different from the output language of the research).

Although both research streams – qualitative as well as quantitative – can produce research which is to some extent “multilingual.” It appears that studies using quantitative research methodologies are more inclined to use multiple languages within a single research work<sup>2</sup>. The reason for this seems to be simple – since quantitative data collection is generally performed using standardized methods (e.g., written surveys) and the collected data is analyzed using quantitative analysis techniques (e.g., PLS, LISREL) the issues and problems resulting from using more than one language in the research are comparably easy to mitigate. Accordingly, most quantitative Information Systems research studies which use more than one language provide clear mitigation strategies for risks arising from the use of more than one language in the process of research – e.g., translations of surveys performed by independent translators, “bi-directional” translations of specific data by different translators, etc.

There exists, however, a very limited number of Information Systems research studies which use qualitative approaches and which can be regarded as “formally multilingual” in nature (i.e., where the use of several languages is formally embedded into the data collection procedures, the data analysis, or the compilation of the final research product). Consequently, there is – to the best of my knowledge – no methodological studies available providing structured guidelines to researchers carrying out multilingual qualitative research in the Information Systems field (contrary to that, there is, although very limited, guidance available in some other fields – e.g., health research).

In an attempt to move towards an initial understanding of the formal use of several languages within the process of qualitative Information Systems research, this meta-study provides structured insights into two major challenges I was confronted with when conducting a multilingual research in Information Systems using qualitative research methodology, namely, the challenge of selecting the inquiry language for each interview of the study and the challenge of selecting the language to be used in the analysis of the obtained interview data. Those insights were gained during the first phase of a three-part research work exploring the individual-level technology acceptance by European IT professionals<sup>3</sup>. This three-part research aimed to identify the critical factors

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<sup>2</sup> Multilinguality in quantitative research work might be caused, for example, by distributing written surveys to participants of a mother tongue which is *not* the language in which the final research product will be crafted. To deal with such situations, surveys are usually designed in the same language as the final research product and then translated into the mother languages of the participants prior to their distribution. Since the answers of such surveys are quantitative (and not qualitative) in their nature there is no need for translation of the responses, as the data is directly usable for qualitative analysis.

<sup>3</sup> This research work consisted of three independent studies – an exploratory study using the in-depth interview technique to collect data, a qualitative case study, and an empirical validation of the outcomes of the first two qualitative studies using a web-based survey for the data collection and the Partial Least Square technique for the data analysis. This paper particularly focuses on the first stage of the research – the exploratory interview-based study.

that significantly influence the intention of senior IT professionals to accept and use the Service Oriented Computing paradigm in their professional work. During the first, exploratory phase, in-depth open-ended interviews were conducted in the native languages of IT experts from France, Latvia, Germany, and Russia. Analysis and interpretation of this multi-linguistic source data presented several methodological challenges. Additional challenges arose in crafting the final research report in yet another language (English). The purpose of this paper is to describe the nature of these challenges and how they were addressed in the course of the research process. Although this paper is specifically addressing Information Systems researchers using qualitative research methodologies and intending to formally employ several languages in the research process, the insights described in this study might also prove to be useful to any qualitative researcher planning a multilingual research or coping with interpretational and representational problems in a research work which spans across several languages.

### **Terminology Used in this Meta-Study**

As outlined above, five different languages were formally used in the research underlying this meta-study: French, Latvian, German, Russian, and English. To facilitate the discussion and to distinguish between the several roles a language can take within a research project, the following terms will be used throughout this meta-study: source language, inquiry language, mediating language, and target language.

The first four languages (French, Latvian, German and Russian) were labeled the *source languages*. In the context of this study, a source language is the mother tongue of an informant. Similarly, English was labeled the *target language*. In the context of this paper, this label denotes a language in which the final research product is compiled. As will be shown later, I have decided to use the mother tongues of each of the informants (i.e., the source languages) as the *inquiry languages* in each respective interview. In this paper, the inquiry language means a language in which the interview is carried out (and, thus, the material of the interview is captured). Finally, in this paper I will also reflect on the usage of a *mediating language* in qualitative research carried out in the Information Systems field – however, due to the background of the study and due to my personal background there was no practical need to employ a mediating language in the technology acceptance research work underlying this meta-study. As understood in this paper, mediating language is different from the target language of the research. It usually would be employed under very specific conditions within a research project – e.g., it is a language which is spoken by several researchers jointly carrying out one research project which leads to a translation of the data material into the mediating language and a data analysis using the mediating language. Only the final research product (e.g., the research paper) is created in the target language.

### **Key Issues**

Although there were numerous highly interesting issues which emerged in the course of the technology acceptance study I have decided to focus on the following two key concerns:

**Issue 1:** Which language should be used as the *inquiry language* for each of the interviews?

**Issue 2:** Which language should be used in the data analysis and at which stage of the research is it most appropriate to *transition from the inquiry language(s) to the target language* of the research?

The following section of the paper will describe in detail both issues, report on my experiences concerning those issues, and suggest structured ways of proceeding for Information Systems researchers using qualitative research methodologies and encountering similar situations in their research.

### Discussion and Reflection on the Key Issues

**Issue 1:** Which language should be used as the *inquiry language* for each of the interviews?

Due to the fact that the participants of the study were of different ethnic backgrounds (German, Russian, French and Latvian), the question in which language each of the interviews should be performed had to be resolved in the very initial stages of the research.

In the context of this issue I identified three possible ways of proceeding:

1. **The mother tongue of the informant** (which might or might not be the mother tongue of the researcher) **could be used as the *inquiry language*.**

OR

2. **The mother tongue of the researcher** (which might or might not be the mothertongue of the informant) **could be used as the *inquiry language*.**

OR

3. **A third language** (i.e., a language which is neither the mother tongue of the informant nor the mother tongue of the researcher but which is fluently spoken by both parties) **could be used as the *inquiry language*.**

From these three choices, I initially chose option 3 (i.e., use a third language – in this case English – as the inquiry language). Firstly, I expected that senior professionals working in the IT field would be sufficiently proficient in English and, thus, carrying out an interview in a (fluently spoken) foreign language would not impact the quality of the interview. Secondly, the target language of the research was English which, in turn, meant that translation of the data obtained through the interviews would not be necessary. And, thirdly, although my mother tongue is not English I considered myself sufficiently fluent in this language and was thus assuming that the interviewer's reasonable fluency in the inquiry language would be completely adequate to ensure a clear, well-understood interview. Initial information obtained from all informants selected for this study made clear that all of them were sufficiently proficient in English.

Accordingly, the first two interviews of the study were carried out using English as the inquiry language. One of the informants had a Russian mother tongue and the other informant had a German mother tongue. However, after a thorough deliberation on the

data obtained through the interviews as well as on the actual flow of the interviews I came to the conclusion that the data obtained through these first two interviews should not be used in the final technology acceptance study. The reasons for this decision were manifold.

Although – as expected – both interviewees were proficient and fluent in English, the atmosphere of the interview was characterized by considerable reservation and detachment. The interviewees seemed to lack passion and interest in the particular subject. Moreover, particularly when speaking about emotionally laden issues, the interviewees tended to interrupt their flow of speech in order to seek for suitable words or expressions. Although discussion of emotionally-laden issues may potentially involve some interruption in the flow of speech even when speaking in one’s mother tongue, expressing emotional issues seemed to get even more difficult when speaking in a foreign language, particularly because of the limited vocabulary in this language.

To verify my assumptions described above I decided to ask both informants to repeat the interviews, however, instead of using English as the inquiry language I proposed the use of the mother tongues of the informants as the inquiry languages (i.e., for the Russian mother tongue speaker the Russian language and for the German mother tongue speaker the German language). Due to my very specific personal background, I speak German and Russian<sup>4</sup> with mother tongue fluency – which meant that I was using my own “quasi-mother tongues” as the inquiry languages. However, my decision to repeat the interviews was aimed at examining the use of the *informant’s mother tongue* as the inquiry language rather than the mother tongue of the researcher.

While the informant of the German mother tongue was not willing to repeat the interview, the informant of Russian mother tongue agreed to carry out an additional interview. A careful analysis of the obtained data clearly supported most of my assumptions made after the initial interview carried out using English as the inquiry language. Table 1 provides a comparison of the interviewee’s response to a question concerning his opinion on the use of formalized and centralized procedures for deploying new technological approaches in an organization as well as the role of an IT leader in this context:

*Table 1.* Comparison of Interview Responses in English and Russian

Interview conducted in English	Interview conducted in Russian	Translation in English
<i>I do not like formalization and standardization. I do not like to fill out forms or papers and then to queue up in front of a manager’s door in order to ask for additional support or additional money. Firstly, I need the room for freedom and spontaneity</i>	<i>Да к черту с этими бумагами и процедурами. От них никакой пользы нету. Пошлешь бумагу куда небудь и тогда будешь ждать неделями. А работа не ждет. У нас в этом смысле все очень просто: если у меня есть идея, я просто</i>	<i>To hell with all those papers and procedures. They do not help in any way. Let’s assume you fill out a paper and send it to somewhere. And then you wait – for weeks. But the work does not wait. As far as we are concerned, everything is very easy: if I</i>

<sup>4</sup> The author of this paper considers Latvian as her first language.



<p><i>and, secondly, asking for resources or money is anyway a task of the CTO or a similar role.</i></p>	<p><i>отталкиваю дверь нашего шефа и говорю: 'Сашка, будь человеком, сходи к этим парням [показывает большим пальцем на вверх] и скажи, что твоим ребятам есть идея.' И Саша знает, что и как говорить, что и как объяснить. Он у нас авторитет ...</i></p>	<p><i>have an idea I simply pop into the office of our boss [CTO] and say: 'Sashka [in Russian, a very informal form of the male first name Alexander], будь человеком [a Russian expression not directly translatable into English language, approximately meaning – be a friend, do me a favor], go to those fellows [shows with his thumb upwards] and tell them that your guys have gotten an idea'. And Sasha knows exactly what to say and how to say. He is really an authority in our organization ...</i></p>
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The emotional difference between both portions of the interview (although both are concerned with exactly the same topic and issue) is obvious. In the second interview, more emotionally laden expressions are used; the interviewee also uses gestures to support his verbal statements. Consequently, a substantial portion of information which I was able to gather using informant’s mother tongue is completely missing when employing a non-mother-tongue language as the inquiry language<sup>5</sup>.

On a question concerning the IT leader the respondent answers:

Table 2. Comparison of Interview Responses in English and Russian

Interview conducted in English	Interview conducted in Russian	Translation in English
<p><i>I really like our IT leader. Alexander is doing great job in our organization. And he is well respected and well regarded by everyone. Even the senior management of the company is taking his opinion seriously.</i></p>	<p><i>Да он нам молодец. Таких людей как его на пальцах сочитать можно. Его все уважают – наши парни, управление, ребята из других отделений фирмы. Но с другой стороны – он и берет только самых лучших.</i></p>	<p><i>He is really молодец [a Russian expression not directly translatable into English language, expressing a high level of appreciation for someone]. You can count on your fingers people like him. Everybody respects him –</i></p>

<sup>5</sup> There might also be additional factors which could account for those qualitative changes in the responses. Similar effects could also be caused by the way how the interviewee is – intentionally or unintentionally – reacting to the researcher’s physical appearance, personality, or the form of communication.

<p><i>Alexander has great ideas, and he knows how to get them working.</i></p>	<p><i>Ребят с идеями. Умных ребят. Ребят, которые не бояться риск-вать если понадобится. Если ты ищешь удобное местечко на пара годиков – даже не мечтай что ты сможешь продержаться у нас больше чем пара дней. Саша очень жесткий – к себе, но и то же к другим.</i></p>	<p><i>our guys, management folks, the business people. But on the other hand – he really hires only the best. People with ideas. Smart people. People who are not afraid of taking risks if it becomes necessary. If you are after a place to conveniently spend a few years – don't even think that you would be able to keep up with us for longer than a few days. It won't work. Sasha is tough to himself, but he is also tough to the others.</i></p>
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Again, while – at a shallow level – the information conveyed using the English language (a non-mother tongue) is similar to the information conveyed using the Russian language (the mother tongue) the actual depth and engagement of the statements is completely missing in the interview carried out using English as the inquiry language. This clearly supports the assumptions which I made after the initial interview round where I was carrying out using English as the inquiry language.

Following the interview on the adoption of the Service Oriented Computing (the second interview, carried out in Russian), the informant agreed to have an informal conversation on the difference between both interviews. This conversation was carried out in Russian. Many opinions expressed in the course of this informal conversation support, again, the assumptions as described above.

On my question concerning the principal difference between both interviews the informant, for example, stated:

Table 3. Example Statement

<b>Example statement on the difference between an interview using mother tongue as the inquiry language and using a foreign language as the inquiry language</b>	
Original statement in Russian	Translation in English
<p><i>Когда мы говорили по-английски, я все время думал – ‘Как бы мне только ненаговорить глупости. Мне надо быть осторожным выбирая слова’. Я все время искал подходящие слова. Иногда, мне пришлось исправлять самому себя когда я заметил, что выбрал неподходящее слово. Вы наверно заметили это. Естественно, я знал что</i></p>	<p><i>When speaking in English, I all the time thought – ‘Hopefully, I do not say anything stupid. I have to be careful when choosing the words.’ I was searching for the right words, sometimes, I had to correct myself since I had realized that I had chosen a wrong term. I assume you have noticed that. Of course, I knew that English is not your mother tongue, too, but</i></p>

<p><i>английский тоже не Ваш родной язык но всетаки ... Правда, я незнаю как Вам это объяснить. Но разница была огромная. Мне все время казалось, что между нами огромное ущелье – я кричу што то с этой стороны, и Вы мне отвечаете с другой ...</i></p>	<p><i>nevertheless ... Well, I really do not know how to explain it. But there was a huge difference. It felt like there was a huge canyon between us – I was screaming something from this side and you were answering from the other side ...</i></p>
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While the first two interviews and the resulting effects seemed to suggest that it is important to use the mother tongue of the informant as the inquiry language to ensure the highest quality of an interview, these interviews and the resulting conclusions did not provide any information whether using the mother tongue of the *researcher* impacts the quality of the interview in any way. In other words, while it seems to be necessary to use the mother tongue of the informant to achieve the best results in an interview, is it necessary that the interview is carried out in the mother tongue of the researcher, too (which would result in the fact that both – interviewee and interviewer – are of the same mother tongue)?

One of the interviews carried out in the process of the technology acceptance research seemed to provide me with some insights into this issue, as the interview was carried out in French. As indicated above, one of the informants selected for the study was of French mother tongue. Although I speak French with relative fluency, my proficiency in French is not comparable with my proficiency in English and, of course, also not comparable with my proficiency in all three remaining source languages of the study (Russian, German, and Latvian). Based on the insights gained through the first two interviews (i.e., the conclusion that it seems to be important to carry out the interview in the mother tongue of the informant to ensure its quality), I assumed that the *researcher's* actual level of proficiency in the inquiry language would not significantly impact the overall quality of the interview and, consequently, the quality of the data obtained through the interview.

After carrying out the interview and considering the flow of the interview as well as the obtained data, I decided not to use the results of this particular interview in my technology acceptance study. Several issues seemed to be significant in this context. Firstly, due to my average proficiency in the inquiry language, misunderstandings of different qualitative levels occurred comparably frequently during the interview. Secondly, after noticing that the inquiry language is not my mother tongue, the interviewee appeared to feel considerably constrained in his ability to speak quickly and without a particular care for clear and precise articulation (which, however, is very important for a French non-mother tongue speaker to be able to successfully participate in a conversation with a French mother tongue speaker). Thirdly, a light detachment and reservation seemed to accompany the interview (which, however, was not of the same severity as observed in the interviews which were carried out using English as the inquiry language – the non-mother tongue of both researcher and interviewee). And fourthly, since the interviewee was a reserved person who repeatedly waited for questions and prompts from me, my average proficiency in French caused the interview to become somewhat artificial and formal and lacking in natural fluency.

While I was not able to identify any strategies which could be used to increase the quality of the data obtained under these specific circumstances, some suggestions might prove useful for researchers who are using the interviewee's mother tongue (which is not the interviewer's mother tongue) as the inquiry language. Even if the data obtained through the interview might not be fully understandable to the interviewer at the time of the interview (due to language-related issues), the interviewer still has the possibility of listening to the recorded interview or reviewing the captured data after the interview. Language-specific nuances which might have not been understood at the time of the interview might become clear thereafter. Regarding my interview with the French participant, a post-interview language-specific examination of the data proved to be relatively useful for me. I have listened to longer passages of the interview together with two French mother tongue speakers, stopping the audio recording at many places to clarify expressions or words mentioned in the interview. Particularly passages of the interview concerning very technical topics had posed a considerable difficulty to me, as French uses neologisms instead of borrowed English words for many technical terms. One of the French native speakers assisting me in the preliminary data examination was a senior IT specialist (i.e., a mother tongue speaker with extensive domain knowledge) – and this proved to be particularly useful when understanding highly technical passages of the interview.

Particularly when using structured or semi-structured interviews, the interviewer will usually have prepared a certain amount (i.e., crafting questions or topics to discuss in advance). Dependent on the purpose and aim of the interview, raising pre-crafted questions and making brief remarks or points in the course of the interview might be sufficient for the interviewer to keep the interviewee interested and responsive, even when the inquiry language of the interview is not interviewer's mother tongue. This, however – according to my observations mentioned above – would only be possible with an outspoken respondent. A reserved interviewee would be rather dependent on the ability of the interviewer to effectively lead and guide an interview – an ability which, in turn, would considerably depend on the fluency of the interviewer in the inquiry language. In addition, for in-depth interviews, the interviewer's preparation can only be very limited and the quality of the interview will be highly dependent on his ability to quickly adapt to the situation and to ask meaningful and clear follow-up questions and make effective points depending on the course of the interview. Thus, the interviewer's fluency in the inquiry language will be one of the critical factors deciding upon the quality of the interview and, in turn, upon the quality of the gathered data.

**Issue 2:** Which languages should be used in the data analysis and which stage of the research is the most appropriate to transition from the inquiry language(s) to the target language of the research?

The following basic structure of the data analysis process was set up when developing the research design of the study:

**Step 1** Initial familiarization with the data material as proposed by Eisenhardt (1989)

**Step 2** Data reduction and data display as described by Miles and Huberman (1994)

**Step 3** Conclusion drawing and verification as proposed by Miles and Huberman (1994)

The following description of those three steps illustrates the use of languages in the data analysis:

Table 4. Use of Language in the Data Analysis Process

Step	Description	How language was embedded
1	In the <b>first step</b> of the data analysis (“initial familiarization”), I read the complete interview transcripts and examined them three times. In the course of the fourth reading, I manually highlighted data material describing issues relevant to the Service Oriented Computing acceptance decision of the interviewee (the subject of the study) and added a short preliminary description of the issue.	Reading data Producing preliminary notes
2	In the <b>second step</b> (“data reduction and data display”), each interview was treated as a separate unit of analysis (“intra-case analysis”). The data of the interviews were divided into meaningful analytical units and they had to undergo the process of transformation through selection, summarization and paraphrasing. Moreover, at the end of step 2, the data had to be appropriately coded. In order not to be constrained by preconceived assumptions and pre-built ideas, I decided not to use an “initial master code list” (Miles & Huberman, 1994), but to subsequently develop a code list and apply it throughout the entire study.	Summarizing, paraphrasing data Coding data
3	The <b>third step</b> (“conclusion drawing and verification”) was primarily devoted to linking similar topics from all interviews into “themes”, conceptually labeling these themes (i.e., constructs), grouping these constructs and discovering any moderating relationships in the data. The principal tools proposed for this step were the “cross-case analysis” and appropriate display for the summarized results of the data analysis performed in step 2.	Labeling themes Describing moderating relationships

The brief description of the three steps above highlights several problematic issues related to the use of language which emerged in the context of the data analysis process. The most important questions were as follows:

1. Which language should be used in the “familiarization” step of the data analysis? (an issue arising in step 1)
2. Which language should be used to perform the “intra-case analysis”? (an issue arising in step 2)
3. Which language should be used to develop the master code list? (an issue arising in step 2)
4. Which language should be used to perform the “cross-case analysis”? (an issue arising in step 3)
5. Which language should be used to label the common “themes” emerging during the conclusion drawing and verification process? (an issue arising in step 3)
6. And finally, what is the most appropriate point for the results of the data analysis to undergo the process of translation? (an issue not attached to any particular step but relevant to the data analysis process as a whole)

**Question 1:** Which language should be used in the “familiarization” step of the data analysis?

In the course of the study, I decided to carry out the activities related to the familiarization with the data material using the inquiry language of the interview (i.e., German for German mother tongue interviewees, Russian for Russian mother tongue interviewees, etc.). There were two principal reasons for it. Firstly, since the main purpose of the “familiarization step” is to understand the overall “atmosphere” of the interview and to build up a coherent high level understanding of the scope and contexts of the key experiences under investigation, it seemed to me that mixing two different languages (i.e., reading the interview text in one language and producing preliminary notes, memos, and labels in a different language) would be rather counter-productive. If the labels, notes, and memos were produced in a language different from the inquiry language of the respective interview it would principally mean that a specific type of translation has already occurred in the data analysis process. “Translated” data lacks some of the language-inherent and language-specific nuances and shades, which, in turn, may result in a limited or even incorrect understanding of the key experiences narrated in the specific interview. This would directly undermine the purpose of the “familiarization step” of the data analysis process.

Secondly, by following the research design the initial part of the data analysis was generally concerned with the “intra-case analysis” rather than with establishing linkages between different cases (“cross-case analysis”). Consequently, there was no need to combine data from several interviews within the same analysis – as the data analysis focused on one “case” at a time.

Thus, using *one* particular language for analyzing *one* particular interview – or, in other words, using the inquiry language to analyze the respective interview – seemed to me to be the most appropriate way of proceeding.

**Question 2:** Which language should be used to perform the “intra-case analysis”?

Following the rationale as described above, I have decided to perform the initial “intra-case” analysis using the inquiry language of the interview. Thus, the data transformation through selection, summary, or paraphrasing was carried out using the same language in which the respective interview was conducted.

**Question 3:** Which language should be used to develop the master code list?

While using the inquiry language of the respective interview in the familiarization phase and in the initial phase of the “intra-case” analysis did not produce any particular issues, I encountered considerable difficulties in making an appropriate decision about the language of the master code list. Basically, a code list provides the researcher with a formal system to organize the data and to document the linkages within and between phenomena and experiences captured in the data. Based on the insights gained through the “intra-case analysis” of each of the interviews (which were conducted in different inquiry languages), I have initially started to create code lists for each of the interviews in the inquiry language of the respective interview (which resulted in several code lists – one code list per language). However, since the coding system is primarily used to document linkages between similar phenomena *in the entire data material* (and not in an isolated portion of data) using code lists in different languages for isolated portions of text (i.e., separately for data from each language) did not seem to fulfill the actual objective of this analytical step. In addition to that, in the process of the data analysis I realized that I had started to create the codes in different languages by – initially unconsciously – emulating the following pattern: while the codes in the respective languages were created to reflect the “low level” (or “language-intern”) understanding of a specific phenomenon, the “high level” understanding of the phenomenon was unconsciously formed (although not captured in writing at that stage) in *one single* language (in the case of this study in the target language of the research). In other words – while it was possible to use a code (and explanation of this code) created in “language A” throughout all interviews conducted using “language A” as the inquiry language (and the same for “language B”, “language C” and so forth), it was apparently necessary to use one single language (which was *different* from any of the inquiry languages) to establish a coherent understanding of the emerging concepts across interviews in several languages.

Thus, in this situation, the code lists in each of the languages seemed to represent an intermediate step towards the actual code list rather than the actual master code list itself. The fact that the master code list was developed in a language which was different from any of the inquiry languages used in the interviews led me to an assumption that a consolidation of the key concepts emerging from multilingual interview data in a “third language” might be a necessary measure to prevent one of the inquiry languages to impose the “language-intern” way of understanding the concepts onto other inquiry languages. Thus, the use of a “neutral” language (which could either be the target language of the research or a mediating language) to build the master code list seemed to be a suitable way to mitigate this risk.

There are many examples illustrating this pattern (e.g., phenomena of “applicability,” “technical compatibility,” “structural flexibility”).

Codes and the related descriptions created, for example, in German and Latvian might be used to exemplify this phenomenon. Several “low level” (or “language-intern”) codes were created in these two languages to label portions of the data which dealt with the issue of how the IT professionals judge if the Service Oriented Computing (SOC) approach is an approach which can be successfully applied in contexts of specific organizations or specific business cases. However, a subsequent analysis of the codes created in both languages revealed that all codes were very clearly converging onto a single “high level” concept which was – initially unconsciously – labeled in the target language of the research. Moreover, neither any label used in Latvian nor any label used in German expressed exactly the full essence of the emerging concept. Therefore, as already indicated, I – initially unconsciously – started to create and use *one* single label (in English) to denote and to “group” all these “low level” constructs expressed in different languages.

Table 5. Provides an Example of this Issue Using the Concept of “Applicability”

<b>Example for “low level” codes mapping to a “high level” code (APPL)</b>				
Latvian code	Latvian description	English code/description	German code	German description
PIEL	Pielietojamība	APPL Applicability of the SOC concept	ANWEN	Anwendbarkeit
ATB	atbilstība		BRAU	Brauchbarkeit
MĒRĶ	mērķtiecība		EINSATZ	Einsatzmöglichkeit
NEPIE	nepieciešamība		VERWE	Verwendungszweck

The same applies to the concept of “technical compatibility” (Table 6).

Table 6. Technical Compatibility

<b>Example for “low level” codes mapping to a “high level” code (TECHCOMP)</b>				
Latvian code	Latvian description	English code/description	German code	German description
SASK	saskaņojamība	TECHCOMP Technical compatibility supported by the SOC approach	ANPAS	Anpassbarkeit
TATB	tehniska atbilstība		KOMP	Kompatibilität
SAVIEN	savienojamība		ANPASF	Anpassungsfähigkeit
SADER	saderība		FLEX	Flexibilität



To formalize the pattern which was described above, I decided to create full “low level” (“language-intern”) code lists in every language used in the study (that is, German, Latvian and Russian – as indicated above at that stage I had already made the decision to refrain from including the French interview in the final technology acceptance study). After the creation of the full lists was completed (and all the material was completely coded using the code list in the respective inquiry language), I consolidated all three “low level” code lists into a single mono-language master code list (a code list in the target language of the research). The process of the master list creation was performed in four steps.

Firstly, for many “low level” (or “language-intern”) codes a corresponding “high level” code had already emerged in the course of the data analysis carried out in the respective language. Thus, the first step of the code list consolidation was to capture all those “low level” codes which were clearly mapping to an already existing “high level” code.

The next step was concerned with analyzing the remaining “low level” (or “language-intern”) codes and attempting - where possible and reasonable – to group them into additionally created “high level” codes.

The third step was concerned with the “low level” codes which did not clearly converge onto any of the existing “high level” codes and where the creation of additional “high level” codes did not appear to be appropriate. To carry out this step, I constantly went back to the respective portion of the data to which the particular “low level” code was attached and re-examined this portion of the data to understand why this particular code was generated, what exactly it expressed, and if this issue was particularly significant or important for the interviewee and for the question under examination in this particular study. In addition, it was necessary to find any comparable issues in other interviews highlighting the same or similar point. In the very rare situations where there were no comparable issues mentioned in any other interview and it did not seem that a new “high level” code should be generated for this “low level” code (e.g., in situations where the expressed issue did not seem to be important to the interviewee), I have dropped the “low level” code without mapping it to any “high level” code of the master code list.

The final step was concerned with replacing all “low level” codes in the transcribed data with the “high level” codes from the final list and conducting a final check whether or not the “high level” code was really reflecting the issue described in the data and, thus, was adequately coding this specific portion of data.

Principally, the data analysis process used in this meta-study was similar to the process of coding used in grounded theory (Glaser & Strauss, 1967). In grounded theory, the words code, concept, property, and category are used to refer to conceptualizing an emergent pattern – the terms “low level” codes and “high level” codes are used very similarly in the current paper. While the process of extracting “low level” codes was similar to the open coding process in grounded theory (Strauss & Corbin, 1990) as it was used to break down, examine, and compare the data, the process of mapping “low level” codes to the “high level” codes was based on the axial coding methodology (putting the data together in new ways and making connections between categories).

**Question 4:** Which language should be used to perform the “cross-case analysis”?

As already indicated above, “cross-case” analysis was one of the tools employed in the course of the *third step* of the data analysis (“conclusion drawing and verification”). One of the principal insights gained during the second step of the data analysis (primarily concerned with “intra-case” analysis and also building a master code list) was the conclusion that it is necessary to converge onto *one* single language as soon as the data analysis begins to span several “units of analysis” in different languages (i.e., interviews using different inquiry languages). In addition to that, it seemed that this language cannot be any of the inquiry languages of the interviews. Particularly, the process of the creation of the master code list made this issue obvious: the code list created in one of the inquiry languages of the interviews could be successfully applied only to the interviews of this particular inquiry language, however, a code list which was usable for interviews in all languages had to be in *one* particular language which was *none* of the inquiry languages of the interviews (in the case of this study, English was used to create the master code list, however, other researchers might encounter a situation where a mediating language is introduced in the research, and in this case the code list would be created in the mediating language)<sup>6</sup>.

Following this insight, I decided to translate any data used in the “cross-case” analysis into the target language of the research. Only after the affected data was completely translated was it used in the data display matrices combining data materials from different interviews. The translation process of the affected data was carried out using a bi-directional translation approach – while one translator translated the text from the inquiry language into the target language, a different translator translated the material back into the inquiry language. This translation approach, which is commonly used in qualitative research studies, allowed me to check for any translation inconsistencies.

In addition to linking similar topics from all interviews into “themes” (which was primarily done using “mono-language” “cross-case” analysis and summarizing the data using “mono-language” data display in matrices), the third step of data analysis was also concerned with conceptually labeling the emerging themes. Following the strategy described above (using *one* language which is not one of the inquiry languages if a particular activity involves data from several interviews in different languages) the labeling of the “themes” was performed in the target language of the research.

**Question 5:** What is the most appropriate point for the results of the data analysis to undergo the process of translation?

As already highlighted above, the translation was not used in the research until step 3 of the data analysis, “conclusion drawing and verification.” In this step, a combined display of data material from interviews in several languages became necessary. Based on the insights gained through the preceding data analysis, I decided to translate the affected material prior to jointly displaying it in matrices and using the data display to draw conclusions and verify them.

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<sup>6</sup> Some interesting questions for future research in this context are: Are some languages used as mediating languages more effective than others? How could be “effectiveness” or “usefulness” of a mediating language be measured? How do we know that a mediating language is performing well?

### Additional Issues Encountered in the Research

Although the reflection in this meta-study focused only on two specific issues related to the multilingual character of the underlying research work, there were a number of other issues related to the use of multiple languages within the frame of a single research study which were not reported in this paper.

One of those issues was, for example, the “IT sensitivity” of a particular language. This can be illustrated by comparing two languages, German and Latvian<sup>7</sup>. In German, IT related terms and concepts are frequently borrowed from English and used in a non-translated way. Exactly the opposite happens in Latvian. Due to the very specific character of the Latvian language and also due to the language-related policies of the Latvian government, all IT-related terms are translated into Latvian and used as neologisms.

An example for this is the term RAM (random access memory). German and English use this term the same way, but in Latvian it is translated into “brīvpieejas atmiņas disks” which, back-translated into English means “*free* access memory” instead of “*random* access memory.” Another example is the term “backup.” Again, this term is the same in German and English, but is translated into Latvian as “dublējumkopija,” which, back-translated into English, means “*doubling* copy.” Quite often, the original meaning conveyed by the English expression does not get fully (or exactly) captured in the Latvian term, which makes a conversation between an interviewer following the original meaning of the respective term and an interviewee following the new meaning created through the neologism a difficult undertaking.

### Summary and Conclusions

The following diagram (Figure 1: Embedding multiple languages into a qualitative Information Systems research work) visualizes how the use of multiple languages was embedded in the process of the data collection, data analysis, and the compilation of the final research product.

Summarizing the observations made regarding the key issue 1 (Which language to select as the *inquiry language*?), the experiences and the related insights which I describe in this paper appear to suggest that:

1. Data obtained through an interview which uses an interviewee’s non-mother tongue as an inquiry language might considerably lack emotional depth. The value and correctness of the description of the experiences under investigation might, thus, be questioned.
2. Conducting an interview in an inquiry language which is not the interviewer’s mother tongue might be disadvantageous in situations where the interviewer’s fluency in the inquiry language is limited *and* the interview is conducted with a reserved and hesitant participant.

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<sup>7</sup> Latvian is a Baltic language with approximately 500,000 native speakers.

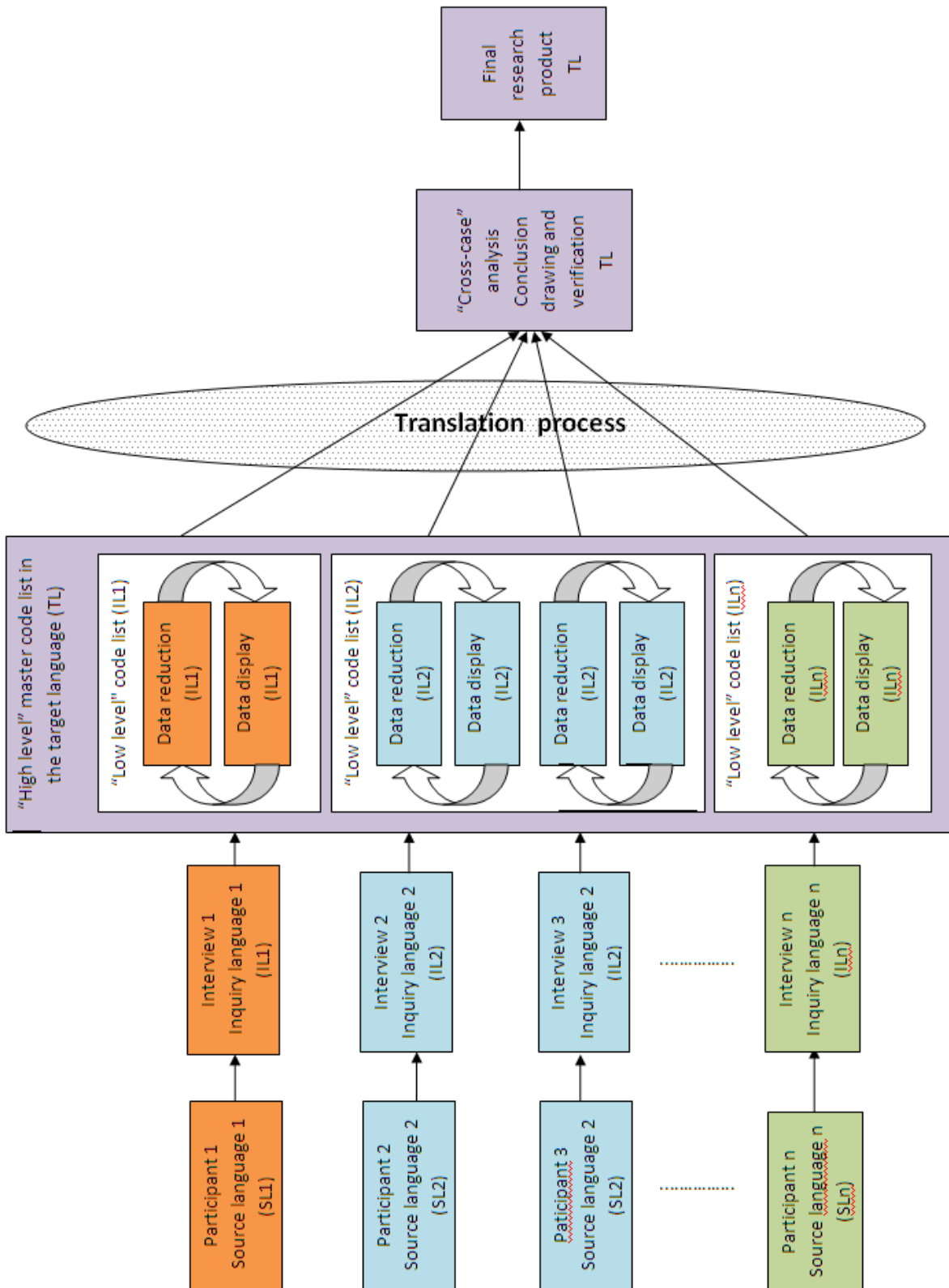
3. Although conducting an interview using an inquiry language which is neither the interviewer's nor the interviewee's mother tongue is possible, it might have considerable influence on the quality of the obtained data as it might lack depth of discovery. The profoundness of the obtained information might be questioned.
4. Conducting an interview using an inquiry language which is neither the interviewer's nor the interviewee's mother tongue might falsify the emotional nuances accompanying the interview. The obtained data may lack potentially important pieces of information.

The most important insights gained with regard to the key issue 2 (Which languages should be used in the data analysis and which stage of the research is the most appropriate to transit from the inquiry language(s) to the target language of the research?) are:

1. It seems to be necessary to use the inquiry language of the interview to perform the initial familiarization with the data (i.e., any notes, memos, labels created in this step should be in the same language as the interview). Using a language which differs from the inquiry language of the specific interview to familiarize with the data will necessarily involve translation which, in turn, will directly undermine the principle purpose of the familiarization step (exploring the overall "atmosphere" of the interview).
2. The "intra-case" analysis of each interview should be carried out using the inquiry language of the respective interview.
3. For each of the languages used in the study, a "low level" (or "intra-language") code list could be created and used throughout the interviews using this particular language as the inquiry language. These "low level" code lists might form the basis of the final "high level" master code list which would subsequently replace the "low level" code lists throughout the entire transcribed data.
4. The master code list should be in *one* single language. The language of the master code list could either be the target language of the research or the mediating language of the research and will usually differ from any of inquiry languages used in the research.
5. Any data analysis combining of data from several interviews in different languages should be carried out using data translated into a single language (which might be the target language or a mediating language used in the particular research).
6. Due to the specific settings of the technology acceptance study forming the basis of this meta-study, I was not in the position to verify to what extent the principles described in this study would be applicable to other language constellations.
7. For example, additional observations would be needed for the case, where a specific part of the interview data is collected in the target language of the research (meaning that the target language is one of the multiple inquiry languages) while the remaining material is collected in languages which differ from the target language. Particularly the issue with the "low level" (or "intra-language") code lists and "high level" master code list would become very interesting in this context. Would the "high level" master code list still be

developed in the target language of the research or would a mediating language be used in such a situation?

Figure 1. The Use of Multiple Languages in the Process of the Data Collection, Data Analysis, and the Compilation of the Final Research Product



Similarly, the role of the mediating language was only briefly mentioned in this meta-study. In specific situations, it might well be advisable to use a mediating language when converging into one single language within one single piece of research. This might particularly be the case when researchers of different (yet similar) ethnic backgrounds are working on a joint research with a projected target language that is unrelated to their ethnic backgrounds. A good example would be researchers of different Chinese backgrounds – Cantonese, Mandarin and Hokkien – working on a joint research with English as a projected target language. This research would possibly be using Mandarin (as the main Chinese language) as the mediating language and translate the final research product into the target language (although an earlier use of the target language in the research process could also be possible).

In summary, in this meta-study I have attempted to provide some reflections on a topic which seems to have received extraordinarily limited attention from qualitative researchers up to this point – including academics conducting qualitative research in the Information Systems field, the domain which served as the basis for this meta-study. Although the amount of the qualitative research studies carried out formally using different languages in the research process seems to be growing there are hardly any guidelines or suggestions available for researchers who are planning to conduct multilingual research using qualitative research methodologies.

This meta-study, thus, represents an attempt to start a discussion on this very important although up to now widely neglected issue and to progress towards an initial view on how the use of multiple languages could be embedded in qualitative research, including qualitative research in the Information Systems field, to produce diverse, insightful, relevant and, at the same time, valid and reliable research results.

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