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Knowledge sharing in online communities

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STORYTELLING AS A TOOL FOR KNOWLEDGE TRANSFER IN THE IT INDUSTRY

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Abstract

As organizations increase their offshore software development efforts, they must develop new methods and models for handling the vast amount of knowledge involved in these projects. Successful knowledge management and transfer is considered key to the success of contemporary organizations. When transferring knowledge to other operating units of a multi national company, the overall goal is to successfully implement the knowledge sent to the receiver. Cultural differences however, can interfere with successful knowledge management intentions. This paper investigates storytelling as a tool to transfer knowledge between global corporate units. A case study on how this instrument is used to communicate knowledge between a German and an Indian IT company gives first insights into factors that influence implementation success.

Keywords: Knowledge Management, Storytelling, Case Study, Culture.

INTRODUCTION

Globalization has played a major role in developing businesses processes. Modern technology supports these transformations and allows members of global organizations to be involved in increasingly international cooperation. In the IT industry, more and more software development projects have been geographically distributed and happen in many different countries at the same time. Offshore software development has thus become a notable area of focus in the IT industry. Nowadays, we often speak about global or offshore software development when it comes to globally distributed development teams working together in different time zones, with different local language settings, with different cultural backgrounds and a different educational approach to software engineering.

1 THE NEED FOR KNOWLEDGE TRANSFER

As organizations increase their offshore software development efforts, they must develop new methods and models for handling the vast amount of knowledge involved in these projects (Desouza et al., 2006). 'Knowledge management' and 'knowledge transfer' become highly prominent in this scenario. *'Knowledge management'* has many definitions, one of them being the process of continuously creating new knowledge, disseminating it widely through the organisation, and embodying it quickly in new products/services, technologies and systems (Takeuchi and Nonaka, 2004). *'Knowledge transfer'* is basically giving background information on software projects to people who do not have it (Stellman and Greene, 2005).

The concept of knowledge transfer is difficult to capture, because there is no clear distinction between the transfer of knowledge and the creation of new knowledge (Bresman et al., 1999). It is customary to speak of the 'transfer' of knowledge between two distant units of a multi national company (MNC) or between two different functional units at the headquarters, between a vendor and a customer, or even between countries. The use of 'transfer' implies flow: knowledge 'flows' from its primary holder to the receiver (Doz and Santos, 1997).

Knowledge flows or knowledge transfer refers to the transfer of either expertise or external market information of global relevance, but not to the transfer of internal administrative information (Gupta and Govindarajan, 1991). Transferring knowledge means the transferring of operational knowledge. This can happen in the form of data, information, blueprints, parts, subassemblies, machines or other means to represent knowledge. It can also happen via persons, individual or teams (Doz and Santos, 1997).

Knowledge flows and knowledge transfers are strategically important to organizations for several reasons. They transmit localised know-how, which is generated in one sub-unit to other locations in the organization. Knowledge transfers also facilitate the co-ordination of work flows linking multiple, geographically dispersed sub-units. Furthermore they can enable organizations to capitalise on business opportunities requiring the collaboration of several sub-units. Knowledge flows are also crucial to the orchestrated execution of unified strategic responses to moves of competitors, customers, and suppliers. Finally knowledge flows enable the recognition and exploitation of economies of scale and scope (Schulz and Jobe, 2001).

The MNC faces various challenges with regard to internal knowledge transfer. Subsidiaries should be motivated to access and produce knowledge within the MNC, which means that relevant subsidiary knowledge has to be made accessible to those MNC units that need it. To do so communication needs to be established between those who need and those who possess knowledge. To achieve this goal the organization has to choose the best instruments of control, motivation and context (Foss and Pedersen, 2002).

Successfully identifying, analysing, specifying and documenting better requirements are very crucial; it becomes a higher priority in terms of its effectual transfer across boundaries in offshore software development cases. Differences in location specific work cultures like work ethic, importance of hierarchy and mode of communication can impact the transfer of the software requirements specifications.

When cautiously considering the inherent risks of globally distributed development (Aspray et al., 2007), co-ordination and communication issues are the most intense burdens compared to distance and time (Herbsleb, 2007). Moreover, issues on data and system security, contractual and intellectual property issues as well as concerns about losing domain knowledge play an important role (Carmel and Tija, 2005). But despite those risks, reasons to offshore are still persuasive with cost advantages as the dominant force (Carmel and Tija, 2005). Offshore strategies are further utilised to gain access to enormous skilled labour pools with a certain domain experience and to exploit time shift advantages by expanding the daily development cycle to different time zones.

Conveying this knowledge to counterparts working in a geographically distant, culturally differing country becomes an important issue to focus on. During such scenarios a lot of factors come into prominence that should be well taken care of. The crucial challenges are 'knowledge transfer' and 'cultural'; it is important to inspect these problems and come up with a feasible solution in each case.

2 CROSS-CULTURAL KNOWLEDGE TRANSFER

Culture plays an important role in any team activity's success (Bhat et al., 2006) and is associated with the knowledge transfer process. Understanding and dealing with the culture of the vendor country for the efficient transfer of specifications is one of the motivations for our research.

Knowledge management literature gives the impression that knowledge management operates in a kind of cultural vacuum. Diversity in terms of language, cultural and ethical background, gender and professional affiliation are considered to be one independent variable, which is in any case pushed to the side. This approach may be convenient for conceptualizing, but is very limited for practical purposes in the modern international business world (Holden, 2002). Hofstede (Hofstede, 1984) furthermore points out that geographical separation and cultural differences can lead to quasi-autonomous sub-organizations which may further lead to numerous problems of communication, co-ordination, control and motivation. Thus cultural differences within an MNC should not be neglected when discussing knowledge transfer and can be regarded as one of the barriers between company divisions and local units of the company (von Krogh et al., 2000, Davenport and Prusak, 1998). Knowledge transfer within units located in the same country can already be troublesome, but it is clear that the problem associated with transfer increases with geographical and cultural distance (Bresman et al., 1999). Li (Li, 1999) shows that communication between individuals in high-context countries and low-context countries differs significantly in the amount of information transferred.

Within knowledge transfer relationships between members of differing cultures interlocutors communicated less information than between members of the same cultural background. His results indicate that low-context/low-context communication relationships do not differ from high-context/high-context relationships in this term. These differences in the communication between high-context and low-context cultures lead to tremendous losses of relevant knowledge within the transfer process between these groups.

Contact and communication between different cultures is an inherent fact of offshoring, thus research on cross-cultural issues in this area is gaining more and more emphasis. Motivated by the immense negative influence of cross-cultural issues on the offshore performance in software development projects (Carmel and Tija, 2005), even information systems research is *'seeking culture'* nowadays. As a conclusion, the common understanding of culture is that it is learned, associated with values and behaviours, shared by a group and passed from one generation to the next (MacGregor et al., 2005).

To explain cultural differences researchers make use of *dimensions of cultural variations*. Dimensions in this context are aspects of a culture which can be measured in relation to other cultures (Hofstede and Hofstede, 2004). Triandis provides an overview of the most popular cultural dimensions (Triandis, 1982). Referring to them helps to understand and explain why people from other cultures behave and think differently than we do. Therefore in the context of offshore software development and the necessary transfer of knowledge we need to analyse some of the typical dimensions to understand why the knowledge transfer is so complicated between team members from different cultures.

The findings of Hofstede and Hall are often discussed in the scientific community and based on their work we can build a model of the most important cultural obstacles that impede the performance of knowledge transfer. The following seven obstacles have been summarized and selected from the cultural orientations formulated by Hofstede and Hall (Hall, 1976, Hofstede, 1984). This selection is based on casual expert interviews in preparation for this research initiative.

Firstly the *power* dimension is one of the most important in any business context. The structure of power accounts for the expression of emotional distance between subordinates (Hofstede, 1984) and superiors where higher power cultures tend to have more autocratic managers (Hall, 1976, Hofstede, 1984). Individuals in such cultures are less likely to express disagreement with their supervisors. Less power-orientated cultures use participatory and consultative management styles. When both extremes have to collaborate in a knowledge transfer initiative cultural obstacles may emerge.

Secondly, *relationship* dimensions reflect the difference between individualism and collectivism. People from individualistic cultures tend to highly value personal freedom, privacy, and time (Hall, 1976, Hofstede, 1984). They are usually expected to look out for themselves, especially in a business context. For more collectivist-orientated cultures, group harmony is more important than personal ambition. At work they have a higher dependence on organization and a stronger desire for non-financial rewards. Some authors in the knowledge transfer community argue that individuals from collectivist cultures are better suited as knowledge transfer partners, because no financial reward is required.

Different cultures experience *time* dimensions differently. For certain groups deadlines are firm and literal, in other words people tend to be on time (e.g. stereotypical Germans and Americans). For others the interpretation of time is more flexible. A team of mixed cultures may find it hard to meet knowledge transfer milestones and to dedicate time for joint work sessions when one part of the team has a different understanding of when to meet a given objective. Since knowledge transfer in many cases, as in the transfer of implicit knowledge, requires that two individuals work together, a different understanding of how often and how rigorously to schedule joint meetings may slow the employee from the more ambitious culture. This would naturally be lead to frustration and conflict between the two parties.

Dimensions of *uncertainty,* as defined by Hofstede, represent the amount of uncertainty an individual tolerates. This is due to the fact that the business environment requires numerous decisions involving doubt and risk. Examining this perspective on the unknown will contribute a description of how people cope with ambiguity. Hofstede, for example has found that British people can handle uncertainty better then Germans (Carmel and Tija, 2005). A similar difference may also arise between German and Chinese workers.

Hofstede defines the '*future'* dimension as how focused on the future a culture is. East Asian countries, including China, Korea, and Japan, tend to be very forward looking. The central purpose of orienting one's work around the future or the long-term implies delaying present gratification or gains in return for future prosperity on a grander scale. Naturally, the opposite would be an emphasis on the present, where instant gratification would reign supreme, or on the past, where present ambitions are shaped by former achievements. In the context of knowledge transfer obstacles will present themselves when one group of workers invests much more time into the long-term objective of knowledge transfer than the other.

Such frustrating situations may become worse if the *communication* dimensions of the parties are also incompatible. Two classifications of communication orientation can be found in the relevant literature on culture in general: high- versus low-context communicators. Low-context cultures listen to what is said rather than how it is said while high-context cultures consider secondary factors such as one's tone and peripheral and contextual information in order to understand each other. Given the fact that a knowledge transfer requires two individuals to communicate regularly often regarding entirely new concepts, different communication orientations can become significant obstacles for knowledge transfer. For example, a low context communicator might find it difficult to explain something to a high context communicator often interrupting him because he sensed, that his partner is bored and tries to convey interest by asking a confirming question.

Finally we identify *information processing* dimensions by the way cultural groups process information. East Asian cultures tend to see more relationships and connections between disparate pieces of data. Westerners distinguish more across categories and taxonomies in a rather disconnected approach. As with communication problems, an expert may find it difficult to explain an isolated metaphor to an individual thinking in terms of relationships.

These *cultural* dimensions help to understand the basic principles of cross-cultural communication and data processing. We concentrate our efforts on the first three dimensions, as we found storytelling to have a strong positive effect on intercultural problems in those areas, but a weaker effect on the other dimensions.

3 STORYTELLING

When transferring knowledge to other operating units of a MNC, the overall goal is to implement the knowledge sent successfully at the receiver's unit (Sorensen and Snis, 2001). Therefore, a shared, explicit understanding of concepts, categories, and descriptors lays the foundation for effective communication and knowledge transfer in organizations (Zack, 1999).

The knowledge to be sent needs to be transferred in a format that can be understood by the receiver (Thomas, 2002). Unfortunately, most of the time the encoded messages cannot be considered universal, since they are culture-specific and arbitrary (Roth, 2001). This might not always be obvious during the communication process. Messages received from individuals of other cultures might have an outward similarity with messages of the home culture; their culture-specific differences are often ignored. This might also influence the transfer of knowledge negatively. Successful transfer of knowledge must thus be based on a collaboratively established consensus among the participants (Sorensen and Snis, 2001) and can improve relationships among organizational communities if there is a commonly acknowledged context in which the significance given by the users to the symbols are unique (Dupouet and Laguecir, 2002).

Ever since human beings have communicated and socially interacted with each other, stories have played a vital role in exchanging and propagating complex ideas and disclosing knowledge. In every culture, different stories exist and have been used to preserve and pass on knowledge from generation to generation. Stories are in a certain intrinsic sense interesting, because they are an attractive high-priority memory booster. With purpose and a meaning behind it, stories will draw and grasp the attention of any audience and in this sense will outperform any logical argument (Haghirian and Chini, 2003, Papadimitriou, 2003).

Stories and narratives are reports about company related incidents that happened in the past and that have a special meaning for the company. Davenport and Pruzak (Davenport and Prusak, 1998) claim the most efficient way of transferring knowledge is through a convincing narrative. People prefer to talk to their colleagues about their latest ideas (Birkinshaw, 2001). They tell stories to exchange knowledge. So narratives are used in order to transfer the complex contents of tacit knowledge (Snowden, 2002). An organizational story is defined as a detailed narrative of past management actions, employee interactions, or other intra- or extra-organizational events. These stories are usually

communicated informally within the organization. Normally, such stories consist of a plot, major characters and an outcome (Swap et al., 2001). Purposeful stories will be able to capture and hold the attention of the audience. They are rooted in truth and are self-propagating (Snowden, 1999). Snowden distinguishes between two kinds of storytelling: storytelling as a knowledge disclosure mechanism and storytelling to create meaning and understanding that can be a helpful tool in getting hold of the valuable tacit knowledge of members within the organization. Storytelling to create meaning and understanding creates metaphors to transfer knowledge in a more transparent way (Snowden, 1999).

Lately, much emphasis has been placed on stories within the organizational knowledge discussion and especially on stories as a tool for knowledge management. Based on studies on communities of practice, of technical knowledge transfer, e.g. Orrs study on Hewlett Packard technicians (1990), and on organizational sense-making processes, it is claimed that stories may fulfil a variety of functions such as the distribution of uncodified or tacit knowledge within knowledge management (Schreyogg and Geiger, 2005). Furthermore, stories allow the listener to comprehend new experiences and to create impressions about the persons, objects and beliefs of the storyteller. Stories help develop general attitudes and beliefs (Adaval and Wyer, 1998). Storytelling as a mechanism for disclosing knowledge can be a helpful tool to get hold of the valuable tacit knowledge within a project team. It creates a self-sustaining, low cost means by which knowledge can be captured on an ongoing basis (Haghirian and Chini, 2003).

These assumptions are based on an understanding of the knowledge taxonomy and address the socially and contextually-bound nature of knowledge, by which any formalised or explicit knowledge can only be understood through its tacit components. Therefore, knowledge can only be shared and understood successfully among people if, and only if, the participants involved share a general set of meanings, beliefs, values and a socially common interpretation. Stories do address the tacit part of knowledge and thus can be seen as a way to establish coherent structure of meaning and frames of references needed to interpret explicit forms of knowledge ending in an effective exchange (Meyer et al., 2005).

Organizationally, stories emerge as a natural part of the day-to-day life, the routines, and the ongoing communication between individuals and groups. Not as a tool but rather unconsciously, they develop from events, extraordinary situations, successes and failures and are told and retold in everyday organizational life. Though during offshore software development, teams are geographically distributed and hence informal communications, spontaneous conversation and informal *"corridor talks"* are eliminated. This informal talk helps people stay aware of what is going on around them, what people are working on, what states various parts of the project are in, who has expertise in what area, and many other essential pieces of background information that enables teams to work together efficiently. In addition, different cultural and social backgrounds exist, resulting in an absent common meaning structure.

To bridge these gaps of culture, trust building, informal corridor talks and collaboration, we propose that storytelling may serve such a purpose. Stories have been used in all cultures to communicate values, norms etc. for centuries (Haghirian and Chini, 2003). Building on the findings of Hofstede and Hall, we can assume that organisations in high-context-cultures emphasise storytelling more. This is especially important for software offshore development because this usually involves *low-context cultures* in the *western hemisphere* and *high-context Asian cultures*.

Storytelling to create meaning and understanding creates metaphors to transfer knowledge in a more transparent way. They help to better transfer any information or formal knowledge in a sequential order, with priorities and including a chain of motivation or justification of the inherent transported tacit parts. This can be especially important in a cross-cultural context. People from high context cultures emphasise interpersonal relationships and developing trust as an important first step to any business transaction. In contrast, people from the low context cultures value logic, facts and directness. To be absolutely clear, they strive to use precise words and intend them to be taken literally (Hall, 1976). These very different styles of communication can more often than not cause misunderstandings and sometimes even failures in the intercultural communications process.

In addition to those communication difficulties, the effective and successful transfer of knowledge between people poses further difficulties. One reason is the ambiguous nature of knowledge itself as a result of the previously mentioned context and social embeddedness.

Especially for software offshore development, storytelling seems a promising tool for transferring tacit knowledge, as other instruments like social interaction between company members, traditions, routines and learning-by-doing are usually implausible due to geographical distance or the impossibility of face-to-face communication

4 RESEARCH QUESTION AND METHODOLOGY

Storytelling is portrayed as an effective tool to communicate and transfer knowledge within cross-cultural teams. However, the case of transferring knowledge via stories in the IT industry has so far not been investigated.

The goal of our research is therefore to examine how telling successful organizational stories can be applied when communicating technological knowledge between geographically dispersed teams that also have different cultural backgrounds.

Since there is little evidence on knowledge transfer via stories and storytelling in a cross-cultural context we applied a qualitative research approach. This allows us to investigate a contemporary phenomenon within its real-life context where the relevant behaviour cannot be manipulated (Yin, 2002). The research is explanatory in nature and relies on an in-depth case study. The collection of data included interviews as primary sources and secondary information from documents and questionnaires regarding software development were used to assure triangulation.
The interviews were mainly conducted from winter 2007/08 through spring 2008. They involved both the client and the vendor, and were conducted each time with a project manager and developers in charge of the relevant project; in total we talked with 14 people. The interviews lasted 45 to 120 minutes. They were semi-structured to allow flexibility and to ensure that the researchers captured any interesting phenomena. Questions were formulated according to perceived performance of the projects, the project communication, the standards and details of the development process and the appearance of context-relevant information. The interviews were conducted with staff and senior management of each company, in Bangalore, India and Leipzig, Germany, together with a review of company documentation and formal presentation material. A number of telephone interviews were also conducted with vendor staff in the United Kingdom (a branch from the Indian company) and India. Gathered data currently includes approximately 90 hours of interviews.

To achieve an adequate level of validity we used multiple sources of evidence and had key interviewees as reviewers. Internal validity, needed for explanatory case studies, was obtained by using a pattern matching technique after coding the interviews. Causal chains are derived from the data analysis in order to later build a causal model (Miles and Huberman, 1994).

5 STORYTELLING AS A TOOL FOR KNOWLEDGE TRANSFER IN THE IT INDUSTRY

We present a case study in this section which will provide us with the result at the end of our research. With respect to the involved corporate partners we will not mention their real names. From a country perspective, India is still the global leader in providing offshore services (Kobayashi-Hillary, 2005). The subcontinent will continue to fulfill this role in the future due to its low labor costs and an abundance of skilled workers (Gott, 2007). We conducted an in-depth case study research involving an Indian vendor and a software company from Germany (client) in order to develop an understanding of the impact of storytelling during offshore software projects.

Here are some basic facts from the case background: the client team had 3 developers, one project manager and one unit manager. On the vendor site, the team had 6 developers, one project manager and one key account manager. Project duration was 8 months and the project was completed in August 2008. Both companies (client and vendor) could be classified as small to medium enterprises. The Indian company has 900 employees and is focused on software services and the client company has 40 employees and is specialised in IT Services for public companies.

The case involved a software development project that included further development and enhancement of an existing software application. Challenges included simultaneous ongoing development at both the client-site and the vendor-site. Therefore it was important for both parties to share the same vision of the products future roadmap. Both teams were urged to share their work experiences and challenges to be implemented in future work.

While focusing on the beginning and kickoff of the cooperation, storytelling was used mainly during the early phases on the project, using a variety of means of communications, e.g. face to face, via phone, chat, mail, and documents.

At the project start many documents and source code files had to be provided to the vendor. A kick-off meeting with members of both parties was held where the development vision was communicated, milestones and timelines were set and specific development tools were agreed upon. Not only the core facts related to the project had been communicated at this meeting but also soft facts like escalation chains and communication schedules for teleconferencing and instant messaging and especially the preconception of the client concerning the realisation of the project. One month after the project start the vendor provided the client with re-briefing and detailed requirement specifications in regards to the vendor's processes. After the initial kickoff and during the starting phase, phone conferences were the primary form of communication. Here, stories were developed and transferred mainly for the Indian developers to enhance and facilitate the understanding of the development background of the product as well as the motivation, the history and related problems and solution. The focus was to transfer the client's preconceptions and to determine a possible solution.
In the ongoing process, the emphasis of the stories shifted towards the use of feedback rounds in which soft factors or problems became an issue. Here stories were used to bridge the difference in dealing with different approaches of problem solving, e.g. dealing with direct critique, and used to understand timing issues, e.g. meeting deadlines. Therefore, main themes of the stories were cultural differences, descriptions of different ways of collaborative work styles and team approaches integrating do´s and dont´s.

To give an example of such stories, one project manager told us the following story:

> "Once I was the technical contact of an offshore project. The Indian company gave my contact data to one of their programmers and if he had any questions I was the person he communicated with. I'm a programmer myself so we share a certain degree of experience. But sometimes the Indian programmer asked an elementary question or could not solve a simple problem that made me think he lacks some basic programming skills. At one point (after several days on his part trying to solve a particular problem) he declared a certain task impossible when I knew it would be quite easy to accomplish. Using a web browser and typing the three keywords into Google gave the correct solution ranking first. So I sent him the article I found and an example of how to accomplish that particular task. I did not get an answer to that email but the next email merely stated the problem had been addressed."

The project manager used his experience from a former project to prepare the team with such stories to establish an open communication within the developer team. From that on, he could clearly ask the Indian team if they needed help. Further he told us many more stories he used in team communication and project set up. The integration of project experiences into the development of stories of both parties involved, the client and the Indian vendor, helped the Indian side, which at the beginning

seemed rather resistant to this management tool, to accept the stories. However, since only some of the developers were aware of the stories, this hindered the Indian team as a whole to take full advantage of the stories in all areas of the development process.
Stories were used at the beginning of the project to diminish issues related to cultural differences. They were also used to convey clear guidelines to the client's counterparts for better communication. Facts explaining why things are done the way they are, the client's expectations etc. were conveyed using stories. Regular meetings were scheduled and took place for tracking the project's progress, noting any significant hindrances to the process. The client transformed his experiences into a story and conveyed it to the vendor, which made it easy for both sides to work collaboratively. These early data show results from instant messaging chat protocols, voice chats, interviews of involved team members of both client and vendor and project documentation.

6 LESSONS LEARNED

Based on our findings, we propose that storytelling can be used as an appropriate instrument for transferring knowledge especially in cross cultural contexts, where the differences in dealing between low context and high context cultures are remarkable. The following table shows a summary of the utilisation of storytelling during the case.

Purpose of storytelling	**Used a story that,**
Establish culture behaviour	Highlights typical problems in dealing with different cultures
Introduce collectivistic Teamwork	Describes and explains teamwork and different collaborative styles Displays different roles within teams
Bridging power distance	Shows a variety of escalation chains and means of decision making Shows advantages of transparent decision making processes
Bridging between high and low context	Shows advantages of a culture fostering open discussion at all levels

Table 1. Purposes of storytelling

7 DISCUSSION AND CONCLUSION

With the help of our case study, we are making an attempt to explore and make use of the benefits the storytelling tool can provide in offshore projects. So far, the findings of the study show that it is a practical and beneficial solution in offshore situations to bridge cultural differences between the parties and members involved. Stories are not generic and are highly related to specific organisational and cultural conditions and therefore create a shared vision, sparking action, and fostering collaboration and understanding within the team. A deeper recognition and understanding of this

utilisable tool in IT organisations is still needed. This area of study must be examined closely with respect to its appropriateness in the knowledge management field. The limitation we see so far is a lack of storytelling cases in the field.

Further research aims to develop guidelines for a way of transferring collective experiences of source group to members of a target group by proper co-ordination and co-operation. Furthermore, research should be validated using additional cases and develop a framework for utilising storytelling as an instrument of knowledge transfer. Research may also focus on different aspects of the storytelling method such as the influence of oral vs. written communication on knowledge transfer, limitations of storytelling, and the role storytelling can play in decision making processes during knowledge transfer processes.

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