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Interaction design & Usability from an Indian perspective

- Talks with: Apala Chavan, Anirudha Joshi,
Dinesh Katre, Devashish Pandya, Sammeer
Chabukswar, Pradeep Yammiyavar

By Torkil Clemmensen

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TORKIL CLEMMENSEN 2009

Front picture by Courtesy of Dr. Dinesh Katre

Introduction is partly based on speech given by Dr. Torkil Clemmensen at World Usability Day in Pune, India.

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**More information about Cultural Usability can be found at
<http://www.culturalusability.com>**

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Preface

This is a collection of talks on usability and culture with prominent researchers and practitioners on the Indian interaction design and usability scene: Apala Chavan, Anirudha Joshi, Dinesh Katre, Devashish Pandya, Sammeer Chabukswar, and Pradeep Yammiyavar. I did these talks because for several years I have been the coordinator of a cross cultural research project in India, China and Denmark that aims at investigating the impact of culture on the results of established methods of usability testing. During these years I gradually have come to realize the need for letting the prominent researchers and practitioners in the Indian software industry and university world speak about the big questions in the field. Without this grand context, it is in fact impossible to understand what research experiments will tell us about interaction design and usability in India and abroad. Therefore I first give an introduction to cultural usability and then present the six talks.

In the introduction I present a framework for thinking about cultural usability. It has five historical phases. The first one is localization of the interface. The second one is localization of the methods used for evaluating the interface. The third one is when a cultural usability actor emerges because we have new user groups. The fourth one is historical changes in the concept of usability as an organizing vision for software development, and the fifth one is managing a complexity of user groups. While introducing the five phases, I also introduce the reader to the concept of usability.

The growing interest in cultural perspectives on usability is evident from the emergence of new paradigms for Human-Computer interaction as ‘cultural computing’ (Rauterberg, 2006), ‘culturally sensitive IT’ (Zakaria & Stanton, 2003), and new terms such as ‘cultural usability’ (Barber & Badre, 1998; Noiwan & Norcio, 2006; Sun, 2003; Vöhringer-Kuhnt, 2002). Recent special issues of HCI journals dealing with cultural usability include (Day, 1998) and (Smith & Yetim, 2004). The focus of HCI is expanding to include culture (Minna, Roman, & Markku, 2006). Books have been published (del Galdo, 1996; Dray & Siegel, 2005) and called for such as the ‘First Handbook of Research on Culturally aware information technologies, planned for publication in 2009. In the field of Information System research the issue of culture has also been prominent in recent years (Ford, Connelly, & Meister, 2003; Leidner & Kayworth, 2006; McCoy, Galletta, & King, 2005; Myers & Tan, 2003). There is a need to address usability issues such as how do we support the input of the many Chinese characters to computers within (or outside) a classic windows-and-mouse paradigm, or how do we design and evaluate the usability of interfaces to Automatic Teller Machines and other text-based interactive products in a multilingual and multicultural country as India. Western countries also face complex challenges regarding the quality of information and communication technology, as these societies are becoming increasingly multicultural and need to provide networked information to both ethnic majorities and minorities.

Readership

The book is aimed at the global audience of designers and usability professionals as well as at researchers and students in the maturing fields of interaction design and human-computer interaction and in particular for those interested in designing for the international market or for the indigenous user populations home and abroad. It will also be relevant to others with an interest in culture, computer science and technology.

The book will have a lifespan of several years – because the people interviewed are first-movers and prominent individuals in the rapidly growing field of usability and Human-computer interaction in Asia.

For students, the book can be used as supplementary reading. For researchers, the book will be a natural choice for orienting themselves in the HCI community of India. For practitioners, the book may create debate and be used as promotion of the field.

Brief introduction to the book:

The production and use of technologically advanced information and communication applications are no longer restricted to the Western world, and there are indications that software design procedures developed for use in Europe or the US do not take into account the characteristics of the indigenous populations in countries such as India, China or Malaysia.

Accordingly, terms such as “interaction design” and “usability” – the design and evaluation of the interaction between humans and computers – are in a search for a new context of meaning in a global and multicultural world. To fill out the need for a culturally sensitive design of information and communications technology, what do we need? Do you believe usability can be an organizing vision for software development and use in India? How do you see the relation between software quality and usability? How do you see the relation between usability and users cultural background? What is most important concept in relation to usability in the coming years? These are the nature of the questions asked and answered in this book.

There have been other interview books with major figures in “interaction design” and “usability” before this. These have however been with prominent persons in Europe and US because that was where usability developed. Now the situation has changed and usability is emerging as a field in China, South East Asia and India. In this book the author talk with six prominent Indian design researchers and usability practitioners. The conversations centre on the concept of usability and what its relations are to software type, software quality and to the users’ cultural background. This topic of cultural usability as an organizing vision in software development elicits new answers and unexpected perspectives. The excitement and new view of usability and interaction design that comes from India has something to tell the rest of the world about cultural usability.

“Interaction design & Usability – from an Indian perspective” has two faces just as the god Janus in the mythology of the author’s Scandinavia homeland. One face is the theoretical engagement and insights of the author as well as the Indian participants in usability and culture. The other face is their social, political and practical engagement in designing for the cultural user in India and abroad. The book is aimed at the global audience of designers and usability professionals as well as at researchers and students in the maturing fields of interaction design and human-computer interaction and in particular for those interested in designing for the international market or for the indigenous user populations home and abroad. It will also be relevant to others with an interest in culture, computer science and technology.

1. Introduction – Design and usability for a diversity of users

Interaction design and usability have become important contributors to economic and cultural development in emergent economies in today's global distribution of the use and production of information and communication technology. Despite this mega trend, research and practice that incorporates cultural and non-western perspectives on software and interactive products are still in their infancy.



Figure 1. Cultural aspects of the design of traffic regulation signs. How much is culturally different? The form of the warning sign? Design-style? Gender roles? Haircuts? Dress and shoes? Bags? Placement of the children? Walking styles?

From <http://www.elve.net/rcoulst.htm> (reprinted with permission)

The Denmark picture in figure 1 is a good introduction to the topic of cultural design. It is a sign we have in Denmark outside schools to warn car drivers to lower their speed so they don't run over children while they are crossing the road towards their school. This was found on an international website of a guy who collects these signs all over the world. And he is very happy about this Danish sign. He says this sign is a craftsmanship without any compromise. He is really happy about this. Look at the legs; observe the ankles, the waist, the neck etc. He asks us to notice all the very nice little details in this sign. So the question is of course how much in this sign is cultural specific. And you might have a very easy answer to that but when the question is asked in Denmark people tend to believe that everything on the sign is or should be the same all over the world. But

if you go on and look at some of the other signs in figure 1, you see some of the differences. For example, you could expect that the shape of such a sign would be universal because in traffic it is a new thing but it is not. You could expect that people everywhere would have feet but some places like China you can see that people apparently do not have feet to walk on (sic). You could expect that everywhere children would walk to school, but in the Netherlands actually this poor little girl is being chased by her big brother to school. Also in India in this particular sign, the child is really in a hurry to get to school. You could expect that everywhere the big one would be in front protecting the small one but that's also different in different places. And the hair – not to speak about the hair. In the Cambodian sign, the boy wears a soldier's cap, the girl a helmet? Maybe they are afraid of stepping into a minefield?ⁱ

That is one kind of cultural difference which surely is there in design. Another kind of cultural difference is on what you might say is a deeper level. There is this one American psychologist, Nisbettⁱⁱ, who study cultural psychology. Why do I mention him? I could have taken other people, but prefer this guy because he builds bridge between cultural psychology and mainstream psychology, so maybe he can be used to do the same job in interaction design and usability. Nisbett showed his students in America and he asked his colleague in Japan to show to his Japanese students - sixteen students each place - small 20 second videos with fish swimming around in this little aquarium. Nisbett and his colleagues had before the experiment defined the fish in the front as the salient objects and the whole thing as the field (or context). This was an experiment about “attention to field”, which is one of the most researched areas in cultural psychology. What Nisbett and colleagues did was, after the students had looked at these 20 second videos, they then were given 90 pictures – 45 pictures would show the fish they had already seen on the video and 45 pictures would show them new fish. And then of the pictures that they had already seen, some of these fish had a new background or had no background. Imagine the fish with the same background as previously shown, the fish with no background and the same fish with a different background. Then the students were asked to recognize the pictures. The American students did not care if there were a background or not, and they were equally able to recognize the fish whatever the background or no background the fish had. While the Japanese students tended to think that this fish with a new background was a new fish, a new picture. So we got some evidence how people in one kind of cultural background relate more to field than people coming from another background. Unfortunately I have not been able to find any studies about how Indian university students react to field or background. But surely there must be.

Nisbett did similar studies in a number of other areas like for example when you explain social events. For example there was an explanation about sometimes in the universities in the US one of the students enters the university and shoots and kills randomly a number of his or her fellow students. Nisbett and colleagues looked at how these kinds of stories when they appear in a newspaper are explained by Chinese students and American students. What they found was that the Chinese students tend pay attention to the field or context of the event. The Chinese student could say ‘no, it is because of the bad family or bad friends this student has become a murderer’. While the American students tended to

focus on the object or salient feature of the event, and would say ‘this student is a murderer because he has a bad personality or something is wrong inside this person’.

This difference in focus between the salient object and the field/context is also evident in other situations. For example if you ask students to explain how animals behave like the fish we saw before. If you ask the students why these fish move around like they do the Chinese students would tend to tell you about the environment the plants and the water and everything while the American students will say this is because this is a very speedy fish or a very slow fish.

Even when you talk about physical events you can see some of the same things. Having a ball in water – why it goes up and down. Chinese students will tend to talk about the water like the salt in the water makes the ball go up. The American students will talk about the ball itself like it is a very light ball or a very heavy ball etc.

So in many areas of life we seem to have some really deep basic differences in our psychology depending on the society we have grown or have been raised in. But of course this is only true to some degree because many of us have more than one cultural background. Maybe you have two or more cultural backgrounds so if you have two cultural groups like I and Z which on an average are very different then in situation A the difference can be much bigger while in situation B you can see there is clearly no difference and in situation C again it can be smaller and situation D can actually be reversed. For example having a Chinese student or an Indian student who has been studying in America, when he is encountered in some kind of test in US he might react either as an Indian student or an American student, depending on how he is primed, depending on who he is together with, what he is looking at, which language the test is in etc. So you can activate your cultural background which one of them you prefer in different situations. So much about culture.

A framework for thinking about cultural usability

This section presents a framework for thinking about cultural usability. There are five levels. Level I and II will be more elaborated than the three other levels. The first level concerns the localization of the interface. The second level focus on the localization of the methods that we use for evaluating the interface. The third level happens when a new cultural usability actor emerges because we have new user groups. The fourth level concerns some historical changes in the concept of usability itself and the fifth level is about managing a complexity of user groups. While doing this I hope you will also get a clear view of what I think usability actually is. So, first of all cultural usability at level one is the traditional way of looking at usability. If you look at culture in that level - usually of you look at computer into action or usability text books which we use to teach our students, you can see somewhere in the text book there will be a list of cultural variables you have to look at, if it is relevant or a cultural layer you talk about. The textbook will say it is very helpful if you want to localize a design to some specific country. Usability is actually defined at this level as we should use existing evaluation methods for user centered designs to test localized designs. So if you are going to develop a design interaction design user interface for let’s say the Danish audience, you will

probably consider some variables about how is the Danish culture maybe if it is a feminine culture, a masculine culture, a collectivist culture, an individualist culture and then you will probably use some established user centre of design approaches. You will take some Danish users and test the interface with these users.

This is the standard way of doing usability and we have a lot of research into this. Actually if you look at international research journals there are plenty of really good results into usability. We have studies of different usability methods which one is better and which one is worse we have studies of how many users you need to get 80 % of the problems in a certain software prototype and we have many studies of that and we have studies about how effects and evaluator effects like the situation that when you have different evaluation of a certain user interface you find different number and nature of usability problems. We have studies of problem discovery and problem classification how we should actually classify usability problem actually this is a huge problem at the moment. What is actually a usability problem how should we classify that so of you have something to write in that area you can surely publish it? We also have research into public communication in Europe right now we have a big multicultural research project in not in how to identify usability problems but how to communicate these usability problems to the people who make the changes in the software because designers usually they can get a report or they can get a PowerPoint presentation or they can get something else from the usability expert. But then they take a report and they put it down below the table and try to forget about it and they only take it up again when some usability expert reappears in the office. And that is a big problem how to keep the user in the mind of the designer. So we have a lot of research in that. That is very good. For example this is an example of problem severity in detection rate for different country groups. You can make things like this which this one actually shows in order to get like say 80 % (0.80) you need in each country only 2 or 4 users with this particular set of test and users. So it is just an example of the kind of scientific evidence you can make on in this area.

But of course there are some problems, when for example I would like to evaluate. This is Microsoft website for online clipart for a couple of years ago. Initial three countries in Europe – this is Turkey, this is Greece and this not in Europe, this is some Arab country but the basic point is I cannot evaluate these three websites because I do not have the skills to do so. I cannot read the scripts; I cannot read the language so I have a problem here. While these four is very easy for me this one is a Danish one and Swedish and Norwegian is more or less the same as the Danish, very close, I can understand and read most of the words and understand the language and the US English I also can understand to some degrees. And if you look at these perhaps you will actually see they are quite similar. It is not too easy to see on this projector but they are quite similar in appearance. I asked my students in one course I had to evaluate these sites to identify usability problems because I wanted to see if you would find the same problems in all sites which I expected we would because there should be the same problems with more or less the same interface. And what did we find in this little exercise with the students, we found that the problem was that the severe usability problems. My students tended to rate the sites which were the Norwegian site the Swedish site and the US site and this is the severe problems. And the students tended to rate the problems they found in the other

country sites more severe than the problems they found in the Danish site so why did they do that. I mean of course they were kind of foreign users because they were not really Norwegian or Swedish or American users. They were Danish students who just looked at some websites. But why did they rate the problems they found to be more severe? I do not know we should look into this. This is one issue we cannot answer. But it suggests that surrogate or foreign users actually might overrate the severity of usability problems that they find in the application. Maybe you have some experiences with this too. So at level one it is very difficult to answer questions like whether usability evaluation methods developed in US and Europe actually can be used in the rest of the world. And even like in Denmark I am not sure they can be used without some adaptation which I could talk about but not today.

For example we could ask the usability evaluator the guy who leads the experiment. Does he need to have the same cultural background as the test user in order to completely understand how these test users actually will react to and respond to the test instructions and to the test methodology? It is difficult to answer in this case. Level two is therefore in my view that we need to localize the methods which we use to evaluate usability and we need another concept, not this national culture concept, we need a concept of culture which is more like everyday situation, specific cognition and experience. So these are the concept of culture which looks at what people do in their work. And usability evaluation in that sense will then be localized usability evaluation. Here we have nearly no research. We have very little research if any at all that says for example how users apply religious rituals as part of the user software. So we lack research on the target user groups. And also we like research on like for example testing in offshore scenario like using surrogate users. We like research on testing in cross cultural usability test with foreign evaluators and local users. So this is what our project is about. Our cultural usability project especially the last part of this. So we focus on a specific technique called the thinking aloud usability test method. And if this method you have a user from the target user group in front of some kind of prototype of the system and he is giving some instructions to do some of the relevant work task in front of this system. And then you have some test leaders called evaluators. They communicate and facilitate the user to get a list of usability problems. And this is a standard setup of usability test, though you can discuss with the professionals for a very long time if this is a kind of standard or not a standard. But this is my view of what is a standard test setup. So how much in this is actually culturally specific? We did some field studies last year which we still are in the process of writing up. So I cannot give you much result but I can look at HR International papers on our website but right here I can tell you that for example regarding the evaluator – user relation. That is the relations between these test leaders and the user. During the test it seemed there were some differences in the different companies. For example we went to the Chinese website called Baidu (the Chinese Google which has over 50 million Chinese users), they have some people who test the website and we watched such a test and took down notes from that test. And one thing we got from there was that the evaluator was not really important. The evaluator was just a person who gives instructions so the user-task interface relation was the really important one. So the user really focused on the task and did that. While we did the same thing in a company here in India and we also watched how they did the usability, the think aloud usability test and

what we saw there was that a very caring relationship between the evaluator and the test user very polite and very caring. So it seems to be very important how the evaluator talked to the test users. And when we did the same thing in Denmark in Copenhagen, in a company there it was not important at all how the evaluator talked to the test user. But the evaluator and a certain degree also the test users were very aware of the client, the guy who paid for the test, who was actually outside. So there were some clear differences in the communication part of the test. So much for the field studies of cultural usability.

We also did experiments in the university labs, so we did experiments on the relations between users having culturally diverse backgrounds like age, gender, nationality, mother tongue, familiarity, sexual orientation etc. working on the localizer artefact and the artefact we used was the clipart collection and again the think aloud usability test and we did that in Denmark and in Assam and in Beijing and this is the kind of the setup of the test. It is a bit complicated but this is in India, this is in China and this is in Denmark and in each place we had used local users like in Guwahati we had the local students in Indian institute of Technology Guwahati and we had a local test leader an evaluator from Guwahati and then we also had test leaders who were foreign to Guwahati – a German and some Danish people. And the same way on China, the local test leaders, local users, local users, foreign test leaders and the same thing in Denmark. And each place we used a localized version of the clipart to make sure that they kind of looked at something which they understood – the local users. At the test task we asked the users to do for example in Guwahati it was the design department so the students were familiar with designing for example imitations so we asked the students to design a wedding card using this clipart. And we were interested in seeing if the evaluators the foreign and the local actually found some similar problems with the clipart collection. And this is the number of tests we did. We called the one with the local evaluator – for mono-cultural and the one with the foreign evaluator - for cross cultural test. We did a number of tests – all in all 22 mono-cultural and 11 cross cultural. Here are some of the results. First of all ‘thinking aloud’, when you ask a user to think aloud while using a piece of software it is like when I am using this software I would do like this ‘Oh now I go to... ah, I try to click on this.. Oh, what is this... oh this is a... aha, this must surely be something I had to look at’. This is an example of how the user thinks aloud and this is supposed to be the same all over the world because it is basic psychological process which every person on the world can be more or less good at but it should be the same all over the world. And actually it was. There were no differences with the local evaluator or the foreign evaluator the user was equally good at thinking aloud. However it is not thinking aloud or it is level three thinking aloud when the user gives explanations or adjustments like ‘I really do not like this interface. This interface is an example of a very poor design. You should really remake this interface if you are the designer’. This is not thinking aloud but this is giving your opinion drawing on your long term memory and that is not what we usually mean by thinking aloud. But here we found a big difference, a significant difference – users with the local evaluator actually gave a lot of these opinions, criticisms, reflections, explanations etc. while with the foreign evaluator they did nothing of this. It could be related to the situation that the local evaluator actually helped out the user a lot so if the user is stuck in the task or the computer, cannot find what to do the local evaluator tended to help the user, while the foreign evaluator does not do that. He keeps being passive as if

it was a real scientific experiment. Also the evaluators use of affirmatives like the local evaluator would tend to encourage the local user by saying 'yes, go on, it is very good, go on keep working, keep thinking aloud' etc. while the foreign evaluator would say nothing or very little during the test. So these are some examples of different relationships during the test which could explain the differences between the three levels of thinking aloud. Does it mean anything? Yes, it does actually. For example in our results it shows that they found a large number of instances of problems in the local situation; in the foreign situation 181 instances and in local situation 353. And if you classify these instances of problems into types you find that there were 35 types all together and 26 foreign which were shared with the local. But then the local one found nine usability problems which were not found by the foreign ones. Of course, the foreign could have found some problems which were not found by the local ones. I do not know why the foreign evaluators did not find any unique problems.

But apparently there is something about the local evaluator local user situation which helped them to find something. This is an example of what we mean by these unique problems. This was found only in the local evaluator condition in Beijing. It is a wedding invitation. The users were asked to make a wedding invitation. And here on the left you see the Danish wedding invitation. And nicely they have put in the front some little clip arts of some hearts, you do that in Denmark and you have some text. While in Beijing the Chinese users tend to be a kind of a background style, the paper you use for the wedding invitation is very important, so they focus on the pink colour of the paper. So that is very important. But the situation and the usability problem is that in Microsoft Word 2003 there is a nice print preview function and if you use that it is perfectly alright for the Danish users because you see the same picture as you have designed. But if you do that for the background style user you have a problem because it does not show the colour of the background paper. It is also in Microsoft office 2007; I think it is an example of a cultural bias in a very well known piece of office software. It was found only in the situation of the local test user because I do not know why but it did not appear in the situation of the foreign moderator. It may be because it will be too difficult to explain to the foreign moderator why this was a very important thing. These features I cannot describe very quickly and I will not try but I will tell you what they show quickly. They show that in Beijing, in Copenhagen and in Guwahati, all three places the test worked equally well. It is not like a usability test only works in Copenhagen or in Beijing or in India, it is not like that. It seems to work equally well all the places from our data it suggests. And also in all places you could see some difference between the foreign and the local moderator conditions - cross cultural and mono cultural.

But quite surprising to us is that, it seems like the foreign moderators were the ones who found the most usability problems. From the beginning we hypothesized that having a local moderator would help find more usability problems but it was the other way round. But what kind of problems did they find? It was only problems of low priority, non important problems that the foreign moderator found. You can easily intuitively understand this because when you are with a foreign person you tend to explain the obvious to this guy, you would explain what you usually do not explain to your colleague because you all know this? But going with a foreigner as your evaluator, you will explain

things because you know that this foreign person does not know about the local conditions. So it could be the same situation we have here and this is why we call this the tourist effect. Having a foreign evaluator we call it tourist effect. Actually it is a bit like having a foreign user, they also tend to rate the severity of problems higher than actually they should do. That was actually what I was going to say about our project. That is my basic argument. We should do more research into the relation between the moderator and the user in this test and especially in a cross cultural setting. And we are doing that right now.

I imagine that usability will develop more and for example the level III development of cultural usability will be that the two concepts actually merge so think about it. For example my friend Niels who is a user experience manager in Nokia in Denmark and he tells me about the Nokia user segmentation model which last year he told me that it has nothing to do with countries; it has only to do with the elderly user or the very technologically advanced user etc. and it is the same all over the world. I was happy making this slide saying that with the new global world new user groups will appear and we will not talk about the national culture or the local culture but we will talk about the technology driven cultures. But then unfortunately he told me the last time I talked to him that Nokia had to do a certain kind of studies of the local user groups too, to add on to this global segmentation of users. So it is not totally like this but surely the technologies like mobile phones create new user groups around the world.

The fourth (IV) level of usability is about the spreading of the concept in society. At a certain point, usability becomes 'folk science', everybody uses the word usability know and then; like in Denmark, where the usability concept appeared in 1984. Since then it very slowly spread in society and today it is a common concept and everybody knows usability - that you can use it is all kind of context, people use it in their everyday language also outside information technology, to talk about usability of a newspaper etc. But it is something that took a lot of years. I have been told today that usability here in India has spread very rapidly and within the last five years it has become widely accepted. I would like to do a study of that by looking at the newspapers and magazines to see how the talk about usability changed from 2002 until today. It could be an interesting research paper to see how you have actually changed the way you talk about usability. I would also ask what would happen if you really decided on a national basis that usability should become an organized vision of ICT development in India, so the user would actually be the one who drove the IT development.

And then comes level five (V). This is the situation we are just beginning to enter in Denmark; I think you have been there for a long time actually in India. In Denmark we are becoming increasingly a part of European Union. When I grew up there were only white people in Denmark, no black person, no Indian person. I never saw an Indian or a black person in my childhood. Today that situation has changed a little bit so today we have 10% of the population are immigrants or children of immigrants but it only within the past 15 years. It is the same thing, only in the past 15 years have we become a part of European Union. For example our universities are only national and our students go abroad a lot. We are not used to the situation which you are used to – actually designing

for a very diverse audience of users and we have to learn that. We have to cope with that. I think this is the future of usability that all the time you have to think about multi cultural users, multi lingual users, global users and you have them in the same user group. You can have people who in one situation have an Arabic background and the next moment they are showing their Danish background, one situation you are appearing as having an Indian background and the next moment you think like an American. How to design for that – that is a challenge.

Considering the context of the framework, you have to include the research on Indian psychology and Indian perspectives on cognition. From the international research we know that maybe there are some contextual things in India which deserves a closer look in order to improve our definitions of cultural usability. It is always about the East and the West and where is India located on that scale? For example this very polite and sensitive relationship that seems to exist in the usability test situation in India, and also the focus on the context of use, are these preferences related to the Indian society and ways of doing things with technology?

Questions asked

In different interviews, a diversity of topics was pursued according to the wish of the interviewee. However, I tried to get everybody to respond to two kinds of questions.

The first set of questions was related to a set of issues concerning the relation between usability and design and development of software in India.

The second question dealt with the relation between culture and usability, including questions to the significance of the users' cultural background, and the relation between culture and usability for different kind of interactive technologies.

Chapters' overview

Chapter 2. A talk with Apala Chavan.

She talks about when you start to design for the bottom of the pyramid in all the emerging markets, because suddenly now you are designing for people who are illiterate, who have very little money, who live in an environment that is not secure, that is not the kind of environment that you need for technology to be used. In particular in India, there are multiple different technology user groups in India, who cannot be accommodated by the traditional usability of a US technology centric view of the world. Instead, she says, definitions of usability may include regional parameters and explains her culturally sensitive design philosophy. If usability has to prevail in India, and it must, there should be government support to usability in the educational system.

Chapter 3. A talk with Anirudha Joshi.

He talks about interaction design, power distance in India between designers that take the morning flight and land with their laptop in the rural village and experience problems with developing partnership with these users. How important it is to come back again and again to these users, and how much designers can learn from user studies.

Chapter 4. A talk with Dinesh Katre.

He talks about facing barbaric technology and how the C-dac mission is to serve the Indian users. As an example he compares MS word and the Indian office software Lead office that has extended Indian script support. For Dinesh, culture shows up not in high tech equipment, but in the day to day dimension of technology use. He points out that currently the Indian software industry is very dependent on the dollar and extending Indian software production to include usability is one way to put added value to the software design. Usability professionals in India are however not exactly similar to usability professionals elsewhere according to Dinesh and furthermore, usability professionals in India is currently a scarce resource.

Chapter 5. A talk with Devashish Pandya

He talks about culture in the sense of location specific culture and culture in the sense of an organisational culture and discuss these in the context of healthcare systems. When designing and implementing such a project India –wide, he says, even though they did not account for the cultural impact on the project when planning, at the time of implementation they immediately had to face cultural issues. One important problem was that if an expert doctor is providing opinion to somewhere in the North-East India, in one hour, let's say nine to ten in the morning, and then from ten to eleven he is providing expert opinion to somebody from let's say the western part of the country, he would see very different kind of interactions with patients. Devashish explains how this kind of situations can be handled. The patient interaction with the expert should be minimal, there should be a presenting doctor at the specific location, and an expert doctor on the other side, and they will talk to each other on behalf of the patient. So the expert doctor who does not see the patient, will not be affected in terms of time or in terms of the quality of data he is getting because of that cultural influence here. In some cultures you cannot ask directly about a lady's health or some of the other people, so that would be taken care of because the local doctor is more sensitive to the local culture than the expert who may have a very straight blunt question.

Chapter 6. A talk with Sammeer Chabukswar.

He talks about getting usability to work in a large Indian company and how individual users contribute to innovation. As an example, he explains the use of a distributed mixed model for user testing that can help decide when it is possible to profile users and use them from the local Indian market, and when it is necessary to recruit users in the foreign market. Sammeer would like to see more research into the matching of mental models for users in the US for specific kind of tasks to see if these are the same as mental models for users in India for this type of task. He has developed a framework for how distributed teams can work together, and this model can be applied to different organizations at different levels of maturity. Maturity is in terms of usability, - whether the organization has started usability, or whether they have a big usability set up or not.

Chapter 7. A talk with Pradeep Yammiyavar

He talks about the mission of IITG and about how usability engineering can be the much needed and wanted research companion to the design discipline in technology education in India. He underscores that the understanding of the multiculturalness and openness to many cultures that for centuries have ensured the Indian identity is an absolute requirement in all design and in particular interaction design in India.

2. Designing for the bottom of the pyramid - a talk with Apala Chavan

Torkil – Could you please introduce yourself briefly?

Apala – Currently I am working with Human Factors International and I look after the Asian operations so I am vice-president of the Asian operations, which really means that my job is to look at how we can grow the usability business in this part of the world, which includes India, China, Singapore, Japan, Korea and Australia - the entire South-east Asia. It started in the beginning of 2000, when usability was not a term that many people understood in India. We started there because I already was a consultant with my own little consulting company and we started because there was a feeling that this was going to be a growth area if we could do it right. Since that time we have come a long way and the usability business has become a very big area for growth both for offshore services to be delivered as well as for the local market. Therefore my job transformed from having to set up an offshore development centre where it is not for IT services but it was to deliver usability in user centered design services to clients mainly based in North America and some in Europe. From that it is transformed to a lot of the business being done in Asia itself. So the development of this market is well as now a stable line of very big business happening here. That is how the business has changed. And therefore my job profile has changed over the years. Right now I concentrate a lot in identifying what are the drivers to make user centre designs grow in parts of the world where it does not originate. This whole concept of ergonomics, human factors engineering, it proved basically in Europe and then took off majorly in the US but Asia was not really a place where there was any organized effort at this. I try to look at what is the flavour of usability likely to be in these areas and how do we identify its own triggers and not try and sell a business model that does not work in these markets. I think we have come to a good point now where we understand what the drivers are, what the triggers are for businesses to want to incorporate user centre design and usability engineering. That has lead to my basic interest in specialization in cross cultural design and research to be now to be used in also cross cultural business practices in the areas of usability and user centre design. I also started a line of business for HFI in 2004 which is called contextual innovation. This was not there in the HFI of business services. Within the area of contextual innovation we help companies come up with new product ideas particularly for what are called the emerging markets – the classic emerging markets are Brazil, Russia, India and China but now there are other countries that are also added to that definition of emerging markets where the rules of design are very different and if somebody wants a new product they have to pick up a product that is successful in North America and with some minor tweaks in the product design it can work here because the entire eco-system in these countries is very different. So that is an area where HFI has a core competency and has a focused business offering and that is something I also look after and I am trying to spin it into a different business entity within HFI because it has a slightly different skill sets and a different clientele from the main stream HFI business. I still work a lot in looking after, generalizing and constructing theories and models about

cross-cultural behaviour – that has continued to a very big interest so I concentrate on trying to write on that as much as I can and present on that as much as I can and also trying to see how that can be a completely focused offering from HFI because we have such an increasing amount of demand from Global multinationals who want cross-cultural rhyme work to be done for several countries at the same time. So that is an area I am concentrating on now - from the point of view of converting that into a stable business service.

Torkil – Ok. That is great. I am part of this cultural usability project where we share some of your thoughts. Maybe we are much narrower just looking at the usability test and the concept of cultural usability. I met a French guy who talked about a certain methodology which he called the organizing vision. He wanted to look at the media use, for example how usability could be used in magazines and journals in France so you could see the development also historically of the concept of usability. In Denmark the concept of usability was very new in 1984, when the first book came up but today everybody talks about usability in all kinds of context. This is a very large scale question but I wanted to ask you what is your opinion – do you believe that usability can be an organizing vision for the software development and software use in India.

Apala – When human factors setup shop in India all the systems, large and small ones, middle tier ones, nobody had much in usability going on. We did a lot of work evangelizing, doing events across the country, in India trying to talk about how usability would be the way that they go up the value chain and at that point most of them thought it was just funny talk. Many of these system integrators said things like ‘well, it’s not really necessary and how can you do user centered design work when your users are in completely different parts of the world, it does not work, design is not something that can be done offshore, that is not going to help us move up the value chain, etc’. But I think over the next few years, till 2004 as all the software companies, both foreign and Indian, when I say foreign – foreign software companies who have large development centers in India as well as the local Indian systems integrators and software product developers, they noticed the fact that we were successful in terms of how we could do user centered design without being directly in the middle of the users and how it certainly did help software companies move up the value chain they integrated usability as a major part of their corporate vision and as they looked at that, the success of that low and behold we find today that everybody has teams everybody wants their usability people to be trained by us. Our training business in India is growing rapidly just because of the software companies who want, who today understand the value of usability, they are organizing their old processes and tools. There are lots of small companies which have people who have ex-HFI and they have taken our entire methodology and our whole philosophy and they have transplanted it into their smaller software development organizations and they want... which is very fine. I think it is great when people who leave our company take the philosophy with them and grow that in another environment. It does not matter whether they credit HFI or not but ultimately it helps the entire industry. Because everybody sees the value of integrating user centered design as part of their major vision and I think that is happening in a very big way in India.

Torkil – And do you think this will go on in the coming years?

Apala – Very much. I feel is that the only problem India has is, I look at China as well as India because I am doing a lot of work in China right now and I feel that the Chinese government is so proactive unlike the Indian government. The Chinese government is pushing usability in a very big way. The Chinese large co-operations, local co-operations are spending much more money on user centered design than Indian corporations are. They are very driven, very organized in their desire to understand how it is done, to integrate it quickly into their own development lifecycles and to learn from the best places in the world. For that they are willing to spend whatever money it takes. And the government is solidly standing behind this effort that the Chinese industry has and I feel every time I am in the china office that if India does not get its act together from the point of view of a macro level push from the government then we are going to maybe start losing the race. India does not have one decent program at the university level where you can get good usability people, not even one program in the whole country. In china it is amazing how much they are putting in to having programs which teach very fundamental human factors engineering, psychology to students. That is where I wonder. Ten years down the line, if India does not change its course, China will definitely be far ahead.

Torkil – Interesting. I tried to get in contact with some psychologists at Mumbai University to see if they did some work in this area but it did not really succeed a lot. But I had one contact, but we can take that later. The first technical question I have is – how do you see the relation between software quality and usability?

Apala – Traditionally usability or a version of usability has tended to sit within the quality function. It has a logical relationship because if you look at what usability is, it is about improving the quality of a product and it is about improving the quality of a website or a physical or tangible product. And so one can understand that, that seems to have been the place where it sat. But I think though usability contributes majorly to improving the quality of a product but it has its own nuances which have its differences from the traditional quality management processes and therefore usability needs to have its own home within an organization, separate from the quality function. And it is not just about testing and figuring out of the quality is good, it is so much more to do with being the.. user centered design needs to kick in first before any other process kicks in when one is developing a product and when I say product it could be software, hardware whatever. If that does not happen and if the perspective is we will do some quality testing, that is something that is too little and too late.

Torkil – How do you then see the relation between usability and type of software? I do not know how you divide software but maybe you can say something about usability and different types of software.

Apala – Our philosophy is that the process tends to be largely the same no matter what one is designing. You can go from a very wide range from medical diagnostic equipments to application software and the whole process in which you would provide usability inputs or do the user centered design is a very similar process. And that is where

we feel it is very scalable. It is not that one has to have very different skills depending on the ultimate domain where you are providing usability services. Once you understand how to do user centre design process, understanding the particular aspect of the domain is a small part of that process.

Torkil – One more technical question. How do you see the relation between usability and the user's cultural background?

Apala – Users have very different requirements. That is such a big issue in terms of the solution one provides from a usability perspective. People have very different mental models depending upon what their context is: whether it is the larger cultural aspect, or it is the peculiarities of the task that they do, so there are lots of differences. And that does impact usability in a very significant way because unless one can understand what is different about a specific user group, what attributes describe that user group and how they are motivated, how they do certain tasks one cannot provide a solution that is optimal for them. So there is no one size solution for usability. And that is why having a very solid user centered design process that again and again touches base with users in the best way possible is very critical. I often have people saying that what is the difference between market research and usability? Market research interviews people all the time. The difference is that in market research there is a lot of emphasis on the 'what', what do people do? What do people prefer? What will they eat? What will they buy? And there is less of an emphasis on 'why'. There is some emphasis these days on why will people buy what they said they will, but the ultimate objective is not so much about a design. It is about understanding a segment of the market in terms of the numbers. For market research whether qualitative or quantitative it is very focused on the numbers game. So many thousands of people will be able to purchase this because of this reason, where the reason is not so important, the number is important. But in usability the number is not that important. It is all about the reason. There are very many ways that usability engineers have found that you do not have to touch large sample sizes to discover how users are thinking for the kind of product you are designing. It is important that the process in which you touch base with even ten users is a very well thought out and designed process. You are not just sitting in front of a user and saying that 'do you like this thing?' and he goes 'yes, yes, yes.' And you come back thinking that the user said yes but you have got to know the cognitive processes of human beings, the cultural differences. In order to be able to design a questionnaire well, which will have questions that will give you valid responses from the users. That part of usability is very important. Thinking about the user, how you will talk to them and how you will fit in their opinion in terms of what is important to them and what is not, because it is very important to understand users but users are not designers. Getting users to give you design solutions will not always work.

Torkil – Great! When I talk to Dinesh and some other people in C-dac and some other places, often this question comes up that there are different kind of users having their different characteristics. Like people from rural areas and people from cities. People from rural areas might use some other kind of software. For example I heard about the agricultural software in which you register the land you own might be very important for

some rural people like farmers and therefore you need to have this kind of software in local languages. So that is a different requirement from what the city people have. Can you recognize this difference between different user groups and different kinds of software? We also sometime talk about power users and advanced technology and so on.

Apala – I think there are so many different types of users and that is what makes some usability work more challenging, but it is very challenging when you have to design something for the whole country. Designing a product or a website or a software application that millions of people in the country would use, which means that you have got to cater for people who are very savvy with technology who are power users or they will become power users very quickly as well as the same interface has to also cater to people who are very casual users, they are beginners – how do you span this whole range and not annoy one user group or the other. That is a very big challenge. There are very many methods which are already available in which you can accommodate all kinds of users – progressive disclosure where you can have, as a user becomes more comfortable and they are more savvy you have different kinds of interaction methods available so you do not reveal everything right upfront but you do have a mechanism by which you can reveal the entire complexity of a software product to a user who wants to get to that complexity so you can reveal just a little bit in the beginning and there are some users who will only be comfortable with that little bit because they do not need any more, but if I want more, if I am likely to be a power user, the application needs to give me a way that I can progress to the more complex features. An interesting example is the availability of shortcuts which you have for applications and websites. It is nothing but a way to accommodate all kinds of users. If I am a casual user I am not interested in shortcuts so I use the more long way of interacting. If I am going to use it all the time, if I am using PowerPoint four hours a day making business presentations then I need a way to do things quickly when I am becoming familiar and a good way is that to provide the shortcuts, because when I am a power user I will start to be comfortable with that. However you are not forcing me to use it, so I can decide depending on the level of my familiarity and comfort I can decide which interaction to use. It is very easy to define something and design and give usability inputs for a small group of users because you can meet every one of them and understand them in detail and design something that fits them perfectly. We all know that designing something for NASA is very simple because you will be designing for astronauts. There will be just three-four of them. You can measure their every aspect and get metric data for them, their behaviour, their cognitive processing, because there are just going to be four of them. You will design something that fits them perfectly. But that is unlikely to be the case most of the time.

Torkil – This is just an add-on. I spoke to a professor in cognitive linguistics in C-dac. He told me one of the major reasons he sees why Indian people do use software so much in Indian languages. It is not a keyboard problem. It is simply that there are not enough websites with Indian content. So we discussed that why do Indian people not use software in local languages. Do you have any ideas about this?

Apala – It is interesting. I think traditionally there has been this whole feeling that it is only a certain section of the population who have access to technology and that section of

the population is also the section which is the higher end of the middle income group or the lower end of the high income group. These people are the people who are more familiar with English and they are the elite. Everything is always designed particularly in emerging countries, for people who are more powerful and have more easy access and have more resources. These are the people who are more exposed to English, educated in English and so everything is designed for them in English. However that is such a small section of the population that I think that now increasingly the suppliers, the service providers of technology service and products realize that just depending on that small English educated, affluent, westernized part of the Indian population does not make their business worthwhile. They need to reach out to the middle classes, the lower middle classes where English is not necessarily the main currency of communication. Attitudes of these sections are also not as westernized or as exposed to English as the elite. Suddenly now there is a major push to customize things, provide more services in local languages, weather it is websites or softwares, it is just started. The psychology of the elite is very interesting and they have an effect on the rest of the population. So India being a very hierarchical culture, it is a very high power distant culture. So the elite influence everything because they are at the top of the food chain. They command this disproportionate amount of power of controlling the entire country and so the rest of the population often aspire to becoming like the elite. One of the things that therefore they aspire to is the attribute of the elite which is about being so fluent in English, being so western. Suddenly there is a whole section of the middle class who even if they are more comfortable with their own language, their vernacular, but they want to aspire to going to the next level in the ladder and they see that some obvious attributes like being able to talk in English, interact with English content is probably going to help them move their status upwards. That has also been a major effect if India where psychologically a large part of the population wants to be seen as being more fluent with English than they really are and more wanting to toggle with English in terms of using websites etc. whereas they are really more comfortable with the vernacular. But now the push is coming from the other side, from the suppliers which is very interesting. The demand was never there for wanting to use local language stuff because that section of the population never thought they were powerful enough to really demand that. They were aspiring and hankering to learn English and to improve their status but the sellers of services could not wait for all that to happen. They were like, if there are so many millions of people who speak Hindi, let us provide stuff in Hindi; let us provide cell phone interfaces and SMS etc. in Hindi, because that way we will get many more consumers. And they are ready now for websites and other services so it is interesting that this whole push for moving towards local languages came from the suppliers of the services, much more than they came from the users of those services.

Torkil – Great. I know that you have been famous among other things among this Bollywood usability testing, so I am putting this question. Do you think that for user groups, usability testing methods should be adapted to the specific user group?

Apala – Absolutely. I think that it is very very important. It is such a critical aspect of getting good, valid results that will inform your design solution that if it is not done correctly the usability testing or even the way that you do user interviews if it is not

adapted to the context of the users you can get completely incorrect, invalid data. Depending on that for your design solution will be a disaster. It is one of those things which surprise me that from the perspective of usability professionals we have been so slow to understand this aspect. If you just look around you see other areas where people who have to be in touch with consumers, they have been so proactive in understanding this. If you look at advertising, they are masters at trying to take one basic template for an advertisement and changing it as necessary to suit different cultures. If you look at films, there is a lot of original films which will then, because it comes from some basic emotion that are universal but the context is wrapped in a local flavour, so different countries will take that basic film and then adapt it to suit their own cultures. Films, music, storytelling, all these understood the importance of localization. In usability somehow we were very late to understand this. I think it is very much because it is software and hardware, the things that came from the western world and a lot of it came from America. The world view that came along with that was that this is very American and that can really be used by everybody in the world but it is not necessary for that particular product to be adapted to the rest of the world. It is a very technology centric view of the world. But I think it has been changing now and that is very interesting. Naturally there are many forces at work, so just the flattening of the world; the whole attempted enabling people from all over the world to use products that come from a completely different area. This sort of globalization has also forced a lot of manufacturers of products or creators of services to really start thinking about that just my advertising is different and the core product needs to be different. Now suddenly people from everywhere in the world can actually use my product and increase my profits many times but then if I do not do something about making that product come close to people's lives in different countries, they are not going to use it and I am going to lose a lot of the money. So a lot of the economic forces now are making people understand the importance of how even in user centered design you need to adapt methods according to different countries and not use one template that comes from North America and think that it will work perfectly everywhere. Sometimes it may but it is not necessary.

Torkil – I love this stuff. But this is about usability testing and do you think that the concept itself – usability has certain definitions from the ISO and so on and affecting the efficiency and satisfaction and so on. When we did a small interview around Beijing and also in Indian cities and in Copenhagen we are just still working on these results that maybe Chinese people in Beijing use more, we asked them about the daily use of software they will put more focus on things like security and if the software is legal or not. While in Denmark it is much more about the traditional usability like effect, if it is fun to use or frustrating to use. Have you noticed, observed or have thought about the concept of usability itself. Does that need to be adapted or not?

Apala – I completely agree with you. That is very good observation. Even the success criterion that we use in defining good usability is not necessarily universal across all cultures. Even within HFI now we say well usability in the classical definition is about learn ability being good and speed of accomplished task should be very good, recovering from tasks should be very good etc. In different parts of the world where technology is used in very many different ways and very different conditions, all those criteria may not

be exactly that important. There may be other things just like you said and it is very right. Weather is legal software, what about the cost of sharing the software with the whole team, these kinds of things may be as important as success criteria which are part of usability definitions. So yes, I think how one defines usability, of course everybody wants things to be easy to use but that definition can include certain parameters which differ from region to region in the world.

Torkil – Thank you. I have another technical question. How do you see the difference between the software type and software quality?

Apala – When you define the quality of what a website is or what it means to be of good quality as far as website versus what it means to be good quality for ATM, the software, versus what is good quality for software like MS Word that I use, there are differences, because the mode of using them and the reason for using them are very different. If it is a website, a website where I want to buy something, then I am really very interested in lessening my work as far as buying that thing goes. I really want to make sure that it is safe and secure because I am going to spend money, without really having a physical contact with somebody who is taking my card, bringing it back – so I have all these issues. I do not have any of these issues when I am using MS Word. But those concerns did exist so the quality of that product and my experience, the user experience is all about how easy will it be for me to complete my task which is creating large documents. So how am I going to understand where to start in terms of my task and how do I know if I have some sudden complex thing to do in the document - who is going to tell me? So it is about solving these problems, weather it takes two minutes or it takes ten minutes I may not be that concerned about it because it is an ongoing job that I have that I do unlike when I am going to get on to an ecommerce site and I want to do it quickly and I want to get out quickly and I want to make sure that everything that I have selected was done in an optimal way and that I have all the information. I needed very different things. On the other hand when I go to an ATM I have no opportunity to be trained. When I use MS Word I come with the idea that I need some training and help. Whatever way it can do it well for me that is what I would like. When I go to an ATM, the ATM interface better be very self explanatory and better be quick. It should not make me, just to withdraw money, it should not make me do many things because I want to get in there and go out quickly just like the ecommerce site. But I need to be able to be very accurate about what I am doing because I know that if I make a mistake my card will be taken etc. So that precision and accuracy is very important. At the same time weather I am a first time user or not I will never get an opportunity to get any help or training with an ATM. So it better be such that anybody can walk in there and start using it and get all the basic functions done. So the quality of that experience again is all about the precision, accuracy and the easy learn ability which is not the case so much with the website where it is all speed and security. So depending upon what category of the end media that one is using it does matter that the quality is not just a one size fits all kind of a quality.

Torkil – The last question. If you think about usability what will you say is the most important concept in relation to usability in the coming years?

Apala – I think, in the coming years the two most important things will be – one is how the social interaction that one has and it is now being brought into the cyberspace. What is the usability criteria for that, what will be the user experience, where will it go, understanding that and being able to forecast what will happen with that, that I think I going to be a very big area, which is very different from the individual experience of the cyberspace that we got used to so far. And that needs to be explored and cultural issues in that are immense. The other is the whole aspect of what does usability mean when you start to design for the bottom of the pyramid in all the emerging markets because suddenly now you are designing for people who are illiterate, who have very little money, who live in an environment that is not secure, that is not the kind of environment that you need for technology to used, example, air conditioning etc. In those kinds of constrains where there will be major growth possibilities for users what will the rules be for usability. I think these two areas are huge.

Torkil – Thank you very much. Anything else you would like to add to this.

Apala – I think it is so important that the ability to do usability is something that needs to be nurtured from very early on in terms of the education system. I look at the countries where there is so much growth, economic growth that is forecast I feel that it is very important that thinking about user centered design in one way or the other should start being integrated into the education curriculum very much from when people are in school and they are in their teens they should already have things that they understand about usability, because one way or the other it will impact their lives much more than it has done before considering technology will be so much more pervasive in everybody's lives. So that is one thing that I really hope will happen in all these major growth countries.

Torkil – Thank you! We end the interview with this very fine hope for the future.

Bio:

Apala Lahiri Chavan, MA, MSc, CUA
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Apala is a world-renowned expert on Contextual Innovation—the discipline of creating breakthrough product concepts and adapting existing products, services, and technologies to new markets. Apala has helped designers, marketers, product managers and ethnographers apply her innovative techniques to develop exciting new concepts and products. She systematically guides the ideation process to uncover subtle patterns in ethnographic and market data to reveal the exciting breakthrough ideas that can drive your business and generate more revenue and profit. Apala has developed a vast array of data-gathering techniques, including the Bollywood Method, Bizarre Bazaar, and the Funky Facilitator, which help understand the user experience in a variety of cultural and economic environments. She and her team pioneered the “Ecosystem Chart” which organizes vast amounts of ethnographic data into a coherent model. She is a creative and dynamic speaker who has received acclaim in USA, Canada, Europe, India, and China for her keynote talks on contextual innovation, internationalization, and designing for emerging markets. Apala has been with HFI since 1999 and is currently Vice President of Asia, managing offices in India, China, and Singapore, and a Contextual Innovation lab in Bangalore. An award-winning designer (International Audi Design Award), Apala has led teams spanning design, development, testing, and deployment of software products. In addition, she is ACM SIGCHI’s Vice Chair for local chapters.

3. Interaction design in India – a talk with Anirudha Joshi

Torkil – How do you see the future of usability in India in relation to organizing software development? Normally I would have told you about the cultural usability project, but you know it very well.

Anirudha – In the short term I see two or three major roles. I am taking the term usability in a broader sense including software design, architecture, HCI, etc. In the short term it is already playing out in companies like HFI or Persistent or organizations which are in outsourcing kind of work. There, particularly for software development organizations it is going to make or it is already making a big impact in terms of the value that they are offering and the quality of the products that they deliver to their customers. I was just discussing this with some friends from the industry. One of the potential benefits is – I do not know if you have been following it but the Indian Rupee has been appreciating a lot in the recent times. In the past one year alone it has appreciated some 10-12 %. Everybody is worried that if it appreciates in a similar manner for the next three years, suddenly our IT industry will not be as competitive as it is right now. I believe that even if that were to happen, one of the things that will be a saving grace will be activities like usability. Right now the Indian Rupee is 39 to 40 Rupees a Dollar, if it suddenly, in a year it becomes 30 Rupees a dollar then that will really be a very bad thing for the Indian IT industry. Indian IT industry will have to rediscover itself in the terms of the values it offers to its clients. Usability is one of the areas which can actually add a whole lot of value and improve the quality of the products by huge margins than what it is able to deliver right now. That is I think in the short to medium term. In fact I won't even say that is the future that is the current or something that has been happening for the past five years in India. It is not happening enough in enough number of companies so probably more companies will be able to or need do something like this. We are beyond proving this at least within the community. It is now the question of how rather than should we, for the Indian IT companies. Although at the same time I must say that even now there are almost half the companies, and I am talking about large companies employing plus 10000 people, do not have significant usability presence. There is a lot that still needs to be done in future. But it is not a question of whether we should be doing it anymore. But the other significant future that I see for the people in this field and I expect them to be working on, in the next couple of years, or if some of them are already working now, is in developing products for Indian markets. There are not many companies which are doing that. We make the largest number of films worldwide. We make a thousand feature films every year and it is more than what Hollywood makes or many of the other countries make. But we hardly make five software products (I do not have statistics on that), which are targeted to the Indian market, simple products like for accounting, for common people. We see a tremendous potential for that. A lot of people do not even have access to computing today. Right now about 25% people in India have access to mobile phones and maybe 3-4% people have access to a desktop computer either shared or in office. If you include the cyber cafes then the figure rises to maybe 8-10%. It is really a small percentage. Certainly when we are saying that by 2020 India will be counted as one of

the developed countries of the world, I do not see how that can happen without improving the efficiencies in terms of day to day life and activities. Already a lot of things have become computerized. For example if you are buying plane or train tickets the easiest is to buy on computer. ATMs and banking have all been computerized. There is not a bank left which is competing right now which has not been computerized. Banks may have few branches which are still not computerized as yet but that is just a matter of time, the bank itself has computerized many of its branches and the others are following suit. In that sense things are varying peoples' lives. People are almost forced to use these products. Many of these products are not very usable today but I think we have to go through the learning curve as a country before we start making usable products and people actually start competing or making usable products. It is bound to happen.

Torkil – Since you are in quite a special position to compare the situation of usability in India with the situation of usability in many other countries since you have been a part of this as usability in China too. Could you comment on that?

Anirudha – One thing that is unique about usability in India is that it is based out of the design profession, which does not necessarily mean that everyone who is in this profession is a trained designer. That is not true. In fact a large majority of the people who come in this field are actually not trained designers. They do not belong to any specific design school. But a significant proportion of them are trained designers and everybody else who is in the field is a self taught person. He does not have any formal educational background. They come from engineering or management backgrounds; some come from writing backgrounds like technical writing etc. I know many people who come from commerce or arts background into usability. Many people from the design field gravitate towards interactive design and usability and HCI and eventually end up in this. I think for their sake let me take the credit to the design schools. In India design schools have had this user centered design thinking for a very long time influenced by foreign schools and now we have a fair number of design schools in India, many of whom are bringing forward this point of view. That, coupled with the fact that the Psychology schools in India did not take to this field very strongly. Neither did the library science, information and architecture schools. There are a few library science schools but not many and they are not really looking at this as an area of application for them. Somehow designers always got attracted to these new things.

Torkil – And computer scientists?

Anirudha – We do have a whole bunch of people from computer science kind of background working in the area of HCI usability but that is really more of an accident. Each of them has a unique reason to be in this field. Not in research. The computer science academia hardly follows the field. They are not even close to doing research in this area right now. Many of them do research in the more traditional computer science databases, networks and algorithms. Some of them do research. I do some of my work in collaboration with our computer science and IT school here. They do a lot of work in this area of design for Indian needs. That tends to be like – there is a low cost computing laboratory in our computer science school. They design many interesting devices which

are essentially aimed towards reducing the cost of producing those devices. We have a digital informatics laboratory in our computer science school which has been a lot of projects for developing countries and doing a lot of field work etc. That is where we collaborate and do a lot of work together. In IIT Mumbai we do have a HCI course and I offer that course, through the computer science school. The school itself does not have any faculty members who are interested in this field. This does not mean that it will not have ever – it is just that any faculty member with an interest in HCI usability is more likely to join our design school than our computer science school. We are working on it. I was in Goa last week, where there was a refresher course in computer science faculty members from some engineering colleges. There were about forty computer science faculty members and I was given an opportunity to conduct a day and a half of program for those people on HCI. It is really very early and there is a long way to go in that. On one hand we have these high end design school which have been at it from 1987 is what I traced one of our early projects to, real HCI oriented work. In the early days in design schools it tended more towards multimedia and hyper card kind of things than building applications or doing usability studies. However we do have, I will show you a photograph of a user test being conducted by a person in 1987 or 1988 dated project report. We of course have a user centered design trace even otherwise be it furniture or signage or any of the other design projects, people tend to use these methods. From a design sense in design schools there has been a fairly rich tradition. Although our design community itself is very tiny. We had two design schools till 1992 in India and the third one started in Delhi. Today we have 18 design schools. That is still small if you compare this with the 1100 engineering colleges that we have or 100 colleges of architecture. We probably need 200 to 250 design schools in India. Given the fact that only 7% of Indians ever reach a graduation stage, even then we need about 200 to 250 design schools.

Torkil – How do you see the difference between design and software quality?

Anirudha – From a design point of view we tend to look at software products also as products, just like we design other products like furniture and appliances and other industrial products. In a similar manner we look at quality of software products as a quality issue. It has all the quality parameters that go into it but essentially whether it is useful for people, whether it is usable by people and if people like it. Those are the three typical things that we look at. There are all kinds of designers so they give different emphasis to different parameters. So some people will do more on whether they like it and some others on its usefulness.

Torkil – You are from ITC and are a key person. What is the mission of ITC?

Anirudha – We have 2-3 main objectives as a design school. One is to bring significant design awareness in India as a whole, in all fields of design – interaction design is one. We actually have four masters program – web design, visual communication design, interaction design and animation design. Of this interaction design and animation design are new specializations that we started last year formally. We have been offering courses related to interactive and animation design from 1995 and students have been doing projects even before that. So we go a long way behind. Visual communication design and

product design are older design streams. We have been instrumental in doing some of the interesting things. For example many of the typefaces designed in Indian languages have been designed either by our alumni or our students when they were here or when they passed out of ITC and there has been a significant impact that we have made in that area. We have been a fairly small school all along but we have always had an edge in interaction design primarily because we are located inside a technology university and we have had a strong influence because of that. Technology has always been a big influence on our design thinking. We have always been a post graduate institute so far. In the past the way we have been looking at it – about 8 to 10 years ago our input was mainly from three disciplines. – Engineering, architecture and arts i.e. all streams of engineering, building architecture and fine arts. Now we are expecting that in the next five years we will have a transition and we will start attracting many design undergraduate which has not happened till now. We have only one undergraduate school – National School of Design and since 1997 we have had IIT Guwahati and we have had many people coming in as interns working with us. So there is going to be a change in the next five years and we expect that our masters program will respond to that change when we start getting lots of applications from people who have done under graduation in design. Our objective of starting new specializations in interaction design, animations, transportation and some other areas of design is that we are able to give an opportunity for people who have done under graduation in design. Now we have many of those. We see our role in those areas. Our role has been mainly in the area of a teaching institute in the past. Another transition that is happening now is that we are shifting more towards research now than we were earlier. In 2005 we started our PhD program. Currently we have 13 PhD scholars or research students working with us. Our PhD program has been a bigger success than we expected it to be. We get really very senior people applying to us and our difficulty is that we do not have that many faculty members to guide PhD students. That is actually a bottleneck for us. We have been asking people to apply again next year because we do not have that much bandwidth. But that is a nice problem to have. At least we have had beginners luck on that. Some of our guys are with 15 years of industry experience. One of our senior most PhD scholars has been a design teacher in National School of Design for 25 years. So after teaching for 25 years she has come back to do her PhD with us. That is great for us as it gives a nice atmosphere in our school. It has been very successful but in terms of outcome in terms of research it will take another couple of years before some of that bunch will come out. The first few batches of PhD people will produce substantial output.

Torkil – Where do you get your faculty from, today?

Anirudha – That is interesting. ITC is one of the only departments in IIT Mumbai which does not have a requirement of PhD for a faculty member. I have myself done masters. We have two PhDs. One person is a PhD in Ergonomics and the other did his PhD part time in Design and management when he was working in IIT Delhi. We still do not have many design PhDs working with us. We are very few in the country. You know Pradeep and Dinesh, these are two other PhDs. I cannot recall a fifth person who is a designer and has done a PhD. In fact design PhD is not a common thing almost anywhere else in the world so in that sense it is a fairly new phenomenon. We are discovering what it is

ourselves as we are going. We have people doing PhD in material science and there is a jewellery designer who is doing new methods of ... The person with lots of teaching experience is doing her PhD in something between ethnography and design and film making – story telling and narrative structures etc. We are kind of exploring what PhD in design is going to be. It is interesting.

Torkil – Some technical questions now. How do you see the difference between usability (as a concept) and usability testing?

Anirudha – Usability testing is a technique to develop to make a product more usable – that is our point of view at least. It is also a skill and not just a technique where you look up in a book or a manual and just apply on the first project that comes along. It is something that takes time to develop and some people do better usability testing than other people. They design better tests and administer better tests. Some people are just good at conducting them. All those things are skill oriented. They take time and practice to master or develop within one. Whereas there are some other people who are naturally very good at developing user products and I have seen that happen a lot at least in our design school and all the designers I have interacted with. Some designers may follow the entire process and still never get it and there are others who are very ad hoc and self taught perhaps but the products that they design end up having very few usability issues, essentially because they are able to look at the problem from many points of view at the same time and come up with a solution. Within a person there will be a strong correlation if he uses usability tests he will get certainly more usable products but if you start looking at across people. Some people do not know about usability testing but the products that they come up with are often very usable, than some others who follow lots of methods but do not come up with a good product in the end. It is a fair mix.

Torkil – When I was in Pune, I heard this presentation in which he said that we try to get the designer right the first time while other people like to do endless usability tests. How do you see the relation between usability testing and different types of software applications?

Anirudha – We looked at what are the different ways in which one can classify software. It is never an exhaustive list but we looked at some seven or eight categories of what kinds of software and what are the different ways in which one can go about evaluating different kinds of software. If I remember correctly it was something like life critical systems, industrial and commercial applications, both of which are used by trained people. So learn ability is important but not one of the most important things. Like in life critical systems you would expect reliability and safety to be more important. In industrial and commercial perhaps becomes more important or ability to do multiple things by a trained person becomes more important. Then home and office kind of applications which are used by large number of people, that is where learn ability and self exploration becomes more important. Then we looked at gaming and entertainment kind of applications and there usability is important in a very different kind of a way. It has to have a lot of emotional appeal; it has to have a lot of entertainment value to it so that one wants to do it in a repeated manner. And then we also looked at micro interface. We call

it micro interface but it is design of hardware, more or less it hinges on hardware where you change the micro interface and actually the problems that one faces, say one changes the mobile phone, the facilities are the same and very often they are done in slightly different ways in different phones. Change is necessitated by some different hardware, maybe there will an extra button here or something like that and it will be given a different meaning. How does one design for habit formation in those cases and how does one test those concepts? We did a project on input devices on Indian languages; it was not so much about speed of use as we thought that particularly speed of use is a second concern. The first concern is actually ease of use. How can the hardware be made to look easy? Once it looks easy then how do I design for habit formation? What kinds of habit do we encourage, simple things like on our keyboards we have those little notches on J and F where we put our finger. They are essentially guiding your fingers actually. I do not even remember, every time I have to look up to remember which two, but if I am typing wrong and I feel that I am typing right then I just feel for the notches and actually the hands go back to the right place. I can actually type without looking at the keyboard, but sometime I look at the screen and I see that the whole word is not, not just one letter. Then I realize that my hand is displaced by one key. So that helps me find it, but if you ask me which are those two letters I will not be able to tell. It particularly happens with the right hand which moves around a lot. Product design, i.e. hardware, there are different categories of products and evaluating them in different context, you need to evaluate different things about them. If you are doing for life critical system you need to be able to simulate a tensed situation under which a person is likely to make a mistake and then evaluate the product under that. Hardware is always a tricky one, when one designs a new piece of hardware it takes too long a time to prototype and then test it out and by the time you test it out problems start pouring out very quickly out of such things. And then you really start feeling that why did I put so much effort to create this. But unless you create that product, in the first two try outs that you do yourself or with a friend, even before you organize a test you understand tens or hundreds of problems that you should have fixed before you made that first prototype. But that is the process. A lot of effort actually now goes in how do I make a quick prototype and my skill is going in. The quick and the most interesting prototype will throw up the most interesting problems that I can now solve. So majority of the effort goes in prototyping rather than usability testing. And that is interesting for me.

Torkil – How do you see usability testing in relation to the different user groups, for example users from traditional or cultural backgrounds?

Anirudha – One interesting thing that I wish to write as a paper some day is, I have found that when there is a lot of cultural difference and in India we find that a lot, there is always this power distance between... We go to conduct a usability test somewhere in a small village, in the middle of India, in the centre of nowhere. Usually we would have taken the morning flight and landed there and by the time we reach this person. We optimize on time because we are travelling and travelling in expensive so one always tries to do that. When one lands there with a laptop and a baggage tag on your laptop bag, it sounds like very touristy and it becomes very difficult to develop a partnership with your users. So when one is doing some location based user studies we have always found

it good to do diary studies because you visit the same person twice, the second time you have a huge level of partnership. That is one thing that we have found to work quite a bit. I am not involved very much in doing usability evaluation per say, the mainstream usability kind of evaluation primarily because in university setup. This is the kind of stuff that happens more in the industry than in the university system. But we are involved a lot in actually doing user studies and in doing contextual interviews etc. and that is where diary studies helped. But I would imagine that one can apply diary study in user testing context particularly if one has a field deployable prototype. In fact that is what we have done. For some products we have deployed them not to evaluate the product but to get the user to think out of the box and to think about other ideas after usage. We have found that actually diary studies have been very useful in these contexts because it breaks the barrier, when you are writing into a diary in that contextual time and then when you go back and talk to the user about that then the user is a lot more open than the first interview. Typically we have found that in the first interview in half hour we run out of things to discuss and the second interview goes on for an hour and a half. One would have expected the opposite because in the first interview you have many things to talk about. It so happens that the first interview is quite dry actually and not very spontaneous and the user does not give anything beyond what you ask him. But if you leave the product with him for a couple of weeks and then go back and ask him to do diary recording. I have found that once you do that, it is a recruited user, they keep fairly extensive diaries. In two weeks they fill up 100 pages and 50-60 pages is typical. We were also surprised to find this. People write two to three pages a day and that is interesting for us. They give a lot of daily reports and it is repetitive but they basically write a lot.

Torkil – A sub question to that, you mentioned about studying people lower than you, have you tried studying people higher than you?

Anirudha – Most of our work happens in the lower socio-economic strata. That is primarily because the larger markets concentrate on the lower economic strata. This is just an anecdote – we once did a fairly wide study of ATM usage. This is an early study – early ATM usage in India around 2003. There were very few ATMs then. What we were expecting was what happens even today that the rich people tend to use the ATM more than the poor people. What we were expecting was that these guys will be busy people and they will not give us very long interviews whereas people who go to the branch may have a lot more time at hand. We were expecting that those interviews will be longer and the ATM ones will be shorter. In fact it was the opposite and we were surprised about that because the people who use the ATMs realize the importance of our interview. We said that we are looking at how people use the ATM so that we can improve the design of the ATM. That was the generic introduction that we had given and that was enough for those people to be involved in our interview. In those days we did not have a long queue in front of the ATMs. On the other hand the people at the branch, we thought that they have already waited for 15 minutes for their turn, they stood in a queue, and they were already tired of waiting, so they did not want to give another interview. Many of them were not using the ATM so they did not feel involved with something that they are not using right now.

Torkil – Now we are talking about ATM and rich people and also some products for the not so rich. Can you see any other relation between the user group's cultural background and different kind of software?

Anirudha – Another thing that I have seen consistently and we mentioned it in a paper also is – India is a very stratified society. There are many social hierarchies in India. There are hierarchies in terms of socio economic status, age, education, language and regional differences (except in bigger cities), certainly comparable to Eastern Europe and Western Europe kind of differences. Substantial differences between people exist. Because of those what we have found is that, in all this milieu, technology scene is a neutral thing., or technology has a neutralizing effect, be it ATMs, computers, whatever technology. I met some people in that ATM study itself who did not like to go to the branch but did not mind going to the ATM. There are two to three reasons. If you take education, about 75% of India has not studied beyond the 4th grade, according to 2001 census. So 75% of India is either on the border of literacy or less and 45% out of that are actually illiterate so about 30% are borderline literacy people. One of the things that may happen is that their handwriting may not be so good, so they may be literate but you may not be able to write very well. When you go to a bank you typically have to fill up a form, a cheque or a withdrawal slip, which involves writing, which means that somebody should be able to read what you have written. These people, as they are not very literate, would mind being told at the counter, in front of other people, that what they have written is not legible. There is no such problem in an ATM, you do not have to write and you just have to read, which is a lot easier. Even if the computer tells you that you have made a mistake, you are inside a cubicle alone, so you do not mind it. We met some people who were very intimidated by the very modern looking branch, with smartly dressed women sitting behind the counter. Many people come from a culture where men and women do not even talk publicly, it becomes very intimidating for that person to go and talk to the opposite sex. Whereas in an ATM one can deal with an ATM without any such hesitation. So technology has these opportunities in a cross cultural, multicultural environment that particularly India is. In that sense it is seen very positively. But the flip side of it is, which I consider negative, is that more or less it is taken for granted in the mind of an Indian that a technology product necessarily is an English product, westernized product and that is because of the history of India. In the last 100 to 150 years the technology has developed so fast, there have been a few indigenous products of technology that have made it into the market and whichever have, have been language neutral. Whereas the language based products, ex. Cell phone, ATM, have been essentially in English. There has not been a single Indian language product which is in the mainstream market and perceived as a great technical product. That is a cultural barrier. To add to that is the 100-150 years of colonial history of India before independence. That mindset has not changed but it has to change in the next few years if new generation technology products have to make an impact on the next generation of users. We can already see that change happening in terms of Indian language cell phones or ATMs. There are Indian language brochures too. The biggest change that we have seen is in the television industry. If you go by the TRP rating, 97% to 98% of the TRP are in the non-English channels. Although there are substantial English channels available and

visible all over the country the non-English channels have high TRP ratings. The 2%-2.5% include many of the cricket channels which are in English because it does not matter much what language you are watching cricket in. You are really concerned about the score. That is something that was never perceived to change but it has changed. Two years ago Star TV launched Star Cricket and they also launched a specialized Hindi TV. Now actually cricket broadcast is in multiple languages, at least Hindi and English simultaneously for the last year and a half. Interestingly even in the Hindi channels the graphics are in English. The visual feed remains the same and the audio feed is changed. The labels of the graphs and the name of the people, all that stuff is still in English. This is because the computer graphics operators do not know how to type in Indian languages. That is the only reason I can think of. That will change I am sure.

Torkil – Is there a relationship between the concept of usability and the users cultural background?

Anirudha – Does that mean that depending on their culture some people will demand for more usable products and other will not? Is that what you mean?

Torkil – A person from Germany did his study among usability 180 professionals and asked them what they thought about usability definitions. He found that some aspects were valued higher in some countries than other aspects.

Anirudha – The thing about India particularly is that it is very difficult for anyone to make a generalization. They say that in India whatever is true, the opposite is also true. To generalize and say something is actually quite difficult. But it is probably true that different communities will value different aspects of usability a lot more. This is not considered to be a good form to pick on a particular community but let me do that. There is a community coming from Western India, in the state of Gujarat which is called the Marwadi community which comes from a region called Marwad. All over the country they are known for being good traders. They are the ones who have a large number of retail shops. The small shops that we see all over the country not just in one area. They bring with them a very strong trading background. They are extremely practical in their approach. Because they are tradesmen they are very practical. I anticipate that there will be more emphasis on the practical aspects of action in such contexts. For example just to pick up a product. If there was an iPod and an Mp3 player by an unknown company which is half the price for the same capability, probably they will go for the half priced good, as a community, from that point of view. Whereas there are many other groups of people, who would take a lot of pride in owning an iPod. But that is very gross generalization. I am sure you will find different people in the same community with exactly opposite points of view. I do not think that many of these concerns are culturally dependant. Anything that helps in projecting or showing one's identity is interesting. I do not know if you have had an opportunity to watch TV recently. There is a particular commercial by a cellular service provider called Idea. In India because there is so much of stratification and occasional communal strife here and there, they have an advertisement coming out right now which they have handled quite well otherwise it could have been controversial. There is a village and there has been a recent communal

strife between two communities. There is a leader of the village who is arbitrating what to do. He decides that nobody will be known by his own name but by their mobile numbers. That is the rule that he makes, saying that a mobile number has more cultural ... It is actually the opposite, because communal tension has been a problem in India off and on in the past 100 to 150 years. They have used that to show that it is okay to be known by a mobile number. It is a nice advertisement, well executed and it is fairly hot as a topic. I am still going back to the earlier part of the question. It has a potential of going across these divides that exist in a stratified society. That is the most interesting thing about technology. Usability also will generally cut across in a similar manner. The other interesting thing that I wanted to say about this is that – one can draw several pyramids about India. If you take education – we have about 7% graduates, which include masters, PhDs, commerce graduates etc., and then another 7% people who have 11th -12th grade education. Total of 25% people have studied more than primary school i.e. 4th grade plus. Then 30% in between with borderline literacy and then 45% even below that. One can draw that on the basis of income and many other different ways but it will look more or less similar. As far the technology based products were really targeted at maybe the 7% graduates. Mobile phone is the first technology that penetrated that level. Television has of course penetrated way below to 70%. But television is a passive technology, you just put it on and change the channel and other than that you do not do much with it. Mobile phone is the first real computer based network technology which is reaching 25% of the population right now and is growing fast. Interesting thing is how it grows beyond this and how much does it grow beyond this and what models are successful after this. In a couple of years that picture will be clear. My expectation is that in the short term it will slow down. And then there will be a reason for the next change. It might just continue with its own pace, because the product can change lives of people. Mobile phone can make big differences, particularly livelihood oriented. If it is a taxi driver he will get more rides. It does not matter if the phone is in English and he cannot make a single call. As long as he can print a number and give it to someone and that guy can make a call, he is probably fine and we will get that kind of a growth. A lot of this growth that we have seen in the telecom business in India has been of that nature. It has been in the so called 2G spectrum, in the voice area, just making and receiving calls. Very few people can save phone numbers in their phone books and very few people can use their radios. It is actually very one off. So it is interesting, let us see how the next few years are. But I think it has a big potential of making a big difference.

Torkil – How do you see the relation between software type and usability?

Anirudha – Usability means different things for different products. In some products learn ability will be more critical, in some others error free use will be more critical and that is why one has to test for different things. When creating a hardware one has to create a prototype because one has to figure out if the prototype is usable in the hardware or not. Whereas if one is creating essentially a software product then one has to really test for things like learn ability probably, if you are targeting that kind of a user segment. If it is a safety life critical system then it is different. These are the things that will actually determine the usability of the product. So you test because those are the things that are important for usability.

Torkil – A sub question to this. Coming back to what you said about some people have a gift of being able to see a problem from many perspectives and that is why they might design products even without usability testing.

Anirudha – I am not saying ‘without usability testing’. What I meant to say is that they may be using think aloud protocol but they never may have learnt think aloud protocol in a formal manner or they may not be using the prescribed way of doing think aloud protocol. They may not have heard of Ericsson and Simon’s paper on think aloud protocol for example. But by a short interaction with the user they may understand what is wrong with the product fairly quickly and not only that but they may be able to come up with the most effective way in which the problem can be solved. What happens is that whereas a person who is not so good will need four iterations to reach the same point where another person will reach that within iteration. So it feels like this guy has not done enough iteration and followed the process sufficiently compared to the other guy. Maybe they will both reach a similar level very fast and are able to get it very fast basically. I have seen a lot of that happening. Particularly good designers do that. It is not a question of degree or a number of iterations I require to reach the same level. I am really not very impressed when somebody says that we took so many iterations to reach here. Probably they did not get it and that alone cannot be a measure. Some people have this ability to see and look ahead, predict on the basis of what they are doing. And that is quite good.

Torkil – That sounds really very important. Some people have this ability to look ahead. But what are the components of this ability?

Anirudha – I think a basic sensitivity to the design process. This really gets onto the abstract notion of what this ability actually is but in design schools we have this thing about what makes a good designer actually. One of the things we say is design sensitivity. Is the person sensitive? Is he sensitive to many things – users, environment, to the needs of the organization that employs him? Are you able to control that sensitivity also? If you are a very sensitive person and somebody says something about your design and you feel bad about it and you go and sulk for five days that is no good either. You have to learn to accept criticism properly. You do not have to be too sensitive also. One interesting example I tell my students and I have seen this happen in my own child – when you came to India for the first time, if you remember, while driving down by taxi and if that taxi stops at a traffic light some beggars will approach you for money. They will particularly approach you because you are a white man. And the kind of reaction that you probably had for the first time this happened. The same happened to my kid. He asked us why they were asking for money. How do you answer a three year old child why that person is begging without scaring him too much? We did try to answer him in different ways. He used to be a very upset when he used to see such things earlier but now he does not get upset anymore. He has killed that part of his sensitivity which was there earlier. As we grow up in a culture this is what we do to ourselves. We have to survive. We cannot get upset for everything every time. I tell my students that as designers you have to rekindle that sensitivity that you had earlier and bring that back to yourself. But you have to be in control of that sensitivity so you see it when you need to

see it and are able to come out with a solution. Not just worry about it but use that as a launching pad to a solution. That ability I think becomes very important. The ability to see problems ... In a society it is very difficult to pin point problems. One knows that there are problems in this space in general but exactly where the problem lies is very difficult to pin point. To have that ability and the ability to find solutions for those problems. Not just write those nice reports, take some pictures and make a presentation out of it, not just that. One should be able to think of solutions for those problems. Over a period of time I see this happening and particularly when I talk to good designers I see this particularly very well that whenever they are mentioning a problem, visually they are also thinking of solutions at the same time. I think that is a very good thing in a designer because if you are not able to see solutions then there is no point in finding problems and showing it to the world. You have to think of solutions. I think that is where creativity comes in, creativity comes in seeing the problem and solving the problem at the same time. Sensitive creative people is who I feel have this natural ability.

Torkil – What is the most important concept in relation to usability in the coming years?

Anirudha – In the coming years I think the notion of user centre design is going to continue to be important. But in addition to being user centered it is also going to be interesting ... I believe that the current trend that we are seeing in terms of social networking is I think in a similar pattern that we saw about 15 years ago when the web suddenly exploded, which is basically to use a clichéd term, people getting empowered to talk about themselves and to express themselves in some way. If you see in the social network and space there are very few new technologies that have come out. Maybe the bandwidth has increased slightly; maybe a few things have happened, but there has not been a really path breaking technology that has happened in the last five years in that space. I can see that pattern getting repeated maybe a thousand times over in the next 10 to 15 years. There probably will not be new technologies that will come out. But existing technologies which are around already will get moulded and remoulded in many different ways to unlock the power that is there in many societies which right now do not have access to those technologies. We have really seen the 7% tip of the iceberg so far as far as that is concerned right now. I think the next few years is going to be in seeing how one can cross those cultural boundaries or cultural barriers that are there between those layers of the pyramid. There are many layers and it is not just the top and bottom of the pyramid. At least 6 or 7 layers are there in that pyramid. Each layer is like a country or a continent. If you look at only a country like India, there are 100 million or more people in each of those layers. I think the unlocking of the potential of those people (who right now do not have access to that) is going to happen in the next few years. It is going to be user centered in the sense that there is going to be a lot of user studies that will happen and so on but I do not think that it is going to be user centered in the sense that these communities will come forward on their own to do something. It is going to be the products that enable them to express themselves. How does one go and create those products and tools? That is going to be a phase that we are going to go through. Only after these communities get empowered and really break out of vicious circles that they are in right now, which is not knowing where the next meal is coming from? When they break out of that will they be able to create their own products and tools and methods.

But until that happens it is going to be really a top-down thing where companies or maybe even start-ups will seed ideas and they are going to come out. It is not going to be then about inventing new technology for these groups of people. I mentioned low cost computing groups that we have and we have a whole bunch of them all over the country, doing very interesting research. Though the point that existed at the back of mind always was that about ten years ago, when some of these groups started their target was that a computer should be available for Rs.10000, which is about \$250. Today we get a computer at that amount. We started getting it about 3 years ago. Not a very high end desktop computer but reasonably well performing computers. In my opinion it is still going to be a barrier for people to be able to do something with it. I think price will take care of itself through market dynamics but the other issues like language, cultural barriers, having the right application types in place are the issues which will continue to dominate. I think that the current design processes have a big role to play in those contexts as well. They are not going to change dramatically. Thought there are going to be some subtle changes like I mentioned that diary studies works better because it helps you create a better rapport with the users. May be some such minor changes or Apala's famous Bollywood method studies, again I think it is a minor tweak on the main process of doing usability test. Very significant, they are going to make differences but it is not something that is going to make a big shift from what we know already. I think that is going to continue.

Torkil – Have I asked you all the important questions or did I forget something important about usability?

Anirudha - I wanted to make one point about how the concept of usability is important in different cultures. It is important in different cultures when you look at them in that pyramid rather than thinking about the Indian culture or the Chinese culture. In other words all rich people think alike and all poor people think alike in many senses. There are many similarities in poor people across the world and there are many similarities in the rich people across the world. If you look at it from an education point of view again. In Denmark maybe there are not that many layers in the pyramid, and in India there will be 7 or 8 layers. So you will not see much of the bottom of the pyramid, and in India you will see a lot more of the bottom of the pyramid. There will be differences across those layers, these are also cultural differences, and they are just not geographical. Urban rural differences are always there. Those are lifestyle differences, how much free time you have and how do you travel to work and do you get a monthly pay packet or do you get daily wages or do you get a onetime annual crop sale proceeds. That will of course have an impact on a lot of things, lifestyle differences actually. But mainly it is the rich and poor I think.

Torkil – Okay. That was a very good ending point I think.

Bio:



Anirudha Joshi is an associate professor in the Industrial Design Centre, IIT Bombay. He teaches and does research in the field of Human-Computer Interaction (HCI) design. His area of research interest is interaction design for users in developing economies. He also works in the area overlapping between software engineering and HCI.

Anirudha conducts workshops on HCI for IT professionals where he helps them to institutionalize HCI in their organizations. Anirudha undertakes consulting assignments in user studies, interaction design and usability evaluation. He has authored papers related to HCI in Indian and international conferences and journals. He was the co-chair of the programme committee of the first India HCI conference held in December, 2004 in Bangalore.

Before entering academics, Anirudha worked in the field of interaction design for software, multimedia and the Internet. Anirudha has a BTech in Electrical Engineering from IIT Bombay, and an MDes in Visual Communication also from IIT Bombay.

4. Civilized people, barbarian technology- a talk with Dinesh Katre

Torkil - My first question is to do with the background of why I am here. I want to ask you how you see usability in connection to software development in India and in general. I ask because of this cultural usability project which we investigate, the concept of usability in different countries. We also talked about this yesterday with the definition of usability. So I am going to ask you how you think usability play a role in developing software in India.

Dinesh – Firstly in India usability is still trying to find its legitimate space in the software engineering process. There are some organizations where they have a very well defined space. The contributions of usability practitioners are also accounted in the entire project budgeting and project planning process but there are very few organizations where it is done so religiously. In offshore IT companies what is happening is that usability is seen as a value added service for which an x amount of money can be charged extra. With the depreciation of the American dollar the annual turnovers of most of the IT companies here are also affected. So usability as value added service is helping them to really compensate for the losses. Therefore suddenly there is demand for the usability practitioners in most of the IT companies. But there is no adequate supply of trained usability practitioners because there are no good training programs. People are still trying to learn usability through articles published on websites, may be attend workshops here and there and they are trying to practice it, learn it on the field, on the job. It is becoming almost like that. If you see some Indian IT companies they will project very large number of user experience design teams with them. If there are not many trained practitioners from where have these teams of UX designers come up? Most of them are graphic designers or web/multimedia designers or technical writers. They contribute more towards visual design aspect. And they know that they have to reduce the number of mouse clicks. With that basic knowledge they get into these companies. Technical writers are also counted as a part of the user experience teams. So most of these companies are filled up with these kinds of people who eventually learn usability on the fly. And many of these IT companies are now therefore asking for usability training courses. I myself have offered usability workshops and small training programmes and oriented the teams. The sad part is immediately after the workshop the guy is placed on an offshore IT project. He flies to Europe or America on some offshore project and he is supposed to deliver usability. This is the fact of life. Now this has a strong economic dimension and the second dimension is the short supply of properly trained usability professionals and unavailability of training programmes. These are the three things impacting us.

Now I come to the cultural aspect of it. Culturally, India has always been phenomenological – observing the behaviour and re-occurrence of certain things. Based on that pattern you build the hypothesis. You do not go about analyzing it too much. If you see the India medicine – Ayurveda. Ayurveda is supposed to be good. It is primarily based on the herbal medication. The roots of the plants, the leaves, and the juice of the

leaves are the herbal medicines. Ayurveda does not give you the analysis of why it works; it only says if you take so and so herbal medicine it works. We have tried it on ten people and it works – so that is phenomenological approach. If you see Indian architecture it is very beautiful and it is traditionally transferred from one generation to the other. People know how to do it but they will not be able to explain the process. They will not be able to present the analysis behind it. This is culturally there in the blood of the people here. They also approach usability in the same fashion. Of course this is my general opinion. If you ask them why you are doing it they will say words like cognitive science, social science etc but they will not go about interpreting the user behaviour with scientific analysis of the problem. They will not try to reason it out properly – why a particular behaviour should be interpreted in a certain way and this is how it reflects in the design. They will be very phenomenological. They will notice that it works like this and it does not work in these conditions, the reoccurrence of this, and they will go by that. This is what I have observed. Because people are not trained and they basically go by the best practice, what is recommended by Jacob Nielsen's website. Donald Norman makes them think a little bit more. Norman is very popular here. He is a usability Guru. Most usability practitioners know Donald Norman. Norman actually gives them the basic thinking guideline. They can easily appreciate 'Norman Doors', it is quite phenomenological style of observing, which is natural to Indians. They will just observe the behaviour and the pattern and based on that they will build the hypothesis and design.

Torkil – Thank you! That was a very good introduction. Just to be a bit more closed here in this area of the country – I would like to ask about C-DAC. What is the mission of C-DAC?

Dinesh – C-DAC is a strategic initiative of the government of India to build the technologies which are not accessible from the developed countries. And to build the technologies which will basically remove the digital divide between the large illiterate populations that we have. We also see it as a tool of poverty alleviation, to spread literacy faster because we have a very large population – 1 billion people. How to reach out to them? Even if we want to teach so many of them, teachers are not available so e-learning is now becoming a very important thing. But if e-learning has to reach the rural masses the connectivity has to be there and the physical infrastructure has to be there. C-DAC is supposed to really focus on these problems. We are not there to serve the American customers; we are here to serve the Indian customers. That is the focus of C-DAC in short. Now C-DAC's main mission – one mission is parallel computing or supercomputing. Like you have space research initiatives, we have ISRO, which builds the satellites, so similarly C-DAC is also here to build the indigenous supercomputing solutions to suffice our weather forecasting needs or the other applications, which are very computationally intensive. The current mission is grid computing where the computing facilities are being linked, across other research and development institutions funded by the government of India and even the business organizations can contribute their computational resources and C-DAC is now connecting them across the country. The second mission of C-DAC is language computing– which is focusing on developing all kinds of Indian language technologies like word processors, fonts, speech technologies, speech to speech, text to speech, translation systems etc., and wherever

language appears in media like electronic display boards, television, mobile phones. C-DAC has contributed immensely in this area. We also contribute a lot towards software technologies in Indian context. Lots of open source solutions are being developed. We are working on telemedicine, e-learning; digital library for preservation of Indian heritage. We are also involved in VLSI design chip making some hardware technologies also like embedded systems. C-DAC, Kolkata is working on olfactory sensors. They have built a system, which can smell the tea and distinguish the quality of tea and it is already deployed in some tea manufacturing companies. Otherwise the quality of tea has to be tested by a tea tester, an expert. We are also working on things like electronic tongue, it will be a tasting tool. Basically, C-DAC is a very diverse organization and because it is a strategic R&D initiative of government of India, we are involved in all aspects of computing. That is C-DAC.

Torkil – Ok. Thank you! That was a nice introduction to question two. Then I had a serious question related to usability. So how do you see a relation between software quality and usability?

Dinesh – What I feel is software quality follows a very binary approach to quality assessment. When you say whether the application works in Internet Explorer or Firefox, that is one test case. It works fine. Does it work with various display resolutions, you test it so that is fine. Does it work with Mozilla or several other browsers? So these are the kind of typical software quality tests which are very objectively defined. And the conclusion of a quality test can be in terms of just a tick mark. It works or it does not work.

Whereas if you see usability brings in all the human dimensions. All the human factors are brought into it. A lot of subjectivity also gets introduced. It does address the quality as a whole but it is not the same thing as quality assurance in software. Usability is definitely different than ‘typical software quality’ and it is more about the process of design, and arriving at a solution, which is useful holistically. Quality test is just a checklist, in which all the things may be checked, but at the end of the day the software may still not be usable. So that is what I think is the difference.

Torkil – Ok. Do you see any kind of a relation between the user’s background and usability we just discussed?

Dinesh – Definitely. User is actually a very complex word. In my lectures, I always tell people that user is like God. People do not know how to define God. They say God is formless, shapeless, colorless, is omnipresent, is everywhere. User is also generally taken like that. Who is the user? Nobody knows who he or she is. How to define user? When you get into defining the user it is really so diverse, they come in all shapes and sizes, in all colours. So culture is an integral part of the user definition. In the professional context, if you have highly professional users then the culture has slightly limited role to play because for example, if you take a very professional perspective- if you look at doctors as users, let us say in tele-medicine scenario. Doctors across the globe who are properly trained as doctors will speak the same language. They will understand the processes in a

tele-medicine solution in more or less a similar way because they are all trained to understand it the similar way. So culture may have little role to play in a professional scenario. Of course, certain geographic conditions, prominence of diseases in a particular region, availability of resources will still impact the processes. But if you are addressing highly professional people, culture has limited role to play. But the moment you come down to masses, products which are used by all kinds of people, culture plays a very important role, because they do not use the product as professionals. For example an MP3 player can be used by anybody. This is not my professional need but I need it as an ordinary human being. I need to entertain myself. That is why cultural aspects become very prominent. Actually I have tried to define the knowledge dimensions of a user. One is professional knowledge, where knowledge is almost universal like all software professionals when they get together they speak similar language whether he is from US or UK or India they will immediately start discussing because they speak the same language and understand it the same way. Educational or professional knowledge dimensions are more or less the same kind of things. Then you have the day-to-day knowledge, which is the knowledge that we acquire from the daily walks of life. Here there the cultural dimension, the localization is very prominent. Each country has public transport system but it may not look the same. All of us have post boxes but our post box may not look similar to what you have in Denmark or in any other country. The moment you bring it to the day-to-day knowledge dimension, the culture variance trickles in and then there is something which is very culture specific. What is culture? We mean traditional aspects of a community. We do certain things because our ancestors did it or our former generations did it. That is where you have your festivals and your costumes and the kind of recipes that we have. All that comes to us from our traditional history. So that is where it becomes really diverse. In day-to-day knowledge dimension, the concepts at its core will be the same. Bus will still be a bus in other countries but the appearance will change. Toothpaste here looks different than other places but it is still toothpaste. Concept is the same but the appearance look and feel is different. In the cultural knowledge dimension certain concepts can also be very different.

Torkil – Yes, so in the relationship with usability?

Dinesh – If you have products for mass use, as you come down from professional level to the mass level, culture has a great role to play. So products, which are designed for mass consumption, are subjected to cultural differences. Usability of such products will have cultural bias.

Torkil – So, for example which role could culture play for usability?

Dinesh – Which role? Cultural needs have to be addressed for winning acceptance for a product. Technology will still be the same. There is another example, which I give is about Buddha idols. If you look at the Buddha idols in India, he looks like an Indian. If you look at Buddha idols in China, he looks like a Chinese – he has the same kind of eyes and nose as Chinese people. If you look at Buddha idols in Japan he will have Japanese features, the overall body and hand and the size of the feet will be smaller. The concept is the same but every culture has adapted it in its own way for acceptance. The acceptance

is greater when there is cultural adaptation. If you look at Sony television, if you look at HP or any of the laptops they continue to look the same across globe but now it is possible to mould them in a way a specific culture would want to see it. Internally it may still function the same way, the core functionality may not change but its acceptance requirements may change and it is possible. Culture is important for acceptance from users.

Torkil – Ok. Do you think this relation is kind of the same no matter which technology we are talking about – the relation between usability and software?

Dinesh – One cannot unilaterally say that for all sorts of technologies. But technologies for masses where we want ordinary persons to start using them as part of their day to day life those are the technologies. For example there are certain technologies which do not really ask for cultural dimensions, they just work. I am not able to quickly mention something but...

Torkil – You mentioned the laptops for example.

Dinesh – Yes, even laptops if you look at the evolution, now what is happening is all manufacturing processes the kind of materials we use everything has become suddenly mouldable and you can do lot of things and I think people have championed those processes – materials and we can shape them in the way we want. So very soon, in the years to come even the notebooks will have certain things, which will be culturally specific. You will find that one or two things will be specific to that culture. Should be definitely possible. Even the hardware products will adopt that. Software is already so easy to mould.

Torkil – So the technology and usability actually does not matter too much which technology. All kind of technology will probably be...

Dinesh – Yes, those which are used by masses. Like for example the ventilators used in hospitals – the respiratory systems. They do not need to have that kind of cultural appearance. User interface may require little bit of localization for understanding purpose but a ventilator has to serve the patient; the patient may not enjoy looking at its appearance. The fancy things have no role to play. Therefore such specialized tools and technologies may not require that level of cultural flavour but technologies for masses will definitely need that.

Torkil – In a way you are also saying that user's cultural background and technology type what is the relation between them?

Dinesh – User's cultural background and technology type? With a further elaboration, if you look at the word processor- now you have Microsoft word and we have Leap office which C-DAC has developed for Indian scripts. Both of software serve the same purpose as far as the technology is concerned. However, when it comes to inputting the Indian

scripts you have to understand the structure of the Indian scripts and accordingly program it. That bit of change has to be there. This is what I can vaguely put it as example.

Torkil – Ok. So we have talked about software quality and usability we called about usability and different kind of technologies we have talked about usability and user's cultural background – what is the relation between that and the same that usability is perhaps related to the user's cultural background. User's cultural background determine usability in some sense if we are talking about technology type, its cultural background and users and usability is important as long as we are talking about mass technology not for the specialized professions, not for the specialized technology.

Dinesh – In the specialized technology, usability will always be important but cultural dimension would be less like for example spaceship. A spaceship has to work perfectly it must be very usable. But culture may not have a role to play there.

Torkil – So be it Indian spaceship, Russian spaceship, or an American spaceship but they look the same and in terms of usability.

Dinesh – They might be functional and just usable. It will be treated as a scientific product. It will not be seen as a cultural product. You can see that in the aircrafts. You have so many airlines, only on the tail of aircraft, there is a reflection of culture in form of some pictures or colours. But the aircraft and the aviation principles cannot be tweaked. They have to be the same.

Torkil – So the cockpit and the technology of the Indian aircraft is the same as another.

Dinesh – It is pretty universal. It cannot be changed. You can change the cushions of the chairs, paint it with different colours.

Torkil – If we were to talk about software is there any kind of relation between software quality and software type?

Dinesh – Software quality and software type?

Torkil – It is a very broad question. I think I have to be clearer, but what is the difference between... Because if we again start a discussion about the software quality and usability and you defined usability as a holistic experience whereas software quality is something that you can test.

Dinesh – It is binary. It is like a checklist of things. It may not ensure that the final product is useful. It may not necessarily. Norman's tee pod is a good example if you look at the components everything will be checked. All is there. But no usability!

Torkil – If we take software quality in that sense, in a checklist sense, is there a relation between user's cultural background and software quality in that sense?

Dinesh – I do not think there is any. Culture has very little role to play, because this is very binary kind of thing. Either something works with a specific browser or it does not. So answers are going to be in terms of yes and no. Even for the evaluator or tester, the culture bias is very less likely in case of quality testing.

Torkil – So the checklist process is also same for all kinds of software technology?

Dinesh – Yes, it is. Only thing is that in some cases it is very rigorous.

Torkil – Which cases?

Dinesh – Like yesterday Devashish was talking about the 3D radiation therapy. You plan the radiation for the cancer patients. So the quality testing has to be very rigorous. When you give this tool to the doctors and they want to actually operate a patient. If something goes wrong one has to pay a very heavy price. The patient is going to die. Whereas in trivial application, not a life critical application if something crashes it does not matter. So based on the impact, the quality has to be tested with rigor, which may be different from application to application.

Torkil – The rigor in software quality might differ from application to application. Ok. A final question. What do you think is the most important concept in relation to usability in the coming years?

Dinesh – I think the most important concept is to really humanize the technology. It is because usability may just ensure the fulfilment of goals but humanizing is something much more than just fulfilment of goals. It is basically imbibing all the human values into the barbaric technologies. In some countries, we still have barbarians; they just do not know how the civilized people live. Like that you have barbaric technologies too. So all human values have to be imbibed into them. If we want human beings to be honest, the technology should also try to stick to that value. If we want human beings to be trustworthy, the technology has to be trustworthy. If the human beings have to be empathizing, the technology should also empathize. It should not be ruthless, rude, or dishonest.

Torkil – Ok. You said something about barbarian technology.

Dinesh – Yes technologies are born barbaric. A mere functionality. Having no compliance with human values.

Torkil – And is that contrast to more civilized technology?

Dinesh – Yes, technologies have to be civilized and humanized.

Torkil – Ok. Super. That was basically the questions I had to ask. Do you have anything more you think is very important to add to write it down about usability and India?

Dinesh – In India there is a lot of curiosity about usability. Wherever I speak I try to motivate aspirants to take the learning approach rather than immediately jumping into practice of usability. That is what is really necessary in India. Our priority should be bridge the gap between demand and supply of trained usability professionals in India.



Bio

Presently, Dinesh Katre is Group-head of Human-Centred Design and Computing Group at C-DAC, Pune. Earlier, he established and managed C-DAC's National Multimedia Resource Centre for about 10 years. This centre was established under his leadership and with the sponsorship of Dept. of Information Technology, Govt. of India in 1998. He has Ph.D. in Human Computer Interaction (HCI) from BITS and M.Des. in Visual Communication from IIT, Mumbai. His Ph.D. research was fully sponsored and hosted by C-DAC.

During past 15 years at C-DAC, he has conceptualized and implemented many R&D projects that deal with Digital Library, e-Learning, Game Design, Museum Informatics, Multimedia Authoring and Content Creation. He is the principle designer of many software, content and training products. He has published around 25 research papers in international conferences and journals. He is a member of Editorial Board of i-Manager's Journal of Education Technology. He presented a research paper on Mobile Usability at NordiCHI 2008 conference at Sweden, as part of an international workshop on Cultural Usability.

He is invited by universities from USA, UK and Denmark to share his expertise in the area of HCI and Usability. During past 2 years, he has delivered over 60 invited talks on wide ranging topics related to HCI and usability at multinational IT companies, research and academic institutes. In 2005, he has launched the Journal of HCI Vistas, which is an e-publication for awareness creation and to encourage the budding usability practitioners in India.

5. Usability, professional culture and location culture - a talk with Devashish Pandya

Torkil – Could you please introduce yourself briefly?

Devashish – My name is Devashish Pandya. I am right now an independent consultant. I help people solve problems in the area of IT. In the use of IT, for meeting their objectives, whatever they may be. I also work in the area of systems engineering, where I figure out the problems that exist in processes, and help tune those processes, with a view to get them more organised for growth. So these are the kinds of things that I do. Specifically the domains that I work in are in the area of telecom, right now I work in the area of telecom, and I work in the area of manufacturing. I work in the area of selling on the internet. So these are some of the projects that I am doing right now. As a matter of profiles, since the beginning of my career, I am a mechanical engineer by education, after doing my mechanical engineering, I worked in the area of operational methods, which is an application of mathematical engineering, I did pre- and post evaluation, which made me get into graphics, that brought me to C-dac. I joined in 1995 as a research associate, in the visual computing group, that's where Dinesh was, and I did a lot of research on libraries, I did some modelling, and I increasingly got into healthcare applications and along the way I was doing other visual computing applications such as video compression, trying to build a video underground server on the super computer that was being built, I used to do authoring with Dinesh.

Specific tools for multimedia, which was not available all world expensive, those are the kinds of things we did. We also looked at building core libraries and graphics, on which we can lay our applications. So we did the core libraries and then we started building applications over that. So, the first application that I did was in the area of healthcare. Three different client systems, the cancer treatment client systems, and that got into version one in '95, '96 was version two etc. So on that path I used to do data visualisation, and visual computing. I set up a medical informatics group. Now as I went along that path, I set up the medical informatics groups in 2000 and starting working in developing technologies, which would be useful for the varied spectrum that we have in India. We have the rural areas, where there is no healthcare. There is the urban area where you have a lot of doctors, but there is lots of things in-between. Lots of primary healthcare centres, secondary healthcare centres to somehow build, a way by which you can short circuit the path, from a rural to a speciality area even without losing control over the patient group. Some of the things that we did were building data interchange applications, data interfacing applications, data viewing applications, collaborations applications because it's a collaborative process between multiple doctors who look after the same patient. And in all of them, we found telemedicine to be a suitable platform, where we could demonstrate the technologies that we were building.

We also went on to propose healthcare repositories for the nation. We found that increasingly, software was not the bottom-line, it was also the framework behind it, people awareness was low, and also medical legal frameworks were required, so went out and tried to do that, standards were missing, so there was no community being developed, so I went on and worked with the government of India as a part of a task force, to write these standards and recommendations for data interchange in healthcare. So these are the kinds of things that I have been doing. Primarily visual computing, and applications on that side, multimedia applications on one side and healthcare applications on the other.

Torkil – The first question is about usability, it has to do with the idea of usability. Because I am coming from this Cultural Usability project which will look at the standard definition of usability, which we see as an ISO definition of efficiency, effectiveness and satisfaction, something like that. But then we are saying that in this project that maybe this standard definition needs to be reviewed, looked upon again, redefined, get more experiences from different countries from around the world, and we are looking especially at ways for testing usability. So my questions will be related to that. Before we go into that, I will ask you this small question that do you believe that usability can be one of the organising missions for software development in India?

Devashish – Yes it can be, it just needs to be timed right. Honestly, I believe that it depends on where we are on the lifecycle of the application. If it is an enabling application, where we are looking at a shoe string budget, where people would bend over backwards to just get that functionality, like it was, in some of the cases, then usability maybe a little low on the priority. But as we go along and we need to get them integrated into the regular workload, then we would definitely need to produce it pretty high, because people are quite sensitive to it, and not just people being sensitive, being in healthcare, it is a matter of a few minutes lost are very critical. So yes, usability is important. And we should form an organising vision, for certain applications.

Torkil – So how do you see the relation between usability and software quality?

Devashish – Usability, has been seen, the way the software engineering concepts are organised, are attributes for quality, it is, no doubt. Like reliability is, this is also an attribute. However, I believe it is something that we need to look at in the sense that quality was. Quality started at the end of the cycle with quality control, and then got integrated backwards into the whole cycle with quality assurance. Unless we take it up like that and put usability everywhere, with the kind of awareness and training that is there, that would be required, it probably would not work. So the usability initiatives have to go the quality way, where they would start at a certain point which is an appropriate point for it and probably be a controlled point, where it is going to go and then bring it back out, to ensure that there is a go at the end of it. So probably that's why we want to use usability.

Torkil – What is the mission of C-dac, from an Indian perspective?

Devashish – C-dac is a strategic organisation. It was built because of certain pressures that we faced, in terms of actual technology. Super computer – so that was the primary mission of the company. Along the way, two other missions were added to the charter, one was to bring access to computing to the Indian masses, which led to the multi lingual aspects. Then, there was another visioning exercise where we sort of put it out together, all together under, computing for human advancement. So now that sort of gave us the mandate to work in areas, which were all going to affect the quality of life for people across the country. Usually in applications, which may or may not be commercialisable in that particular sense. So that's the broad agenda for C-dac. It is an evolving agenda, usually gets reviewed every three years. Till about 2004, computing for human advancement was the mission of C-dac.

Torkil – What happened then?

Devashish – I think it still remains that, but they have changed the focus from super computing. It used to be the core of the whole mission, and now it has become a lot more broad based. Increasingly it is getting more and more broadly based.

Torkil – In what sense?

Devashish – Well, if you see, healthcare used to be an application for supercomputing. Now healthcare is among the identified areas, where C-dac will contribute. It contributes not just in terms of software, or in terms of hardware, but it contributes in terms of working with the regulatory framework, it participates in task forces etc. So this is in fact, moving one step ahead and saying while we build the enabling technology, we go on and influence and create the environment around it, which will help this technology to be used, so the responsibility is a little broader.

Torkil - How do you see the relation between usability and usability testing?

Devashish – Usability testing. I would say it is a quality of usability indicator. In my view, usability testing is not something that you use at the end of it, it's like a thermometer that you keep inserting into the oven and keep saying are we there? You can push it into the cake and say are we there or not? So I believe, in the kind of software lifecycles that we adopt we include all these interactive cycles. When we use those lifecycles, you may have usability goals that need to be balanced with competitive pressures, functionality, budgets, schedules etc. So every time the focus on usability could be slightly different. The priority of usability can change from week to week. One needs to keep checking, whether it is at a minimum level and at the desired level, how far are you from that. You can definitely not go with below minimum level, but you need to be between the minimum and the desired level. I see it as an indicator, which has to be used across the lifecycle, rather than the end of the cycle.

Torkil – How do you see the relation between usability testing and the type of software which you are developing?

Devashish – For healthcare? That we developed at C-dac? I will keep it in that context. In the first versions it was not very important, because we were trying to prove with a pilot, that it can be done, let's all get together and do this. But as you get into version two, into usable systems that are actually deployed, that time, a lot of usability constraints have to be taken into account. Especially in the area we are in, it does not have professions which are defined, it is not clear who is going to use a system. It looks like doctors are going to use the system but they have an assistant; assistant profiles are not clear, their education is not clear, their training is not clear. So then, we just don't have to develop this software system, we also have to develop the staff structure that needs to be employed there, what are the profiles, what are the trainings that need to go and we sort of cluster these and say this is the profile, that you will need to have, at your centre if you are at this level of hierarchy, in the tele-medicine centre. And then, for that, we bring in some usability features to match that person. So it is important, but just that it falls below the reliability, it falls below the accuracy after that, so that's how it goes. What I am trying to say is that a nurse is a very vague concept. A nurse maybe well trained, it may not be well trained, a nurse who works on the nursing station with a PC is a different kind of nurse, but we also need a nurse who can do ECG, can do a Doppler test, can do a Minimum Path, we take a blood and some minimum things like that and also work the computer. Also the basics of communication need to be understood. It is extending the basic qualification. We say you need to put in through a one week course and then you will become this that I can work with. We have to extend and draw boundaries for the kind of people you need to work with.

Torkil – Is that because you develop - I asked about relationship between usability testing and software types so are you saying that you develop different kinds of software for different kinds of nurses?

Devashish - That's right. I would not say nurses, but different kinds of people who participate in the work load. What we do is wherever there is a paucity of time that is something we would consider for usability. Wherever the user types are very severely constrained that's where we will do a lot of usability. For example, one of the places where people were worried in starting to use the mouse, so then we had this sophisticated version which had a right click and a left click like you would expect a doctor to use. There was this person who is assisting the doctor or a set of people assisting the doctor and we had to change it and make it like a bank, and we had to give him indications saying 'tap', 'down, down, down, tap', because they need a certain word flow in the head and if they have to handle forty units of data in two hours, they need to have that thing that they cannot look and click. Without looking, as if looking at a paper and picking it up and talking to somebody, in their heads they have got the taps recorded. If they want to insert something they will do 'tap, down, down, down tap, down, down tap, down tap'. They know all this, the entire structure of the menu, quite well, to go with it.

Torkil – So that procedure is for exactly in putting this kind of data

Devashish – Correct. So then what would be done is using that as an input you need to go back and change the specifications and hence the usability test. Who is using the software, the software attribute changes, and accordingly we have to make the changes.

Torkil – Just for my understanding, if you had to classify different types of software usable in this area, could you give me some examples?

Devashish – There are some software's that are used by people who are used to IT. For example, radio therapists. They routinely work with the console of the CT scan; they also work with other treatment planning systems, so this is one kind of usage, where it is already integrated into the regular workload. There's another one, who are enablers, they are assistants to these people, so they do a lot of text work, but that's all they do, they don't work really with images and ECG's and stuff like that. But we need to fuse the gap between the two, because there is no longer a machine on this side, it's been acquired from somewhere, so these guys are something that we need to increase, we need to qualify them a little further. Then there are others, who are IT professionals, who have to support these processes and hence they know a lot more IT but they just don't have the context, the clinical context, so then this is the other one.

Torkil – I get that but have you so far developed a specific application for medical software, would you give a name like, have you developed a e-journal system or piece of interface for reading out the machine from the patient or?

Devashish – Yes. Let me give you the case where we developed a “Televersion” system. Now this “Televersion” system is actually a collaborative system. It's an electronic medical record, like an e-journal system and it had a data-centric collaboration between various sites. So, that would be the application which I would use, it's called ‘Mercury’. We have been on this since 1999, and it still continues, just keeps evolving over a period of time. For this, initially we worked with the broad agenda saying doctors would use this, but as the patient load keeps increasing, the doctors would say why do I need to do this? Because I don't do it usually, give me an assistant. So under the project, you allocate more budgets, get them staffed, and get them one more place to sit and everything and then you put in one more staff and then you allocate the workload and do that.

Torkil – Now I have this question, some of the questions always overlap each other; this question is about how do you see the relation in usability testing which uses cultural background? Usability testing and users cultural background, what is the relation between these two?

Devashish – Culture impacts in various ways. I am going to talk about cultures in two senses. The culture in the sense of location specific culture and culture in the sense of an organisational culture. These two impact us separately primarily because we were bringing together, geographically distant, locations into a virtual organisation of sorts to provide healthcare. So a person from the North-East, let's say in Assam, we worked in Sikkim, we worked in Mizoram, and they would connect to let us say places in

Hyderabad, in Andhra Pradesh. They would connect to Andhra Pradesh. That is the centre of the place – a different set of values, a different set of cultures. So I am saying the cultural impact on the project, we did not account for it but till 2004 we were already facing it. Because of the way in which you would present it to the doctor. There are some cultures which are a lot more cosmopolitan. There are some cultures which are a little more democratic; there are some which are hierarchical. So then, why we didn't change the system. There were practised guidelines used saying that when you start this session you have to say these things. Whenever you have a place where you are having such an interaction, your room should look like this. So those kinds of guidelines were created to sort of make some uniformity in the kind of interaction that we have. If an expert is providing opinion to somewhere in the North-East, in one hour, lets say nine to ten in the morning, and then from ten to eleven he is providing expert opinion to somebody from lets say the western part of the country, he would see very different kind of interactions. The way in which the data would come, the way in which the patient would be presented, the way in which the patient would talk would be different. So we sort of face these problems and then issued guidelines to do that. They probably are yet being incorporated in software; we don't understand exactly how and how much we need to put in the software. Right now, it is being handled as follows, in the patient interaction with the expert should be minimal. There will be a presenting doctor, and there will be an expert doctor on the other side. So they will talk to each other on behalf of the patient. So this doctor who does not see the patient, will not be affected in terms of time or in terms of the quality of data he is getting because of that cultural influence here. In some cultures you cannot ask directly about a lady's health or some of the other people, so that would be taken care of because the local doctor is more sensitive to the local culture than the expert who may have a very straight blunt question.

Torkil – So you have to put in a local doctor in the chain of communication to.....

Devashish – The local doctor was there. Just that he was made a much more active participant in the whole thing. The other thing was we issued guidelines. Even the assistants who talked, they have to set up a session. So then there is an assistant here, there is an assistant here, there is a doctor here, there is a doctor on another side, and this assistant may talk to this doctor, whatever. So then we had to sort of issue a set of guidelines as to how do you interact? Because it is almost like setting a standard operating procedure for an organisation which is virtual, which is quite widespread.

There are also these other issues. On one side you have this very premium organisation, among the three biggest, the best hospitals in the country, a very large, hierarchy out there, very strong hierarchy out there. They are here. On the other side, the total number of people in the entire healthcare unit is three that includes the person who cleans the place, the doctor and his assistant. So then the kind of interaction that you have here and you have here is quite different. But you still need to enable this in a way where you need to, bring some semblance of this hierarchy into the entire interaction. So then, that's something that we need to account for. We have accounted only by practised guidelines as of now. It probably needs to be taken into account a few more times.

Torkil – ok, so that was about the usability testing in user’s cultural background.

Devashish – The reason why I keep saying that is because you find the system is not accounted for it; the entire attribute has been transferred into an Anthony of the system which is these documents which go with the system. In the training that goes with the system. So whenever people buy a system, they get the entire package. So as a product, we have packaged it into a separate thing. It probably will need to be brought into software, and when it is, then usability testing will be brought in at that time.

Torkil – Would you imagine that who should be part of the usability testing? Should it be the local doctor or?

Devashish - We need to think about it because you see the same system is in use - was trialled in Australia, was trialled in Ethiopia, it’s been used in Kerala, it’s been used in northern parts of the country, it’s been used in Cuttack and Orissa, in Mizoram, in Sikkim, so very diverse backgrounds, it’s a very large problem.

Torkil - But you don’t already have a set of usability testing

Devashish – No we haven’t for this because this is a new problem that we have. When you are looking at a target audience which says that give me a technology that connects these three hospitals with these seven hospitals, so then you know what your user groups are, you are already talking to them. Otherwise in the next phase they say replicate it across these twenty two places and they come up with a new list of locations which raise new challenges.

Right now we are depending on the fact that doctors are able to handle the interaction well, because of their long training in various places. Usually doctors are not trained locally, they get trained in various places and then they are stationed in different areas where they serve. That would somehow take care of these things, but as we bring down the doctor to doctor interaction, we bring in some paramedical interaction, or patient interaction, then the cultural things would take over a lot more. Doctors are a little more culture neutral than other people.

Torkil – So we were talking before about different software types, different software applications in developing these, so do you think there are some of these technologies which are less or more related to user’s cultural background?

Devashish – I find the fact that we are trying to bring together a set of organisations a challenge. Challenge in terms of cultural integrations and whenever you have for example, two expert organisations having a second medical opinion, kind of a conference, there are issues. Why should I seek an opinion of that hospital? We are as good, we are better. I am not sure whether that is a cultural thing or what. Some organisations, some doctors tend to be more open about it. Some others are not. So this is one kind of thing that we face. The other kinds of things that we face are based on the fact that there are some places where you have specialised roles and specialised people

for roles. And in other cases we have because of the culture situations where you have one person doing everything related to one functionality in all respects. He is very well trained in all functionalities and can do a lot of things. So there the challenge of usability are slightly different, because as a user software he is also using a gel and he is applying to an ultra sound machines and also trying to work on the software on one side. So now, I am not saying that these are culture usability issues, but because of the culture that they have in the various places, where one person does everything or different people doing various things there are different usability problems. In one case you would not have a problem where you have one dirty hand and one clean hand; in another place you may have that problem in which case you have a problem of coordination between two people one with a dirty hand and one with a dirty hand.

So that's one thing, the other thing is that we are trying to induct into this chain of interaction, more people who are assistants of sorts. I believe the cultural issues will come in there because they are sensitive to the culture. They are from the local areas and then they will come. One of the focuses is to reduce the amount of time that a doctor needs to spend for diagnosing a case and treating the case. So currently it would take twenty minutes to do that. With the help of an assistant, with proper presentation, in a real scenario you would have a junior doctor preparing the case outside and then presenting it to the doctor as the patient is talking to the doctor. So this sort of breezes up efficiency. As we bring in assistants, that time we believe that cultural aspects will come in because those other assistants are not as culturally neutral as the doctors are. So those challenges are some things that we see coming in as the chain gets longer.

Torkil – If you could kind of elaborate even more on the cultural background of users and the idea of usability. We have been discussing this during the last two days

Devashish - I find that there are certain cultures, which are a lot more tolerant. That means is that the certain class of users who are quite goal focused, quite task focused and even if it is difficult in terms of interface, that they keep at it. So this is one kind of user group that you have. There is another kind of user group which are really looking at it as a job and because of which medical profession also requires lot of passion. Due to which we find that they need to be served a lot more in terms of ease of access, a lot more trinkets have to be given to them as compared to the main group, core functionality plus trinkets, so then they usually get taken into the second round of implementation and not in the first round of implementation.

So then I was trying to classify users, in the kind of people who are very function focused and usability product where they compromise usability as long as they get access to the care.

So the other user group, which is actually a little fussier and lot more time conscious, or at least that's what they say in the face of it. I am going to classify these and I am going to say that some cultures, the mix of these is different in different places, where we work; different organisations where we work. I keep bringing up organisational culture, because I think that is a very strong culture that we have to work with. In some organisations, it is

depending on the kind of leadership that is available, some kind of corpus that is around these kinds of accesses, they would be a lot more tolerant. In others, because they have a real need for it, they can see their own patient being affected they would be more tolerant. Others who are already overloaded, or for some reason not as motivated, they would be less tolerant. The motivation is sometimes a matter of the kind of responsibility that they feel towards their own patients and the patients across. So these are the kinds of things that we face.

We tend to avoid thinking in terms of location wise cultures, and the kind of users, the user type. When I say user type it is more to do with the makeup of the person, kind of expectation that the person has, the possibility of using the system in a sustained fashion, the tolerance that can be, because in this entire interaction, there are two users and the acceptability system is both systems used together. So if I am a user, I know my system well and I am a good user; but if I am intolerant to the other guy, who is a little less sophisticated user and is taking longer and is trying to figure out the system, then I will say can't do it, takes too much time. So overall, the software is acceptable on this end but on the other end, it is breaking down on the user acceptance. If that user finds it acceptable by himself, but on this guy's benchmark of the kind of latency that cannot be, he will say why don't you make the software little better, a little more usable so the other person does not take so much time and I don't have to waste time.

So the challenges are not as what you face in a desktop kind of scenario. It is also this built about – it's a group of people using this software, and all of them have to be able to use it in their own levels of requirement. To make the certain kind of benchmarks in terms of time, in terms of quality.

Torkil - Still you are saying that you are trying to avoid thinking about location specific problems, but you have been this all over India in the sense in the North and here so why do you avoid talking about. I have understood this having social and having space distribution situation because you have several people working together, but I guess that it's not like that you have one centre, you probably have different centres of telemedicine so, could you say something about that?

Devashish – Honestly, we are at a phase where we are just trying to provide the functional backbone. These are real issues and need to be addressed as we go along as the penetration increases. Today we have about thirty-thirty five locations across the country out of which there are concentrations in three parts of the country. As it goes into a larger area, probably that would be the time, or when you say let us do hundred or two hundred installations within a state, at that time would probably be useful, to take those cultural traits into account to make it a little more appropriate for that culture. As of now, in terms of the kind of schedules that we run and the kind of focus on functionality that we have, those challenges are taking over the other finer points. As we get into a more mature user, the more number of users should be a right time to do this.

Torkil – Interesting. Just for comparison, in the little state of Denmark, they teach the kind of top down approach and they tried the bottom up approach to the e-journal which

resulted in waste of millions of DKK because you have a different areas of the country develop different systems which don't speak to each other across the municipality limits of the borders of that area. But I am not sure which one would give the best result in that because might be the top down and bottom up because you are facing the same problem but from a different perspective.

Devashish – We saw from the experience of the west that this is a possible problem. We intervened and in about 2002 we set up a task force, the Government of India set up a task force and we at C-dac contributed to the technical standards of data interchange. Which sort of sets up a standard which is you can keep the data you want, but when you want to send it to the other system, this is what you need to use. So that we are trying to address. That risk is being addressed. At the same time we find that it is slightly different in India in terms of healthcare.

Healthcare is quite ambiguously controlled. Usually, the healthcare budgets are set out by all the other things like communication etc are frivolous issues, the union government, which sits in Delhi, has a lot of control over it. A lot of influence. The health is a state issue. So the states are quite autonomous in the way they employ their healthcare resources. Now this, leads to some amount of their own little projects going on and their liberal influence there. What we are saying is, the amount of private participation in healthcare in India, is much higher than anywhere else in the country. More so the healthcare is delivered to private doctors and practitioners. They have their own systems. They work entirely differently. So what we are trying to do we are saying is let these grow as “cylos” wherever they are, the islands can grow, it is our job to bring in, if an island is not getting certain kind of healthcare, then we bring it in. For example, in the state of Sikkim, the population is almost two and a half lakhs, small population, and large state. Because the way the government works, they did not have a cardiologist for that small population, so what we did was we put a Doppler machine there and a cardiologist from somewhere else, in Andhra Pradesh would look at that data there. What this does is, it somehow, is looking at, is trying to address the bit where you say let local systems go the way they want to or they can. From the centre, we will try to reach out. So you will be the hub and start reaching out. Set up hubs everywhere. Anybody who wants to connect into a hub is welcome. You can use the system that the government has developed, or you can use a system that you can get from outside as long as they comply to the standards. So both the top down and the bottom up both are in play.

Torkil – So we are talking about the relationship between the user's cultural background and usability. We are not talking about real individual users, we are talking about usability in the sense that we have different states where the federal government have different conversation cultures and so we are different groups of people who are using this.

Devashish – Ok. I think I will clarify myself. Organisational culture is more important in this case, the way it is because it is used by doctors. Doctors due to the kind of training they are getting in various places before they actually get placed become quite cultural neutral. Especially in the professional practice. They may be otherwise sensitive, but

when they deal with patients they are quite the same, as they may be in Delhi or in Assam will be quite similar. Only at the lowest level, at the grassroot level the GP would be quite sensitive to the culture, but he is not in the gamut of the application that we are developing. Therefore I don't have a lot of users who are sensitive to culture. But the medical assistants are local entities, and as they are brought into the cycle, they are the ones who are sensitive to culture, and for those we right now are using guidelines, but we need to address them when we have the budget and the time for specific locations when we see that the penetration in certain areas is larger. Let us say if we take Tamil Nadu and put two hundred systems out there, then it would be interesting to do something specifically for Tamil Nadu. Otherwise it is not worth doing it when you don't know where you are going.

Torkil – That was very good clarification from you. Could you also clarify the relation between software types and usability? Assistants, as they come into the system, they might require some kind of a cultural adaptation of the system and also of the testing and everything. Will the system for example get access to all the kinds of software applications you develop or

Devashish – That is a matter of design right now. When I left the project in 2004, the design consideration was as follows. Some doctors would like that an assistant works on the same station that he would work on. Set it up for him, as if it is a doctor doing, and then the doctor would come and sit on the station and start working. So that is actually working on behalf of the doctor working there. It is not about the workload. So there are actually two users, using the same software, at different times. Now there is another school of thought that we are trying to propose saying that extend the change. You have the assistant, give him the role, and you can allow him to do certain things, do not allow him to do certain things, create a separate work space for him. So in that case you have to. But then, there is a third problem, in which case there are certain places where you do not have an assistant, in which case the doctor will have to use two systems to do his job. So right now this is something that we are working with and I believe that some decisions need to be taken based on the kind of areas we look into.

Torkil – The last question. What is the most important concept in relation to usability in the coming years from your perspective?

Devashish – I have a take on this. I keep talking to Dinesh about this. Usability, we are not talking enough about the user experience as such. So I believe that the usability has to enhance or increase the amount of efficiency, increase the amount or reduce the threshold to acceptance. There is a lot of paucity of time, so this has to enhance working quickly, that's efficiency in a way. There is also this bit about intolerance between two people; the usability has to somehow even address those saying that right now usability is for one person using one system, we need to figure out, when there is more than one person using the same system, participating in the same transaction, how is it that we can work with usability, when you are two different kinds of users participating in the same transaction.

So this will be something which will be interesting for an application like ours, as a collaborative application with two different kinds of users on both sides. I also feel that as people get more used to a system, they will get less tolerant of usability. So we have this first line of features which come in where they say thank you god helping me to do this that's it. And the second line they say but what about that, what about that. So we are getting into that phase now, where basics are being met, so we will get into usability quickly.

If we look at some of the big tenders that are out in this area, none of them had usability beyond a line saying it should be usable and fit to use and all that. But as you go along, safety considerations need to be put into account. Also these bits about doctors are also worried about whether they have considered all data, for making the decision. That needs to be pointed out to them saying there is no data you have not seen it, there is no data, but it is not available, it is the quality that is available. There has to be ways by which we can help with these kinds of a) renditions of these parameters and b) somehow trying to quote those into the documents that we had generated based on the decisions, which were made in the days of I know there are four CT's available, three of them are available with me. I need to have a usable way of making a report which says three of four were considered and move on.

So we have brought data from one person from one to the other side. There's this bit about the actual creation of the 'care' plan, so we will deal with the usability issues in actually diagnosing and creating a 'care' plan now.

I Think I will broaden it a little and say user experience. In the case of user experience I find that there are users of the system. They are operators of the system. But there are also others who are stakeholders in this entire process who have either due to the kind of structure that they are they hold the responsibility on the welfare of the patient. They also need to be aware saying if they use the system, all the interaction using system will be medico-legally acceptable. All the things that are done with the system will be acceptable to my insurance company. All the transactions using a system will be of a bearing standard. So such things in spite of not being a direct participant of the system, I have this.

I let us say work with you, for a period of six months, for a specific area, I learn a lot, from our interactions, daily interactions. So what happens is that the relevance of the system changes, the original relevance was I used to send you twenty cases a day, later on I am sending you five cases a day. Because over six months I have learnt a lot and I can handle my own patients.

Software may have more users in the sense different user groups, or in a same location you can have many groups.

I think I will not get into because that is not correct in a way... if you are making large deployments, as I said if you are dealing with, let's say Tamil Nadu, two hundred, then is a time to actually look at what are the specifics of that location.

That you know, avoid having bananas in the morning, in a state that usually eats bananas. Some places they have coffee in the morning, some places they have tea in the morning, different interactions can occur. So doctors from Delhi, it may not occur to them saying there is coming around where they may eat a lot of certain kind of food, which may affect the treatment. So they need to give specific instructions for that. So these are the things that need to be taken into account. Also, while we have this Ayurvedic system, there are also local variants of the Ayurvedic system. There are also other systems, medical systems in India. People usually don't use just one system. They will use allopathic system that's what we are providing for but they will also use local medicines. And doctors have in a way, started factoring that. They would also advise saying stop that, don't do that now or do that only after a while, or please continue that if you are doing it, then I will not give you this medicine. So this is something which is specific to the culture, within that location. All of these can and should be built in whenever we have sufficient penetration plan within a certain area.

Torkil – Ok. Thank you.

Devashish – We need to be sure that the system is robust and reliable, that user experience will never come, without a proper functionality design. Not just functionality design, but demonstrated and documented functionality design. It has to be indicated on the screen saying yours was a secure transaction, secure transactions complete, so that's one kind of thing. The other thing is in healthcare, the interfaces are quite complex, they provide a very large opportunity for complex interfaces, non standard interfaces. So when you deal with 3D graphics, you need version track balls, you need new representations of abstract data because usually when we talk about data representation, abstract data if you talk about you have these standard graphs and spider charts and radar charts and all but in healthcare you need to get in beyond that and look at these large set of attributes which are interrelated, so there lies a challenge, especially in exploratory problems, where you are not sure the plan that you need to prescribe, then you would need a little exploration of the knowledge that is out there, of the data that is out there. That exploration is currently linear more or less. Even of it was hierarchical the access is linear, the presentation is linear. So we need to figure out how is it that we can present after saying in this area there is a lot more information, would you like to look at it? You can't make a thousand line page for him. So it would be interesting to look at that. Some of the slides that I presented in that one, it gave not just how much is out there, it also gave relationship strength of the correlation between. So these are the kind of challenges that exist and we should take them up.

Torkil – Thank you.

Bio: Devashish Pandya is an independent consultant, who helps people solve problems in the area of IT. Specifically the domains that he work in are in the area of telecom, the area of manufacturing, and the area of selling on the internet. He is a mechanical engineer by education. After doing his mechanical engineering degree, he worked in the area of operational methods, which is an application of mathematical engineering, He did pre-and post evaluation, which made him get into graphics. In 1995, he joined C-dac. as a research associate, in the visual computing group, Here he did work on healthcare applications, visual computing applications such as video compression, and a video underground server on the super computer that was being built, before he turned to consultant work.

6. Innovations in the hands of individual users – a talk with Sammeer Chabukswar

Torkil – Could you please introduce yourself briefly?

Sammeer – At present, I head the usability practice at Persistent. I have been in this field for about seven plus years, and my total industry experience spans over twelve years. I started my career as an Industrial Engineer. That's where I found myself thinking about improving all the systems on the basis of human interaction. Then I did my masters in human factors from Clemson University in South Carolina, USA. I worked there for few years and came back to India. Back in India, initially I worked with consulting firms and eventually moved to Persistent. In short, my usability experience spreads across mainly consulting. We are retaining a similar model at Persistent. I love providing consultancy rather than being associated only with certain development teams. We are building and organizing this whole new service, new team, within a technology focused company. Needless to say, this journey been pretty challenging and there is a lot more to come.

Torkil – Where do you want to go in the future with this? What is your mission in this? Do you want to be very big department within the system?

Sammeer – As a matter of fact, we have had a very well defined vision and mission before we started working. We want to establish ourselves as the usability hub of India – a firm or a consulting engagement where anybody coming to India for usability work should choose to work with us. The choice has to be Persistent. That is the vision.

The mission is: 1) To build awareness – Providing our specialized services only to certain mature markets, such as US or Europe, is not going to help us. Every day, we are witnessing more market growth and penetration in this part of the world – the Asia Pacific region, especially India, China and BRIC countries in general. We need to expand in these markets, and that is the strategic position for us. Also, we have certain advantages over other countries that are surrounding us. Our education system, availability of resources - with the analytical, design, creative skills is superior to others. That's the reason we are saying that India is the next design hub or usability hub. 2) To grow business – This is a more concrete mission. Business growth, in terms of the maturity of the business itself, is very important to thrive. As I said earlier, the business of usability has many aspects. One of them is Research. Even if we just keep working on usability projects, we can easily survive and expand business. However, there will be no growth, because it is just applying one's skills over and over again. Unless we add some value, by some fundamental research, new methodologies, and new techniques, the success and expansion will not be real. 3) To tap the business potential in rural India – We come back to the aspect of market penetration here. Software has not yet reached the rural part of India so effectively. About 65-70% of total India is rural and is still untapped. This is a big potential market for us. When software reaches their everyday life, it is going to pose a whole new set of challenges. We, as human factors engineers, can provide effective solutions. Especially in India, people try things once. If things fail,

they do not try them for a long time. We need to go to the rural regions with new specialized methodologies. As a society, we need to make this conscious decision beforehand.

Torkil – Could you please introduce Persistent? What kind of a company is Persistent?

Sammeer – Sure. Persistent is an outsourced product development company. What sets us apart from other such companies is that we work on a product in its entirety, design and develop it and then give it to the client. For example, if we design and develop a product for large ISVs, they give us the requirements initially and market the product later. At Persistent, the core focus is technology. When we established the usability practice here about three years back, it still was a geek company. It was a challenge to establish ourselves here as questions that surrounded us were, “Usability? What’s the use? Who needs it? What exactly do you mean by design services? Why should clients pay for the design?” We have successfully managed to get people to a substantial level of understanding of usability. We are moving towards seamless integration of usability with the software development process. Persistent works in a variety of domains, such as life sciences, telecom, finance, databases, ecommerce, and so on. As we work with the world’s most successful companies, we also work with several start-up companies and we grow with them. Many of our client companies are working with us for seven-eight years now. They started as small companies, grew big, and got acquired by larger companies... But they have chosen to continue working with us and we are still with them. Sometimes, even if people in the client companies move from one company to another, they are still with Persistent as our new clients.

Torkil – And you are an Indian company?

Sammeer – Yes, we are a privately owned Indian company.

Torkil – I have this very grand question like do you believe usability can be one organizing mission for software development and use in India?

Sammeer – Can you please elaborate the question?

Torkil – User training innovation is a big thing and has been for some years, in different places, and usability per say or user centre or human centre design, is if you really are on the radical side, you would argue that you should develop technology, today with the users and with the focus all the time – specific users with the end user’s needs not all those stake holders but end users. Here I am just asking for your mission, if you are really a hardcore software developer with a little usability, you will say no, you will say usability is an important component, might be, but basically there are many stake holders. If you are a really hardcore usability person, you will say yes, usability is more important than everything else. But I guess you have some past viewpoint, usually. It relates to what you are doing in the company of course and the discussion you have between colleagues and how you develop?

Sammeer – Of course, we would like to be at the centre of attraction, at the centre of the technical universe. Though reality is a little different today, we are – at least – at the centre of attention. The obvious reason is that we are promoting user experience – the third wave of information technology. Everything is being revolved around user experience. See any other products in any other market. What are the USPs today? A company offers you ‘x’ technology and a number of features in its products; another company can also catch up and offer the same technology and features. The only difference then is the user experience of the products they are offering. At Persistent, we are trying to use that (user experience) as a strategic differentiator. We build products with a focus on user experience. Our clients can use this user experience as a differentiator for selling their products. Personally, I feel user experience is extremely important and it should be given more thought, but that is not a really radical view. I will strive for promoting this as much as I can. I certainly see that there is more value in features and functions only if it is driven by user requirement- which essentially comes from the design of the product. I have not thought of what is going to happen after a few years. We have experienced the change – from hardware to software, and now it is from software to user experience. It is all about users. What’s next? Once all products become user-centered, what after that? Is this the big question? I have not thought about that yet.

Torkil – In the context of - the Indian software industry is a very large industry with very many employees and the number usability professionals within that must be very small compared to all the Indians. So will that change or?

Sammeer – That is bound to change. However, we need to do something about it to accelerate the change. As a community, we have started an initiative. In fact, we recently met the Vice Chancellor of the local university. We urged him to start a multi-disciplinary human factors program. I also know some good professionals from US universities. I am trying to bring their human factors program here, so that we can learn from some of the best people in the industry. That’s the way people should learn. There are many good design schools coming up in Pune. People are aware, but I think everybody has their portion to do. Either it’s in the larger product design aspect or in usability engineering. Industries should come forward to promote this field. If we look at the requirement for usability engineers, any company should have at least about twelve percent staff dedicated to user experience. The larger lot of user experience professionals would be usability engineers, maybe graphic designers, content writers, any and every faculty that has something to do with interfacing with the users. Maybe, marketing professionals and product designers should dedicate at least twelve percent of their staff to user experience. But that’s not happening. Today I think it is less than one percent if you consider the overall industry percentage. As far as usability community is concerned, you have seen some of them in Pune. As far as I know, there would be around fifteen hundred to two thousand design professionals.

Torkil – That is an interesting figure because in Denmark we have around 1500. And if it is the same here then it is a larger proportion in Denmark as we are about 5 million people. Now I have all these questions about usability; the first one is how do you see the relationship between usability and usability testing?

Sammeer – I consider usability as the whole - the user centred design. I know different thoughts are going on in the West about usability. Now they are calling it user experience design, which is nothing but the user centered design. I do not think that just changing the name will really help. I still see a lot of people using the terms “usability” and “user experience” interchangeably. People, who are advocating the term “user experience,” are also confused about what exactly user experience is all about. In the telecom domain, adding new features to telecom products is being called “user experience.” So as a design community, I think we don’t have much clarity- all of us throughout the world. If you see the whole science of usability emerged from human factors which started around World War II. But the application of human factors or ergonomics to software design, which is typically usability engineering, has started just twenty years back. It is now emerging, so it is a nascent field even today. I do not see usability testing as usability – it is a subset of usability engineering – it’s just a technique to evaluate the usability of a product. Usability for me has a larger definition and scope, where we do everything – from user focused analysis, user focused design to establishing standards. In short, all the stuff that’s necessary to make products usable.

Torkil – Software quality in usability - the relation between these two concepts?

Sammeer – Usability is one of the characteristics of software quality. But since it is associated with the user front ending, which is a whole new paradigm, it requires to be treated with special attention. It cannot be just a check mark in a testing sheet. It cannot be a question with yes/no answers; it cannot be a tick mark for a procedure or for conforming to specifications- which is the classic definition of quality. Usability cannot happen that way. There are some known facts with the help of which we design a usable product. However, there are some unknown facts like the very nature of the users, the user needs, goals and motivations. There are some implicit needs, and we may not be fulfilling all the needs. In software quality, you can just put a tick mark for a working function or feature. It is this kind of a hierarchical thinking that we need to avoid. So yes, usability is a characteristic of software quality, but it needs to be treated differently.

Torkil – So usability testing as a technique - how is that related to different kinds of softwares, software types?

Sammeer – Do you mean desktops, websites?

Torkil – What makes sense in your company? How would you divide software?

Sammeer –Essentially, there are the desktop applications, web applications, and websites. It really depends on the usage patterns of the users. From a usability perspective, it really doesn’t matter if it’s a desktop or web application or a website. Just as we say that if user centric design is a robust technique, it can be applied to different industry verticals and domains. It should equally apply to any interface, not just software. It should be applied to any product that has an interface. There may be a little variation in the way the tests

are setup or conducted, but again, I really do not see much of a difference between the ways we test different types of software.

Torkil - Take usability testing as a technique as specific interest in usability, and then relate that to the cultural background of users, and your, what do you say about that?

Sammeer – From my studies and experiences so far, I think there are two aspects – the administration of the test itself and the user. The technique of testing is the same everywhere. Jakob Nielsen has already done a great deal of pioneering work on usability testing. Cultural background also makes a difference. If the user belongs to the same culture, the moderators are also comfortable. They are less conscious about themselves. If I am testing with an American or a European, I am more conscious, more aware. Probably I am more deliberate in doing certain things. If it's my culture, I tend to take the user for granted, though it's a job. From a user's perspective- and I have not been a user many times- but I see that there are subtle cultural differences, and certain norms that apply to anyone who is being observed. Like the classic tale of study in industrial engineering, when someone is observing you, you become conscious. This behaviour is still common in every society, every culture. I have tested people from various countries, I have tested Chinese people, I have tested people from the US, Europe and India. I still see that initial hesitance, even to look at certain things. I have not done any deep studies in culture, so I am not the right person to comment on other aspects.

Torkil – But what about when you test Indian subjects, obviously there are many different states and all kinds of religions, age and gender and all that stuff. Have you any kind of experience with that? Have you ever made use of, let's say this user I cannot moderate because of she is too different or whatever?

Sammeer – I have not, frankly. There were situations where the users were illiterate, but I could talk their language. There has not been a case where I was not able to talk the language of the user, though it might be interesting to see what happens in such a case. We use translators, to speak to the user and get their feedback. But then in such cases, nothing else really communicates with you other than the body language. The tone of voice can tell you a few things, but we really cannot know unless we know the culture. For example, in a Chinese usability testing case, somebody is talking in Chinese and you are thinking, that it sounds the same. You are lost and you are just reading away.

Torkil – And then the test users you use in Persistent from India, you do not use people, I mean you are never at a situation where social status, or caste, religion or anything plays a role, all the users are able to

Sammeer –I have not observed so. You might know, in lab testing, especially, even when the users are from different states and different ethnic groups, they speak in English. Once you come inside a company and into a lab, I think the environment is more formal. The user also has a pressure to behave formally and make sure that he or she is contributing. That is the impending thought even the moderator becomes informal. It is not like going out in the field. Talking to a farmer in his natural surroundings is different.

He does not have to be formal, so he behaves as he would anyway. This would be a classic situation to really observe the cultural differences. Probably, usability testing for cultural studies should not be conducted in labs. If we really want to study we must take a deep dive and see how cultural differences affect the usage. Ultimately, our goal is to find out what is the best for a particular user in a given context.

Torkil – That's a good point, I could even suggest that while observations on a few tests I have seen in India that the users you use are highly qualified, I mean they speak in English maybe 4% of the population is able to or something like that, and they are well educated and they are very able to speak fluent and so you can compare to I mean a German user, they might be not that good at English and not well educated, might be not very educated. I think you have a very interesting observation about the lab situation, it kind of attracts a specific group of users.

Ok what about, maybe you have already talked about this before, talked about different software types, so and so forth, is that related in any way to the user's cultural background? I mean for example, yesterday I took Dinesh to the language group in C-dac and they were talking about, for example developing language for the rural areas, one application is for language administration and you might want to have an Indian language, but how, you have any experiences with users cultural background and software type?

Sammeer – As an avid usability and human factors professional, I would like to think that there is no connection or correlation between culture and the type of software. Again as we have been saying, users' focus is to complete the task. As long as it is completed, users really do not care whether it's a mobile phone, or a desktop, or a laptop, or any other medium. That should be true with any culture, as long as the user is able to do what he intends to do. However, there are other factors in the market that influence the type of software. For example, many people in the villages of India may not have seen a laptop. But you talk to anyone in the village about a mobile phone and they have seen it, they use it. Again, it depends on the comfort level of the users with that software type or technology. I might have more usable software on a kiosk, right at the centre of a village. They may not find it usable because they have not seen a kiosk or heard of it. If I have the same software in a mobile, they may find it much more useful because they are used to this technology.

Torkil – Very interesting point. Next one was about the user's cultural background and usability, but we have already talked about that to some degree, but still I will continue with that. We have a study from Germany's Master Thesis, we did a survey on different countries around the world in which asked usability professionals, a hundred and eighty or so about how they liked the different aspects of usability and it turned out that in some countries they focussed more on effectiveness and other countries more on satisfaction. So do you think recognise this picture or there might be some difference between the US experience with people in the interaction of the technology what they focus on and the Indian perspective?

Sammeer- Yes, definitely there are differences. In the Chinese and Japanese context, efficiency or productivity of use is paramount. They focus completely on what they are doing. In Indian context, it's probably more about satisfaction. Whether one completes the task or not is okay, one should feel good. They will take their own time, do not push them. That is the kind of context. In the US context, probably it is again a focused approach. It is a very conscious effort of efficiency, effectiveness and also satisfaction. One variable that plays a role is the maturity of the market itself. Let us take an example of the US, which I feel is a mature market. People there have been seeing all these different applications from childhood. They are using them much more than in other parts of the world. Their expectations from software are different than those of people in China, in rural areas of India, or in some East Asian country. I do not know whether that is a cultural aspect or not, it is probably just proliferation of technology within peoples' lives. A two year old in the US is already playing with digital equipment which may not happen here in India. Even in the urban areas, a person may not be exposed to it till the age of five, seven, or ten. I think all these factors are contributing eventually to the cultural aspect, and not just the fundamental culture. The other thing I see, in the Indian context, is that the culture is very deep. Since there are so many facets, culture changes every hundred miles here. Even if I go to some other part of my state, I have to behave a bit differently than usual. For example, I have been to a sea shore just last week. It's in the Konkan region of Maharashtra. In the urban regions, people talk to elders with respect. For example, in Marathi, "you" becomes "tumhi" for elders (denoting respect) and "tu" (you) for people of your age. The same thing doesn't happen in Konkan. They don't differentiate while addressing elders and others- not to say that they disrespect anyone ☺. They say "tu" to everyone. I think such customs also play a different role and could make a subtle difference when we design software for those users.

Torkil – If you look at the next five years what would be the most important thing related to usability?

Sammeer – I see that logical step of cultural usability growing. I think designers want to move forward but yet, usability to the masses still remains a problem. In next five years, maybe the cultural aspects will be more enhanced. The other aspect is innovation. A lot of people are thinking about innovation, and that could be a big thing in the next five years. We will see a methodology, or a model, where innovation will be a part of life. I mean right now innovation is limited to thought leaders. They will come and say – *let's innovate, this is my methodology*. I see that coming down in the hands of individual users in some form or the other. The customization that we see today will take a different form of innovation. It will be left to the user to innovate in certain space, in certain constraints, which will be an attraction for the users. I see that as a next wave of selling products also. Hope this works.

Torkil – Do you use, when you do the development at Persistent for US clients, do you use Indian users to test software for US party?

Sammeer – No

Torkil – How do you test it? There must be a thing about how you do that in practice? You gave the example of Outlook. How do you develop that?

Sammeer - There is a distributed mixed model that we have. The answer is ‘no’ as well as ‘yes’. It depends on the profile of the users. If the user is a network administrator or a system administrator, and the task is a transaction type hierarchical task, then there is a very little difference between a US user and an Indian user. They will think in the same way and they will do the task in a similar way. The variability is very small. In such conditions, we can profile those users and use them from the local market. In conditions or cases where it’s an e-commerce website, it’s very variable, dependent on the motivations, goals, moods and other variable factors of the users. For e-commerce, health insurance, or for other things to do with the Internet, we actually recruit users in the US.

Torkil – Why do you, just from intellectual curiosity I can gather from all your discussion that if you take the user into the lab the cultural usability will disappear because the user will act formally and also get from some jobs like the systems administrator and all the is the same all over the world and people do that and think the same way because they do the same task, so why not e-commerce? What is the difference here?

Sammeer – People think differently. Let’s take a small example in e-commerce...

Torkil – Amazon for example, you want to test a few web pages for Amazon for example a few US book. Why could you not use Indian users? They also buy books online.

Sammeer – The Indian users buying books will think differently to look for a book. Here we are talking about an average user; we are not talking about the technologically sophisticated user. Maybe, at the top level, the sophisticated users in India and the US may think the same. We have observed that, even in simple tasks, such as buying a purse, women buying purses online think completely differently. Some women in India would not look at the purses first, but at the accessories for the purses. Maybe in the US, it’s just “I want a purse and I am going to buy a purse.” They will start from a larger context of a category, looking at all the purses or handbags they want to buy, and then they will narrow down. These are two different approaches that I see. One is from macro to micro, and the other starts from something very random. It’s like the study somebody did about diapers and beers. Keeping beer cans right next to diapers in a store will sell them more. That’s because new fathers go to buy diapers, see beers, and say, ‘let me have a beer too.’ I think more study needs to be done. I am not updated on the research of an average Indian user or how do they compare, and it would be very interesting to see that in certain normal tasks.

Torkil – That would have practical implications. You should be the best to do these kinds of studies, who else can do it?

Sammeer – We need time.

Torkil – You need some university students to do that research.

Sammeer – We need collaboration essentially. We cannot just go out and do research because we are also running a business which forms a large part of what we are doing.

Torkil – So that was some really interesting thing because we have this discussion about users tasks, but apparently the tasks are slightly different, from an Indian attitude like in e-commerce and American user, seems the task of buying a purse is not the same.

Sammeer – Buying a purse is not the same. The task is in the world. Once the buying process comes into play, the knowledge is in the head. That's where we are lost. What we are trying to do is to ask the user to think aloud, and we are trying to get the mental model of the user. Now is it established that mental model for users in the US for this kind of task is same as mental models for users in India for this type of task? I don't think so. I have not seen a study like that.

Torkil – I think the assumption is it would be the same or is an important matter. We have to study in detail to learn what the differences are. Have you experienced other examples like this?

Sammeer – Not that I recall right now. This is a very good question, I will remember this. I will make now a conscious effort to look at these differences that we constantly study. It's a very good research point because then it will suddenly promote something which people have been contending about. Users are here, you are there, how can you do usability? If it is established that there is a general mental model for a certain type of task, and that there is no difference, then everyone will be happy.

Torkil – You in your business could establish a procedure for - let's say for example, comparing a few users, American users, few Indian users and then have an argument – “ok, for this task, we have compared five to five, three to three, so now we can use twenty more Indian users because you know exactly what the profile, this profile for this task is an excellent fit, this area. This would be valuable. That will argue for the users and then there's the question of the moderators, and if you do a test for American and you will need to have American moderators too

Sammeer – Sure. We will remove those variables which can affect the experiment at that time. But don't you think that this will be a piecemeal approach? There are hundreds of thousands of tasks. First we will have to divide everything into task types- simple task, decision making task, etc. Instead of that, can we derive some kind of model, and then look at experimentation? What are your thoughts on that?

Torkil – I think you need to gather experience, probably I think you should do for your clients, some typical tasks, or a limited number of tasks and it would make sense to link comparing user groups from these tasks and do a kind of model. I agree with you that you should work on a model. I think you could do that on the same time and then use it to get some university professors, convince them that they should spend their life to redo the literature about e-commerce for example, from a business school and we still need a lot

more to do because for example it came to a high during the year 2000 and 2001, then it went down and now it's come up again and what are the business for that and how are different user groups and which business areas do we want to buy and so on and so forth. Then in a model, you should have somebody looking at all these research papers and try to extract some relevant information for this particular business propaganda. You can use Indian test users instead of American users for this particular product.

Sammeer – That is a very good research topic, we will start something on that.

Torkil – So you were trained in the US. Did you have a supervisor or something?

Sammeer – Yes I did my thesis in Visual Search. Especially, it was on visual search for inspection task. I looked at random search strategies and systematic search strategies. I built software to train inspectors into these two strategies and looked at the effects of that. I had one research paper coming out of that, which was published later. Now my interest lies more in making this global model for user centred design work. Time and distance, everything is amplified once development is offshore in India. But then, why can't we do user centred design in that fashion? Hence I am interested in this global model. I have developed a framework, based on my experiences, called Overlap Usability, which talks about how distributed teams can work together. This model can be applied to different organizations at different levels of maturity. Maturity is in terms of usability, - whether the organization has started usability, OR whether they have a big usability set up or not. What kind of User centred design activities they perform? Whether they are ready for outsourcing, and off shoring their design work? Today organizations want to keep design with them since that's the core, and then outsource development. That's the trend that we are seeing right now. As an outsourced product development company, we can take projects on a turnkey basis. We can develop an entire product from ideation to implementation. This trend will grow. I think the things that we discussed would be one of the pieces that could be added after research. If testing can be done universally, it solves a lot of problems.

Torkil – Have you written anything about this?

Sammeer – No, not recently. I would like to actually ask you, have you read about this?

Torkil – We are running a course in our institute. Me and a professor of Economics. This fall, what we call virtual written versus computer support work within virtual software development teams. I am looking at the social psychology of how you get people to work together when the work is distributed. Maybe because I have some anecdotes from my friends in Danish software industry that they have had some very bad experiences with Russian developers, programmers working in disguise and also that my colleague who looks from an economic perspective how can you get people to work with incentives that you provide to do the work because when you do distributed work like out of time and place, you don't have the power, closeness so people might not do the amount of work that you want them to do, so in that sense we could talk about distributed development. I also think that my guess would be that in terms of stereotypes and prejudices in this kind

of work so like say taking software programmers when they work with Russian counterparts, they are not talking to a real picture of the other guy they are talking to all kinds of wrong thoughts about Russians. So that should be developed. So the first model work we did in that is to take a framework of same place, same time, different place different time and the use it to put in what kind of incentives do you need for a team which is in the same place, same time like we normally have a team which is in the same place but different time like night shift or something, a team which is in different place different times what kind of social mechanisms are working in that.

Sammeer – Good! I would like to read that. Is it available anywhere on the assignments?

Torkil – So far this is a course, but if you are really interested, I can send you the list of literature we have for that course, there are a few papers for example. This professor, a lady with an Indian background, professor University of California, she did a study on US type of development teams, who were students mainly but had ten groups of students in this place, working together and studied different aspects like trust and credibility, moral etc.

Sammeer – I think I have seen that paper. I think *B.J Hogg* is from the same university. He has lots of written material on trust and credibility, and it is very interesting. Do you have any courses in human factors? Like a two month, three month course that you offer?

Torkil – We have a study programme which we think we have done for twenty years which we think is pretty advanced, because it's a combination of computer science and business administration, which we train when they leave our Master programme. They are able to be project leaders and they can understand both the hardcore programming and the really soft organisational, cultural perspectives. So they might not be experts, but might be experts in one of these areas or they are able to understand. Very few people do actually do that, but in that study programme we have and computer interaction and international design, for example in second year bachelor level we have twelve hours of teaching, which will give them the basics of the find user course and user experience course, do some task analysis, user environment, prototyping, usability testing, persona, so you get the capability to do let's say five analysis, because we feel that this is, if you have to do with people who don't have too much interest, too much time for going into kind of the philosophy behind all this, least you can do is give five hands on techniques with which you will be able to master to some level, so if you can do these five techniques, then you will know what is going on in the user oriented design and no longer master them. There are different semester courses on different aspect of area like human interaction and cognition or something which basically is a designer oriented course in which working with different materials and is based on a *philosophy of design*. Then we have few usability courses which basically run through the concept of usability and usability testing, training them to do usability testing, discuss the problems of evaluator effect in usability evaluation, user effect in different usability, we have few papers in that, and e-learning, study of websites. At some point of time we discussed with Pradeep of Guwahati that we do a combined Master level course, but nothing has happened so far, because somebody has to spend a lifetime doing this.

Sammeer – Yes, we are trying to bring in at least one a one year programme to India from some US university. We have been in talks with some US universities now for quite a while. Initially, we thought of bringing someone from outside to train people for two-three weeks, so that people start understanding that there is value. Today there is nothing apart from a few courses of 2-3 days, which are not of real value that people can use in their daily work. Unless we start training people at college level, we are not going to get people in the industry to work for us. The chicken and egg story.

Torkil – Yes, to some extent, we have the same problem, I mean most of the people who worked with big Professors in Denmark, say fifteen hundred people, the basic training consist of some kind of many background in communication, then they have done their Master Thesis in human factors, but only a few have held degree in this. Probably you have better education than many of these guys who learn human factors. So you could say that there is a need for dedicated postgraduate after Master thesis courses, like say you say two three weeks or maybe one week, but we have not found a market for that. We tried once or twice to give a course during summertime.

Sammeer – No, in Belgium there is no market.

Torkil – I think you will find the same here because even if you offer the course, I mean immediately guys like you would say okay you want to go for the course, but maybe not this year but next year because there is a very important task you need to do right now. So I still think that the idea of developing a Master level, maybe not even a hosting programme, just some courses like Anirudha Joshi in Mumbai. I think it's very important which University is hosting this course, because if you put it on an engineering university, you get this flavour, you put it in design, you get that flavour. One thing I think lacking here in software in India is the connection to the social science departments. That's a very important characteristic in all over the countryside, that more connections is needed between expertise in human and users and expertise in technology.

Bio:



Sammeer Chabukswar heads the Usability Engineering practice at Persistent Systems and is responsible for building the Usability Engineering organization within the company. He is one of the leading practitioners of Usability Engineering in India, and has several years of experience working on consulting assignments for Fortune 500 companies in the US and India. His software design experience spans across industry verticals ranging from life sciences, healthcare, and ecommerce to government and technology.

Sammeer has been successful in building and managing cross cultural, cross-functional design teams, and has been a course instructor in usability engineering. He has published papers in international journals and regularly presents at international conferences. He is also instrumental in teaching usability concepts within the educational community.

He holds a MS degree specializing in Human Factors and an undergraduate degree in Industrial engineering in addition to a post graduate degree in business management. His interest areas are offshore usability operations and user centered design methodology.

7. Usability engineering as design research - a talk with Pradeep Yammiyavar

Torkil – All the questions will be about usability. Before we begin could you briefly state your credentials? Who you are and in terms of interaction usability designing in India?

Pradeep – My name is Pradeep G. Yammiyavar. I am a professor at the Indian Institute of Technology, Guwahati. I teach in the department of Design. Though I am a product designer, of late my research interests are in areas like interaction design and usability engineering. I have been teaching and practicing design for over 23 years now. I have been instrumental in introducing HCI – Interaction Design - Usability Engineering stream at the undergraduate, postgraduate and PhD level at IITG. This is a unique pioneering degree program in India in the field of Usability – HCI and Interaction Design. In five years, with this specialisation, over 80 of my Design students are leading successful careers in the Information Technology Industry all over the world.

Torkil – I remember you have been a part of some major conferences in interaction design in India. Is that correct?

Pradeep – Yes indeed. In 2004 I was part of the first conference exclusively on this area in Bangalore, in partnership with institutions in Britain and India. During this conference I had the opportunity of presenting my school, i.e. the Indian Institute of Technology, Guwahati, along with my students and their work. Almost about 10 or 12 papers were presented between me and my students on various areas of interaction design as applied to digital and software products. After that in 2005 I organized a symposium, under the Indo-Danish collaboration project ‘CultUsab’ - Cultural Usability in India. The Indian Institute of Technology, Guwahati and CBS (Copenhagen Business School) came together for this symposium. There were about ten European members and two Chinese Academy of Science members on this project. Apart from research students a number of interaction design specialists from India, both from teaching institutions as well as industry also took part. A total of about 26 or 27 papers were presented and debated in this particular international symposium. It is this Indo-Danish symposium that strengthened Usability Engineering as a specialization area for design students at IIT, Guwahati. It was a good symposium because the students as well as the other presenters could look at the differences in approach to thinking given the same problem. It was a good mix of all types of professionals, engineers, computers scientists, social scientists, designers who came together and it is this symposium that really brought the students at IIT, Guwahati into understanding issues in Usability Engineering, both internationally as well as nationally. So far all the reference texts and other reading material in the area of usability engineering and interaction design were based on foreign authors while the projects that were being encouraged here were Indian based projects. It is such symposiums that bring in the multi cultural view of the problem as well as the solution

that has been thought of. So it was truly multi cultural and it transcended the nationalities as well as the issues.

After the symposium the Computer Scientists in India who rarely paid attention to useability issues have now become more sensitive to Design and the border socio-cultural issues that Designers research into. Communication designers who normally focused on Graphics & Aesthetic skills started taking more interest in the emerging area of Useability Engineering which includes the research part of Interaction Design.

Torkil – Thank you! An introductory question to open this discussion is that – do you believe that usability (as now you have outlined it as the research part of interaction design) can be an organizing vision for software development and use in India? Something which software developers, software designers, programmers and interaction designers, will use and where they will use. I can tell you compared to Denmark for example. Usability appeared in Denmark around early 1980s and was at that time a very unusual word and I remember one of my teachers at the University said, ‘Usability – that concept does not exist’. But today it is so broadly used that people and newspapers are talking about usability of every product, not just software but books and door handles etc., like a common word. Do you think a similar kind of development will take place in India?

Pradeep – Yes, It will. If you look at the Indian scenario of Information Technology, we have it very closely connected to the education system in this country. Traditionally whatever has to be done with computers or digital technology has been a preserve of what we call computer science. But in India which is very strong in fundamental areas of Engineering, i.e. computation, mathematics, etc. issues that are actually related to designing of complete products have never been part of the education system before. But as companies in this sector are young, very new and very enthusiastic about their future, they are now expanding from what was previously service sector or BPOs, they are expanding from body shop providers to problem solvers. The problems obviously are starting with re-design of existing products, wherever they originate anywhere in the world. From there the next stage for the industry would be conceptualizing totally new products for the world market. It is here, where usability engineering is going to play a very leading role because it helps define the specifications of a product. It helps understand the user end of it. It helps understand the integration part of it which are actually missing in Indian education scene as far as the professional design education or computer science education goes and which will be required in very large numbers if one were to look at the plans of the Indian Information Technology industry as a whole.

Torkil – Thank you! How will you describe the mission of the department of design at IIT, Guwahati?

Pradeep –When I look at it from the Design point of view – IITG is one of the youngest schools, it is part of a highly acclaimed series of institutes called the Indian Institute of Technology, that are known the world over because they train a very large number of successful engineers and technocrats, who man research and development positions in

innovation or management, in multinational companies all over the world. When we look at the design department here at IITG, at the moment, it is working hard to find a new identity given the rapid changes in the Design discipline worldwide. Like everywhere else in the world design (- traditionally industrial design – design of products and visuals, which has its roots in art & crafts) - has steadily shifted to Technology and is now absorbing more of Engineering. In India where Engineering has a very long tradition in terms of education departments, the attitude shift required to keep pace with changing scenario in the outside world- is not visible especially in the department of design at the moment. The change that is happening outside is so fast and so furious that any curriculum more than one year old seems to become obsolete. Even before a decision is taken to change a curriculum or understand a curriculum, the whole world has moved forward, be it in manufacturing, industrial production, or be it in understanding change in tastes and living standards of people. The department is right now caught in an identity crisis and seems to be losing its ability to put its pulse on the younger generation of learners, who are more in tune with what the world requires of them as young professional designers.–About five years back, this new research area called Usability Engineering is what I choose to experiment with at IITG. After initial two years of trying it out in terms of offering courses in information system design and elementary interaction design and environment experiential design, the students of design suddenly seem to have found the ‘missing part’ in their design education. I introduced these Useability Engineering courses almost at the end of their four year degree course duration and all of them have given feedback that it is too late - it should have been introduced much earlier, in the program so that there was more time to imbibe and study.–There is lot more theoretical content in usability engineering or interaction design based on advances in cognitive sciences than in traditional art and craft based design which has basically a skill oriented instructional structure. It is an ambivalent love and hate relationship between art & technology. But none of the faculty members here disbelieve in the role and importance of such emerging disciplines and their capability of changing the entire design profession in India. Very strangely I must add that, elsewhere in the world computer scientists and social scientists seem to be looking at usability and usability engineering issues whereas in India it is not the Computer engineers but the designers who simply seem to have taken to it like duck to water. The transition for Designers is so smooth that they do not even realize that they are working in a pure usability related issues or pure design issues because at some point of time they are all interconnected. Like usability, design also is user centered. Everything starts with the user, goes along with the user and ends with the user. Another factor with our design department here is the changing scenario of the employment profile that the companies want in India. Obviously India’s IT strength means India’s employment potential for such professionals, who are going to help build new virtual products, products that do not really require any materials and processes as such but require huge amount of intellectual efforts, innovation in the mind and thinking efforts. It is but natural that the young design students of IIT would gravitate towards these new areas in Design. So much so that in the last five years since I have introduced Useability Engineering courses into the design education at IITG, all the 18 or so passing out graduates per year, which means about 80 graduates who have passed out of this design department in the past five years since 2003 have found themselves gainfully employed as usability design professionals in

Information Technology Industry.–About 1/10th of them have also continued pursuing their masters degree in human computer interaction, interaction design and other related disciplines in usability engineering. One is very optimistic of this particular specialized Design discipline gaining more importance pulled by the market forces rather than encouraged by tradition bound design educators who always fear drastic sudden changes.

Torkil – How do you see the relation between software quality and usability?

Pradeep – This comes down to the ability of a multi disciplinary group writing specifications for a product that neither has substance nor material nor form before it has to be produced. When a product in IT is being spoken of, from scratch, somebody has to write a specification for it specifying its quality. The first tendency in India is to immediately write the technical specifications, which is not so very difficult, given the large number of expertise and standardized procedures that are available. But when the team starts developing the product they soon realize that all their parts or ways of thinking are going into circles. The questions regarding who the user is going to be, and how he is going to react, how much it is going to cost, how better can we do things. These questions start coming up and like all professionals - unless the team sees the expected end result first in their minds eye, a team cannot perform as a team. When I say 'see the end result' it can be in terms of specifications or sketches or simulated screen shots that designers are so good at conceptualizing. So all this is not purely a technical specification. It does require inputs from usability specialists and usability experienced professionals. I definitely see that there is no way out for the Information Technology industry but to embrace Useability and Design at the conceptualization stage itself. It is not only about software engineering quality. When we talk of Information Technology, one thinks first in terms of software, but the very thin line between software and hardware is disappearing. If you take any traditional interface, for example the computer, the number of interactions required with the physical buttons is drastically coming down with the introduction of touch screens. With the advent of voice operated systems this touching of the screen will be further minimized. While one can say that quality software can be written it is not as easy as it sounds like. One has to specify how this interaction will be between the user and a product - who graduates from tactile to voice operated. The issues regarding usability will eventually crop up for the IT industry. I do not think that it is just common sense between software quality and applications. It is about total conceptualization, creatively observing the user, understanding the user, solving the users problem as the user wants it to be solved, and not as what a group of engineers or technical people want to solve it or want to define its quality. This is possible only when we see beyond engineering quality of software. Where do we go? We have to go into this new discipline which we call Usability engineering here.

Torkil – How do you see the relation between usability and type of software?

Pradeep – If you look at software what started as operating systems, soon one operating system starts shaking hands with the other operating system requiring one more layer of integrating software. Software segmentation itself is layered both horizontally and vertically. The horizontal layering is basically an engineering issue and their top most

layers are the one that comes in contact with the ultimate user of the product. Some products require that this top most layer be done with utmost care and some other products require care at a very robust operating system lower level. These two levels are extreme ends of the product called software. The usability engineer I think will be involved in defining, conceptualizing and solving those layers that are closest to the user, because these layers are the ones that are also going to define the nature of the lower level layers, Which one to take - the top down approach or the bottoms up approach, this is the way I look at the question that you have asked me. Clearly the bottom up approach is well known in engineering. It has been practiced for ages. The top down approach involves total understanding of the holistic product and then breaking it down into parts to realize it. It is here where usability engineering will show its true strength. That is the relationship between usability engineering and software.

Torkil – How do you see the relation between usability and users cultural background?

Pradeep – I will take the same analogy as different layers of software. I said software - as a product- has different layers which are horizontal as well as vertical. It is like an inverted triangle in one way. In the horizontal layers are the technical issues and in the vertical segmentation I see issues of users' segments. Users could belong to multiple segments or groups. Users could belong to different cultures but may use the same functional product. Or the users could all belong to a single culture and use different products within that culture. This thing called software is so pliable, so malleable that you can turn it around very easily and make it usable including the cultural requirements. Products exist because users want it, users want it because they are comfortable using certain products. They will not like to test out new products if it disturbs their everyday environment too much. Culture is a very critical aspect that governs and regulates this environment of the user. Any software product has to be dependent on the cultural aspects or cultural specifications. What I am trying to say is that culture is and must be an important part of the specifications of any user centered usability specifications of a product.

Torkil – How do you see the relation between usability testing and users cultural background?

Pradeep – It comes down to the fact that any product in software today has to be a team effort. There are going to be huge number of people distributed across different countries and geographical regions who will either be using the product or creating the product or developing the product. When you look at testing, we mean testing at the user end or testing when the development is going on. In both the cases one can test very easily against technical specifications. But one may find it extremely difficult to test in terms of specifications that are directly connected to the user. Now to get a user's sample representation for testing is going to be increasingly a difficult task because even - within a single mono culture - individuals may differ. When we talk of testing in usability, we will increasingly be requiring multi cultural teams to set up a test in different cultures is going to be an enormous task. To test a simple application like a word document in India, may seem the same as testing the same in Europe, but it is not so. To understand how a

test is to be set up in a different culture requires cultural inputs. This is about testing. The same argument holds good about user data collection which can also be a form of initial testing of a set of tasks that the usability professional performs. It is but natural for a user from the same culture to be able to specify what a product should be for that culture but often this common sense way of looking at it may or may not work across different cultures. A professional from a different culture if trained to be culturally sensitive will be able to probably look at problems and issues in usability engineering across cultures with a sharper observing mind than a person belonging to the same culture. And the vice versa is also true. A usability professional of one culture may find things so different in another culture that all his pre-conceived notions may start contradicting each other. What it comes down to is – whether it is usability testing or developing or user based design, we have already said culture is an important factor, and then we need to have methods of how to incorporate these issues where all the activity around this profession keeps happening. So there will be multi cultural teams or multi cultural frameworks at least. Somebody has to write these frameworks for testing, for specifying for collecting data, for designing, because software does not recognize national boundaries. Software products do not recognize national boundaries. Increasingly companies involved in software are trying to develop first a core module that is universal and then are trying to adapt that module to different set of users, segments or markets probably belonging to different cultures. When we speak of cultures, we have to be very careful with the definition of culture. The definition of culture in terms of marketing professionals today would be - say urban culture or youth culture etc. The term Youth culture and urban cultures may sound the same across eastern hemispheric cultures and western hemispheric cultures. But youth in India, even while they may act and adopt the ways of western culture visually, they may not ‘think’ in the western culture mould. Their thinking may be dictated by an Indian based culture set of norms. This is going to be a major issue – that is - how does one interpret the thinking, usage and habit patterns of a user who belongs to one culture, works in another culture, produces products for a third culture. It starts becoming too complex to handle unless usability professionals start taking more interest in trying to rationalize this whole issue. What seems to be a subjective set of knowledge – culture seems to be too complex in reality. One needs to cross the boundary to an objective set of heuristics- call it specifications, call it whatever, this transformation has to happen. This transformation should not however happen with mutation. If the usability professionals end up disturbing the culture or end up mixing up two cultures or end up unknowingly strengthening one culture against the other through the use of such products - that would be a very sad day for the very existence of technology. So I feel that while designers and usability professionals may have the necessary skills and may take pride in being good at their work and be contributing to this industry called Information Technology and its products, they are also carrying a huge amount of responsibility on them just to keep the cultural richness of this world intact. I do not mean this in a traditional sense of building a protective wall around culture of a group. As an Indian I would definitely not like to be considered as somebody who has a culture phobia. In India we always believe that a culture survives only if it keeps open all its doors to receive experience of other cultures. That has been the tradition in India and that is why what we call as traditional Indian culture has remained monolith across history and time immemorial. For years together we can trace something called Indian

culture. But the India of today is as modern as any other nation as compared to India of 5000 years ago. Technology by itself is not a threat to culture but the way technology is used in that culture could lead to cultural mutation. Culture is a very loaded term and it definitely needs to be properly defined by usability professionals from their and users' point of view.

Torkil – Thank you! Could you say something about software type and users cultural background?

Pradeep – I can answer that question purely from an Indian point of view. For Indians culture is very hard to define in the way it is defined in the text books. Not that the textbook definitions are wrong but they are not sufficient to cover the richness of what we mean as culture in India. For Indians culture is something that comes and runs in our blood. It is a strange combination of myth, tradition, and patriotism, past life, future life, behavioural norms and what not. It is a very heady mixture. It somehow puts a very strong framework for an Indian to form his/her identity. The same could be said of any other culture. But since I am an Indian I can only speak about the Indian cultural background in this way. I said the Indian culture is very rich because it is not just a question of behaviour or habits or way of life. Indian culture embodies a lot more things that define the cultural background of a User in India. If one were to design a product specifically for an Indian set of users, one has to understand many issues in what is termed as Indian culture. In India the tendency to put together as a mono culture often comes up but Indian culture is a mixture of many sub cultures and it is highly multi cultural. Indian culture has been open to absorb by adaptation from many different cultures from the world over without any phobia. It would be relay sad if software applications being developed in India - for its own consumption or for others - is done in a cultural vacuum that is - deliberately in a de-colourising way - just to be in tune with the so called universal 'type' of applications - being developed elsewhere. Users' cultural background could be a method based on which a new software 'type' classification can happen.

Torkil – A supplementary question – if we divide software into different application domains like software in Banks or military software or software in the internet in homes. Is there any relation between users' cultural background and these types of software?

Pradeep – It is a wonderful question. Yes, there is a definite relationship. Banking or military or medical software seem to be clear cut islands and yet universal. Banking software used in India should have no difficulty in being used in Europe – so it seems from what you said. But it is not so. For the simple reason that the way Indians look at money would be different in the way Europeans look at money. Not the value of money, I am talking about the attitude –the way one handles or treats or thinks about money. These are clearly cultural ways of doing a thing. Take a very simple instance in India, you see a small petty shop keeper would first take the money and then deliver the product. Similarly in Banks, if I have to exchange a bank token for withdrawing cash, the cashier first takes the token, and only then hands over the cash. Whereas this token requirement may have completely disappeared in banks in Europe, in Indian banks, even today, one

has to wait for the token number being called as it defines the user's position in a queue. The way one is used to dealing in the banking environment is going to be critical in designing the software of a bank ATM in India. In India, standing in a queue is alien, except for rationed food articles as in the past which has now disappeared. Around the ATM in a small town everybody waiting in the queue is enthusiastic to see how the other one is taking out money. It is not about trying to get into the other persons privacy it is just inquisitiveness. In India human beings are very open, there is nothing like private activity in a public place. Privacy is only at home! In an ATM one would find about five people standing parallel to you peeking behind your shoulders, and not behind you in a queue - waiting for you to finish. Not even for a moment-wondering it is bad manners. If the ATM keeps snapping the photograph of these five faces during the withdrawal, it may land up confusing the face recognizing software! Dealing with a human cashier in a bank using a token is not the same as dealing with the ATM! The Useability of an ATM and its software needs to be culturally sensitive for a small town in India. Such very simple issues of withdrawing cash from ATM come down to culturally loaded usability issues and culturally conditioned attitudes. How do we deal with it? These behaviours is what I am saying, if they are to be transferred back into a product cannot be done simply through coding, or logical thinking by trained engineers. It has to be done by usability professionals who are sensitively trained to recognize those cultural issues and aspects and not only recognize but to categorize, to quantify them and to specify them and then to build products to satisfy those cultural norms. It is a very vast field as I see. No two individual users in a given culture are the same and so are no two cultures. There is always going to be this personalization versus universalization issue that is going to prop up again and again when new products are specified, developed or written about. If a group of software experts were to sit here and listen to this they would say that usability & culture habits forms a very small portion of the entire project. They would be more bothered about software standardization, timelines, deliveries, encryption issues etc. This 'user' stuff is only when we come to the end of the project.' But it definitely is not as simple as that because the same group of professionals who said this - will eventually tie themselves into knots and threads when they go deep into developing the product and not knowing how to get out of this tale of a snake swallowing itself - situation when the product cannot perform as assumed... and at that point is when a usability professional should be able to step in and undo that and say that this is the cultural grid which exists, and which you did not see. And this cultural grid is to be drawn in this particular way through Useability research. So this horizontal segmentation that I was speaking of could be cultural segments within a culture or cultural segmentation across two different cultures. This grid that I am speaking of, what I call culture grid, which is not visible and no rules exist for it to be drawn as such needs to be looked at by usability professionals basically through fundamental research.

Torkil – How do you see the relation between users' (end users) cultural background and the quality of software?

Pradeep – The quality of software to me is quality of use, quality of acceptance, quality of performance. Quality to me is the very purpose why that software exists. Whereas, if I look at it as an engineer – quality to me is its reliability, operability, efficiency,

adaptability etc. Because I am an engineer, a designer and a usability professional- all rolled into one, I see that these three things that are put into compartments because of our unfortunate disciplinary compartmentalisation. What ultimately will settle the matter is quality as defined by the user – this is well known. But unfortunately the user does not know what quality is acceptable to him unless he tries it out, so the experiential part of it comes into picture. A usability professional who can predict the user's experience much before they model it, a usability professional who has the tools to extract what the user thinks, create/simulate the experience and then creates the entire specifications that define the quality of a product will naturally be more successful than a trial and error specifier or a quality specifier who will first say, 'I will first fix the quality of engineering, i.e. reliability, adaptability etc and then let me take a look at the usability quality.' Such a demarcation/dichotomy actually cannot exist in the definition of a quality of a product. Use quality simply has to be built into it, it cannot happen by itself. Who has to build it? How does one extract it? At what point of time does it have to be built in addition to technical quality? How does one test this? All this is what usability is all about, that is what I think.

Torkil – Thank you! How do you see the relation between software type and software quality?

Pradeep – If we say that the end user of software is another machine for ex. an operating system. – then no human being comes in contact with the software at all.-In this type of software operating in the background, issues like reliability come into picture. If we were to look at the word reliability beyond just a number of failures/errors, we will realize that its parameters have to be set in the real world. They have to come from the real world. Even though this is not the kind of software that is coming in contact with the real world the parameters for such background operating software have to come from the real world itself. What I am trying to say is even if apparently what it seems that the user is not in touch with or is not required to be in touch with this type of software, this type of software has to take into consideration real world inputs. This requirement gathering from the real world requires a lot of relearning, a lot of effort on the part of software professionals and people who are involved in creating digital products. The products that were fully hardware are completely converted into software, requiring various layers or various complexities of these types of software to operate it. Obviously the integrating factor between these horizontal and vertical layers comes from the top end, which I think is the user's end and also it determines the ultimate quality of the software product. Understanding users is the key to this entire thing that defines the relationship between software type & software quality.

Torkil – Thank you! The final question is – what is the most important concept in relation to usability in the coming years? Feel free to say this from an Indian perspective.

Pradeep – In a culture like India – when I live my life today, I have to carry on my back a huge amount of obligations of the past Indian culture, traditions, values – of course they are very dear to me and that is why I am an Indian. Every Indian gets his or her identity from Indian social culture. When I look at it and when I think about what are all the

products that one would like as an Indian - as the quality of life in India starts improving, I think what will become important in terms of need from the Indian context is not the individual user's requirements alone. It is the products ability to retain the collectiveness of the Indian as such that will be more important. The ability of the products to allow and strengthen his/her Indian roots and identity and the ability to be associated with another Indian will become a quality measure. What I am trying to say here is individualization or the classic case of the individual coming first or being bigger than the community is clearly an issue in traditional cultures like India. Such products that encourage too much individualization may not find many admirers here in India. Even if an Indian buyer is buying for him/her self for his own value for money, for his own hedonistic pleasure, please remember that his or her decision is weighed down as I told you, with a whole lot of old traditional baggage. We have to remember that what the concept of hedonistic pleasure itself is is defined by the Indian culture. When an Indian user buys a new product or is confronted with something new which he/she cannot decide the only way the Indian does is look around him and see what others are doing. How did it perform when used by them, is it required, why is it here, what will others say about it and more important what will others feel about him buying it. Let me first ask and see what is happening around and then I will come back to buying it is the preferred cultural thinking pattern. And then one will go, discuss, talk with friends and family and often also with strangers in the market place before feeling comfortable about making ones decision. This 'collective weighing' pros and cones from the community level comes basically from cultural background. It cannot come only from the user's education. As an engineer I may know what is a good code and a bad code or a good product or a bad product but as an Indian I would like to know what that product will do to me as an Indian and not just only as a user. I am sure that there are users in other cultures who also think alike. To use a metaphor - even if the inner soul of a product is purely technical and universal, one needs to give a skin or an outer interactivity layer that is very culture specific. That is what is going to make a product successful in India. Only those products that can integrate themselves into the culture will survive here. Any product that is to be introduced weather it is a word document of Indian language or a small town ATM interface, it is not going to be accepted here unless it respects Indian cultural norms. It is very difficult to define what it is but there is something like Indian culture. I am sure there is something like European culture or Danish culture or Chinese culture too. Saying one product fits all is de- culturising products. Professionals who believe in universal solutions will have to be explained that beyond a certain point there is nothing called universalization. It hardly takes 15 minutes to introduce a new product in a public place like say Mumbai railway station and by involving strangers and acquaintances alike in a discussion regarding the pros and cons of the product vis a vis its cultural compatibility, you will know the fate of the new product if introduced across India ! .

Torkil – We should call this the Mumbai railway station test.

Pradeep – Or the 'Indianess' test.....

Torkil – Do you think there is something else I should have asked you about relating to cultural usability?

Pradeep – What I feel is, we are in the process of defining a new discipline. It could be marked out from territories of other disciplines. This is a controversial point of view. The new way to look at Design is definitely inter disciplinary and definitely multi disciplinary, I would put it that way. That is where Useability Engineering is very close to design especially as viewed from India. The future of Indian design is in strengthening itself by intensifying research in this emerging area of Useability Engineering. The sooner a usability professional gets down to giving him/her self a clear identity, the better it is. The questions that are missing are, how long will it take for that to happen, where are we at the moment - in that happening and does this Useability Engineering have a future at all? At this point in time we are discussing because this seems to interest us but will only interest suffice. What should we be doing next? These are the questions that need to be added, or asked or looked upon. I see for Indian designers a very great opportunity to hone their creative skills through Useability engineering. For me research is creativity and design is creativity therefore design is research. Usability and interaction Design gives me that opportunity to try out my intuition, to try out what I imagine to be fable. I think usability is one of the best ways to realize a successful design based on solid research. The relationship of usability to other disciplines is what perhaps your questions did not cover.

Torkil – Thank you! This will fit very well to conclude the several other interviews done in India.

Pradeep – The knowledge base required for this is enormous. Even if it already exists somebody needs to put it together in a usable format. While usability professionals are involved in testing, designing and conceiving, somebody has to do the other part. There is no one to do it. So either we invite people with similar thinking from other fields or we go and join them. That is necessary; otherwise Useability will remain only an idea floating around.

Torkil – So the identity of the usability professional is quite necessary.

Pradeep – But I personally feel that there is no harm in the usability professional also maintaining the identity of his/her previous discipline. The only thing is that it has a stamp of professional across the world agreed upon and it needs to come out. That is possible through books like this one for which you are interviewing me and other usability professionals. A usability professional actually helps bring two cultures together without destroying them. This is the ultimate pleasure why usability professional holds responsibility. Any designer can design a thing for himself or for anybody else but to design a thing for a large group of people that simply enhances and enriches their culture would be the very purpose of existence for the profession. Thank you.

Torkil – Yes. Thank you!



Pradeep Yammiyavar has donned the roles of an Industrial Designer, Engineer, Scientist, and Teacher during his career of 23 odd years in the profession of Design. He is a Fellow of the Design Research Society (UK). His academic specialisations are in Product Design, Product Engineering, Management and Psychology. He holds a BTech in Civil engineering and an M.Des from IIT Bombay in Product Design besides a PG Diploma in Mental Health & Psychotherapy. His work on Emotions as Semantic Constructs, earned him India's first Doctorate in Industrial Design from the Indian Institute of Science, Bangalore where he also worked on the Faculty as Principle Research Scientist and headed the Industrial Design group. He established the M.Des program at Indian Institute of Science, Bangalore before joining IIT – Guwahati in 2002 as a Professor.

His research areas include Product Semantics, Consumer Behaviour, Design Management, and Usability Engineering. He has taught a wide range of subjects in Industrial Design, Product Engineering and HCI to Graduates, Postgraduates and Research Scholars studying in India's best Technical institutions. He is widely recognised as one of the pioneers of Useability engineering education in India having set up the first Useability engineering Research Lab at IITG in 2002. More than 80 interaction Designers and Useability Engineers have been supervised by him in their thesis projects in the field of HCI.

Prof. Pradeep Yammiyavar has been an Industrial Design consultant to industries in the areas of Product design and Engineering, Graphics, Transportation Design, Exhibition Design and Environment Design. His clientele includes corporate such as INFOSYS, SASKEN, Featherlite, Ponds(India), VS group, DASSG (Swiss) to name a few. He has worked on international projects in Europe and Thailand. He holds a total of 9 Intellectual Property Rights and has over 25 publications in Journals and International conferences proceedings. He has convened National and International conferences. Besides being on editorial Committees, he has been invited to deliver key note addresses at International symposiums and workshops.

Prof. Pradeep Yammiyavar has been awarded the Swiss Government Fellowship twice during which he has worked in European Design Studios and conducted research in Universities in Switzerland & UK. He has been honoured by the Government of Thailand, won an ICSID prize in Japan and has been a recipient of the Indian Institute of Technology, Bombay –IDC Distinguished Alumni award. He advocates and practices the paradigm of 'Creativity - Innovation – Invention – Technology' within Design.

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9. Endnotes

ⁱ This interpretation was suggested by the road sign web site owner, Bartolomeo Mecánico, <http://www.elve.net/rkidcb.htm>, September 2008.

ⁱⁱ Nisbett, R. E. (2003). *The Geography of Thought*. London: Nicholas Brealey Publishing.