Dramatic Sketches: A New Interaction Design Resource for Communicating Contextual Factors

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Abstract. User-centred design approaches focus on understanding usage contexts and evaluating usage through primary data. Collecting primary data is more feasible for contexts that project teams can directly access. Otherwise, secondary sources may be the only practical source of contextual information (and even when it is not, secondary data can still be valuable). When designing software for localization across global markets, comprehensive collection of primary data may be infeasible, but existing secondary data could be made more accessible via an appropriate design resource. In this paper, we present Dramatic Sketches as a resource for representing cultural factors. We relate a set of Dramatic Sketches to three field research studies in Jordan and show how a few Dramatic Sketches and auxiliary Micro Sketches can compactly communicate many cultural factors.

Keywords: Dramatic Sketches · User-Centered design · Contextual user and usage research · Culturally-sensitive design for arab countries

1 Representations for User-Centred Design

User-Centred Design (UCD) provides two important groups of practices to Interaction Design. Firstly, it has developed and disseminated practices for collecting and analyzing primary data relating to intended usage contexts and users. Secondly, UCD has advanced practices for empirically evaluating interactive systems. In both cases, the results of these activities need to be documented and shared within design teams. This paper focuses on the representation of potentially relevant usage contexts fora wide range of software design projects that are unknown at the time of authoring. The aim is to provide re-usable understandings of cultural factors for localization of global software products and services. The case study presented here collected data in Jordan, but much of this will generalize to the Arab Middle East, and some more generally to Islamic cultures.

Existing UCD representations are almost all aimed at specific software development projects. For example, *Personas* (Pruitt and Adlin 2006) need information

skeletons that are fine tuned for specific project needs, corresponding to, for example, a project team's specific interests in relevant behaviour patterns, user goals, skills, and attitudes, and usage environments. Each persona skeleton is then filled with information, for example from interviews. A few added fictional personal details can then bring a persona to life. Similarly, *Contextual Design Models* (Holtzblatt et al. 2005) are also not well suited to communicating general cultural factors, since they have a broad focus on concrete aspects of computer usage contexts as identified in field studies that are focused on a specific project's needs.

In contrast, one existing UCD representation, *Scenarios,* could be given the generality needed to disseminate re-usable understandings of cultural factors for localization of global software products and services. Scenarios can avoid the fixed common skeletons of project-specific personas, and also the narrowly focused predefined models of Contextual Design. They may thus be better suited than personas and contextual design models for re-usable communication of cultural contextual factors. However, scenarios have many alternative forms, and thus we must identify a form that will appeal and be readily comprehensible for software designers who need to understand users from cultures different to their own, such as the Middle East.

A suitable scenario format could provide software designers with information on computer usage and preferences in Middle East countries, the problems that users face, how these arise in relation to cultural variables, and how these problems could impact usage. A creative synthesis of existing HCI approaches to expressing usage contexts could enable rapid familiarisation with Middle Eastern or other cultures by quickly exposing software designers to unfamiliar cultural factors that could affect computer usage in a range of cultures, without the need for extensive original primary research. This paper presents Dramatic Sketches and Micro Sketches as novel scenario formats for re-usable communication of cultural contextual factors.

2 Supporting Culturally Sensitive Design for Arab Countries

The computer has become a part of life in Arab countries at work, for study and for social and entertainment purposes, but still less so than in Western countries. However, experience and expertise in computer usage is rapidly evolving across the developing world. To gain an understanding of computer usage in Jordan, we carried out three field studies, one based on repeating a US study in Jordan (EL-Qirem and Cockton 2012) in between two interview studies. The results of these studies were combined with factors from a literature survey to create a comprehensive *Diamond Model* of cultural factors in computer usage (EL-Qirem and Cockton 2011). This novel compact design resource identified 46 cultural factors, which were grouped and organised into hierarchies. Information from the field studies was used to populate this model with Jordanian instances of cultural factors, where some had been discovered. This was not possible for some factors from the literature survey.

The identified factors were too extensive to combine within one or a few persona skeletons, and the resulting personas could add further unnecessary complexity to the cultural insights from our field research. At the same time, the general forms of example Jordanian instances for the Diamond Model could lack the focused specificity

associated with well-designed personas, for example, the specific goals for users of a specific new software design. We thus needed an alternative format, potentially scenario based, to communicate Jordanian instances for Diamond Model factors. Dramatic Sketches emerged as this format.

There is no expectation that software developers would be given a Diamond Model with national instances and be expected to author Dramatic Sketches themselves. An initial set of sketches would be written by researchers familiar with the field research and the resulting instances of cultural variables. However, software developers may be able to extend a set of Dramatic Sketches provided to them by reference to the instances of a Diamond Model's cultural variables.

3 Dramatic Sketches

A Dramatic Sketch has two components: a scene and a dialogue. Scenes are introduced in forms similar ones used at the start of a scene in a play (hence *dramatic*). The second component is a dialogue. Scenes are set sparingly, and dialogues are informal in tone (hence *sketches*).

The combination of a scene sketch with a dialogue between fictitious individuals can allow a relatively large number of cultural factors to be represented within a single Dramatic Sketch. This can be more engaging and compact than scenarios as typically authored for specific software design projects. This would allow a relatively low number of Dramatic Sketches to cover all instances of the cultural factors for computer usage in Jordan that were discovered or confirmed by our field research. The expectation is that software designers could quickly read through these Dramatic Sketches to improve their understanding of Jordanian users and computer usage, and thus design more effective, efficient and enjoyable software.

There is no single specific recommended method for authoring Dramatic Sketches. Instead, the authoring of Dramatic Sketches is an *approach* (Woolrych et al. 2011) that openly and flexibly combines an (incomplete) set of (incomplete) design *resources*.

For each Dramatic Sketch, an author could choose a 'cast' of factors from the Diamond Model. This would require access to and familiarity with the Diamond Model and its associated instances, which would be aided by familiarity with the originating field work. Dramatic Sketches would thus be authored by researchers who are familiar with the cultural model and instances on which they are based. This familiarity, often extending to knowledge of the original field research, allows a researcher to select instances that support scene setting and dialogue generation. These instances are then combined a lively communication of experiences of, and attitudes towards, computers. However, Dramatic Sketches are not tied to the Diamond Model. Alternative informative resources could be used as a source of cultural factors and local examples long as there are narrative aspects to these examples.

Each Dramatic Sketch has a cast of Jordanian instances that can cover a range of cultural variables in the Diamond Model. Each time we write Dramatic Sketches, we could begin with a story skeleton and then fill in the detail with instances of cultural instances that can be connected into dialogues between people. Preparation for Dramatic Sketch authoring could start by listening to recorded interviews as a basis for

identifying a story skeleton and selecting a cast of instances, based on the many usage and evaluation stories that were shared during the interviews.

3.1   Example Jordanian Dramatic Sketches

Dramatic Sketches are intended to complement, and not replace the Diamond Model. Therefore each example sketch is related to (specific instances of) cultural variables in the Diamond Model, and may also comment further on the role of these variables in the dialogue. Designers with access to the Diamond Model and sets of local instances for each factor can then use the Dramatic Sketch as an index into a more formal, detailed structured model. We now present four example sketches.

Dramatic Sketch 1: Ahmad and Dr. **Lila.** *Ahmad is an IT expert who works at AL Zaytoonah University of Jordan, Ahmad is a specialist in IT support who help students and employees' at the university to solve computer problems, such as technical problems, software problems, hardware problems, and network problems. Ahmad is 29 years old and has worked at the university for 6 years, so he has good experience in solving the computer problems that face the users in the university. Ahmad works every week day from Sunday to Thursday, from 9:00 am to 5:00 pm. He works at the computer centre (computer service for students and employees). One day, Ahmad is sitting at his desk working on his computer, programming some database tables for the registration department of the university, while he was seating in his office his phone rang, and he answered. A member of staff working at the nursing school needs help to solve her problem.*

> *Ahmad*: Dr. Lila, what is the problem in your computer?
> *Dr. Lila*: this morning I try to turn on my computer but it doesn't work.
> *Ahmad*: did you turn the power on?
> *Dr. Lila*: yes I did, and it's still not working.
> *Ahmad*: then give me half an hour, I have some work to do after I finish it I will come to your office to solve the problem.
> *After 45 min Ahmad arrives late at Dr. Lila's office.*
> *Ahmad*: sorry I am late I had a problem in some programs on my computer and it took time to solve.
> *Dr. Lila*: no problem, could you please check what is the problem in my computer?
> *Ahmad*: sure, that's why I am here, let me see your computer please.

Then Ahmad looks at the computer and checks that the computer is connected to the electricity and it was connected. After that, he press the power button and the computer works, but still nothing appears on the screen, then Ahmad looks at the screen but the power light on the screen is not lighting. Ahmad presses the power button on the screen, then it's turned on and works.

> *Ahmad*: the screen was not turned on therefore you can't see anything appear on the screen. You thought that the computer was broken and does not work, and the only problem is that the computer screen was not turned on.
> *Dr. Lila*: really, I am so sorry, I didn't know because my computer knowledge is so poor.

The first Dramatic Sketch: Ahmad and Dr. Lila, involves a cast of Jordanian instances of Diamond Model variables (e.g., attitude to time, individualism, power distance, and personal experience/knowledge). For example, we draw attention to Jordanian attitudes to time keeping in the Dramatic Sketch above. Note that the weekend is different in Islamic countries and that power distance is high in Jordan. This is the basis for authoring a Dramatic Sketch, i.e., the author reviews the Diamond Model for a coherent set of instances that could be formed into a short story. This 'cast' of instances are then assembled into a Dramatic Sketch, filling in some details fictionally if necessary. Ideally, it should be possible to form the scene setting and dialogue wholly from instances for a specific culture.

Dramatic Sketch 2: Amjad and Tariq. Computers should help to accelerate work and make it easier, but not all cultures want to be speeded up. In Jordan, employees may enjoy the rest that can accompany a computer breakdown. When their computer stops working, they don't feel any responsibility to solve the problem or even call the IT support until they've had a rest. In a second Dramatic Sketch, the 'cast' is formed from Jordanian instances for cultural variables of attitude to time, individualism vs. collectivism, power distance, and attitudes to work. These are used to set a scene and form a dialogue.

Amjad is 30 years old and has worked in IT support a mobile company, (The Global for Mobile Phone Services) for more than 10 years. Amjad works at the company all weekdays (Sunday to Thursday) from 8:00am to 5:00 pm. He works in the programming department and also in IT support, helping employees to solve technical problems with their computers. There are another 5 IT support workers in the same department.

Amjad faces lots of technical problems during his work because most work at his company depends on computers such as connecting the mobile phones to the computer to update data and for programming mobile phones for customers.

Tariq works in the data-entry department and most of his work depends on computers. One day, Tariq's computer breaks down and by default Tariq should call the IT support to fix his computer and solve the problem, but this does not happen, and Tariq stays in his office sitting in his chair and relaxing. He didn't tell anyone immediately about his computer. At the same time, Tariq is supposed to have some work at the computer to submit to his manager today. While Tariq is sitting in his office, the phone rings, Tariq's manager is calling him to ask about the paper that Tariq should submit today.

> *Manager:* when will it be finished?
> *Tariq:* I am sorry I can't finish it today, because my computer has broken down and I can't continue my work now, I will wait until the computer is fixed and then I will continue my work.
> *Manager:* OK, I will wait until your computer is fixed and then I need the papers.

After the manger finished his call with Tariq, he calls IT support to check to ask if fixing the computer will take much more time, because Tariq had lots of work to do today. Amjad answers the phone.

> *Manager:* Hi, your department received today a computer from Tariq to fix, and I need you to fix the computer as soon as possible please because he has lots of work to do today.
> *Amjad:* one minute please I will check with my colleagues.

Amjad; sorry, but we haven't received Tariq's computer and also he did not call us today to ask for any help.
Manager: Ok, thank you I will check that with Tariq.

After that, Amjad called Tariq immediately and asked him if his computer has broken down or not.

Amjad: Hello Tariq, did you have any problem in your computer or not?
Tariq: Yes, my computer has been broken from more than 4 h.
Amjad: Then why you don't call us to fix your computer today?
Tariq: In fact, I don't want to call the IT support centre to fix my computer now.
Amjad: Why?
Tariq: I came in today and I found my computer broken and I don't want to call you to fix the problem, because I had lots of work to do today, and I need to have a rest and relax. Therefore when I saw the computer was broken, I decided not to call IT support to fix it. I will call them later to fix it, and during this time I will take a break from the work.
Amjad: But I knew from your manger that you have work to submit today.
Tariq: Yes that's right, but I prefer to have a rest from the work and tell my manager that my computer broke down and we need time to fix it. And you know Amjad that any problems with a computer will take time to solve and my manger will accept that.

Dramatic Sketch 3: Anas and his Teacher. The third Dramatic Sketch communicates how the English language could be useful to learn in Jordan. The cast of instances is formed from Diamond Model variables: English fluency and the role of the educational systems; attitudes towards Western Technology; familiarity with English spelling; Government Language Policy; text direction (language and semiotics); and authority and policy of companies. This wide diverse cast of cultural variables is combined into a Dramatic Sketch that covers a range of factors that will affect the usage of computer, e.g., forcing use of English software rather than Arabic. Also, government policies are different to private sector ones, as users should use Arabic software but in the private sector, Jordanian companies use English software. Private and public sector practices differ: most private companies use English software to communicate with the world. But government sectors use Arabic software as it will be simpler for users (the Jordanian public) who don't all speak or write English.

Anas is a student at Jordan University, who studies computer science. Anas uses his computer at home for studying, playing, graphic design and for internet use. Anas and his friends are in the same school, studying most subjects in English and using English software. One day, one of Anas' teachers asks students whether they prefer English software or software translated from English to Arabic.

Anas: Truly, I use some Arabic programs translated from English to Arabic and I face lots of problem, therefore I decide to use the English versions.
Teacher: Why Anas? And what are the problems that you face?
Anas: Some Arabic programs translate the word directly without anyone thinking about what it really means. Therefore it causes some changes in the meaning and sometimes causes confusion for us.
Teacher: what else Anas?
Anas: Also, when I use English software I develop my English language by reading and learning some new words. Typing and reading will be in English, therefore I will learn more and get more experience with the English language.
Teacher: That's true but sometimes we need to use Arabic programs, especially in the government and education sectors, because most of them use Arabic software.

Anas: Yes, but on the other hand there are private companies who prefer their employees to speak and write English fluently, and also have skills in using English software.

Dramatic Sketch 4: Nasser and Jamal. Some Diamond Model factors that form the cast of variables for a fourth Dramatic Sketch are: patterns of thinking and values, access to, and experience with, Technology, and affordability of internet access.

Nasser, 30 years old, has worked at bank in Jordan for more than 8 years, Nasser is using the computer all the time, at work or out of work. Nasser uses the internet most of time for chatting and sending email for his friends or family inside or outside Jordan.

Nasser: Most of time I am busy in the official holidays with my family and relatives and I don't find enough time to visit my friends therefore, I use the internet to send an electronic card by email to my friends at work and out of work.
One day he faced a weird situation, as Nasser himself told us:
It was special event (Eaid EL-ADHA) and I thought about sending an electronic card to all my friends before one day of the Eaid, because during the Eaid day I don't have enough time to use the computer, send e-card or even visit my friends. Therefore, I sent the e-card to more than 6 friends and all my friends received it.

After that, when Nasser returned to his work, he saw his friend at work Jamal (38 years old) who was one of Nasser's friends who was sent an e-card at the Eaid. Jamal looked angrily at Nasser, saying: I don't accept your greetings of the Eaid this year.

Nasser: Why Jamal, if there is something wrong? I sent to you and all my friends an e-card.
Jamal: And do you think that is greeting, it just an electronic card that is available on the internet.
Nasser: You don't like the e-card?
Jamal: No, the problem not in the e-card. The problem is the idea itself, and the principle of this idea.
Nasser: What principle?
Jamal: The tradition on this special day is to visit each other, sit and talk or even talk through the phone, not just send an e-card. Also I don't have an expensive internet connection in my home and I don't check my email all the Eaid's days therefore I just saw the e-card yesterday.
Nasser: But I thought that the e-card was a good substitute for a visit.
Jamal: No, that's not acceptable for me in our society; we must visit each other or at least talk by phone.
Nasser: I am sorry Jamal, next time I will visit you and not just send e-card.
Jamal: I prefer that, thank you.

3.2   Micro Sketches

In four Dramatic Sketches, we have covered an extensive range of relevant cultural variables. This supports the conjecture that a relatively set of Dramatic Sketches could cover most common cultural variables and their Jordanian instances. However, it may not be efficient or effective to cover the remaining variables via complete Dramatic Sketches for a range of reasons. It may result in unhelpful inefficient repetition, forced and ineffective story lines, or unrealistic scenes.

We have therefore complemented Dramatic Sketches with an additional more compact design resource. These *Micro Sketches* comprise little scene setting (or none) and a very short dialogue (or even a monologue or a single response from an

interview). Generally, it is best to have some scene setting and not expect a short quote to speak for itself. Also, while Micro Sketches need not simply correspond to quotes from field data, there is no point in adding to or revising quotations that clearly communicate Jordanian instances of cultural variables.

Both forms of sketch are a good complement to the Diamond Model because they can express specific moments of time and place that we encountered as snapshots of, and flashbacks about usage, which simultaneously provide an accessible impression of people, their work and their work place.

Micro Sketch 1. The cultural variables that influence computer usage for this Micro Sketch are attitude to work and family obligation and relationships. Where there is no dependency on using the computer for most work, users will not be frustrated when facing problems, and won't care about usage problems very much. Here, the micro-sketch is just a quote from an interview:

Most of my work doesn't depend on computer and if the computer stops working, I have other work to do until IT support fix my computer

Inefficiencies in Jordanian workplaces are often related to the social or economic situation, including the income of employees, which can leave them inadequately motivated about their work. Also we found issues that may be rarer in western countries such as Nepotism in employment, which causes overstaffing at work that increase the number of employees and delays work by passing it between different people.

Micro Sketch 2. *After I finish my work I go home to do some works such as cooking, cleaning, take care of her child, visiting family or friends*

The main cultural variables that affecting usage in this Micro Sketch are: gender roles, and family obligation and relationships. The social life of woman in Jordan affects usage of computers. Woman return home after work to prepare food and take care of children, and thus don't have enough time to use computer at home. .

Gender roles impact usage of computers, letting men use computers more than women, which could affect computer skills by increasing the experience of the men when compared to women.

Micro Sketch 3. *Sometimes older people at work don't accept people younger than them teaching them how to use computers*

In this Micro Sketch the main cultural variables that affecting the usage are patterns of thinking and values, and age differences In this final example Micro Sketch, differences in age between teachers and learners impact usage of computer in Jordan. Older people reject learning from younger people, which could cause trouble for a company to convince them to learn from experts who are younger than them.

3.3   Analysis

The four Dramatic Sketches and three Micro Sketches cover 17 of the Diamond Model's 46 factors. Some variables are unlikely to apply in all HCI settings, such as material culture variables where there strong relation between these variables and

computer usage is restricted to physical (ubiquitous) computing, which remains rare in Jordan. So, although it may be possible, using a similar range of cast sizes to the examples above, to cover all 46 identified cultural variables using 11 dramatic and 8 Micro Sketches, and fewer should be required to cover the Jordanian instances identified in this research. The expectation is that such a set of Dramatic and Micro Sketches would be more understandable and memorable than a textual Diamond Model with Jordanian instances. For reference, the factors and Jordanian instances that covered through Dramatic and Micro Sketches above are:

1. Attitude to Time
2. Individualism vs. Collectivism
3. Power Distance
4. Personal Experience/Knowledge
5. Attitudes to Work
6. English Fluency
7. Role of the Educational Systems
8. Familiarity with English Spelling Across Cultures
9. Government Language Policy
10. Text Direction
11. Companies' Policies
12. Patterns Of Thinking And Values
13. Access to, and Experience with, Technology
14. Affordability of Internet Access
15. Family Obligation and Relationships
16. Gender Roles
17. Age Differences

For other factors or variables in the Diamond Model, see EL-Qirem and Cockton (2011). We created Dramatic Sketches to explore alternative formats to the comprehensive text hierarchy of the Diamond Model. We did not think that this thorough text format would be easy to internalise and reflect on. We feel that the informal narrative formats of Dramatic and Micro Sketches are more approachable and will trigger thought and reflection on the part of software designers.

Dramatic and Micro Sketches have not been tested yet with actual software designers. We have presented detailed examples above to allow HCI researchers and Interaction Design practitioners to judge for themselves as to whether Dramatic and Micro Sketches are an effective format for rapid communication and challenge.

It is important to avoid stereotypes in culturally-sensitive Interaction Design. The sketches above are not true reflections of all Jordanian computer users, nor are they exclusive to Jordanian computer users. Their role is not to represent a single true reality, but to present examples of Jordanian culture in ways that expose and challenge software designers' assumptions. They illustrate how computer usage in another culture can differ from usage in software designers' home cultures. However, subcultures may exist in software designers' home markets that are similar to Jordan. For example, female roles and responsibilities could reduce the digital literacy in many software markets. Poor motivation at work, non-meritocratic employment and promotion practices, age hierarchies and similar factors are not unique to developing countries.

Our expectation is that our Dramatic Sketches can also promote reflection from software designers who are not targeting products and services at Arab markets, and expose the risks of assuming that all users are highly motivated digital experts who will be frustrated and annoyed by usage factors (EL-Qirem and Cockton 2012).

4 Conclusions

Selected casts of Diamon Model instances can be used as a basis to author the scene setting and dialogues for Dramatic Sketches, a more accessible and appealing format for communicating cultural differences to software designers. As with travel, our hope is that culturally specific Dramatic Sketches will broaden readers'minds by challenging established Western stereotypes and values, as well as reducing the time spent on familiarisation with Jordanian or other cultures. However, systematically evaluating the effectiveness of our novel promising communication formats is a task for future research.

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