Using Contextual Inquiry as a subset of Requirement Gathering Process

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Abstract—Contextual Inquiry (CI) is a technique for examining and understanding users and their workplace, tasks, issues and preferences. It can be used to produce user needs analyses and task analyses. Contextual inquiry (CI) is a user-centered design (UCD) ethnographic research method, part of the Contextual Design methodology. In this paper along with introduction of contextual inquiry, discussion of two projects being carried out where CI was explored during requirement gathering extensively. The experience so far, the implications, goals of projects and possibility of merger of CI with Requirement Gathering are discussed.

Keywords—Contextual Inquiry, Contextual Design, Ethnographic Research, HCI, Requirement Gathering, SE, UCD.

I. INTRODUCTION

CONTEXTUAL INQUIRY is collecting detailed information about the customer work practices by observing and talking about the work while s/he works. Researcher ought to stay on the background and let the user lead the situation as much as possible. This means that researcher tries to form a partnership with customer i.e. work with him/her as an apprentice while the customer is the master at work. This helps the researcher to understand the customers work. The goal is to understand how, what for and why something is done or why something is not done [1].

Contextual Inquiry Principles

Four basic principles of contextual inquiry [2]

Context: the analysis must be performed within the user's work site. It should maintain focus on the specifics of the work. Work is an ongoing experience, involving actions and artifacts. Collect concrete data, rather than abstract data

Partnership: the analyst and the client are collaborators in

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understanding the work of the client. Recognizes the client's expertise in the work. Recognizes the analyst's expertise in seeing/inducting/abstracting work structure from a series of specific events. Two activities during the meetings alternate with each other. Direct observation of the work being performed. Conversation about the work.

Interpretation: assigning meaning to the events and objects observed. Facts must be interpreted to be useful for design.

Line of reasoning: fact → hypothesis → implications for design → design

The analyst's hypothesis must be confirmed before using it as the basis for design and it is best to check with client.

Focus: the point of view of the analyst while studying the work. Set a focus for each interview.

How the principles work together (context, partnership, interpretation, focus: Context and partnership support the master/apprentice relationship while Interpretation and focus enable you to use the data for design.

II. USAGE OF CI IN PROJECT STUDY

A. *Objectives of the projects being carried out*

The following two projects are being carried out with the help of 80 UG students, 5 teaching staff, 8 industry experts for smooth integration of Software Engineering process with HCI process[3].It also attempts to merge each of the sub processes viz Requirement Gathering with CI,HCI design with SE design, SE testing with usability testing. Ultimately we are going to prototype a product design rendering interface metaphors [4] [5] from day to day life. These projects are being carried out to validate the author's contention that for a new product design and visualization of interface metaphors [6] an alternative software development methodology can be proposed which is a holistic merger of HCI and SE.

Project 1

Design software for working professionals like professors, doctors, businessmen. These working professionals have many debit and credit cards; many e-mail ids, ids for online transactions like online banking, PayPal etc and policy numbers. It becomes difficult for them to remember and keep

Rajesh Kulkarni et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 3 (1) , 2012, 2940 - 2942

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their ids and passwords secured. Design a secure interface for keeping those ids and passwords at a secured place. Also, these professionals need many documents and certificates to retrieve any time they need. They waste a lot of time searching these documents. Design an interface for the same so that they can retrieve immediately the required documents as and when they need.

Project 2

Redesign a medical instrument (ECG) so that it becomes more user- friendly. It should have local language support. It should also overcome present ergonomic barriers which are faced by technicians handling them.

B. Results of the projects So Far

These projects are given as classroom projects, mentors from teaching community are assigned and inputs from software professionals are being taken on an ad-hoc basis. Contextual Inquiry of both the projects is completed. Participants were recruited by students [10]. Each project group(1 moderator-faculty and 8 students) were to recruit 7-12 participants. First appointments of the participants were taken and then the contextual inquiry happened. Very interesting insights and design ideas for both have come out. The teams are gearing up for interpretation, focus, affinity, paper prototyping which are steps of contextual design at their end while at our end(faculty) we are trying for possible placement of CI at appropriate place in Requirement Gathering process. Requirement Gathering is still not structured, ad-hoc and no set templates are used. Some Professionals found Volere Specification Template [9] useful and we are exploring the same for possible merger.

Breakdowns in CI indicate hurdles, difficulties or interruptions. Breakdowns lead to new design ideas. In our ECG redesign project some of the breakdowns in handling ECG we came across are:

- Depends on electricity
- Time consuming
- Only experts can handle
- Difficulty in taking the readings from the graph obtained

Design Ideas evolved from these breakdowns are:

- Digital and completely automatic.
- Electricity independent.
- Monitor ECG.
- Memory storage like soft copies.
- Backup system.
- Simplified with local language support.
- Automatic graph calculations.
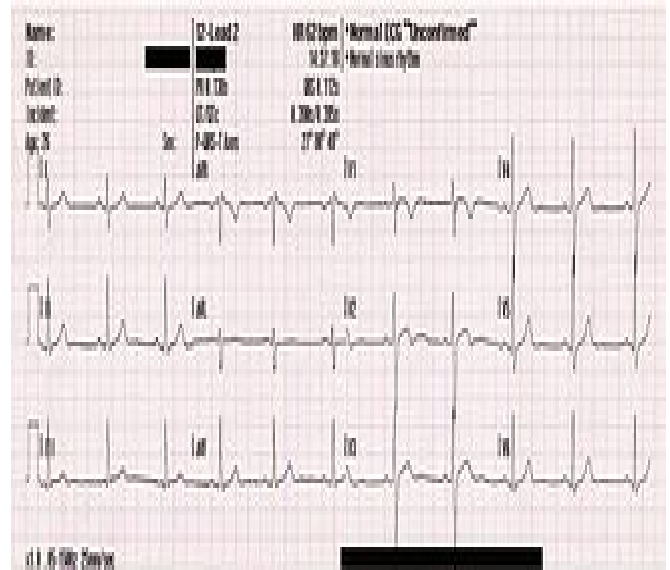- Wireless system like Bluetooth

Fig: 1; ECG of a 26-year old male. Artifact collected during CI.

III. CONCLUSION

Contextual Inquiry is difficult. In order to use contextual inquiry for purpose of requirement gathering or as a subset of requirement gathering a design language has to be evolved [7].During CI people's (interviewed) bias has to be separated from the actual work. This can be done through mathematical analysis.CI connects in a methodical way the client for whom the product is being designed and the designers and also gives answer to what, why user wants [8].The project studies are representative contender of adding CI flavor in requirement gathering process of SDLC.

Usable HCI products can be successfully built if user and his needs are understood. There is a scope for merger of HCI design with SDLC/ CI with Requirement gathering [7].

As contextual Inquiry is more qualitative it will not yield good statistical data. For quantification [11] other avenues and inspirations are to be explored as supplement.

Conducting contextual inquiry in itself is a huge task involving going to place of work of the interviewee, waiting for him, create camaraderie with him, spending many man hours with him and patiently focusing him towards the intended direction during interview. Author had to take the additional care of keeping the groups focused and motivated.

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