Perspective on End User Development

Henry Lieberman
MIT Media Lab
Cambridge,
MA 02141, USA
+1 617 252 0315
lieber@media.mit.edu

Fabio Paternò
ISTI-CNR
Via G.Moruzzi 1
56100 Pisa, Italy
+39 050 3153066
f.paterno@cnuce.cnr.it

Alexander Repenning
University of Colorado
Campus Box 430
Boulder, Co, USA
+1 303 492 1349
ralex@colorado.edu

Volker Wulf
University of Siegen
and Fraunhofer FIT,
Germany
+49 2241 14 2993
wulf@fit.fraunhofer.de

ABSTRACT

The goal of the workshop is to bring about a coherent research agenda in the field of end user development. We seek contributors concerned with: adaptability, adaptivity, tailoring of system functionality and user interfaces, the use of annotations for individuals and user groups, and use of effective visual and multimedia representations.

Keywords

End-users, Development, Context-dependent Interactive Systems, High-level Languages, Usability.

INTRODUCTION

While some substantial progress has been made in improving the way users can access interactive software systems, developing applications that effectively support users' goals still requires considerable expertise in programming that cannot be expected from most citizens. Thus, one fundamental challenge for the coming years is to develop environments that allow people without particular background in programming to develop their own applications, with the ultimate aim of empowering people to flexibly employ advanced information and communication technologies within the future environments of ambient intelligence. Over the next few years we will be moving from *easy-to-use* (which has yet to be completely achieved) to *easy-to-develop interactive software systems*.

The wide-spread penetration of interactive software systems has raised an increasing need for better environments for building applications. The interactive richness of new devices has created the potential to overcome the traditional separation between end users and software developers. New environments able to seamlessly move between using and programming (or customizing) can be designed. Advanced techniques for developing applications can be used by individuals as well as by groups or social communities or organizations. There are studies that indicate that the end-user programming

population will be growing at more than 10 percent per year worldwide. A growing community of researchers already exists on this and related topics.

This workshop is organised in cooperation with EUD-Net, the European Network of Excellence on End User Development (http://giove.cnuce.cnr.it/eud.html).

GOALS

The main purpose of workshop is bring about a coherent research agenda in the field of end user development. Therefore we will bring together actors from the fields: adaptability, adaptivity, tailoring of system functionality and user interfaces, the use of annotations for individuals and user groups, and use of effective visual and multimedia representations. Both single and cooperative environments will be of interest.

Typical applications areas for end user development are mobile systems and their applications (for example commerce), office and decision support applications, and home applications. We will also try to address the needs of expert communities, such as those working in CAD Systems, technical maintenance, and Air Traffic Control.

In the workshop we aim to review the state of art in these field, to give a framework to evaluate current approaches, and to identify promising research lines and the possible results which can be foreseen in the next years.

Topics of interests include:

- end user development architectures
- innovative scripting languages
- web-programming
- adaptive and situation aware applications
- interfaces for end user programming
- model-based design
- collaborative programming/tailoring activities
- design principles for end user environment
- psychology of end user programming
-heuristic evaluations of end user programming environments
- ethnographical studies on end user programming

BACKGROUND

A growing community of researchers already exists on this

and related topics. We can mention the work done in end-user programming by developing languages suited for non computer experts; examples are AgentSheets, developed by Alexander Repenning [3], KidSim/Cocoa/Stagecast developed by Allen Cypher and David Canfield Smith.

Another group of researchers has developed an approach to programming called Programming by Example (or by Demonstration) [1]. In this approach, a software agent records the interactions between the user and the interface and writes a program that corresponds to the user's actions. The agent can then generalise the program so that it can work in other similar situations.

To analyse and evaluate development environments, general HCI principles and heuristics can be useful, as can cognitive dimensions for notations (such as closeness of mapping, viscosity, hidden dependencies, imposed guess-ahead and visibility).

One goal of end-user development environments is to provide a close mapping between the way the developer envisions a problem solution and the expression of that solution in the system implementation. This calls for representations of activities required to reach the users' goal rather than low-level command oriented programming environments. Engineered tools supporting easy development and interactive simulation and analysis of task models are beginning to appear (such as the ConcurTaskTrees Environment). From such models it is possible to prototype user interfaces for various types of interaction platforms [2].

The international community on visual languages has indeed pursued for a number of years the objective of easing the way people program and interact with computers.

Another important aspect is supporting users to tailor an application. To this end some approaches have been developed, for example the concept of direct activation [4], which simplifies the discovery of a tailoring function at the moment a tailorable function needs to be modified.

WORKSHOP ORGANIZATION

Workshop participants are selected on the basis of the quality of their abstracts and of the relevance of their background. We want to stimulate an interdisciplinary participation (designers, developers, psychologists, ethnographers) from both industry and academia. The maximum number of participants is limited in order to have

a more focused discussion and the possibility of producing interesting results.

We have started an open mailing list on end user development at eud@isti.cnr.it that will be active also after the workshop.

A list of issues will be circulated among the participants before the workshop. Position papers are publicly available at the workshop site.

The activity plan for the workshop is:

- Introduction of the workshop goals and participants;

- Presentation of basic concepts particularly relevant for the end user development field;

- Presentation of a list of issues particularly important for the future of end user development;

- Interactive discussion with participants on the research topics discussed, selection of those that seem more important, and comments on the solutions proposed;

- Discussion on future plans, in particular on how to create a common background in this area among those who are interested in it and how to influence companies and international bodies such as European Commission, National Science Foundation. We also plan to write an edited book with selected and revised contributions to the workshop and related events.

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