A User-driven Workplace Software Certification Process

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Introduction

This is a description of a process for user-driven certification of software used at workplaces, as part of the workplace user network UsersAward.

The first initiative to the process was taken by LO (The Swedish Trade Union Confederation) in 1997. In the years 1999-2002 the process has been developed in cooperation with researchers in the ITQ (Quality certification of IT Support for the Developing Work). The researchers were coordinated by Yngve Sundblad, CID, KTH, Stockholm. The other participants were Åke Walldius, CID, Bengt Sandblad, Jan Gulliksen, Iordanis Kavathatzopoulos and Mats Löfberg, HCI, Uppsala University, Lars Bengtsson and Martin Ljungström, Industrial Economy, Gävle University College, and Torbjörn Ilar, Production technology, Luleå Technical University.

The methodology is based on experiences gained from a number of pilot projects, described in Swedish in references [2] and [6], from an extensive survey of users' satisfaction with their IT-support in industry, and from quality assessments done in connection to the yearly Users IT Prize Contests 2000-2002. The TCO Certification programme of computer hardware (TCO'92, '95, '99, '03) is an important source of inspiration for the UsersAward programme.

After extensive work and use of a successively developed list of about 30 user quality criteria in a questionnaire, filled in and discussed with hundreds of users, the user software certification process was ripe for use in the first certifications of work place software in 2002. The deployment and use of the time management system Time Care was assessed at two workplaces (a department store in Stockholm and an emergency ward in Falun). This assessment marks the transformation of the UsersAward/ITQ-project into a permanent certification programme based on systematic assessments of user satisfaction. The certifications will be conducted by the newly formed non-profit organisation UsersAward AB. UsersAward AB is jointly sponsored by the Swedish Trade Union Confederation and the

Swedish Agency for Innovation (VINNOVA) and the certification programme will be carried out and further developed in partnership with the Royal Institute of Technology (KTH) and the Swedish Confederation for Professional Employees, (TCO), the initiators of the TCO Certification programme.

The programme's connection to publicly sponsored research means that its criteria and assessment procedures will be updated in new versions based on experiences gained from two to three years of assessment activities. These experiences will be presented to the public – at conferences, in articles and on the UsersAward website – and the feedback obtained from these presentations will help keep the programme abreast of the latest developments in the software industry.

Additional information can be found in the web sites:

http://cid.nada.kth.se/ao/ao_itq.html
http://www.usersaward.com
and in references [3], [7] and (in Swedish) [4].

Method for the certification

The label "User Certified" warrants that the software has satisfied users.

As described below the process consists of evaluation and assessment of information obtained through the following sources

- a questionnaire on quality criteria, answered by at least 10% (and at least 10) of the users at three work places, the most central information,
- the same questionnaire, somewhat extended, answered by the managements at the workplaces investigated (supplementing information)
- a "self declaration" questionnaire to the software provider (supplementing information)

What kind of software can become user certified?

The set of criteria developed for the certification programme is designed to comprehensively measure the usability of software systems, which are used by or involve a large number of employees at the worksites where it is deployed. If a software provider wishes to apply for a specific certification, national or international, a prerequisite is that the system has been in daily use for at least one year.

Since the process of deployment is a decisive factor for the overall level of usability at the individual worksite, the assessment not only includes technical and organisational aspects of the system but also the design and performance aspects of at least three individual deployment processes.

Who gets involved in the certification?

The assessment is always carried out on at least three different workplaces. This is done in order to reduce the dependency on (overly) specific preconditions for deployment on the individual worksites. The software provider suggests three workplaces where the assessment can be carried out.

The user certification is based on the participation of representative end-user groups at the three workplaces. The group should comprise 10 percent of the workforce, with 10 persons as a minimum representation. The UsersAward organisation contacts person at each workplace, who is generally a representative from the employee organisation, is responsible for making the panel representative for all end-users at their respective workplace.

At each workplace, three end-user representatives are interviewed based on a questionnaire, which is also filled in by the user group. As supplementary information the same questionnaire, extended with a few questions, is used in an interview with about three representatives on different levels of management at the workplaces.

Other supplementary information is obtained from the provider of the software, see below.

How is the certification process carried out?

A software provider, that has applied for certification of a certain software package, is asked to fill out a self declaration regarding the package and its intended use. It is in this declaration the provider suggests three workplaces at which the (exemplary) use of the package can be assessed.

The next step of the certification process is a hearing, conducted by the UsersAward evaluators, in which the provider presents the software package and to what extent it is used as intended at the three workplaces.

After that, the evaluator team carries out interviews and questionnaires at the three workplaces.

Based on all this information the UsersAward evaluation team makes the evaluation and assessment in cooperation with the CID researchers, who verify interpretation of the results.

As a whole, the typical certification is carried out in less than two months.

How is the user satisfaction measured?

In the interviews and questionnaire, each criterion of the defined set of 30 quality criteria is presented in the form of a statement to be confirmed on a value scale between 1 (total dismissal) to 6 (total agreement).

The assessment is done on the three workplaces named by the software provider out of which two workplaces have to qualify to the stipulated level (se below). At each workplace, three end-users are interviewed and asked to 1) confirm the statements in the questionnaire with a value between 1 and 6 and, 2) give a short motivation to their level of agreement. Then three representatives from management are interviewed in the same way. (All interviews are sound-recorded.) These interviews are then complemented by a questionnaire to a panel made up of ten percent (or at least ten users) out of the end-users at the worksite.

Required levels of user satisfaction

The users are considered satisfied as a whole when at least two of the investigated workplaces meets the following levels of proportion of confirmed criteria statements in the questionnaires.

- a mean value of at least 4.0 on 80 percent of the statements for all users
- a mean value of at least 4.0 on 67 percent of the statements for each user category
- a mean value of at least 4.0 on 67 percent of the statements for both men and women

The criteria on user categories and gender are only applicable if there are at least 5 users in each group.

To what does the certification apply?

- The certification only applies to the deployment and use of the software version specified by the provider and assessed by UsersAward. Hence, the certificate is not applicable to earlier or later versions of the software.
- The certificate is only valid for the modules specified by the provider. More extensive systems with a large number of modules require multiple certification processes.

- Certifications can apply to specific user categories. When the system typically is used only by specific professions with well defined tasks and activities the assessment is done with those users.
- The certification applies only to the country/region in which the software deployment and usage has been assessed.

What the certification entails

UsersAward agrees to publish information about certified software packages:

- at Swedish and international conferences,
- at the website www.usersaward.com,
- in consultations for consumer, employee and management organisations.

The software provider is entitled to use the UsersAward logotype in advertisements that apply to the certified software packages.

Quality criteria

The project has identified the following six fields of relevance in which the user satisfaction is measured.

1. Total benefit (2 criteria, 1 extra for management): The benefit of the deployed IT support is satisfactory for better quality, higher productivity, development of competence, for customers, clients etc
2. Deployment process (5 criteria, 4 extra for management): The IT support is deployed from a clear idea, taking the users' ideas into account in an active process, giving the users adequate education and possibilities to develop competence
3. Technical design (10 criteria): good overview, flexibility, adaptability, integrity, help, undo, access and input of information, etc
4. Support for work tasks (6 criteria): overview, engaging, avoiding stress, test alternatives, follow-up
5. Support for communication and cooperation (5 criteria): authority and independence, cooperation in teams, other parts of organisation, suppliers, customers, clients
6. Feedback and redevelopment (1 criterium): Continuous feedback of user needs

The criteria have been developed and tested in three major national questionnaires, in discussions within the projects User panel, in a series of pilot studies, in some 20

visits to nominees of the yearly IT Prize Contests and in discussions with the jury for that contest.

The quality aspects deemed relevant to assess apply to both the software as artefact and the method in which the software has been deployed in the client organisation. Hence, the aim of the set of criteria is that it should embrace both tangible characteristics of the software package and its associated documentation (declared design principles, principles for deployment, functionality, cost, documented efficiency measures etc) and end-user experience of how well the software provider has managed to live up to the declared levels of performance.

In order to provide good grounds for end-user participation in the assessment, UsersAward will publish relevant analysis of key aspects – from successful and less successful solutions – for the criteria covered by the certification.

Relation to other criteria and certification processes

The UsersAward certification programme has common features with many existing certification programmes. Both the TCO, see references [1] and [3], and Swedish Software Industry programmes, SPI2000, build on tangible characteristics while the Swedish and the American Customer Satisfaction Index, SKI and ACSI, build on experience expressed by representative samples of customers/users.

The set of criteria within the UsersAward fields of relevance are based on, and are in some instances refinements of, quality criteria found in ISO standards for Software Quality (ISO 9126) and for Ergonomic requirements for office work with visual display terminals (ISO 9241).

The Swedish and the American Customer Satisfaction Index involve a large number of respondents to assess the relative customer satisfaction with products and services in a wide set of industries and service sectors. The UsersAward on the other hand aims at involving representative panels of end-users from three workplaces in which the software to be certified has been deployed in comparable configurations. The long-term goal of this strategy is to initiate sustainable dialogues on software quality both within and between these (and other) workplaces.

The idea of assessing three independent deployments, of which at least two should pass the certification requirements, is inspired by the Internet Engineering Task Force (IETF) which has as a basic requirement that complete implementations of a candidate protocol/standard/application shall be demonstrated on at least two different platforms.

UsersAward's emphasis on sustainable workplace dialogues, based on clear statements of requirements, is derived from the findings of numerous research projects which all verify that user participation and management engagement are two of the most important factors for a successful deployment process.
The 1999 update of the Chaos Report, a survey compiled since 1994 by the

Standish Group [5], is particularly revealing in this respect: "The three biggest contributors to project success are user involvement, executive support and a clear statement of business objectives. Together they account for 50 % of a project's chances for success." The fact that user involvement is found to be the most important factor for success confirms the UsersAward strategy for sustainable quality work. The report's estimation that "user involvement" has a weight of 20 points, while "executive support" and "a clear statement of business objectives" only has 15 points each, further verifies the necessity of not only involving end-users in the certification process, but to make the process user-driven in respect to criteria articulation and institutional affiliation.

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