Usability Promotion Activities of NEC Soft, Ltd.

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Abstract

Improvement in "ease of use" has become one of the critical themes in the process of software development for the SI and packaged products of NEC Soft, Ltd. The Usability Engineering Office of the VALWAY Technology Center introduced usability engineering from an early stage and is currently promoting this technology for its dissemination and application in various projects.

This paper is intended to introduce the usability promotion activities of NEC Soft, Ltd.

1. Introduction

At NEC Soft, Ltd., we conduct SI business by placing the first priority on the creation of customer values and the improvement of customer satisfaction with the awareness that the provision of real "ease of use" for customers is an important issue in this regard. In order to create systems with real "ease of use," we have introduced usability engineering systematically within our own organization and are advancing our activities aimed at its promotion outside the company. The Usability Engineering Office of the VALWAY Technology Center began these activities in January 2007 and has introduced and adopted the concept of usability engineering in-house. The concept has actually been applied in some development projects and the results have been evaluated over the year since its introduction. In FY2008, our activities are entering the stage of promoting massive applications and the introduction of a technology based on the results of evaluations made over the previous year.

In this paper, we summarize our activities and the results of the past year and describe our plans for future activities based on these results.

2. Start of Promotion Project – Setting the Targets –

The promotion project began in January 2007 when three of our engineers were assigned the task of introducing and learning the usability engineering technology (the number of staffers has been increased to 8 as of the end of January 2008). The

introduction consisted mainly of transferring technology from the Human Interface Center, NEC Common Platform Software Research Laboratories. At the same time cooperation was also received from NEC Software Hokkaido, Ltd., which has been engaged in a university-industry based cooperation project called the usability solution R&D project.

We decided that the policy to be adopted for these activities would consider the characteristics of our business as an SI company. We began our activities with a few pilot projects during the first year but our ultimate aim was to apply the technology at once over the entire corporate range by the means of standardization without being satisfied with piece meal applications. We also recognize the importance of finding the optimum method of application for each business or operation type according to its properties. For this purpose, we
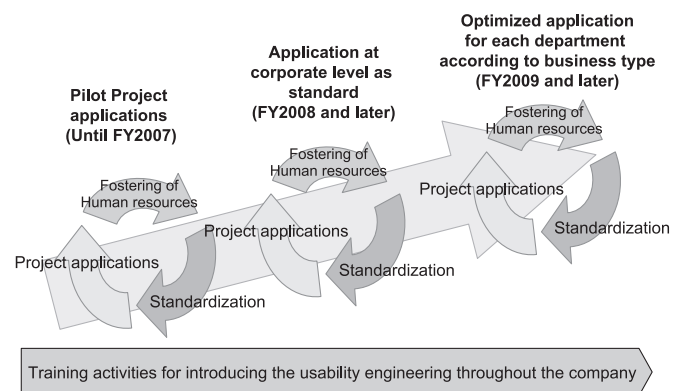

Fig. 1   Usability Promotion Policy of NEC Soft, Ltd.

consider that training activity for introducing and disseminating the concept of usability engineering throughout the company is of fundamental importance (**Fig. 1**).

Based on the above policy, specific targets were set as follows.

1) FY2007 would be the stage at which the engineers of the Usability Engineering Office perform trial applications of the technology in ten pilot projects.

2) FY2008 and FY2009 will be used to foster 30 usability engineers in the division so that usability engineering can be applied in 100 projects per year.

3) These same two years will also be used to incorporate usability engineering in our software development processes, so that usability engineering may be spontaneously applied to routine development processes and quality control activities. This procedure will make it possible to apply usability engineering in all of our more than 1,000 projects.

4) In order to enable 1) to 3) above, the usability training of all SEs and development personnel will be provided as a priority theme.

3. Corporate Introduction/Dissemination Activities – Staff Training –

Our usability promotion activities began by establishing a program of developing training materials and training courses. We decided to independently develop new training materials that could help the Usability Engineering Office staff to assimilate the new technology. The actual training materials were developed in full collaboration with NEC Software Hokkaido, Ltd. and the training course is currently in operation at both NEC Soft, Ltd. and at NEC Software Hokkaido, Ltd.

The training course consists of the "Beginner's Course" and a "Practical Course." The Beginner's Course occupies two hours in allowing all of the trainees to learn the importance of usability and the concept of human-centered design, and the Practical Course is designed so that the developers can learn the practice of usability engineering in the development process through exercises. The Practical Course spends a total of three days in dealing with "Requirements Definition," "UI design" and "evaluation."

It is the role of the "Beginner's Course" above and various forums to promote the introduction and dissemination of the concept of usability. Forums are held in every type of business by assigning researchers from both inside and outside of the company as lecturers, including NEC researchers. Each

➢ Questionnaire (494 persons)

1. Degree of understanding of the forums
2. Necessity of usability
3. Applicability to projects
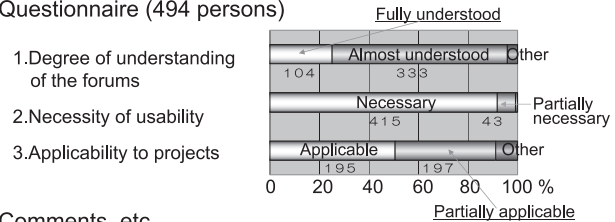
➢Comments, etc.
- Explanations were easy to understand because many specific examples are mentioned.
- I am always conscious of usability improvements and also interested in them.
- I feel that I discovered clues for improvement of actual development work.
- Usability is important also for defining our work characteristics.
- It is indispensable also from the viewpoint of CS.

Fig. 2   Results of the questionnaire.

forum deals with a specific target subject, such as top management or middle management with the aim of understanding the importance of usability and considering methods for its systematic promotion.

The total number of trainees attending the Beginners' Course and/or forums has reached 557 as of the end of January 2008. However, this number is considered to be unsatisfactory in terms of the total number of employees of 4,600 and an increase in promotion is required. "Beginner's Course" training is given to classes of 20 to 30 persons per session. Nevertheless such a small number of participants allows us to monitor the needs and opinions of trainees throughout their education and contributes to promotion activities. **Fig. 2** shows the results of the trainee questionnaire and some of their needs are revealed. In the future, we believe that we will be able to disseminate usability throughout the entire company by establishing its position in the mandatory education of each layer of the corporate staff.

On the other hand, the fostering of usability engineers is the role of the Practical Course, which spends a day each in dealing with "Requirements Definition," "UI design" and "Evaluation" in courses provided for a total of 78 trainees, or about 25 trainees per course. Trainees participating in this course will be trained to become usability engineers in various departments after experiencing OJT (On-the-Job Training) in the actual field of project applications.

4. Evaluation of Applications for Pilot Projects – Standardization –

Applications for pilot projects and the evaluation of results

Table　Applications for pilot projects.

Project name (Note)	Purpose	Usability Techniques Used									Evaluation
		Interview	Creating personas	Task scenario development	UI prototyping	Walk-through review	UI guideline development	Heuristic evaluation	Accessibility evaluation	Usability testing	
Business package software for service industry	To introduce significant improvements to "ease of use" of package renewal.			○	◎	◎	◎	○			• Improved competitiveness, reception of more orders • Dissemination of usability among project staff.
Business package software for local government (One of a series of products)	To improve the competitiveness of products by commercializing a series with a total commitment to usability.					◎		◎			• Enhancement of brand power as a product series.
Development planning of next administration service web system	To improve the service for an undefined number of multiple residents who are not accustomed to web procedures.								◎	◎	• Discovering operational errors that were not expected by developers thanks to usability tests.
Digital content distribution system	To improve the operability to allow non-skilled users to easily perform editing.			○	◎			○			• Improvement of product competitiveness by UI design improvements.
Our corporate website	To increase the number of job-searching students entering the website by improving relationships with them.	◎	◎	○							• Improvement of relationships with students in search of jobs • Increased number of website entries.

(Legend) ◎: Technique applied with emphasis.　○: Other technique.

(Note) The table does not mention specific product names in consideration of product planning issues.

began in April 2007 after a three month preparation period. The number of projects was 5 in the first half of FY2007 and another 5 in the second half.

The following three targets were defined before the start.

1) All of the main techniques of usability engineering should be experienced at least once in accumulating expertise in the Usability Engineering Office. Subsequently, we will decide on the application methods that will suit our company policy for the future.

2) Only those people who understand and support usability engineering should be assigned to each department.It is this elite group of engineers that will inform the other people in the department about usability promotion activities and thereby promote its in-house dissemination.

3) Actual examples of applications should be developed and the effects of such applications should be identified.

Similarly to 2), this is also because we believe that actual examples and demonstrations of the effects of applications are most effective for promoting the dissemination of usability engineering in-house as well as for the understanding of our activities.

Table shows the status of the applications of the five pilot projects handled in the first half of FY2007. For each of the usability techniques that were applied we compiled an application report to be submitted to the project and an application

procedure document to enable sharing of the know-how in the promotions office. These documents have now become our internal common assets.

As of the end of January 2008, we were able to very nearly achieve the purposes intended by 1) to 3) above. The reports submitted by the application-target pilot projects stated; "we have succeeded in receiving orders thanks to applying usability technology to the UI design," "the importance of usability was disseminated among all of the project development members" (Business package software for service industry), "the entries of students increased by 20% from the previous year (Our corporate website) and so on. On the other hand, we are also finding new themes and issues to be dealt with. These will be further described in the next section.

After the applications to the pilot projects, we attempted over the period from July to October 2007 to incorporate usability engineering in our software development processes.

This activity consisted of the compilation and publication of Edition 1 of the UI Design Guide based on collaboration with the Production Engineering Department of NEC Soft, Ltd., at the same time as the publication of the first edition of WBS (Work Breakdown Structure) for the NEC Soft Engineering Framework (the standard development process of NEC Soft).The UI Design Guide is in fact based on the UI Design Guide in order to develop the NEC's new software architecture
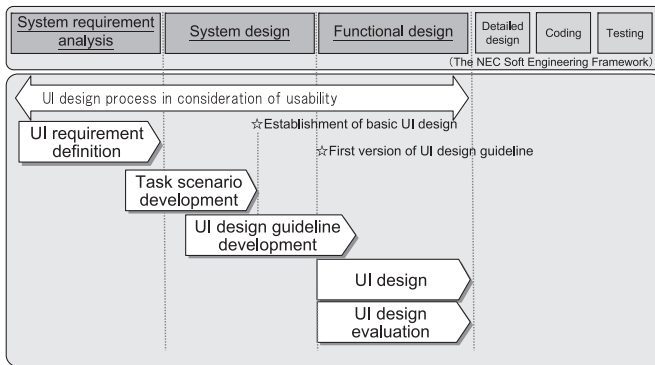
Fig. 3   Development process of usability engineering.

"SystemDirector Enterprise" for which compatibility with the activity of our standard WBS and the "Task scenario development" are added (i.e. the activity for use in the basic study of the UI basic design)(**Fig. 3**).

Subsequent to the above, which was aimed at improving the evaluation of the UI Design Guide and on to the second-half pilot projects that were started in November 2007, we have been attempting to advance work along these guidelines. At the same time, we are also advancing the work for incorporating the guidelines into our staff training program materials.

5. Interim Evaluation (End of January 2008) and Future Efforts

The evaluation of the results of applications to the pilot projects as described in Section 4 above has led us to discover new themes and issues as summarized in the following.

1) Although our method of promoting usability engineering is actually taking shape, it is necessary to be able to move from the UI design process to the software implementation process efficiently.
As the UI prototype in current use for determining specifications in consultation with customers were not capable of being packaged without applying differences in their details, we had to re-code them in order to suit the specified package development environment.
2) The improvement in usability on a per project basis is limited. It is important to improve it on a larger scale such as for a business or a fully operational unit (per-department basis).
Although the above result was expected from the beginning, it is at the present stage of the project that we have just

begun to clarify the distinction between the actions to be taken on a per-project basis and those to be taken on a per-department basis.
3) For the measurement and quantification of the effects of application of usability, we have been accumulating the results of its application to pilot projects. However, we are not yet capable of presenting an easy-to-understand way of indicating the effects of its application. Quantification is an important function of presentation for projects and customers as well as for managing the quality of usability.

We have elaborated the measures for solving the above themes and issues as follows,

For 1), we will try to provide solutions by developing a new UI design support tool. This tool will make it possible to select the UI structure (screen transaction) and skeleton (screen layout) from a selection of edited patterns. It may be used in the basic design and general design process in which joint examination and agreement with customers are necessary. Accurate layout will be possible by registering the shapes and sizes of the UI components to be used in the actual package environment. The tool is being designed so that it may also generate source codes for the package development environment.

For 2), we think that the basic concept of usability means a spiral design based on prototyping and user-participated operation simulations. However, the actual SI projects are subject to many restrictions due to the severity of the delivery terms of each process of the overall project. As we have improved the production technology by standardizing and modularizing the software production method for each job or operation type, we believe that a similar approach must also be taken in the applications of usability engineering. In other words, we will standardize the UI design guidelines for each project and the checklist for usability evaluation as far as possible and run the usability improvement cycle based on such standards on a departmental basis.

For 3), Usability evaluation may be indicated as an easy-to-understand value such as an overall index by ensuring the universality of the evaluation (i.e. elimination of any variations in evaluations that depend on the evaluators) and by determining the relative degree of importance between the evaluation items. We are planning to achieve these functions by introducing the results made by other research groups in the NEC Group. When this becomes possible we will be enabled in our future endeavors to continually measure the analytic, objective evaluation indices and customer satisfaction as identified in the CS surveys.

6. Conclusion

Usability promotion activities are regarded as being the processes by which users and engineers jointly attain optimum goals. We are determined to advance our activities so that the systems and solutions that we offer are "easy to use." At the same time we will create a process of usability improvement suitable for fabricating an "easy-to-use" quality of systems and solutions that is as clear as possible to our customers.

In the above, we have focused mainly on usability engineering activities at the stage of the project development process. However, customers actually use a large variety of systems. This means that creating a society that is designed to be "easy to use" for all of its users is just as important as our corporate-level activities for improving the "ease of use" of our solutions. In parallel with our activities at the corporate level, we also aspire to engage in activities that are oriented along these lines for an overall improvement of society.

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