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A measuring method of satisfaction rating in service engineering

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Abstract— **We can expand the service time zone and the service offer place at a low price by using the system that mechanizes it. However, user's complaint about the system is not a little. The service engineering proposes the model that user's satisfaction rating is fed back to the system. We tried a measurement of the satisfaction rating along the model of the service engineering for a system that constructed by Web. As a result, it was clarified that we can classify users by the distribution of the inspection time of users.**

Keywords-component; Service Engineering

I. INTRODUCTION

Various services that human beings have provided up to now have come to be provided by machines. For instance, various counters become the ATM and ticketing device, and stores has been changed into EC sites on the Internet. The system that mechanizes it not only is lowered the operation cost of service but also leads to the improvement of the service time zone.

The complaints such as user's "It is not easy to use it" and "It is not easy to understand" are not little. Developers design the system to keep the response performance, and the multiple performance etc. But they are unable to measure user's satisfaction rating. So, these complaints are not fed back to the system.

We tried a measurement of the satisfaction rating along the model of service engineering for a system that is constructed by Web. As a result, user's group was able to be extracted from the distribution of the inspection time.

II. CONCEPT OF SERVICE ENGINEERING

In the service engineering, the system that provides service is modeled as a service media[1]. Service is measured, and this service media is fed back to the system as user's satisfaction rating(Fig.1).

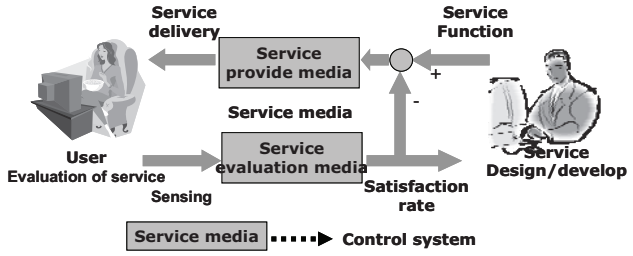

Figure 1. Service media in service engineering

If the evaluation to the user's service can be measured like this model, the problem like the above-mentioned is solved.

III. MEASURING WEB SYSTEM USERS

The Web system is used for not only EC sites and information services on the Internet but also in-house business systems, etc. The Web system is a general form in the system that used computer and network. The user connects computers on the network with a browser software that works on PC, and inspects information, and inputs data.

There is a research that analyzes the change in the user's interest from the access log of the Web system as an evaluation of the Web system users[2].

Some analysis service of the Web user's inspection time on the screen that the Web system displays is done. For instance, Google that provides service that combines the retrieval in the Internet with the advertisement is providing the web analysis service as Google Analytics. Moreover, it is announced that the research company Nielsen shows the value of the site is changed from PV (page view) to the inspection time. In these evaluations, the evaluation rises by the inspection time long. This depends on moving to other pages instantaneously if not suitable for the user's interest.

But the Web system in this research, is a system for the employee in the enterprise. The user of the Web system uses it with a specific purpose. Moreover, When the purpose is completed, the user operates to the following screen.

IV. USER CATEGORIZATION

It seems that the user consists of some group with different inspection time. Users of the system are composed of two or more groups. It is thought that independent normal distribution is shown at the inspection time of each group. We thought users of this Web system to be composed of the following three groups[3].

Group 1: User who uses it ardently and interactively

Group 2: There is both either

Group 3: User who uses it dull with no interest

The distribution of each group can be shown as follows.

$$N(\mu_1,\sigma_1^2) \quad N(\mu_2,\sigma_2^2) \quad N(\mu_3,\sigma_3^2) \tag{1}$$

$$N(\mu_i,\sigma_i^2) = \frac{\alpha_i}{\sqrt{2\pi}\sigma_i}\exp\left\{-\frac{(y-\mu_i)^2}{2\sigma_i^2}\right\} \tag{2}$$

μ_1, μ_2, μ_3 and σ_1^2, σ_2^2, σ_3^2 are average and distribution of each group. And α_1, α_2, α_3 are $\sum \alpha_i = 1$.

Overlapping the density function is as follows.

$$f(y) = \sum_i N(\mu_i, \sigma_i^2) \tag{3}$$

V. CASE STUDY

Fig. 2 is a histogram at the screen inspection time of a certain Web system. In this Web system, 70 users are accessing it 700 times a month.

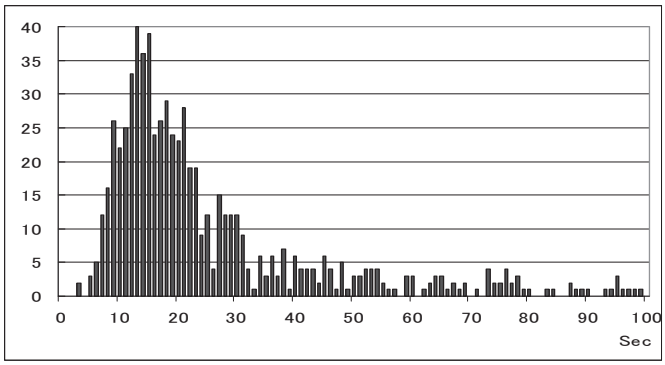

Figure 2. Distribution of observed browsing time (g(y))

When three groups are assumed, and the above-mentioned type is applied, it is possible to approximate as shown in Fig. 3.

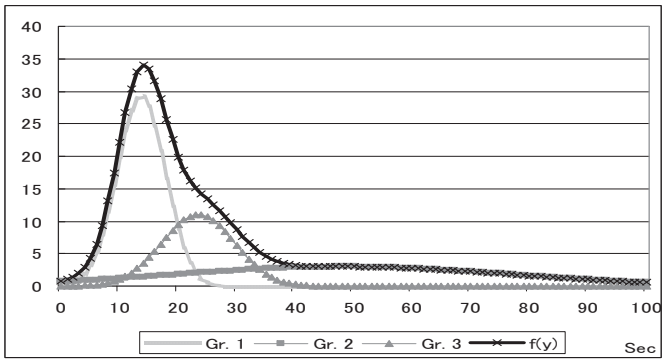

Figure 3. Superposition of 3 normal distributions (f(y))

VI. TIME SERIES CHANGE

This Web system gradually increases the average of the inspection time as shown in Fig. 4.

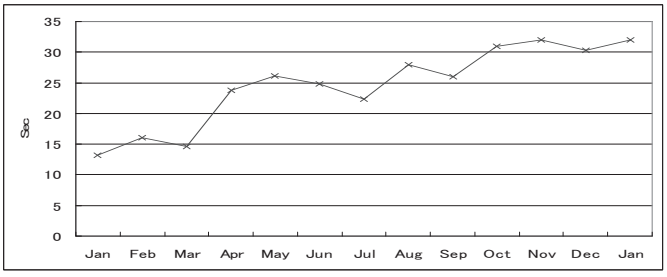

Figure 4. Change in average of screen inspection time

The browsing time g(y) and Superposition of 3 normal distributions f(y) of each month are shown in Fig.5 - Fig.17.

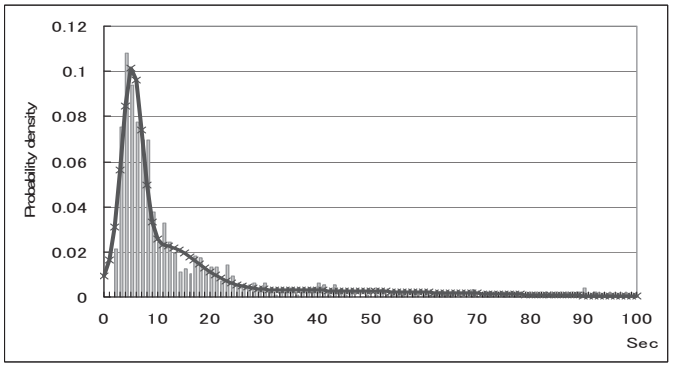

Figure 5. Browsing time g(y) and f(y) in Jan.

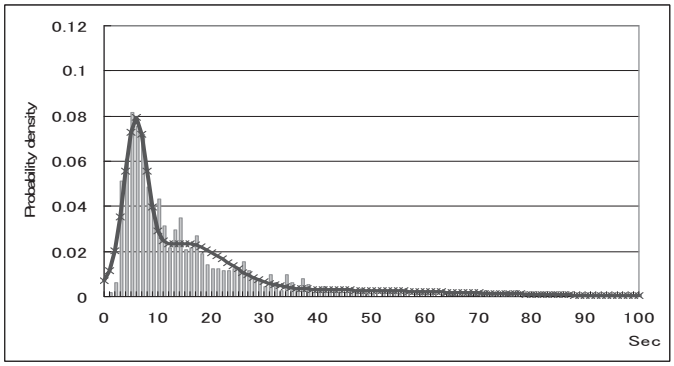

Figure 6. Browsing time g(y) and f(y) in Feb.

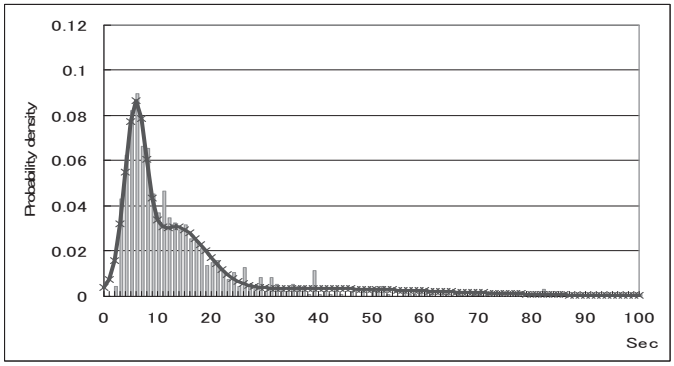

Figure 7. Browsing time g(y) and f(y) in Mar.

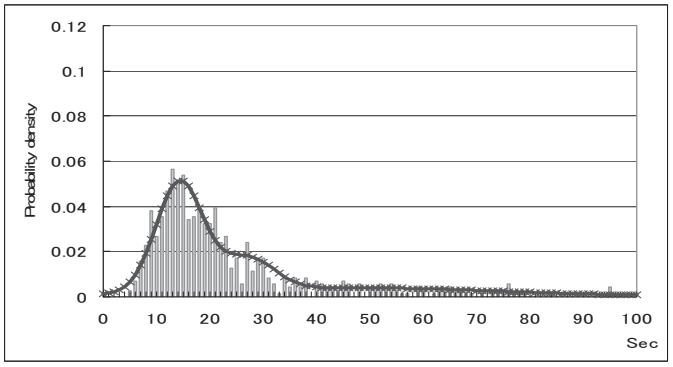

Figure 8. Browsing time g(y) and f(y) in Apr.

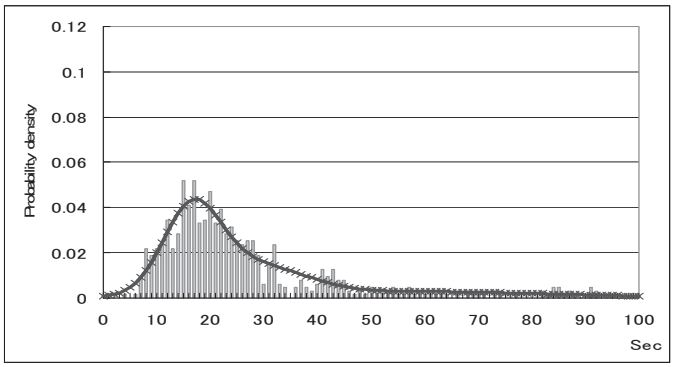

Figure 9. Browsing time g(y) and f(y) in May.

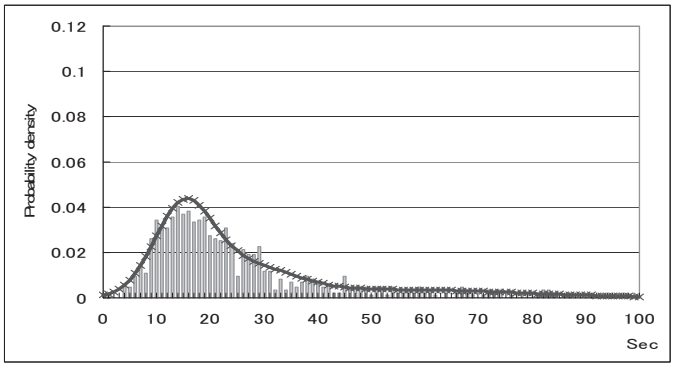

Figure 10. Browsing time g(y) and f(y) in Jun.

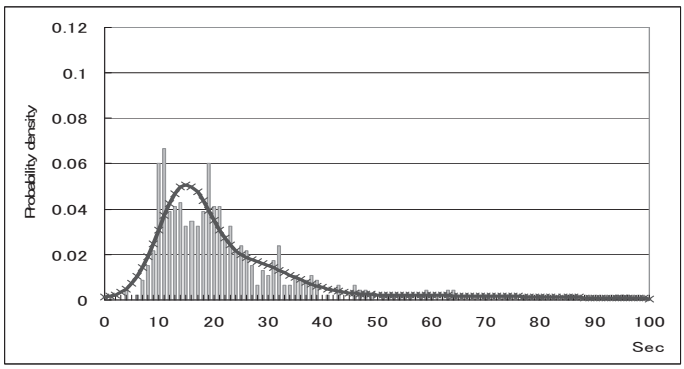

Figure 11. Browsing time g(y) and f(y) in Jul.

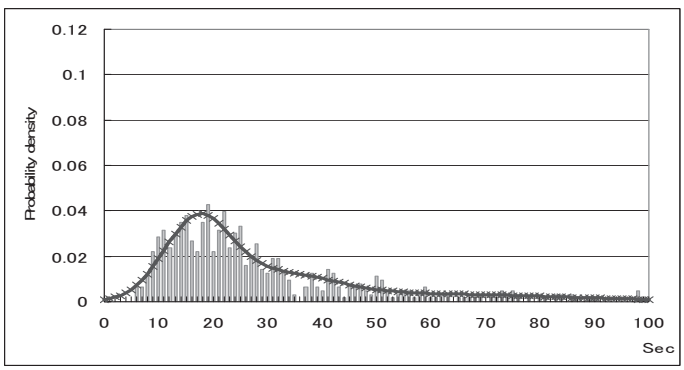

Figure 12. Browsing time g(y) and f(y) in Aug.

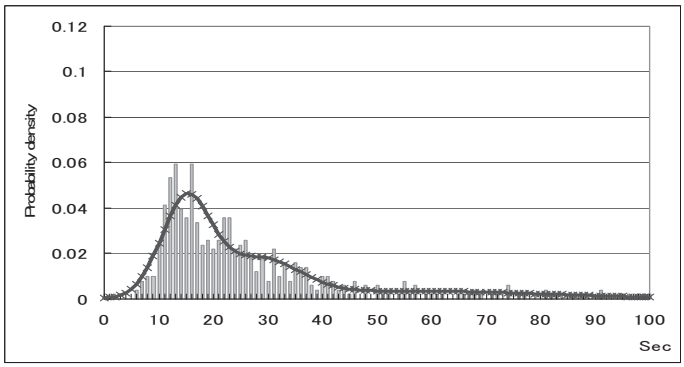

Figure 13. Browsing time g(y) and f(y) in Sep.

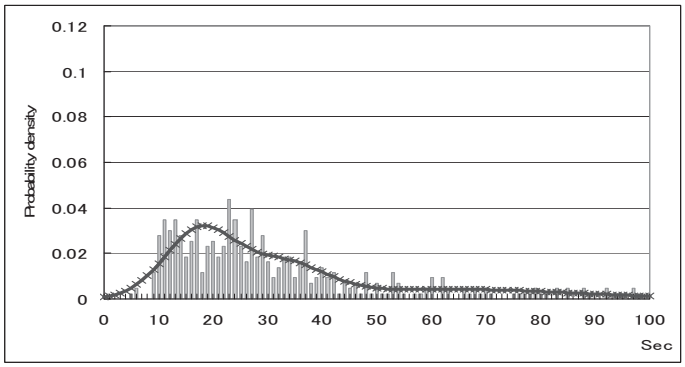

Figure 14. Browsing time g(y) and f(y) in Oct.

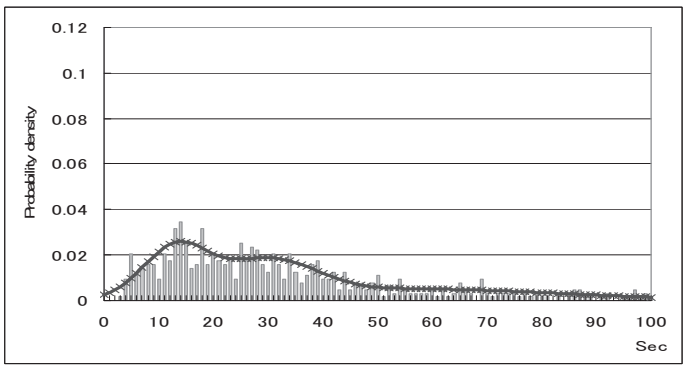

Figure 15. Browsing time g(y) and f(y) in Nov.

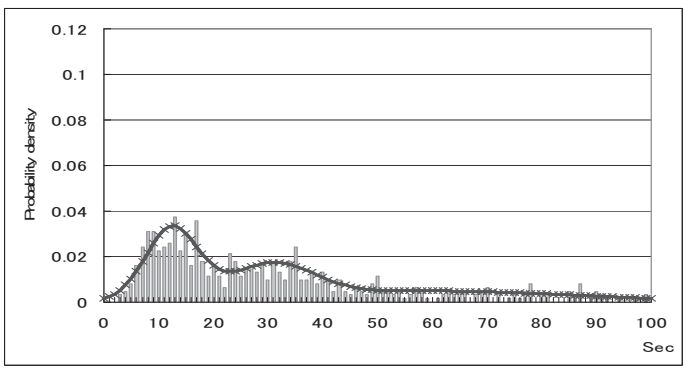

Figure 16. Browsing time g(y) and f(y) in Dec.

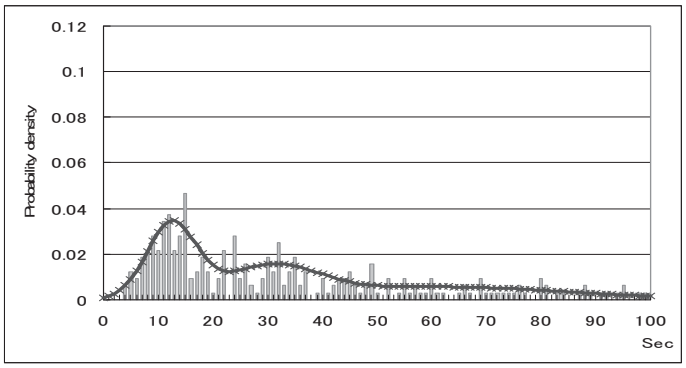

Figure 17. Browsing time g(y) and f(y) in next Jan.

f(y) every month of this period was obtained. The average and distribution of the inspection time of each group have changed as shown in Fig. 18 and Fig.19.

It was clarified by this analysis that it was group 2 that increased the average of the inspection time.

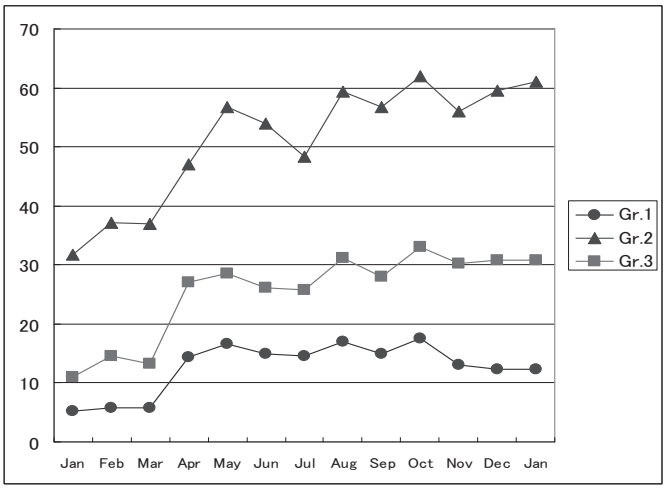

Figure 18. Time series of average

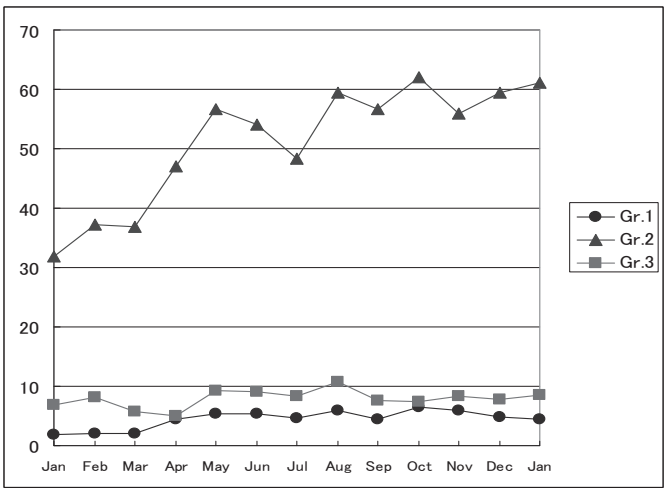

Figure 19. Time series of distribution

The ratio(α_i) of each group has changed as shown in Fig.20.

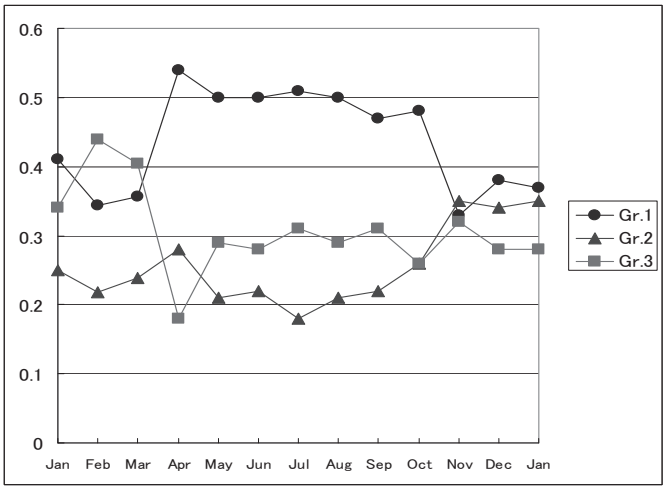

Figure 20. Time series of ratio

It is thought that the ratio of groups changed by changing some systems. The change in the method of operating the system is done in April. Moreover, the change in the user interface is done in November. It is thought that these influences have been received.

VII. CONCLUSION

The service engineering aims to feed back user's satisfaction rating to the system. This research paid attention at the inspection time of the user of the Web system. As a result, user's group was able to be extracted from the distribution of the inspection time. It is thought that this can be used to measure user's satisfaction rating.

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