

Assessing the Impact of User Interfaces to the Usability of a Clinical Decision Support System

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Background

In a clinical decision support system (CDSS), the outcome of the system is related to the user interface directly. A successful CDSS should offer an efficient user interface to clinicians in order to get the most proper consultation results. This study is to assess the impact of user interface to the usability of CDSS.

Two different types of input user interfaces were integrated into a well-established CDSS, namely, keyword-based interface and menu-based interface. The operating time of each interface was assessed, and the efficiency of the interfaces, effectiveness of the systems, and enjoyment of the users were also evaluated for degree of usability¹.

System Design

Two kinds of user interfaces, keyword-based and menu-based, were designed and integrated into a well-established web-based CDSS for infectious diseases², which is now used officially by the Center for Disease Control³ in Taiwan to support diagnosis on infectious diseases for primary practitioners. Two groups of clinicians (n=8), divided as board-certified specialists and non-specialists, were randomly assigned to log into the system to use different user interface by the system. Twenty test cases were abstracted from the real patient records. A background operation recorder was used to record the operating time of each consultation, which reflects the efficiency of the interface. The process is shown in Figure 1. A questionnaire was filled by each clinician to evaluate their perception on the efficiency of the interface, effectiveness of the system that represents the diagnostic consistency, and enjoyment of using the system. The results were collected and analyzed with two-way Analysis of Variance (ANOVA).

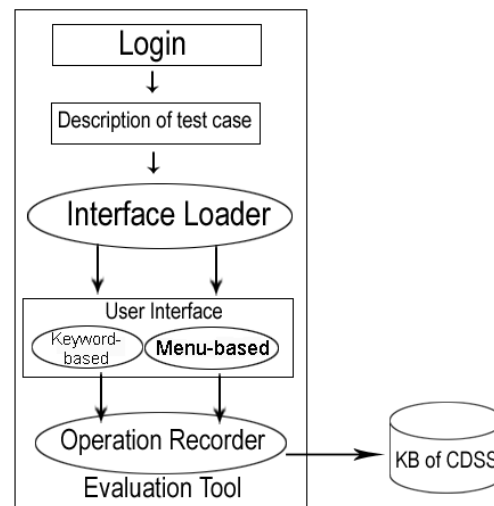


Figure 1. The flow chart describes the steps of the evaluation process using two different user interfaces.

Results

As for the efficiency of the interfaces, keyword-based was superior to the menu-based one across all clinicians both in terms of operating time (p=0.036) and personal preferences. There is no statistical significance between two interfaces in the effectiveness of the system. The specialists preferred keyword-based interface in the aspect of enjoyment of using the system. This result contributes the function of user interfaces in the different type of CDSS.

References

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