

Table 4 Identified examples of usability problems according to violated heuristics and potential errors

Heuristic	Examples of usability problems	Potential errors on users
Visibility of system status	1. Lack of the horizontal scroll bar in presentation of patients search information. 2. Unspecified hierarchy under windows. 3. Not giving a message to user when selecting invalid information for the patients.	Fatigue User confusion Waste of time Dissatisfaction
Match between system and real world	1. Nonidentical order of displayed tests on the computer and on the printed results sheet. 2. The pop-up message and the actual task executed.	User confusion Waste of time Incorrect data entry Failure of quality of care Risk patient safety
User control and freedom	1. Inaccessibility to the previous or next windows. 2. Inability to remove a sample in the delivered samples section	Fatigue User confusion Incorrect data entry Waste of time
Consistency and standards	1. Lack of a consistent standard for displaying the window titles (Farsi/English/No Title). 2. Inconsistent application of highlighting techniques (like bolding text). 3. Different information display for test orders.	Hesitate Fatigue Dissatisfaction
Help users recognize, diagnose and recover from errors	1. Including the serial number of patients insured by the Armed Forces Insurance Organization is a requirement. 2. Failure to record number results in inappropriate message reading: 'no match found in the patient search'	User confusion Reduce performance Slow down Waste of time Error in performance
Error prevention	1. Failure to prevent the entering of wrong data. 2. Allowing the users to enter numerical data in letter fields.	User confusion Incorrect data entry User confusion Waste of time Incorrect data entry Failure of quality of care Risk patient safety
Recognition rather than recall	1. Inability to identify the functions of the existing items on the previous orders of the patient and the abbreviated name field in the test orders window. 2. Separated and scattered insurance data.	Slow down Dissatisfaction Fatigue
Flexibility and efficiency of use	1. Inability to magnify windows. 2. Lack of settings to accommodate user preferences (colour, font, window size, and customization of the program). 3. Invisibility of the titles of patient information columns. 5. Inability to print the test fees or perforating (the users have to manually write down the test fees one by one on the prescription).	difficult to work Fatigue Dissatisfaction Hesitate Reduce performance
Aesthetic and minimalist design	1. Application of small font size. 2. Bad colours (overly light-coloured text). 3. Crammed information on the test orders page. 4. A large load of information in advanced search results	Fatigue Slow down Dissatisfaction
Help and documentation	1. Absent or inaccessible program Help (including help buttons, and descriptive, procedural, interpretational, and navigational info).	User confusion Waste of time Reduce performance Error in performance