

Chapter 11

User Acceptance Test

The OncoSys has been designed and developed as per the requirement identified from the Oncologists and also tested for its acceptance among them. This chapter deals with the test of acceptance of OncoSys among Oncologists in terms of User interface, Decision Support Interface, Documentation Interface and Statistical Interface.

11.1 Introduction

Clinical Decision Support System plays a vital role in providing care and services to the patient suffering from the disease. The acceptability and sustainability of these applications largely depends on the satisfaction of end users with the system. The end user satisfaction can only be measured by conducting an acceptance test where the end users are asked to go through the application and provide feedback in terms of its features and functionality. The test is conducted to determine if the requirements of specifications are met [126]. It is usually a black box testing that focus on usability and functionality rather than the technical attributes. [127]

11.2 Purpose

User acceptance testing (UAT) is usually conducted to determine whether the software both deliverables and non-deliverables function are successfully together in an organizational setup and fulfilling the user expectations as defined in the functional specifications. In short, the acceptance testing check that the system delivers what is requested. [128]

11.3 Phases of User acceptance Test

It is generally assumed that the system must have undergone unit, integration and system testing but conducting a user acceptance test generally be a good idea where the system can check against the user requirement [129].

The following phases are considered to perform a user acceptance test:

1. User Acceptance Test Planning

- The strategies for successfully conducting the acceptance test
- It describes the key focus areas, entry and exit criteria.

2. Designing UAT test cases

- Helps the execution team to test the application thoroughly and to ensure that UAT provides coverage to all scenario.

3. Selecting a Team that execute UAT test cases

- Select a team to execute the system in a proper manner.
- The team comprises of real world users and the actual users who are going to use the system

4. Executing test case

- Team execute the test and also perform if any additional random test is required and team log their comment if any issues identified during the process.

5. Documentation

- Documenting the defect found during the acceptance testing.

6. Resolving the issue/Bug Fixing

- The issues are discussed and resolve with the mutual consensus and to the satisfaction of end users.

7. Sign-Off: After UAT and resolution of issues it is generally indicate the acceptance of application among end users.

Figure 11.1: Phases in User Acceptance Test

11.4 User Acceptance Test for OncoSys:

OncoSys is designed and developed with the objective to support the oncologists in quality decision making during the patient care. The inclusion of end user expectation and requirement into the system always creates an ownership among them about the system. Similar process was performed in case of OncoSys where the requirement and expectation of oncologists were identified during the survey and the same were incorporated into the system during the design and development of OncoSys.

A User Acceptance Test was conducted to ensure whether the application is satisfying the expectations and requirements of Oncologists identified during the time of survey. A team of experts from the Oncology were asked to screen-out the OncoSys and provide appropriate feedback for the further improvement.

Following steps are being performed to conduct User Acceptance test:

11.4.1 Installation of the OncoSys on Intranet

The OncoSys was installed on the Central Server and linked to the intranet to ensure that the application is accessible to all Oncologists at their respective location i.e. Medical Oncology, Surgical Oncology and Radiation Oncology.

11.4.2 Demonstration of OncoSys to the Oncologist

The OncoSys was demonstrated to the Oncologist where the detailed features, functionality and use of OncoSys related to Patient Database, Search Engine, Knowledge base, Case Base and Statistical Analysis were explained to them. The experts were asked whether the features and functionality of the system

satisfies their requirement in terms of retrieval and access of patient information and domain knowledge. The experts agreed that the system satisfies their expectations and requirements and can completely support in quality decision making during patient care and evaluation. In addition to this a user acceptance tool was distributed to the experts to rate the interface of OncoSys in terms of Users, Decision Making, Documentation and Statistics.

11.4.3 Collection of feedback to determine the acceptance level of OncoSys

The Oncologists were asked to mark their response on a 5-point Likert Scale and mention their requirement if system lacks in providing patient information and domain knowledge in clinical decision making during patient care and evaluation.

11.4.3.1 User Acceptance related to the User Interface

A total of 16 Oncologists were asked to rate the features of the application and determine whether their requirements, specified during the survey, are met. Table.11.1 represent the response of oncologist with respect to the user interface of OncoSys. The mean score represent their level of acceptance towards the acceptance of OncoSys. The result revealed that they were highly satisfied with the user interface and felt that user interface is friendly, supportive, logical, consistent, helpful and easy to use. They also felt that implementing OncoSys would be wise for them and hospital. They intended to use the system in case of doubt during patient care and evaluation.

In comparison with the existing workflow pattern they felt that the OncoSys can greatly reduce their time in access and managing of patient information.

User Interface features of OncoSys	N=16					
	SD	D	N	A	SA	Mean Score
Amount of information displayed on each module is adequate	0	0	0	12.5%	87.5%	4.88
Arrangement of information displayed on the screen is logical	0	0	0	18.8%	81.2%	4.81
Sequence of the screen is very clear	0	0	0	37.5%	62.5%	4.62
Arrangement of the information displayed on the screen is logical	0	0	0	31.2%	68.8%	4.69
Use of medical terminologies throughout the system are consistent	0	0	0	25%	75%	4.75
Message appears on screen is consistent	0	0	0	37.5%	62.5%	4.63
Instruction for correcting error is clear	0	0	0	43.8%	56.2%	4.56
Error messages prompt out on the screen is helpful	0	0	0	31.2%	68.8%	4.69
Error message always clarified the problem	0	0	0	6.2%	93.8%	4.94
Learning to operate OncoSys is easy	0	0	0	18.8%	81.2%	4.81
Response time for most of the operation is fast	0	0	0	12.5%	87.5%	4.88
Feedback on the completion of sequence of step is clear	0	0	0	25%	75%	4.75

OncoSys is easy to use	0	0	0	25%	75%	4.75
Using OncoSys is good idea	0	0	0	25%	75%	4.75
OncoSys is a wise implementation	0	0	0	18.8%	81.2%	4.81
I intended to use it in case of doubt	0	0	0	12.5%	87.5%	4.88

Note: **SA**= Strongly Agree, **A**= Agree, **N**= No Opinion, **SD** = Strongly Disagree, **D**=Disagree

Table 11.1: User Interface Feature of OncoSys

Table.11.2 represent the responses of Oncologists related to the decision making interface of OncoSys.

Implementation of OncoSys will assist me in:	N=16					
	SD	D	N	A	SA	Mean Score
Clinical decision making by providing various clinical knowledge	0	0	0	25%	75%	4.75
Making correlating patient condition with available clinical knowledge	0	0	0	43.8%	56.2%	4.56
Timely access of patient data and domain knowledge	0	0	0	37.5%	62.5%	4.63
Updating the clinical knowledge of healthcare team	0	0	0	6.2%	93.8%	4.94
Promptness of problem solving with access of clinical knowledge	0	0	0	18.8%	81.2%	4.81

Note: **SA**= Strongly Agree, **A**= Agree, **N**= No Opinion, **SD** = Strongly Disagree, **D**=Disagree

Table 11.2: Decision Making Interface of Oncosys

They were questioned mainly related to the support of OncoSys in quality decision making in cancer care. From the mean and percentage score, it is evident that the Oncologists were highly satisfied with the support of OncoSys in updating their clinical knowledge and utilization of it in promptness of problem solving.

Implementation of OncoSys will assist me in:	N=16					
	SD	D	N	A	SA	Mean Score
clinical coding and documentation	0	0	0	0%	100%	5.00
Generate variety of statistical analysis	0	0	0	31.2%	68.8%	4.81
Following test results over time easier	0	0	0	18.8%	81.2%	4.69
Improving communication and collaboration	0	0	0	12.5%	87.5%	4.88
Easy Data retrieval	0	0	0	6.2%	93.8%	4.94
Interdisciplinary communication	0	0	0	12.5%	87.5%	4.88
Reducing the duplication of work	0	0	0	18.8%	81.2%	4.81
Enhancing coordination of care	0	0	0	12.5%	87.5%	4.81
Improving the productivity of the hospital	0	0	0	18.8%	81.2%	4.81
Enhancing evidence based practice	0	0	0	25%	75%	4.75

Note: SA= Strongly Agree, A= Agree, N= No Opinion, SD = Strongly Disagree, D=Disagree

Table 11.3: Documentation and Statistics Interface of Oncosys

They agreed to the fact that the search engine and knowledge base will assist them in searching the best evidence and to create a warehouse of knowl-

edge. They also felt that the patient database will provide them the real time, up-to-date and relevant information related to the clinical event of patient care.

When the Oncologists were asked to rate their level of acceptance of OncoSys in documenting patient's demographic and clinical data and generating various statistical analysis, all of them felt that the content of the module will definitely support them in this. They agreed that implementation of OncoSys will help them in maintaining complete, accurate, adequate and timely data coupled with easy retrieval and dissemination of information during cancer care. The automated ICD-Oncology-3rd Version and AJCC TNM Cancer Staging impressed the Oncologists during the acceptance test. They were found to be highly satisfied and felt that the implementation of OncoSys will greatly reduce their time in managing patient's information. They agreed on the fact that the statistical analysis module will contribute in generating variety of statistical data for health research, reporting, conducting various cancer control and prevention programs. The OncoSys will, in general, help in enhancing their productivity and also will contribute greatly to the evidence-based practice.

All Oncologists felt that the system has all the features to support them in quality decision making and should be implemented in all the hospitals.

They expected to have the same system for other kind of cancers such as Head & Neck, Oral, Lung, etc. The scaling of OncoSys has been considered as a future work by the investigator.

11.5 Conclusion

User Acceptance Test was conducted to determine the level of acceptance of end users towards OncoSys. The result of the user acceptance test of the OncoSys indicated that the Oncologists looked very enthusiastic towards the implementation of the application in their practice. They felt that the expectation identified during the survey are met and the system will completely support them accessing instant patient information and domain knowledge for quality decision making during patient care.