

FAMU/FSU College of Engineering

Department of Electrical and Computer Engineering

Functional Decomposition

Team 304: FPL ATS Training Application

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Introduction

Functional decomposition is an important design concept that allows a system to be broken down into its simplest components. Each of the overall system functions are recursively broken down until component level is reached. To better understand the decomposition of the project, a function tree, an analysis of the decomposition levels and a summary of the functional behavior of each module was conducted. The overall purpose of the product being developed is to virtually train Florida Power & Light employees on troubleshooting and performing maintenance on an Automatic Transformer Switch. The overall purpose of the product along with the customer needs provided most of the initial modules that were then decomposed through completion.

Functional Decomposition Cross-Reference Table

Table 1:

Level 0	Training							
Level 1	Educate the User							
Level 2	Inform user of ATS hazards and warnings	Display Virtual model of ATS			Instruct user of proper maintenance procedures		Instruct user of proper troubleshooting procedures	
Level 3	Display all necessary hazard information	Inform user of ATS functionality and components			Define situation in which maintenance is required	Demonstrate proper steps to be taken	Define situation in which troubleshooting is required	Demonstrate proper steps to be taken
Level 4		Identify ATS components	Explain functionality of each	Demonstrate executing various functionalities				

Table 1 Continued:

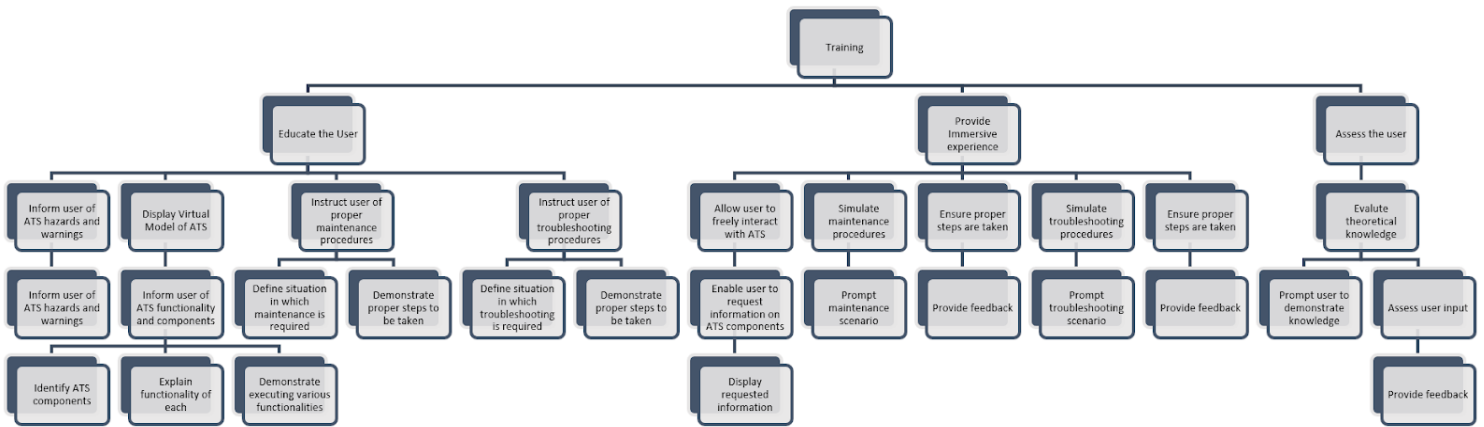
Level 0	Training continued								
Level 1	Provide Immersive experience					Assess the user			
Level 2	Allow user to freely interact with ATS	Simulate maintenance procedures		Simulate troubleshooting procedures		Evaluate theoretical knowledge		Evaluate practical knowledge	
	Enable user to request information on ATS components	Prompt maintenance scenario	Ensure proper steps are taken	Prompt troubleshooting scenario	Ensure proper steps are taken	Prompt user to demonstrate knowledge	Assess user input	Prompt user to demonstrate knowledge	Assess user input
Level 3	Display requested information		Provide feedback		Provide feedback		Provide Feedback		Provide Feedback

Table 1 Continued:

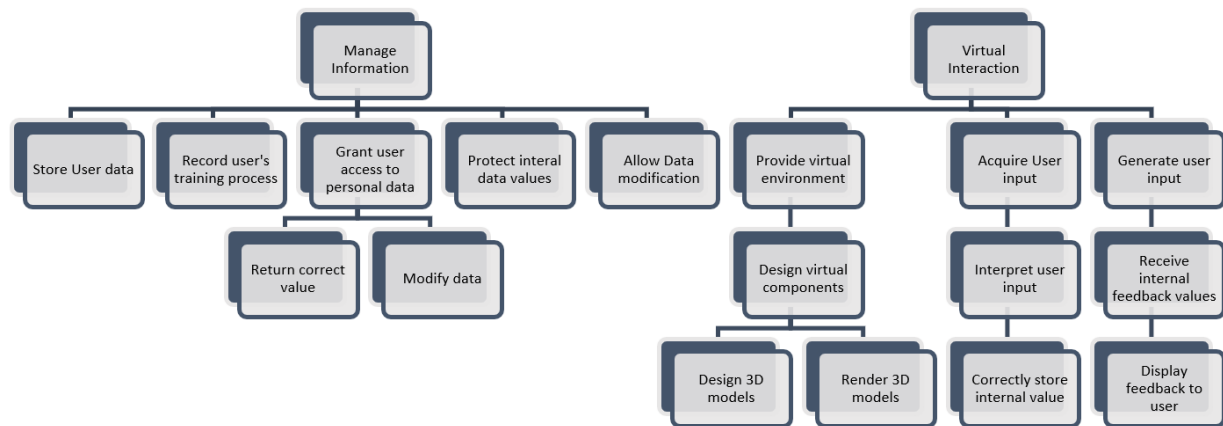
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Function Tree

Graph 1:



Graph 1 continued:



Decomposition levels

Level 0:

Table 2

Module	Training
Input	Information: Information about the ATS that can be viewed by the user.
Output	Display: Show all relevant information about the ATS, display instructions
Functionality	Design a training application that will train workers in how to perform maintenance on the ATS

Table 3

Module	Manage Information
Input	Store: answers given during the training simulation.
Output	Display: display the information and answers the user had during the simulation and display the overall score
Functionality	To store and display the information that is given during the training simulation to allow the company Florida Power to know which user passed the training simulation.

Table 4

Module	Virtual Interaction
Input	Design: Design of ATS, store user input
Output	Display: Render of the ATS, and displays Information about the ATS
Functionality	Design a virtual ATS that can be interacted with the user and can show all the relevant information that all the users will need .

Integration

Table 5

Integration	Description
Training-Virtual Interaction	Virtual Interaction and Training integrate through how the user interacts with the ATS. Virtual Interaction will display information that is needed in the training section
Manage Information-Training	Through the training section the information that is needed will be recorded that is important for the manage information section

Summary

The functional decomposition was derived from the needs and requirements that we derived for our customer. The general needs and requirements were able to provide us with broad overall functions that could then be broken down into multiple sub functions until a component level function is reached. The main overall functions that we decomposed in our function tree consist of training, managing information, and virtual interaction. These three functions are extremely similar to the customer needs and provided a great starting point for the decomposition. The functions were broken down until simple input/output redirection was reached. Displaying or returning extremely basic values back to the user constitutes as component level for software development and does not need to be further decomposed.