

CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

Visualization is a representation of an explanation, orders, etc. by using text, images, numbers, maps, and charts. In the education world, visualization media can facilitate students in learning process. Visualizations can be created with JavaScript and HTML5 programming languages. HTML5 has a library called canvas that can be used to draw objects.

Linked list is a data structure that contains a data set called nodes which are arranged sequentially and interconnected. Linked list have two type that are singly linked list and doubly linked list. Single linked list only have the next pointer, while doubly linked list have two pointers which are next pointers and prev pointers. The next pointers is use to connect the next node, and prev pointer is use to connect previous node. It is used to make linked list's operation easier to do.

Linked list is one of the learning materials in informatics engineering. Many students have difficulty in studying linkedlist autodidact. Therefore, visualization media is needed to facilitate the linkedlist learning.

This application will create visualization linked list. In this application have many facilitate, there are add, delete, search, sort, and count the number of node. If the linked list only have one node, then those node is called head and tail. But if the first node in linked list is called head and the last node in linked list is called tail.

4.2 Desain

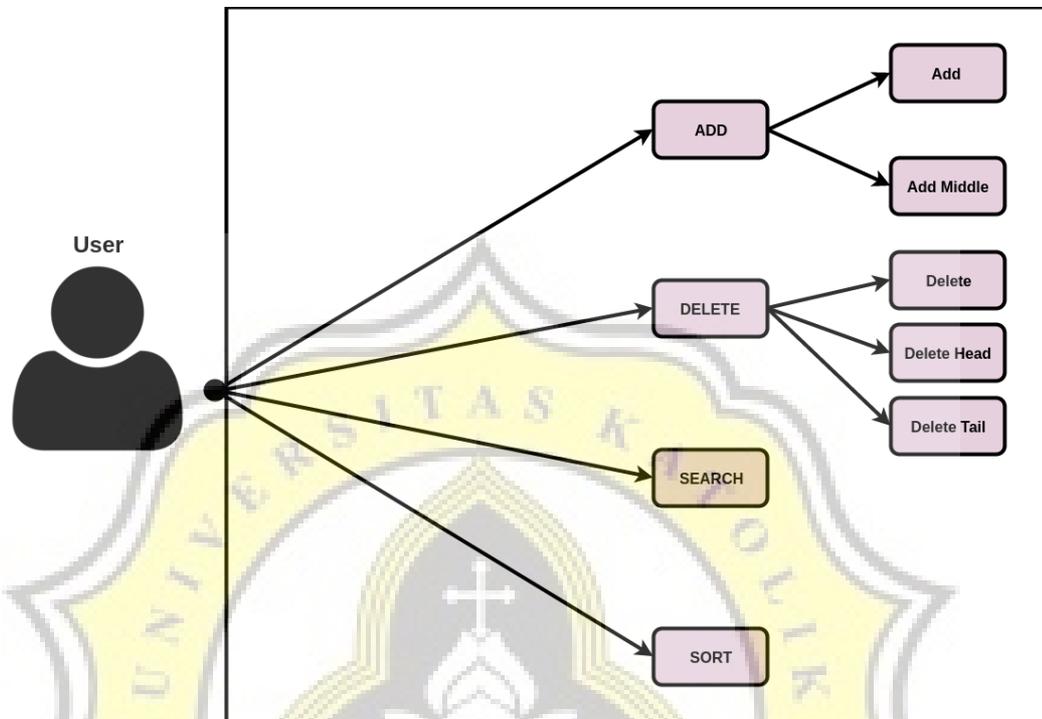


Illustration 4.2.1: Use Case

The use case diagram above show that this application have four main menus, there are add, delete, search, and sort. In add menu, there are two submenu, add tail and add middle. Illustration 4.2 below shows flowchart for the add process.

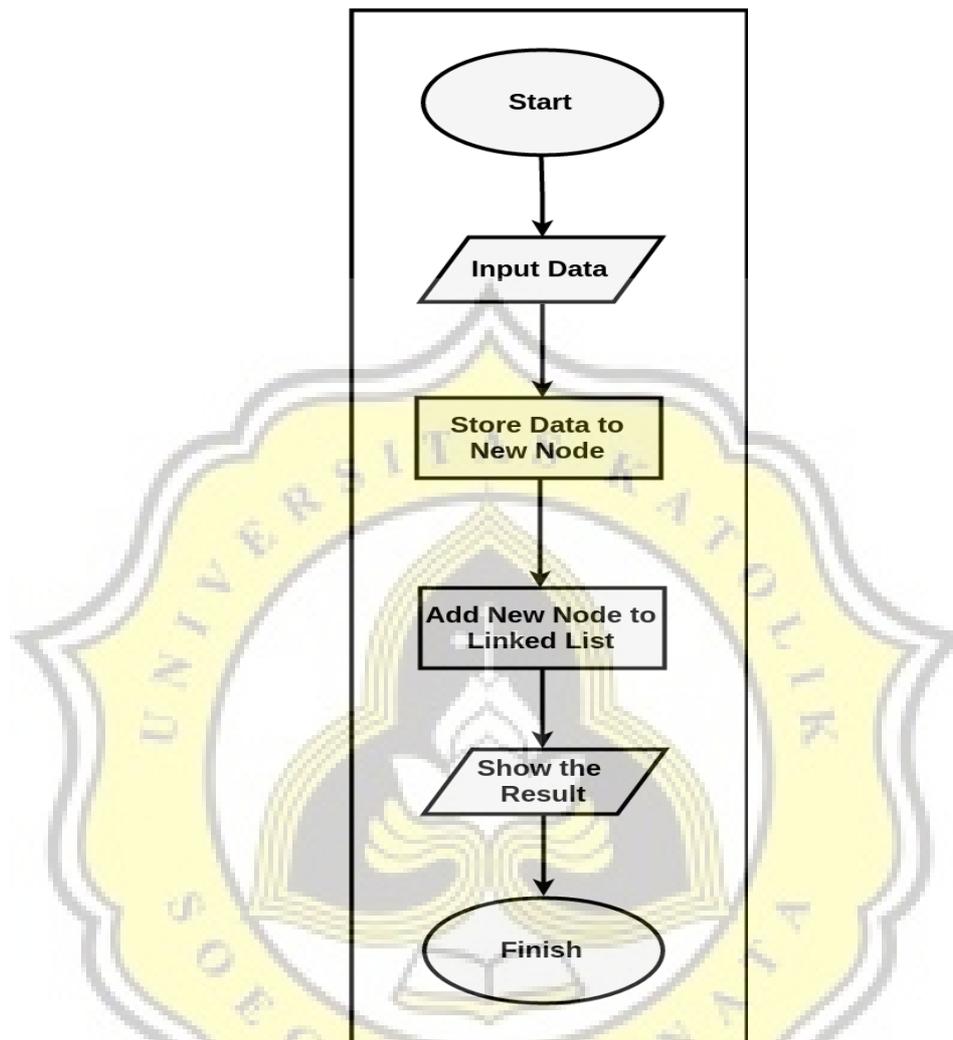


Illustration 4.2.2: Add

In add menu, user input data that want to be stored in linked list. After the data have already store in node, then the node will be added to linked list and the application will show the result. The second submenu is add middle, in this menu this application will add data to the desired location.

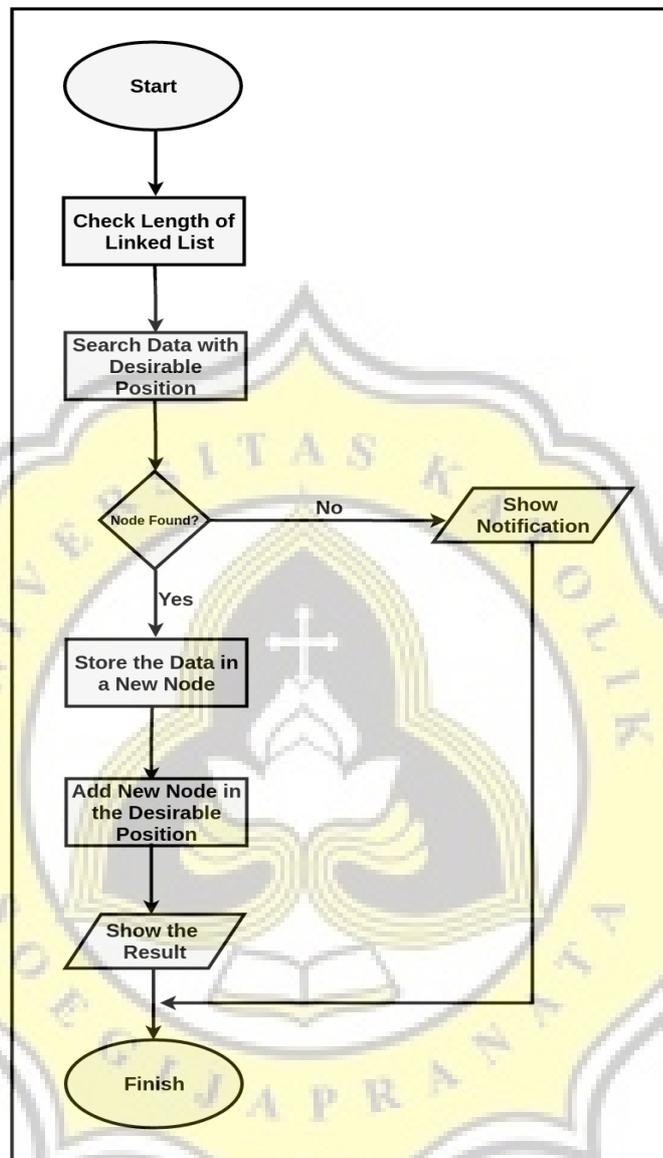


Illustration 4.2.3: Add Middle

From the illustration above that show the first step to add middle is check length of the data, then this application will search the data with desirable position. If the data is found, then this application will be add new node in desirable position. After the data is stored in linked list then this application will be show the result. But if the data is not found, then this application will not add new node in linked list.

The second menu from this use case is delete menu, the delete menu have three submenu there are delete, delete head and delete tail. The first step in delete menu is the user will input data that will be delete. After that this application will be search the node according to the data. If the node is found then this application will be delete all the data that have same data with the data that user input before and show the result. But if the node is not found then this application wouldn't delete any data. This illustration below will show the delete flowchart.

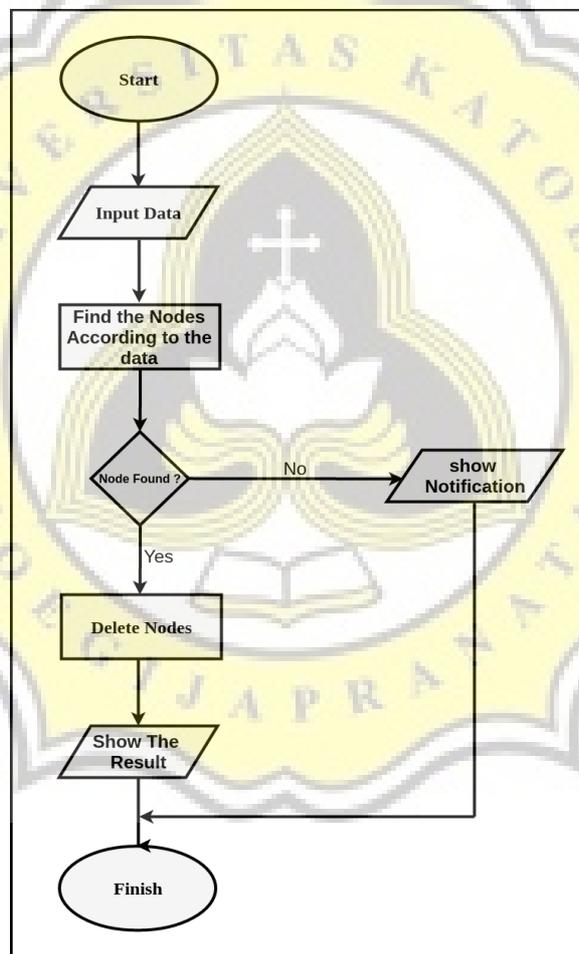


Illustration 4.2.4: Delete

The second submenu in delete menu is delete head and the third submenu is delete tail. The first step from those menus is this application will be check the data in linked list. Then if the menu that choosen is delete head then the head from this linked list will be deleted, but if the menu that choosen is delete tail then the

tail from this linked list will be deleted. In illustration 4.5 will be show the delete head flowchart and in illustration 4.6 will be show the delete tail flowchart.

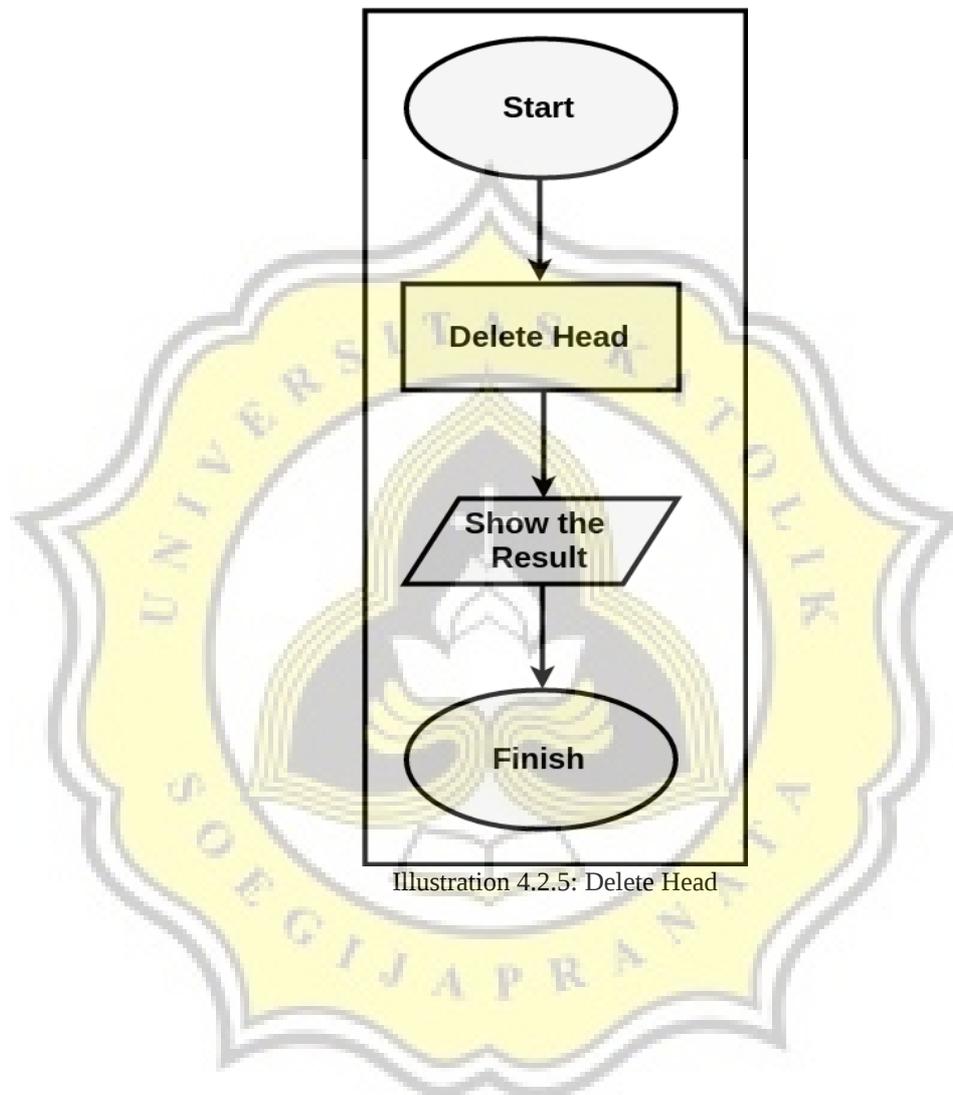


Illustration 4.2.5: Delete Head

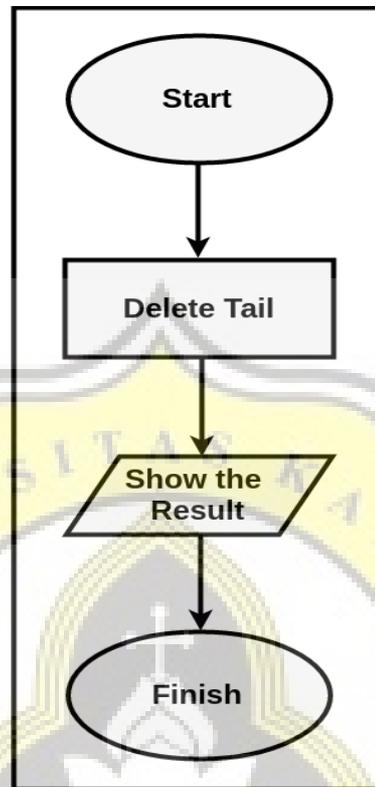


Illustration 4.2.6: Delete Tail

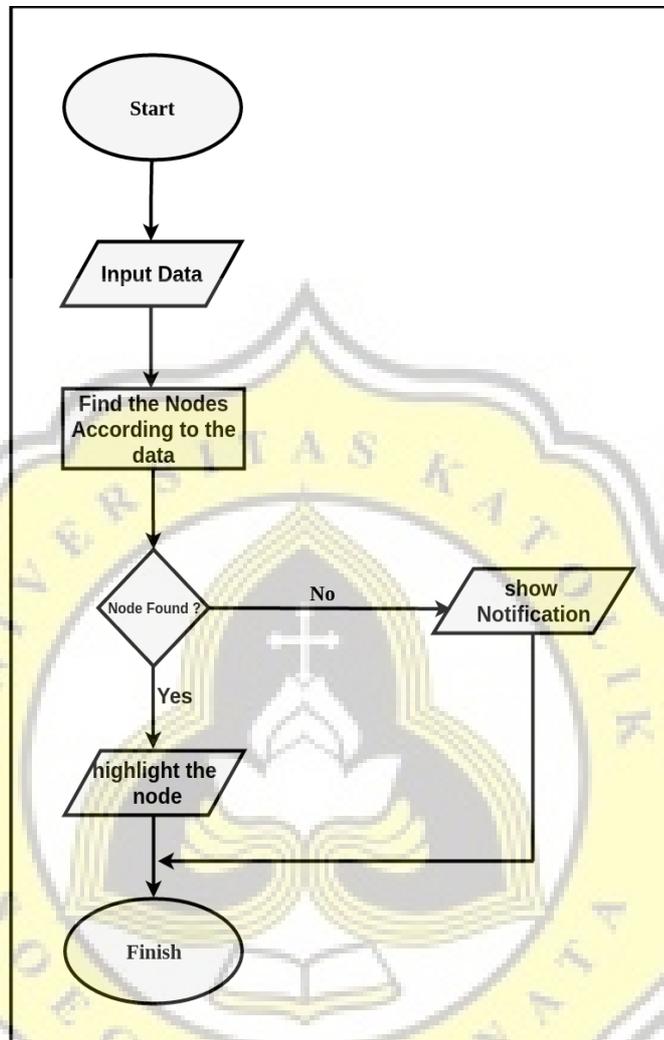


Illustration 4.2.7: Search

In illustration above is show the search flowchart. First step to run the search menu is the user input the data that will be search, after that this application will find the node according to the data that user input before. If the data is found then this application will highlight the node that searching for. But if the data is not found this application will show notification that data is not exist.

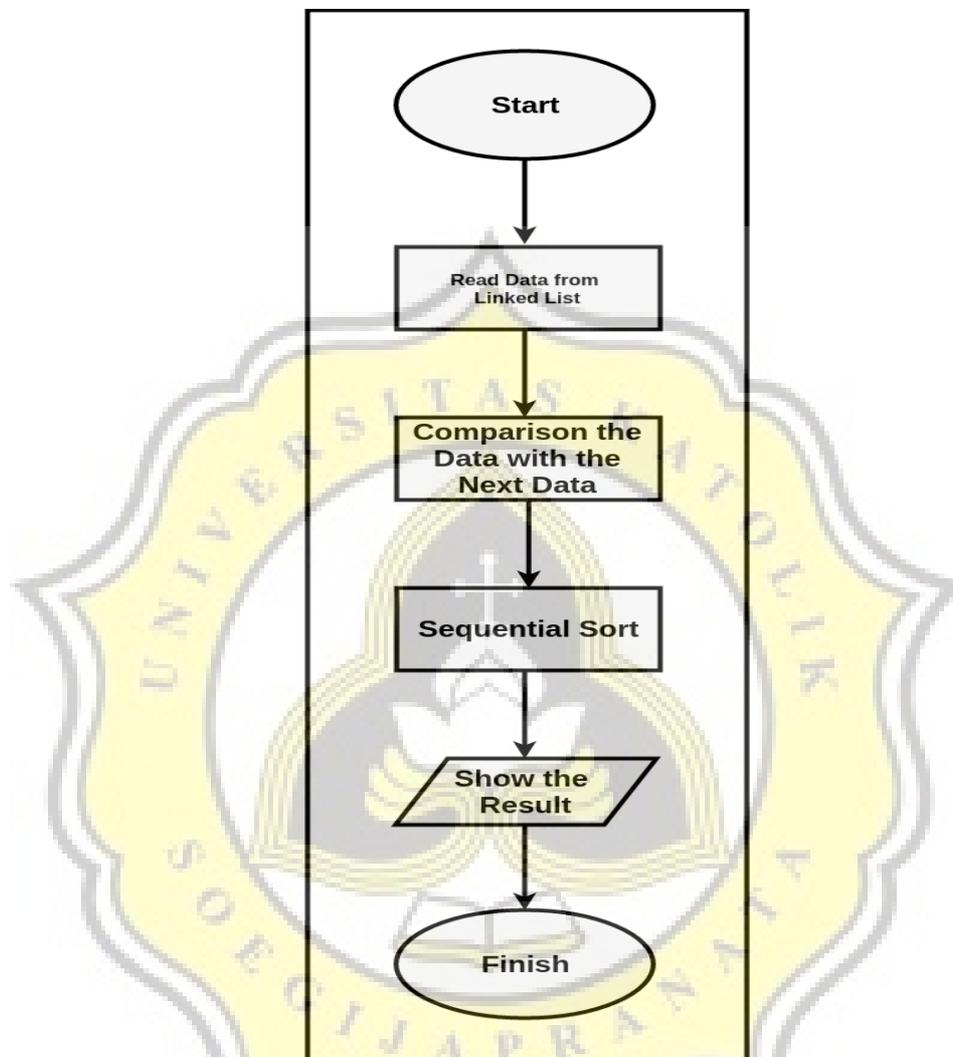


Illustration 4.2.8: Sort

In illustration above is show the sort flowchart. First step to sort the data in linked list is this application will check the data in linked list, after that the data will be comparison with the next data. If the data is bigger than the next data, then the data will be swapped. But if the data is smaller than the next data, then the data will be check and compare the next data. After the data have already sort, then this application will show the result.