Introduction to Software Engineering

PCTrack

By:
Nikhil Aggarwal & Sakaar Khurana
Department of Computer Science and Engineering,
Indian Institute of Technology, Kanpur

About PCTrack

It is a **windows Desktop application** that will keep track of all the activities user perform on his desktop/laptop and log them so that user could analyze how he spent his time on computer and how efficiently he managed his time.

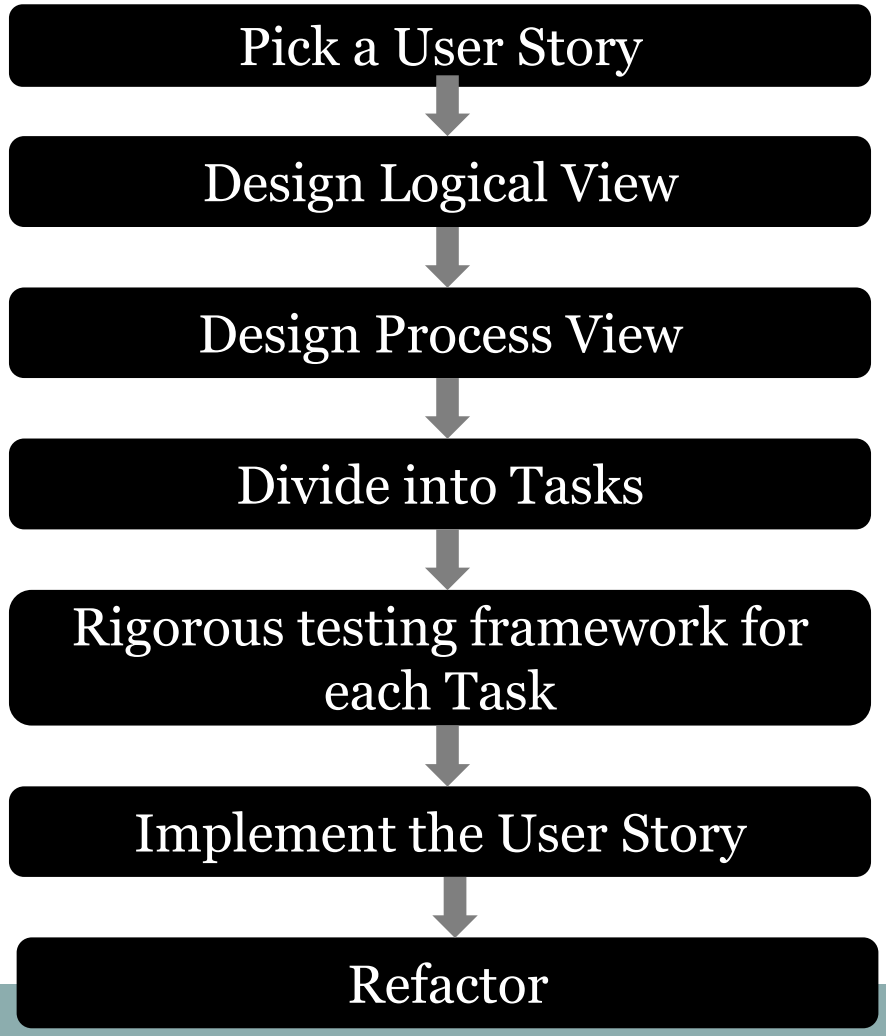
About PCTrack

Various Features:

- Start automatically at startup in background
- Password protection of user log
- Separate log for separate users
- Pause the application
- Editable logs
- Efficient use of resources
- Detects when computer is idle
- Efficiently manage frequently switching between processes
- User interface to analyze the log based on time and task

PROCESS BY US

- Extreme programming



Using XML for Storing Data

We are using XML to store data. Reason been:

- Amount of data to stored is very less
  - Less than 5MB for a year
- Our Data is hierarchical in structure
- Queries are less
- Ideal for sending data across applications

Log will be saved in three steps:

1. First temp files
2. Temp files processes to secondary files
3. Secondary file processes to final log files

USER STORIES

***As a** user, **I want** the application to run in background on Windows startup.*

***Scenario 1**: Background*

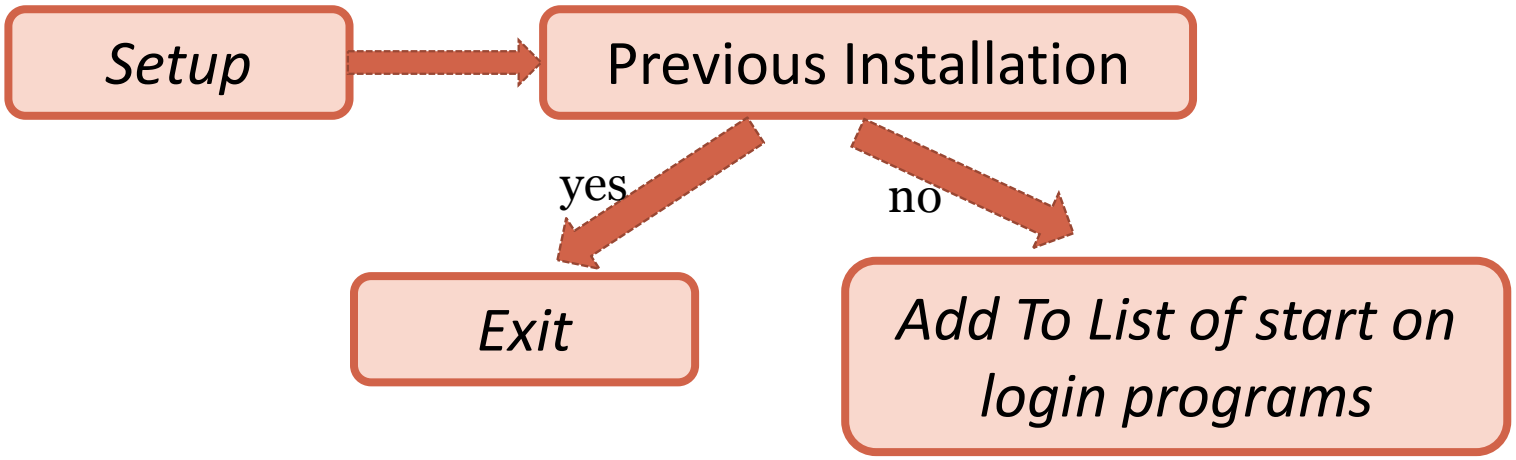
***Given** I have application installed on PC*

***When** I start the PC*

***Then** application automatically starts in background and starts logging the activities.*

Logical View

Process



Testing: Manual Testing

Implementation: Done

USER STORIES

***As a** user, **I want** to get log of time spent, so that I can analyse and keep track of my activities on PC.*

***Scenario 1**: Time Log*

***Given** I has spent some time on PC after installation of application*

***When** I Start the application and open the logs*

***Then** I get a chronological list of activities and time spent on each of them for that day.*

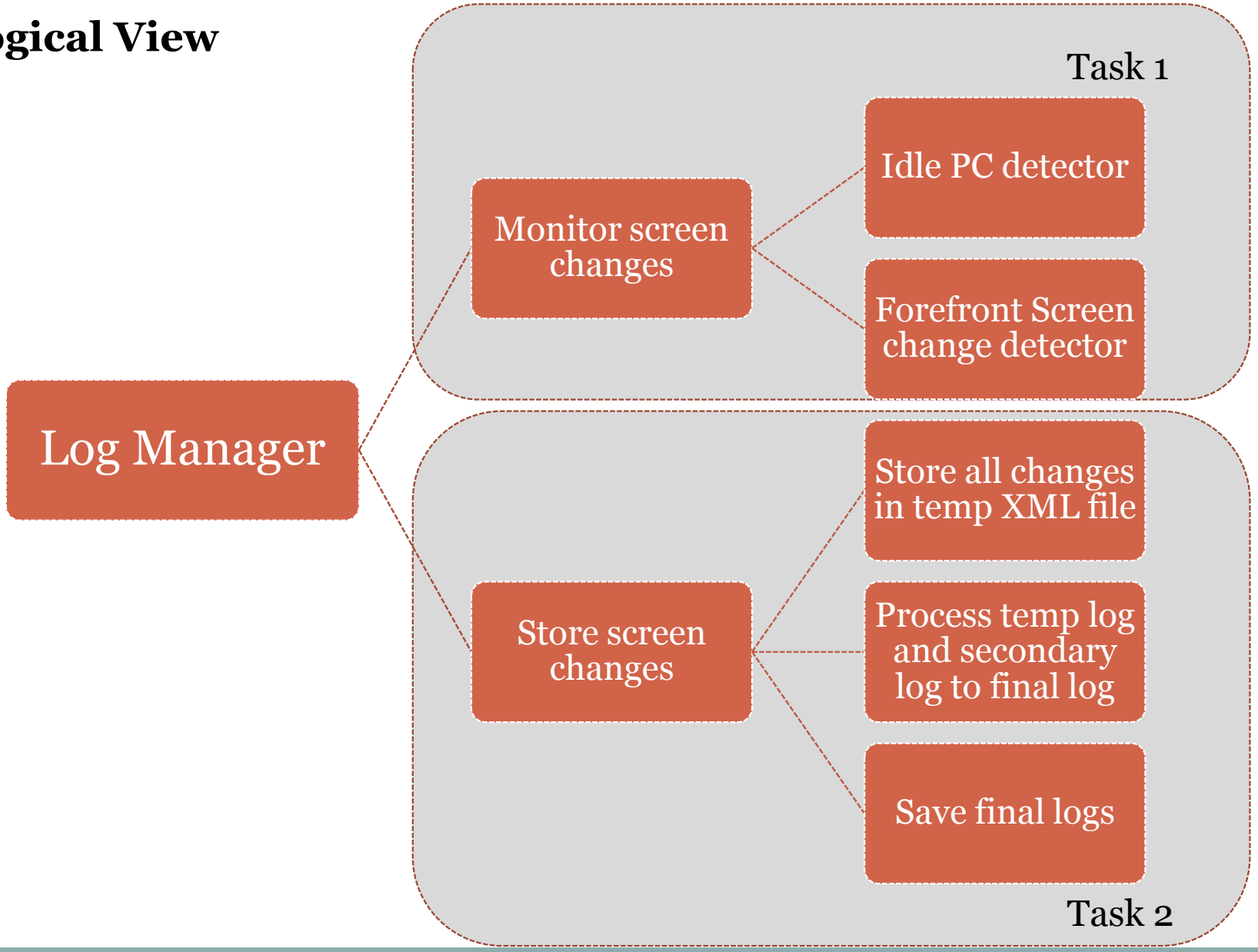
USER STORIES

***As a** user, **I want** the logs to be accurate and meaningful so that factors such as leaving PC idle and frequent*
switching between applications are accounted for.

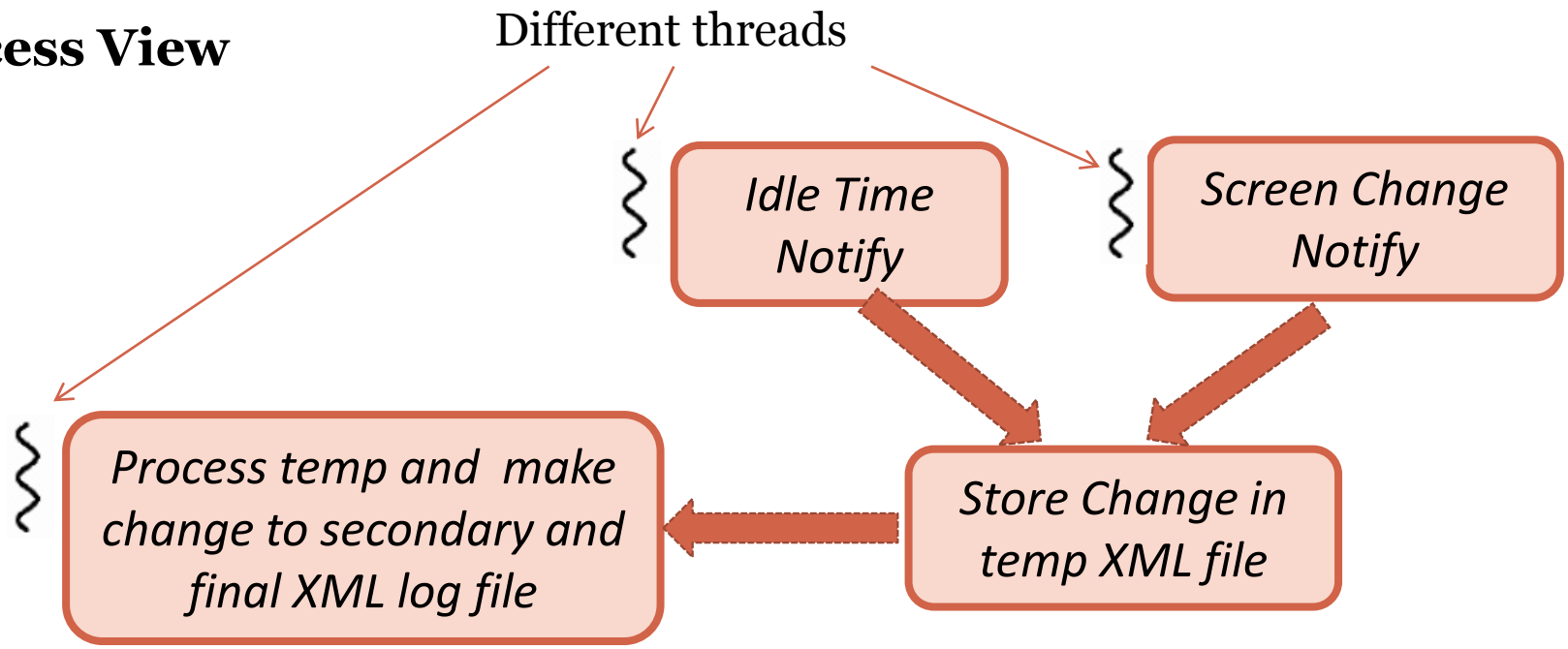
***Scenario 1**: Detect idle time*
***Given** The application is running*
***When** I leave the PC idle*
***Then** application should detect that PC went idle and should not log whatever application was open before.*

***Scenario 2**: Improvise multiple task switches*
***Given** The application is running*
***When** I switch between tasks say 20 times in 1/2 hour*
***Then** application should not log each of those 20 items, rather it mentions that you switched between tasks a lot,*
And maybe log 2/3 activities on which maximum time is spent.

Logical View



Process View



Testing:

- **Task 1:** Manual Testing
- **Task 2:**
  - Made unit test for each subtask like writing in temp log file, processing temp to secondary log file and checking for correctness of entry and processing secondary log file to final log file
  - Code Coverage > 90% (rest tested manually)

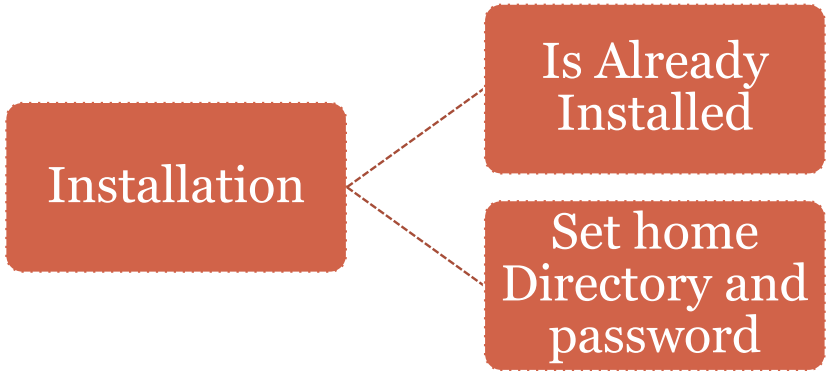
Implementation: Done

USER STORIES

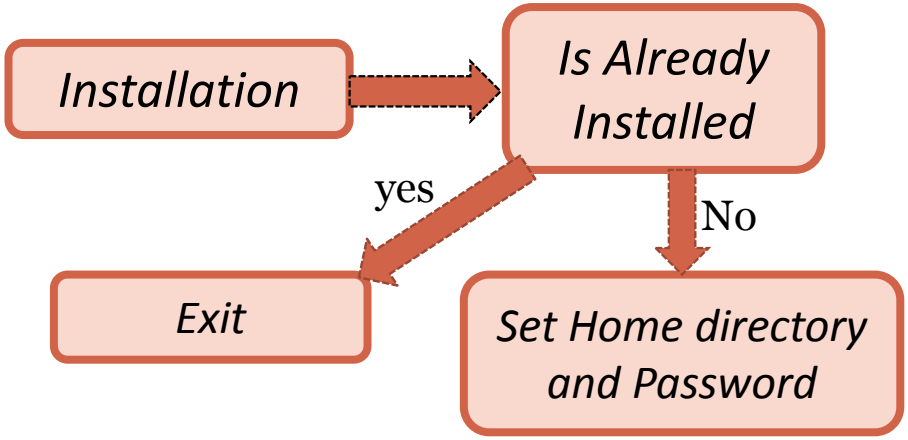
***As a** user, **I want** separate logs for different users.*

***Scenario 1**: User based Logging*
***Given** I start my PC with a user account*
***When** I open application and view logs*
***Then** I see logs of only the logged in user.*

Logical View



Process View



Testing: Manual
Implementation: Done

USER STORIES

***As a** user, **I want** the application to consume minimal resources(CPU, memory) So that it does not affect the performance of other applications.*

***Scenario 1**: Resource friendly*

***Given** the application is running*

***When** I start several other applications and switch very fast among them*

***Then** I don't want their performance to be affected.*

Logical View: None

Process View: None

Testing: manually checked the CPU and physical memory usage in windows task manager

Implementation: Done

USER STORIES

***As a** user, **I want** to password protect my log So that any personal data is not compromised.*

***Scenario 1**: Set the password*
***Given** I installed the application and never started it*
***When** I start the application*
***Then** I am prompted to set the password if I want to.*
***Scenario 2**: Password protection*
***Given** User has used the application for some time*
***When** I start the application*
***Then** I am prompted to enter my password if it is set.*
***Scenario 3**: Changing/Removing Password*
***Given** I used the application for some time*
***When** I open the application*
***Then** I have an option to change/remove the password.*

Not implemented yet!

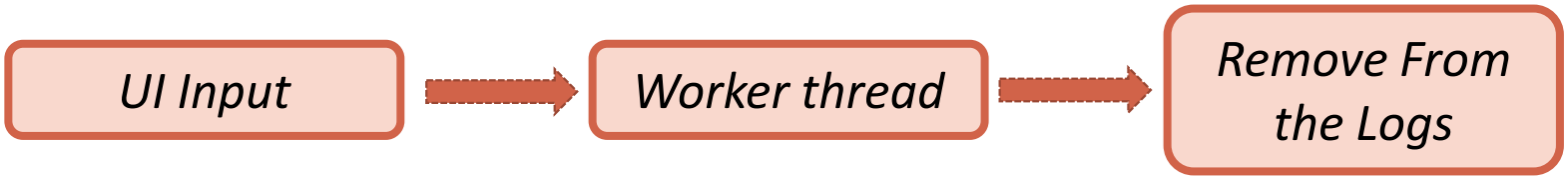
USER STORIES

As a *user* ***I want*** *logs to be editable So that I can delete any (other) activity to the log*

Scenario 1*: delete the logs*
Given *the application is running*
When *I Open log for some date*
Then *I should be able to remove activities from it.*

Logical View: None

Process View



USER STORIES

As a *user* ***I want*** *common log of my activities on different computer or operating system So that I can analysis my all logs at one place*

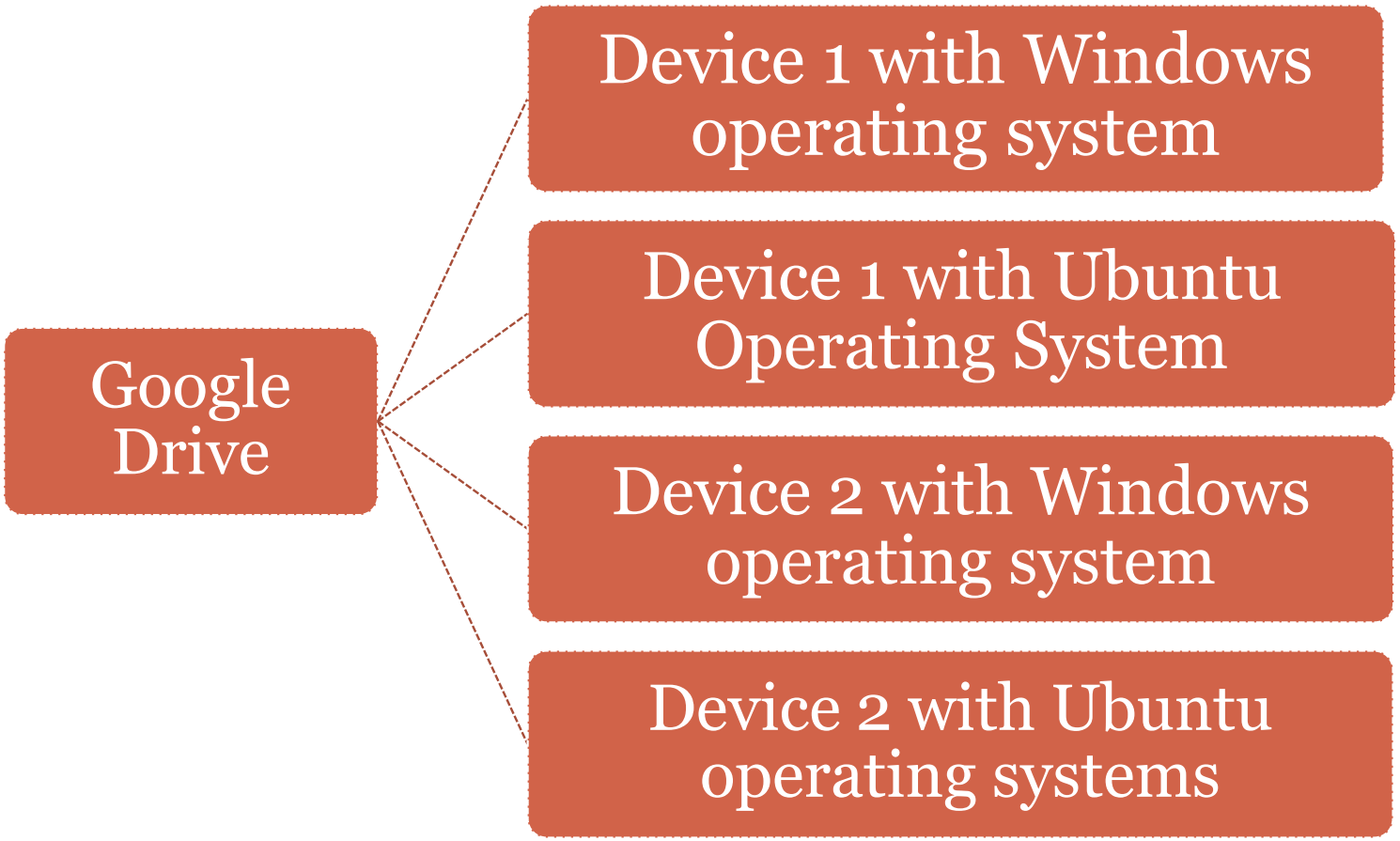
Scenario 1*: Common Logs*

Given *I use more than one computer or operating system and application is running on all of them*

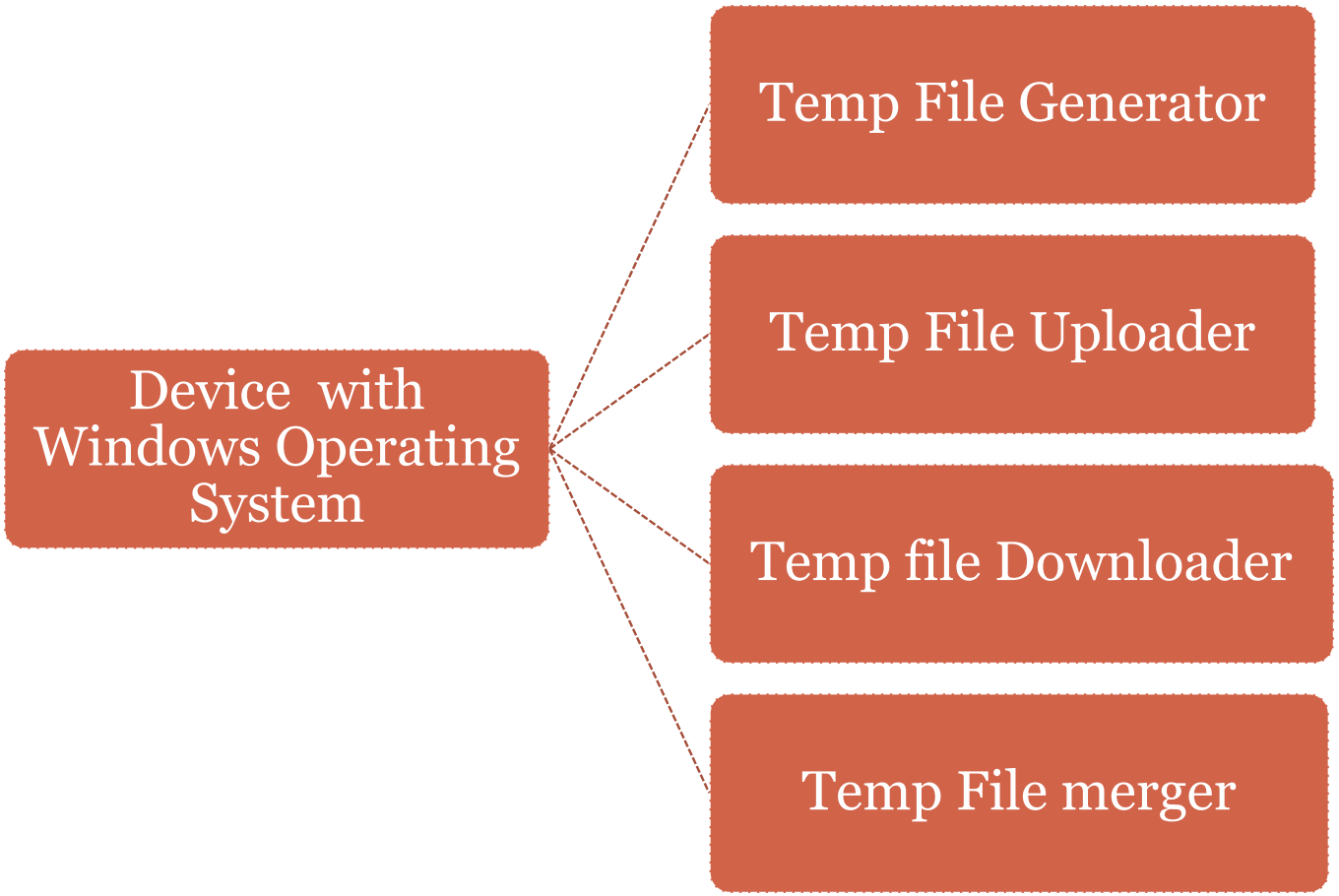
When *I Open log for some date on some computer*

Then *I should be able to analysis my all activities on all computer's and operating systems*

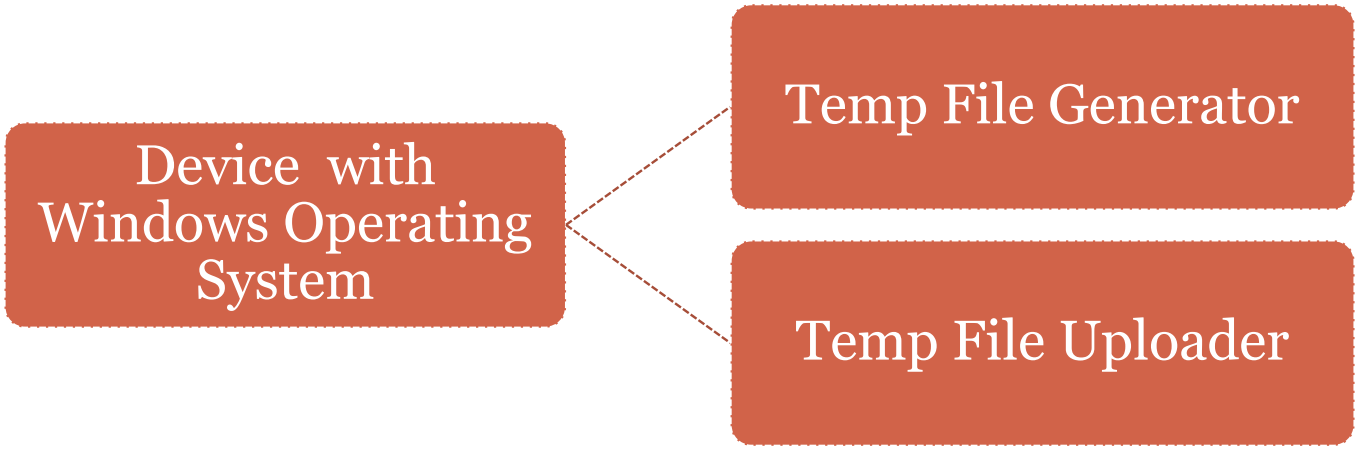
Physical View



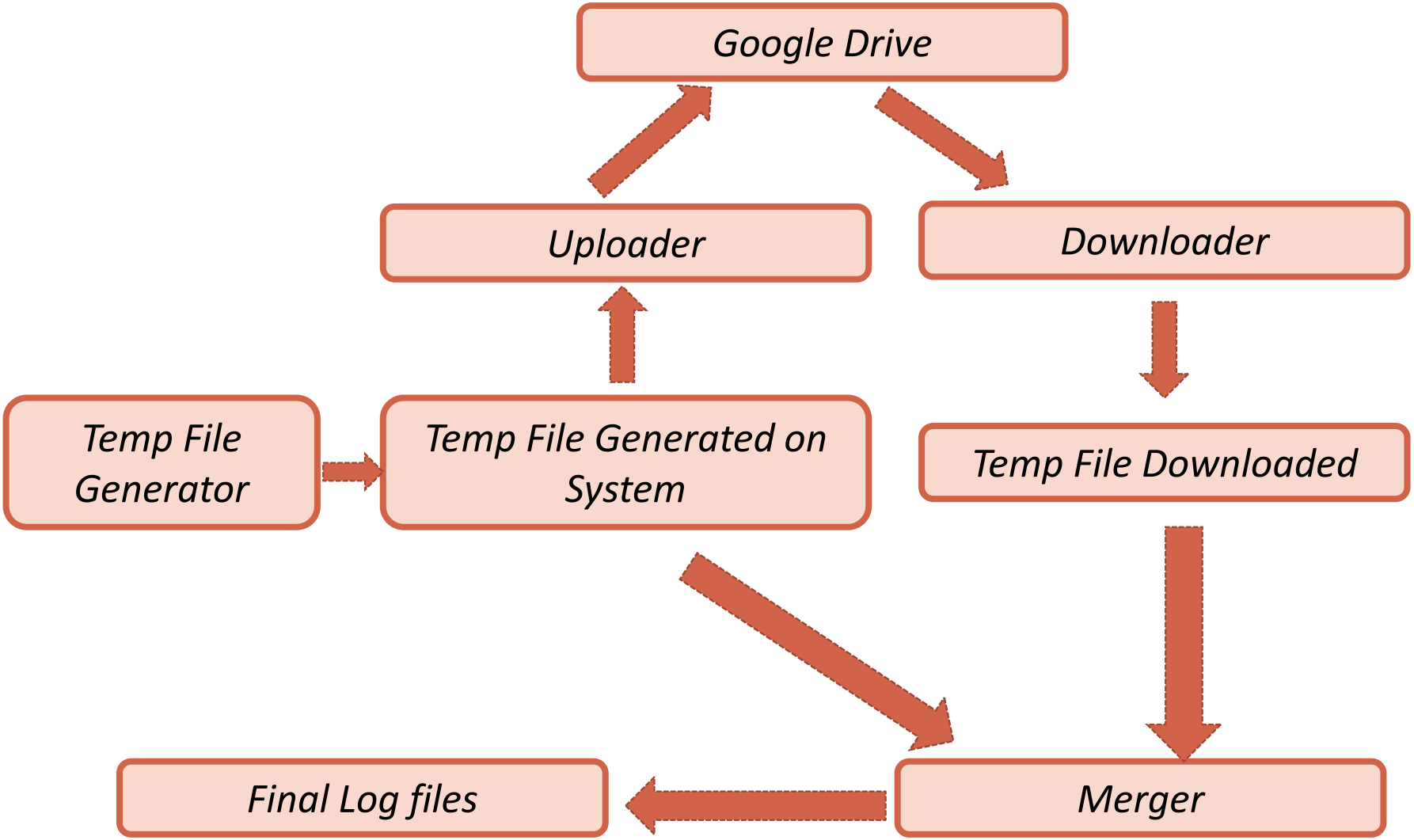
Logical View For Windows Operating System



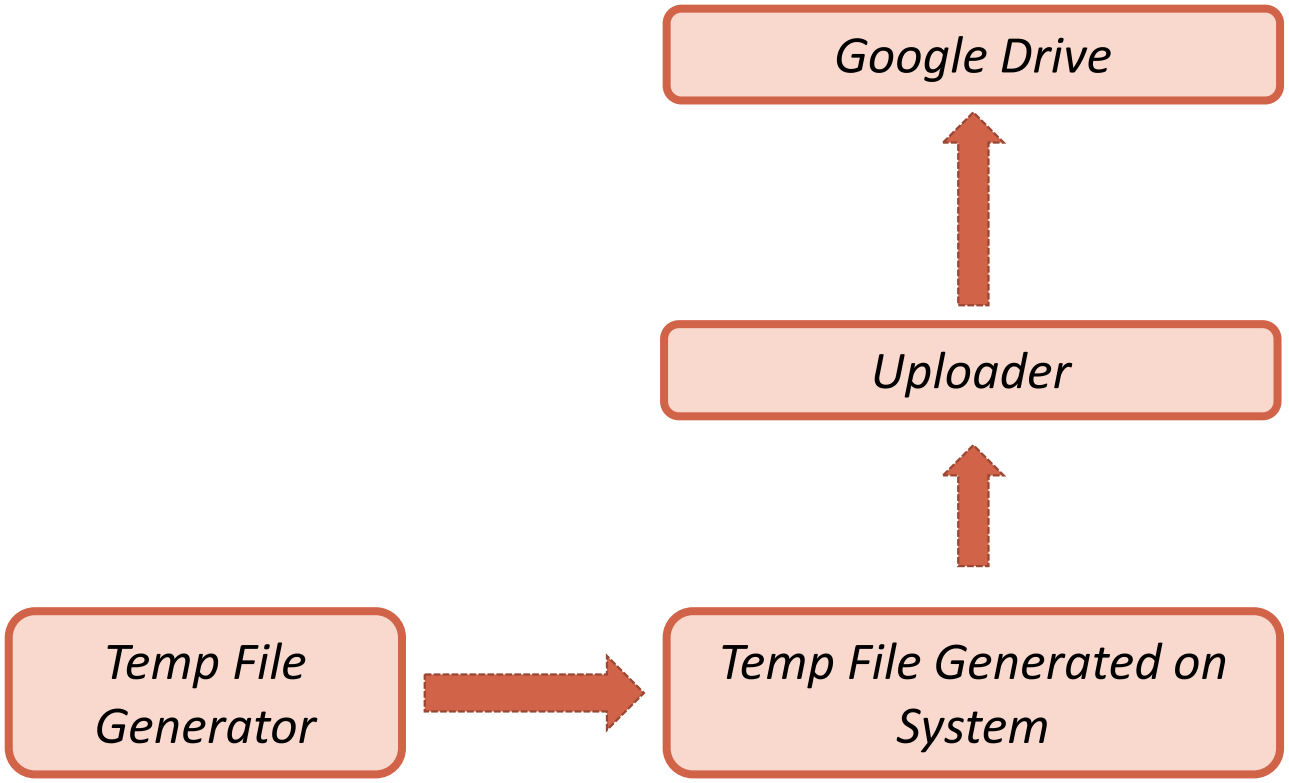
Logical View For Ubuntu Operating System



Process View For Windows Operating System



Process View For Ubuntu Operating System

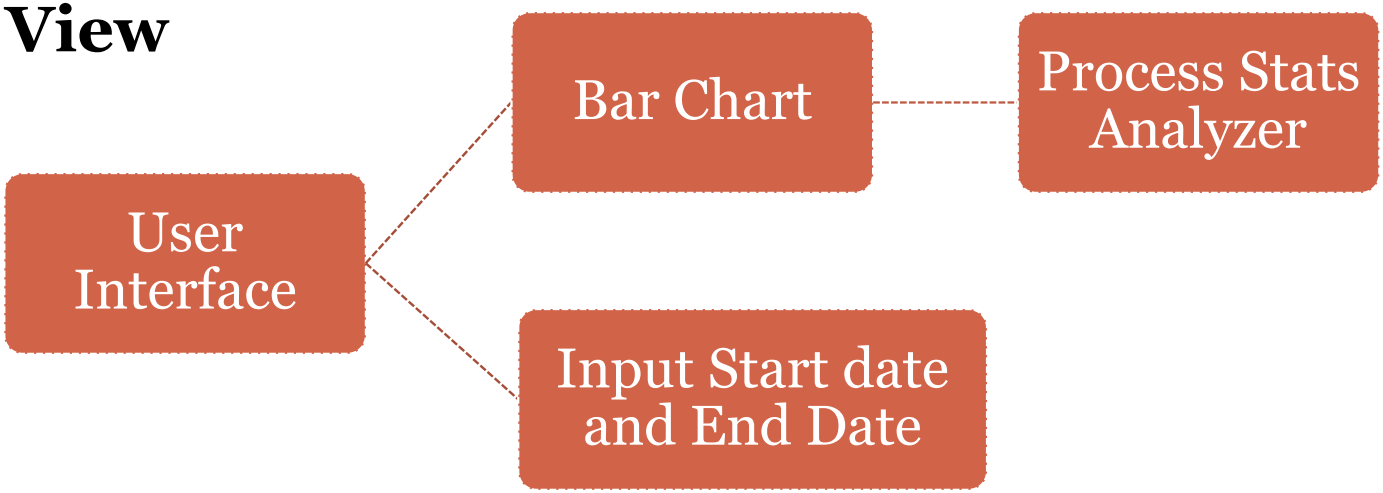


USER STORIES

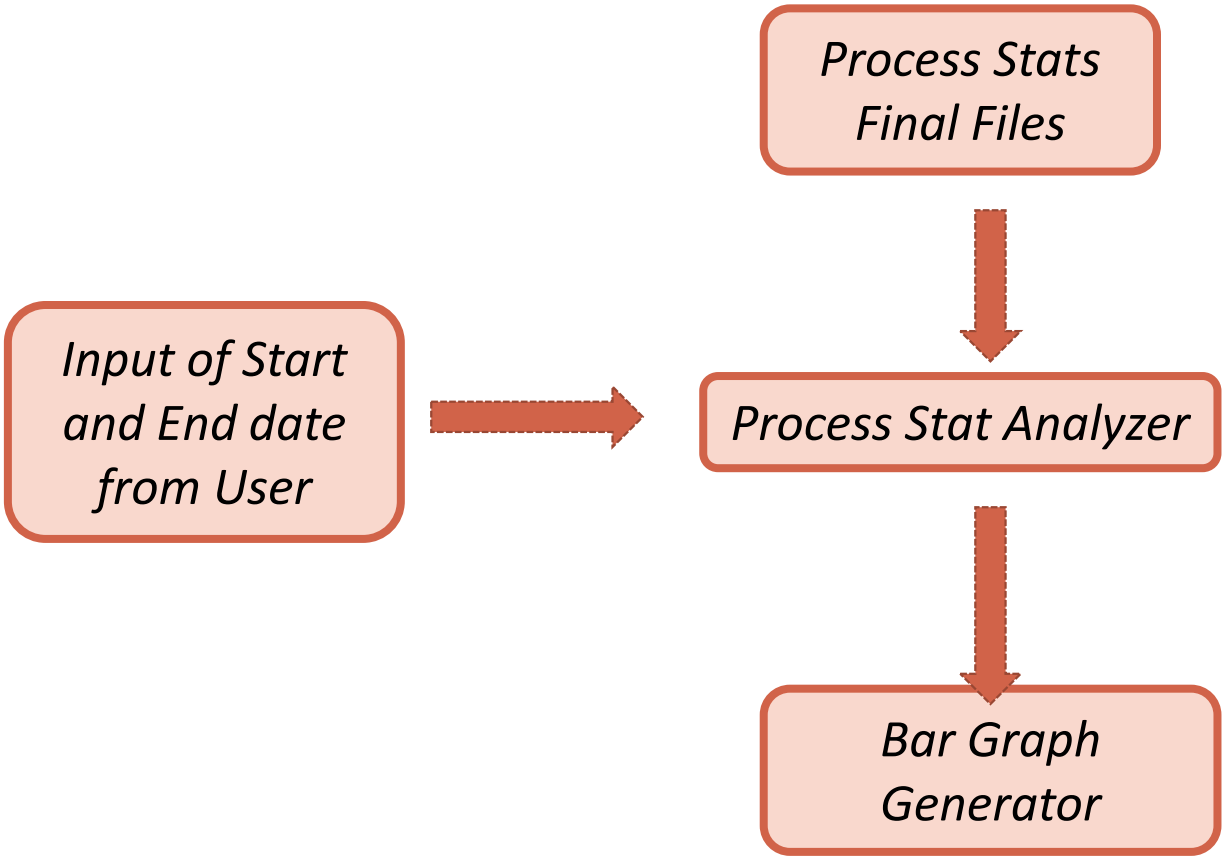
As a *user* ***I want*** *to know which are the main processes I have used over a span of time*

Scenario 1*: Easy Analysis of Processes used*
Given *my activities are logged for some days*
When *I Open my log*
Then *I should be able to analysis which processes I have used for maximum period of time for some specified dates.*

Logical View



Process View

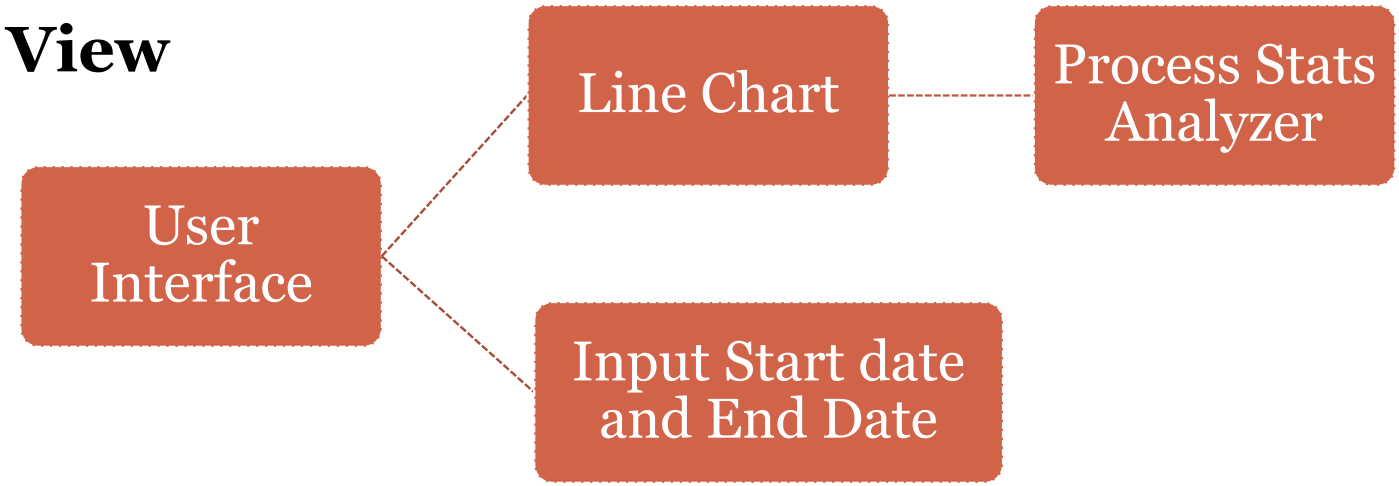


USER STORIES

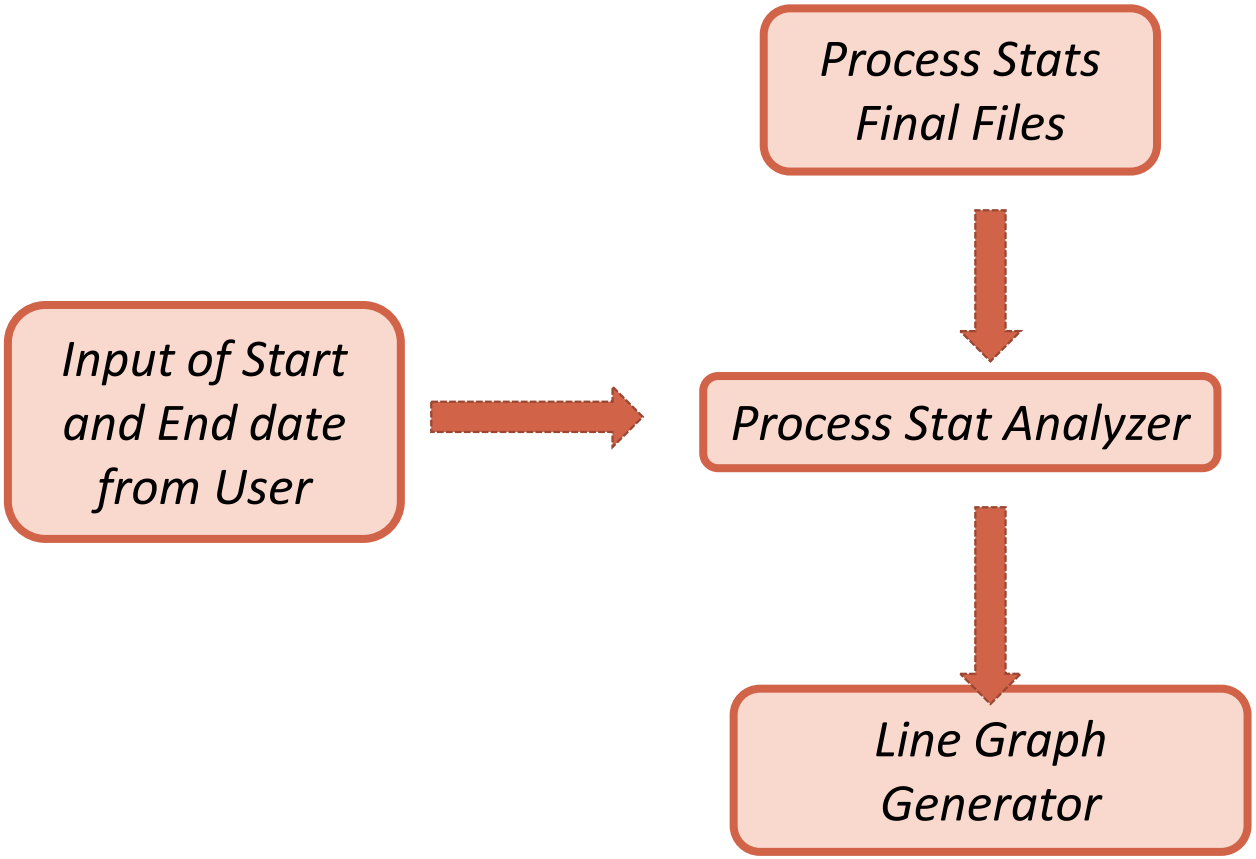
As a *user* ***I want to*** *analyse how much time I have spend on Computer in given period of time.*

Scenario 1*: Easy Analysis of time spent on Computer*
Given *my activities are logged for some days*
When *I Open my log*
Then *I should be able to analysis how much time I have spent on Computer over a period of time and analyse increase or decrease in it.*

Logical View



Process View



Learnings Experiences

- **Technical:**
  - C#
  - .NET framework
  - Developing WPF apps
- **Software Engineering:** following software development process from making user stories to testing and refactoring
- **Test Driven Development:** developing test before writing the code