



# *Network Printer System Analysis*

소프트웨어 공학 개론 B - T1

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# Network Printer System

소프트웨어 공학 개론  
Class B Team 1



## Network Printer System Analysis

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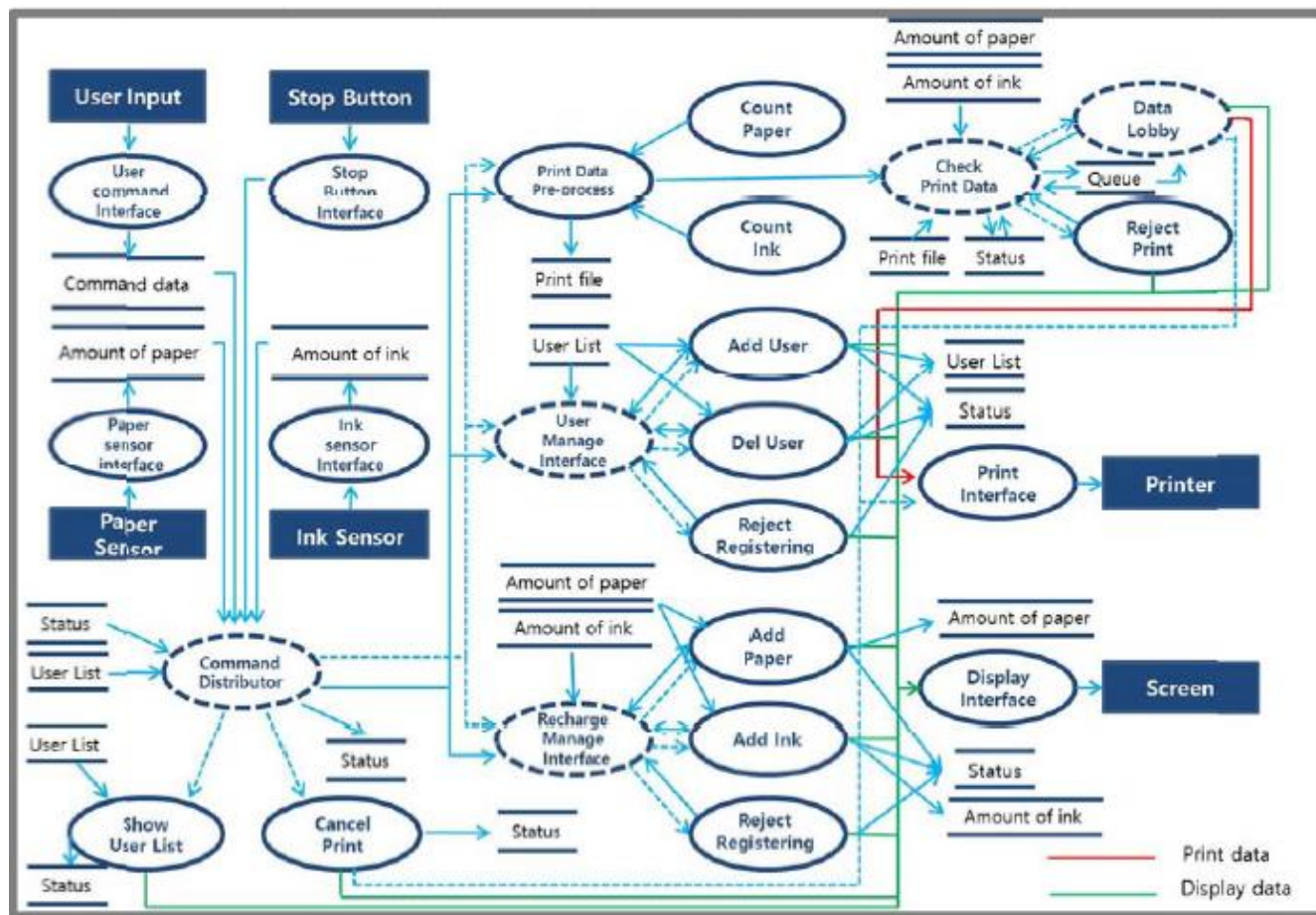
# System Explanation

- Overall
- Advanced



# System Explanation

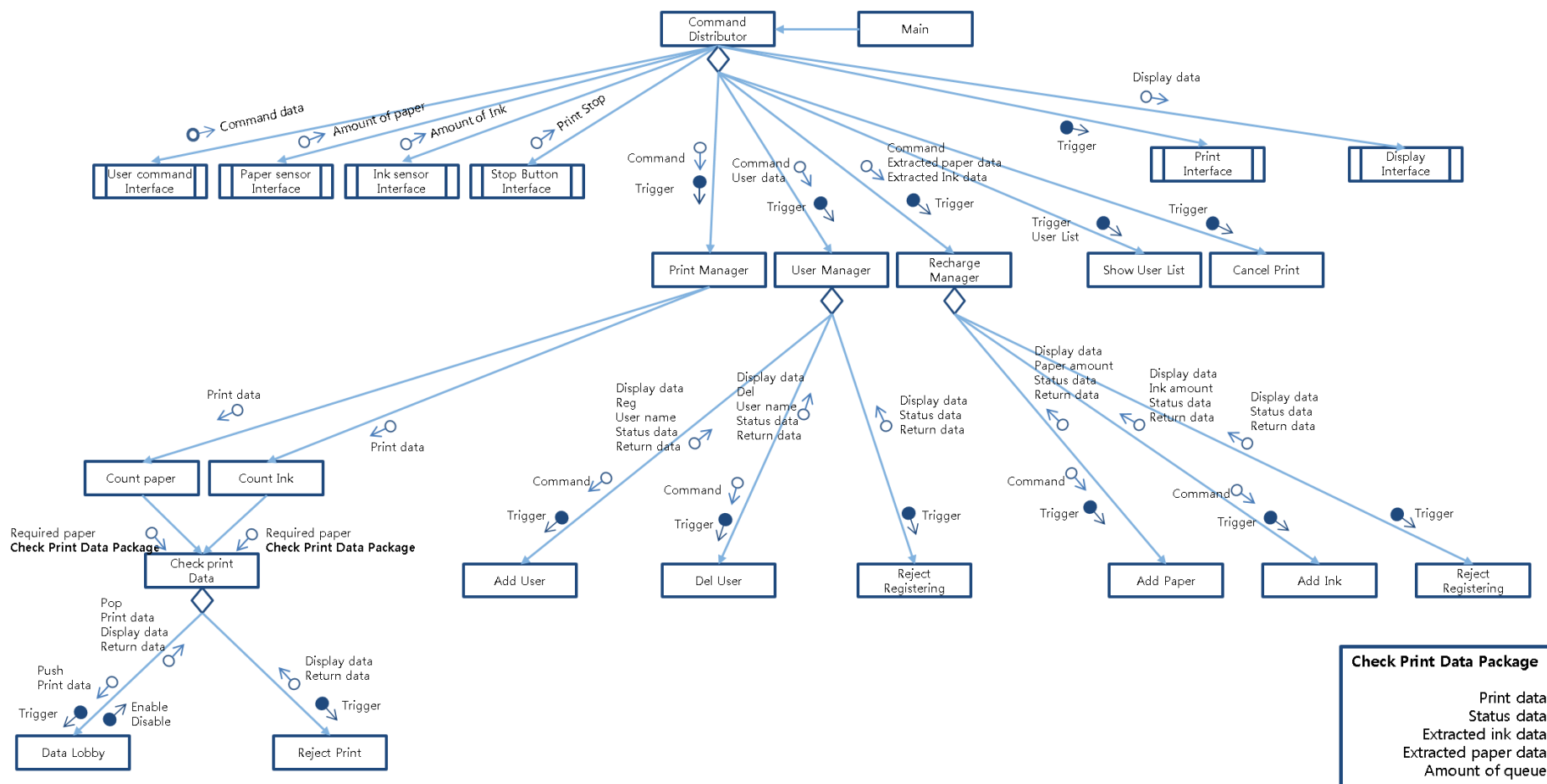
## Overall





## System Explanation

### Advanced



**Check Print Data Package**

- Print data
- Status data
- Extracted ink data
- Extracted paper data
- Amount of queue



# System Test Countermeasure

- System Test Result Review
- System Test Analysis
- Solution
- Final Result



# System Test Result Review

## <Table> STR Failed

Test case identifier	Input Specification	Output Specification	Pass / Fail
T1_NPS_STC_002_001	(UserData) Input "userA a.txt" Remain Paper = 4 Remain Ink = 2550 Require Paper = 24 Require Ink = 80	"paper low Reject command"	Fail
T1_NPS_STC_002_002	(UserData) Input "userA a.txt" Remain Paper = 4 Remain Ink = 2550 Require Paper = 15 Require Ink = 80	"paper low Reject command"	Fail
T1_NPS_STC_002_003	(UserData) Input "userA b.txt" Remain Paper = 60 Remain Ink = 1550 Require Paper = 24 Require Ink = 2000	"ink low Reject command"	Fail
T1_NPS_STC_002_005	(UserData) Input "userA team1.txt" Remain Paper = 20 Remain Ink = 2000 Require Paper = 20 Require Ink = 2000	Remain Paper = 0 Reamin Ink = 0 Status = "Printing" "data lobby start"	Fail
T1_NPS_STC_002_005	(UserData) Input "userA team1.txt"(Remain Paper = 20 Remain Ink = 2000 Require Paper = 20 Require Ink = 2000) and "cancel"	Status = "Printing" "data lobby start" -> "Current Print is stopping"	Fail



# System Test Result Review

## <Table> STR Failed

Test case identifier	Input Specification	Output Specification	Pass / Fail
T1_NPS_STC_002_014	(UserData) "cancel" when printer is not printing	Nothing happened	Fail
T1_NPS_STC_002_015	(UserData) Input "userA a.txt" and "cancel"	Nothing happened	Fail
T1_NPS_STC_002_016	(UserData) Input "userA a.txt", "aaaa b.txt" and "cancel"	Nothing happened	Fail
T1_NPS_STC_002_032	(UserData) Input "userA a.txt"(11 lines,. This file's last line is empty(new line character)	RP = 2	Fail
T1_NPS_STC_003_012	(UserData) Input "userA a.txt"	Status =>"printing" Printing = "userA page(now printing)/total page count"	Fail
T1_NPS_STC_003_013	(UserData) Input "userA abc.txt" and "user B a.txt"	Status =>"printing" Printing = "userA page(now printing)/total page count" Wait Queue = "userB b.txt's total page count"	Fail





# System Test Analysis

## Problem

- Print command must be rejected when RP and RI are insufficient. But print is running with negative RP and RI value.
- When print data's last line is '\n'
- 1) required data is 27 lines but printing data is 28 lines.
- 2) If print data is 11 lines, RP should be 2 but RP is 1 in Display. And used paper is 1 but result print data is 11 lines with 2 paper.
- Cancel command is executed even if current printing data doesn't exist.

## Analysis

- When user require a print data, system decide whether printing is available or not with RI, RP in current queue. In this step, error is occurred because RI and RP that used in before print is remained .
- When printer read current print data, data is saved in temporary buffer. The buffer must be initialized after use. If not, data is remained in buffer, so it occurred error.
- It's just exception problem. It haven't an effect on system, but it will be confused for user with incorrect display.



## Solution

### Negative value in RP and RI

#### Code before edit

```
for (i = 0; i < end; i++) {
    aRP += Queue[i].RP;
    aRI += Queue[i].RI;
}
aRP -= Queue[top].now;
aRI -= Queue[top].now_ink;
aRP += pd.RP;
aRI += pd.RI;
```

#### Code after edit

```
for (i = top; i < end; i++) {
    aRP += Queue[i].RP;
    aRI += Queue[i].RI;
}
if( top!=end){
    aRP -= Queue[top].now;
    aRI -= Queue[top].now_ink;
}
```



## Solution

Not same between display and real print

### Code in CountPaper function before edit

```
int CountPaper(FILE* cFile) {
    int count = 0;
    char strBuf[255];
    if (cFile != NULL) {
        while (fgets(strBuf, sizeof(strBuf), cFile)) {
            count++;
        }
    }
    return count;
}
```

### Code in CountPaper function after edit

```
int CountPaper(FILE* cFile) {
    int count = 0;
    char strBuf[255];
    if (cFile != NULL) {
        while (!feof(cFile)){
            fgets(strBuf, sizeof(strBuf), cFile);
            count++;
        }
    }
    return count;
}
```



## Solution

Not same between display and real print(cont.)

Code in PrintInterface function  
before edit

```
while (status.isCharging == 1);  
if (status.isPrintRunning == 1) {  
    int j;  
    char temp_buf[31] = "";  
    int count_ink = 0;  
    fgets(buf, sizeof(buf), fp);
```

Code in PrintInterface function  
after edit

```
while (status.isCharging == 1);  
if (status.isPrintRunning == 1) {  
    int j;  
    char temp_buf[61] = "";  
    int count_ink = 0;  
    memset(buf, '\0', 255);  
    fgets(buf, sizeof(buf), fp);
```



# Solution

## Cancel command display

### Code in CancelPrint function before edit

```
void* CancelPrint()
{
    status.isPrintRunning = -1;
    status.CP = 0;
    strcpy(now_display.message, "Current Printing is canceled.");
    now_display.status = "waiting";
    Display();
    //wait(NULL);
}
```

### Code in CancelPrint function after edit

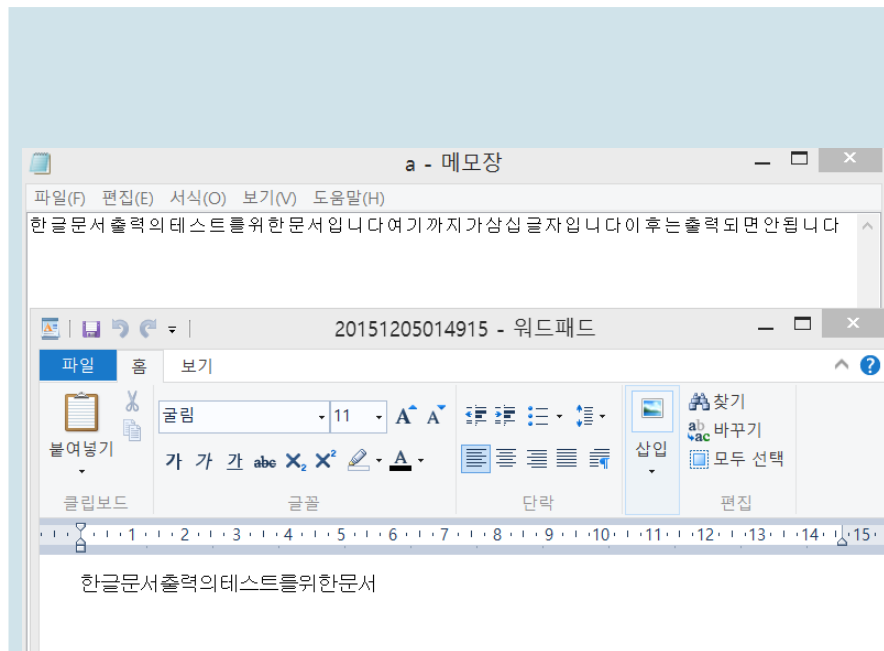
```
void* CancelPrint()
{
    if(status.isPrintRunning == 0) {
        strcpy(now_display.message, "Printer is not running.");
        now_display.status = "waiting";
        Display();
    } else {
        status.isPrintRunning = -1;
        status.CP = 0;
        strcpy(now_display.message, "Current Printing is canceled.");
        now_display.status = "waiting";
        Display();
    }
    //wait(NULL);
}
```



## Solution

### Print in Korean data problem

#### Problem



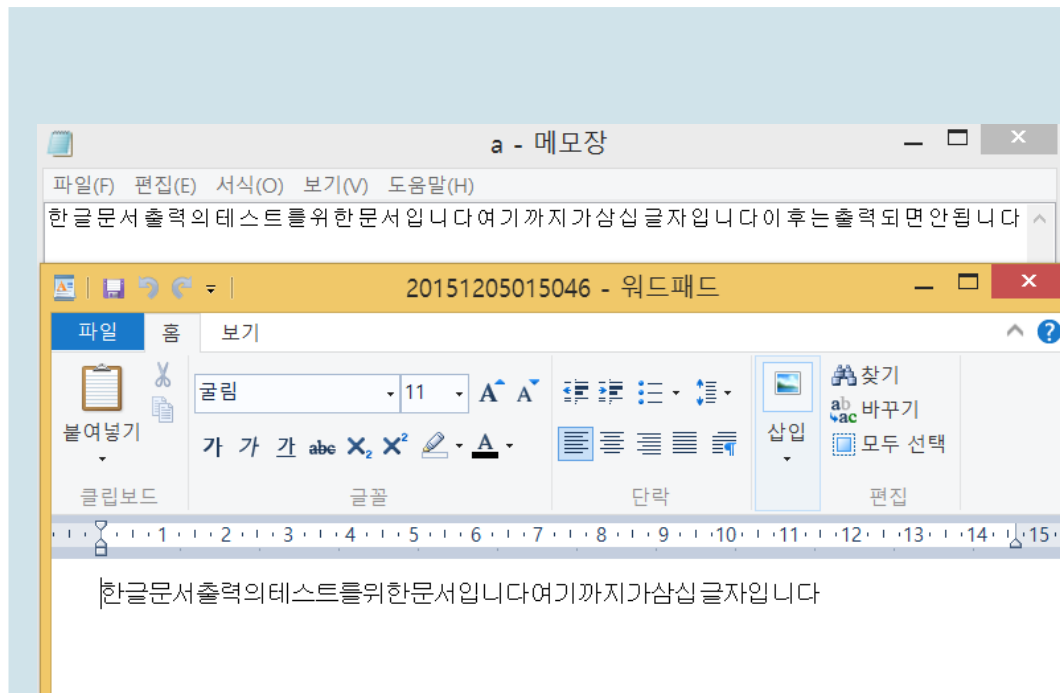
- When we request 30 characters in Korean, printer just print 15 characters.



# Solution

## Print in Korean data problem(cont.)

### Solution



```

while (status.isCharging == 1);
if (status.isPrintRunning == 1) { //If cancel during printing
    int j;
    char temp_buf[61] = "";
    int count_ink = 0;
    memset(buf, '0', 255);
    fgets(buf, sizeof(buf), fp);
    for (j = 0; j < 60; j++) {
        if (buf[j] == '\n' || buf[j] == '\0') {
            temp_buf[j] = '\n';
            break;
        }
        if (buf[j] != ' ') {
            count_ink++;
        }
        temp_buf[j] = buf[j];
    }
    temp_buf[60] = '\n';
    int counta=0;
    int i;
    for(i=0;i<j;i++)
    {
        if(temp_buf[i] < 0)
        {
            counta+=5;
        }
        else
        {
            counta+=10;
        }
        if(counta>300)
        {
            counta = counta-5;
            break;
        }
    }
    int realink;
    realink = counta/10;
    int space=0;
    int k =0;

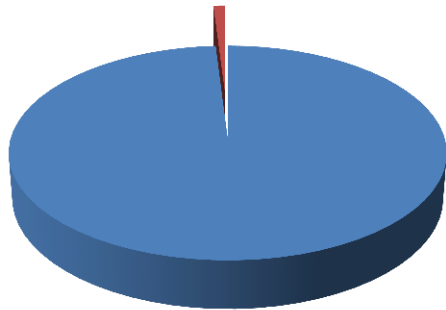
    for(k=0;k<i;k++)
    {
        if(temp_buf[k]!=' ')
        {
            space++;
        }
    }
    temp_buf[i] = '\n';
    temp_buf[i+1] = '\0';

```



# Final Result

## Result



- Passed(100%)
- failed(0%)

## Result

- All of item is edited that failed in system test.
- Do system test again with edited code and get all passed.
- Find new problem and solve it.





# System Demo



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Class B - Team 1

Thank you