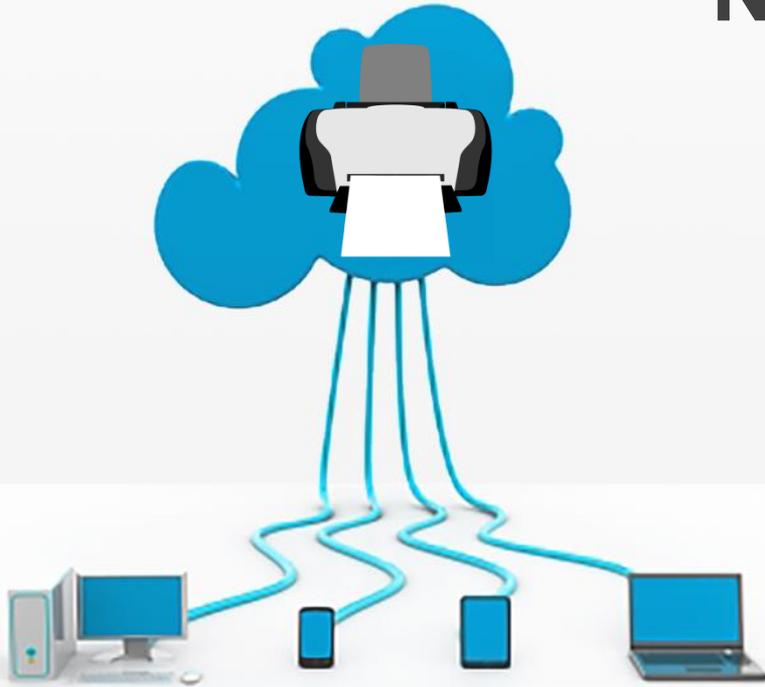


# N.P.S

# Network Printer System

SA Presentation



201011355 이재상  
201012047 신보선  
201111396 한재만  
201111345 김종우

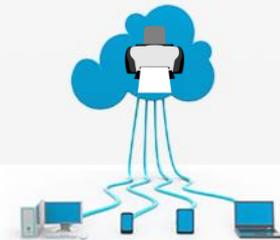
**Purpose & Requirements**

**Context Diagram**

**Data Flow Diagram**

**State Transition Diagram**

**Q&A**



# Purpose

## Software Engineering-Network Printer System

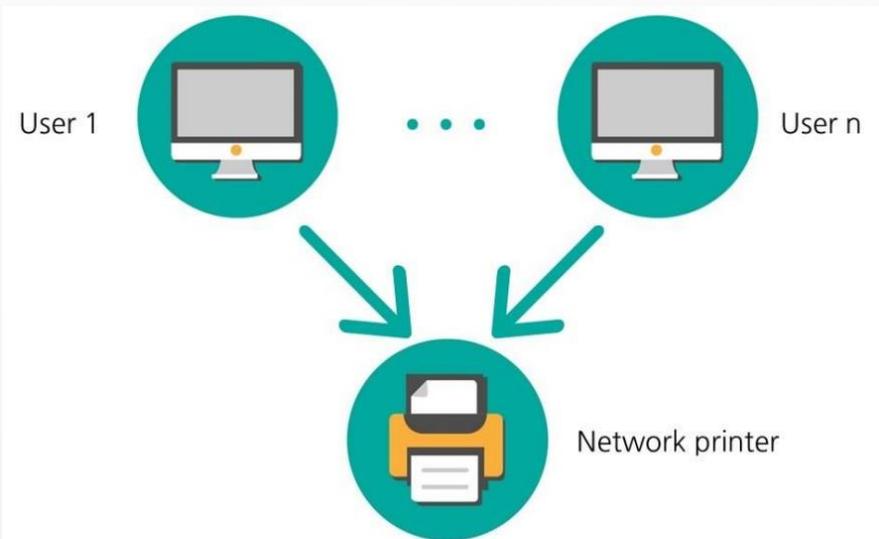
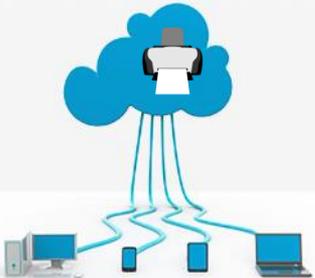


그림 1 일반적인 Network Printer 구성



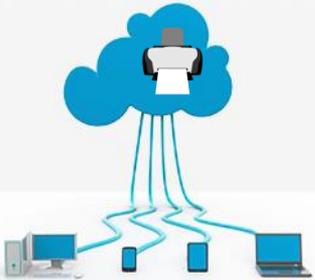
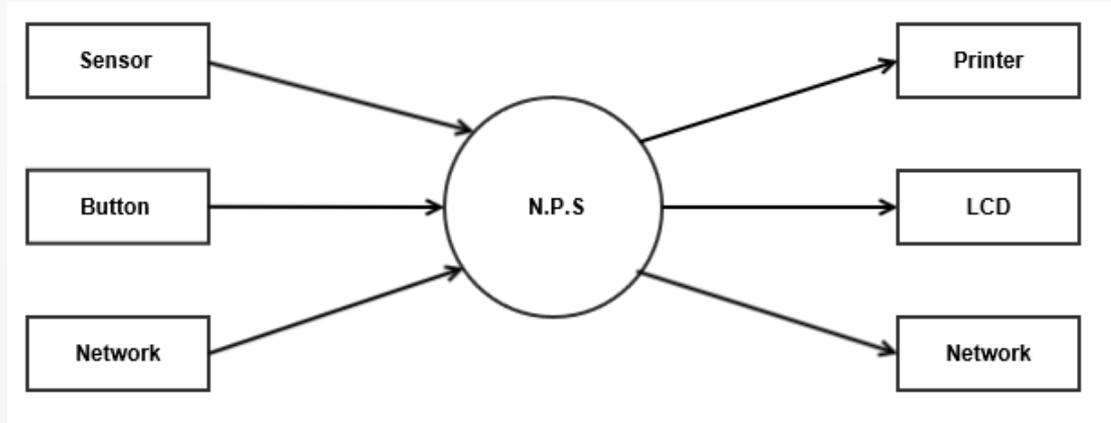
# Requirements

SW로 개발하는 가상의 네트워크 프린터 시스템



# Context Diagram

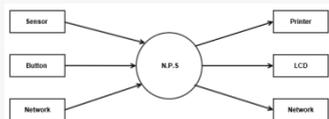
Basic



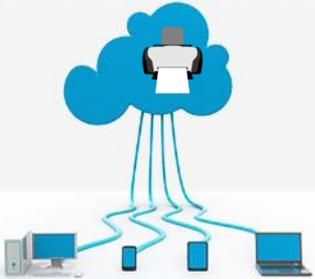
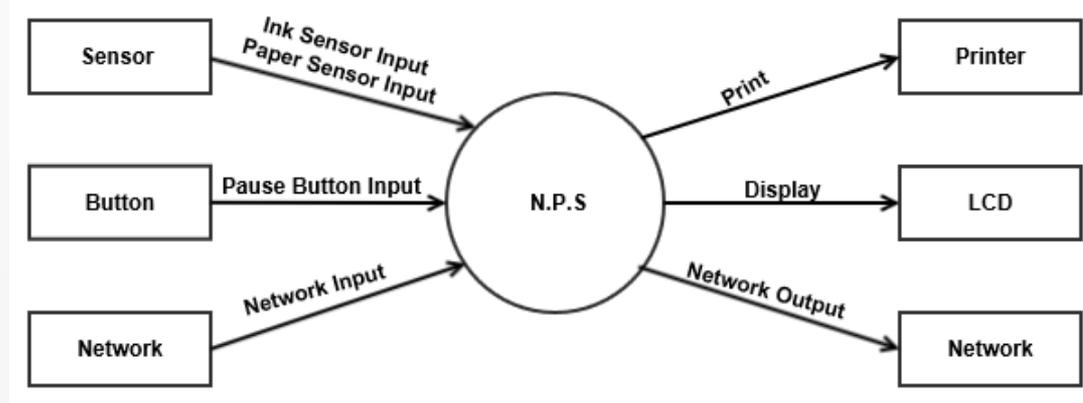
# Context Diagram

## Event List

Input/Output Event	Description
<b>Ink Sensor Input</b>	잉크의 잔량 정보
<b>Paper Sensor Input</b>	용지의 잔량 정보
<b>Pause Button Input</b>	정지버튼에 관한 정보
<b>Network Input</b>	네트워크 프린터 사용자들 및 관리자의 요청 정보
<b>Network Output</b>	네트워크 콘솔에 출력할 정보
<b>Display</b>	LCD화면 출력 정보
<b>Print</b>	Print할 파일의 정보

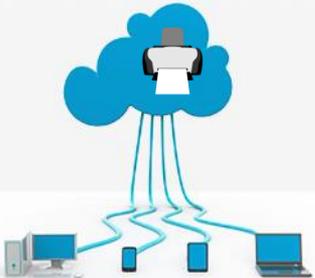
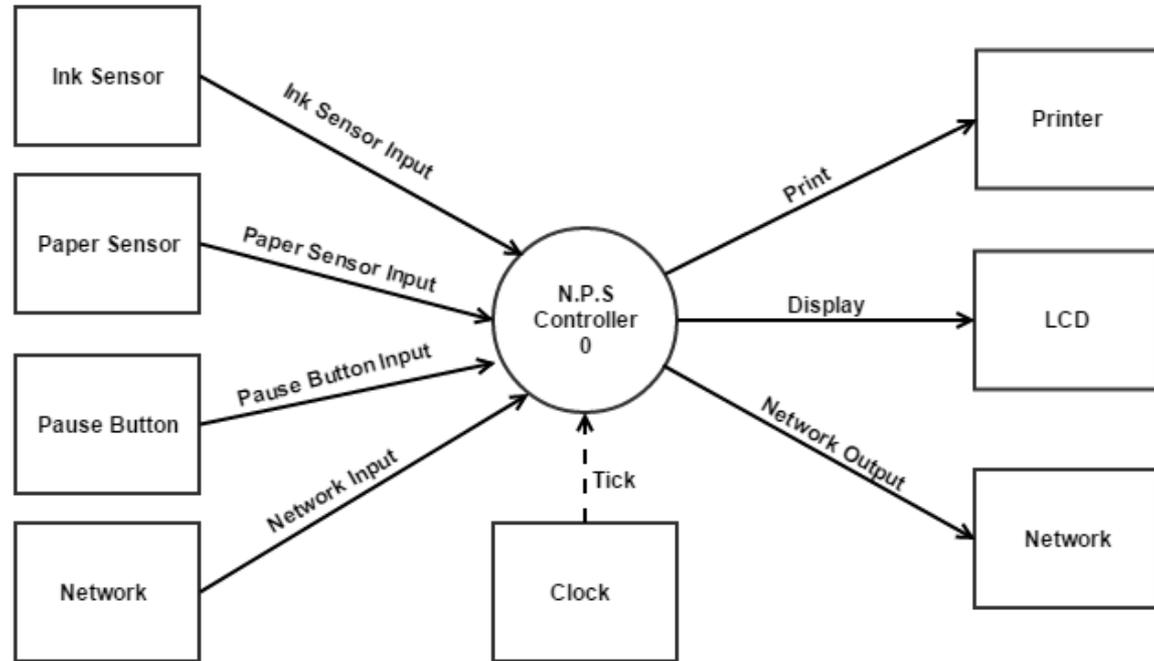


# Context Diagram



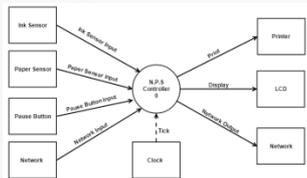
# Data Flow Diagram

Level 0



# Data Flow Diagram

## Process Specification-Level 0



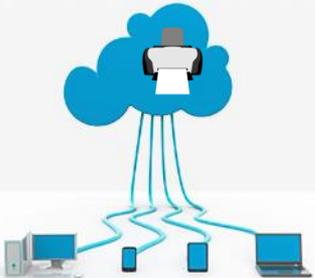
<b>Reference No.</b>	0
<b>Name</b>	Network Printer System Controller
<b>Input</b>	Ink Sensor Input, Paper Sensor Input, Pause Button Input, Network Input
<b>Output</b>	Print, Display, Network Output
<b>Process Description</b>	각종 센서 및 버튼의 정보와 데이터 흐름 신호들을 받아 N.P.S 컨트롤러에서 처리한 후 프린트할 정보들은 프린터로 보내고 다양한 출력 정보들은 LCD로 보내고 출력불가, 사용자 리스트 등은 Network 콘솔창으로 보낸다.



# Data Flow Diagram

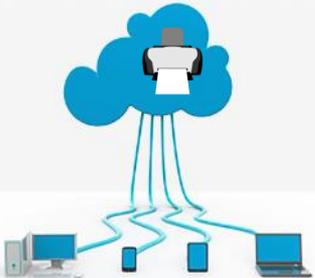
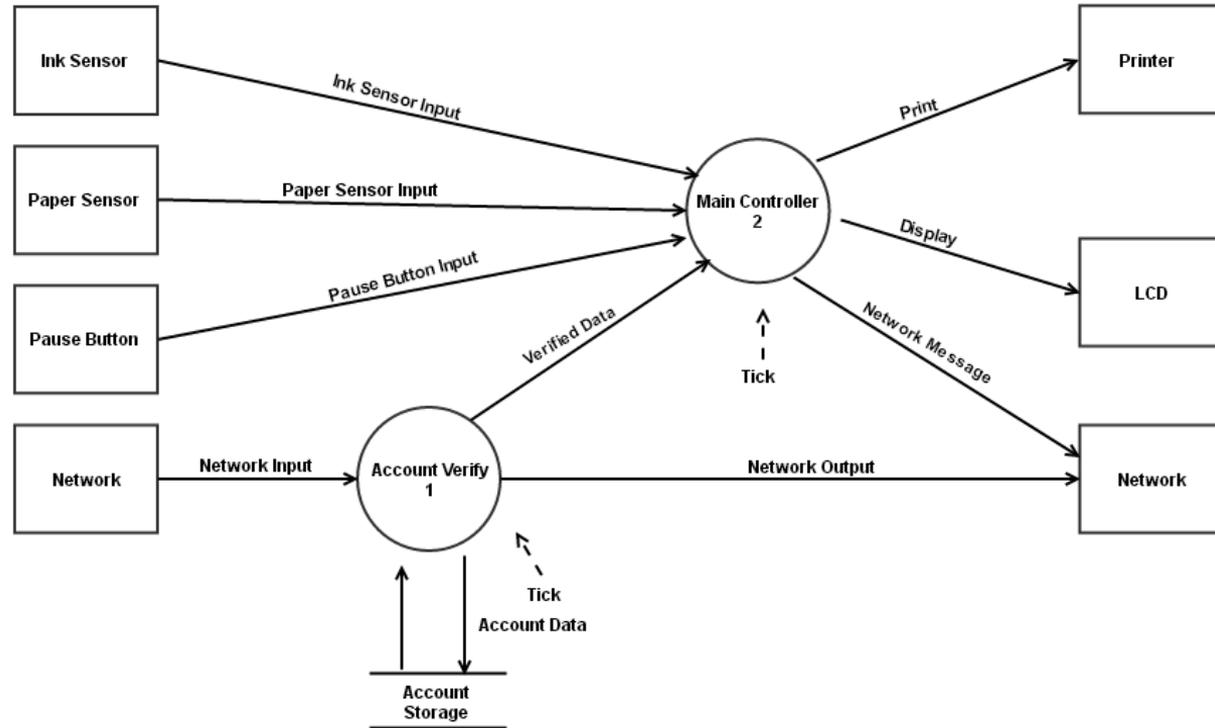
## Data Dictionary-Level 0

Input/Output Event	Description	Format / Type
<b>Ink Sensor Input</b>	잉크의 잔량 정보	Int / Periodic
<b>Paper Sensor Input</b>	용지의 잔량 정보	Int / Periodic
<b>Pause Button Input</b>	정지버튼에 관한 정보	True, False / Interrupt
<b>Network Input</b>	네트워크 프린터 사용자들 및 관리자의 요청 정보	
<b>Network Output</b>	네트워크 콘솔에 출력할 정보	
<b>Display</b>	LCD화면 출력 정보	
<b>Print</b>	Print할 파일의 정보	



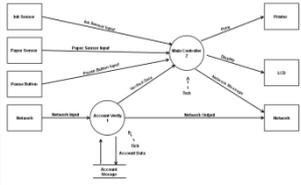
# Data Flow Diagram

## Level 1

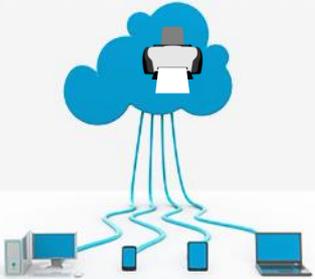


# Data Flow Diagram

## Process Specification-Level 1

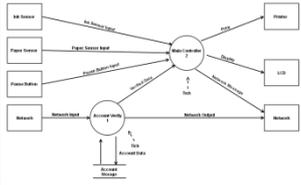


<b>Reference No.</b>	1
<b>Name</b>	Account Verifier
<b>Input</b>	Network Input, Account Data
<b>Output</b>	Verified Order, Account Data, Network Output
<b>Process Description</b>	Network입력을 받아 관리자인지 사용자인지 검증되지 않은 사용자인지를 판단하여 검증된 경우 출력정보를 Main Controller로 보낸다. 유효하지 않은 명령이 들어올 경우 콘솔 창에 메시지를 띄워준다

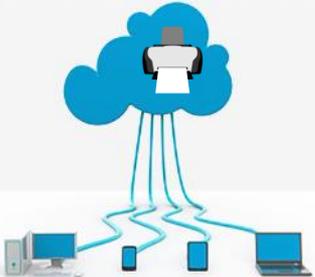


# Data Flow Diagram

## Process Specification-Level 1



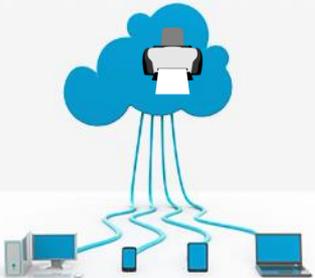
<b>Reference No.</b>	2
<b>Name</b>	Main Controller
<b>Input</b>	Ink Sensor Input, Paper Sensor Input, Pause Button Input, Verified data
<b>Output</b>	Print, Display, Network Message
<b>Process Description</b>	Ink 잔량정보와 Paper잔량정보 정지버튼의 입력여부 및 출력물의 정보를 받은 뒤 Main Controller에서 계산하여 Print할 정보를 Printer로 보내고 Display할 정보를 LCD로 보내고 Network Message를 Network로 보낸다.



# Data Flow Diagram

## Data Dictionary-Level 1

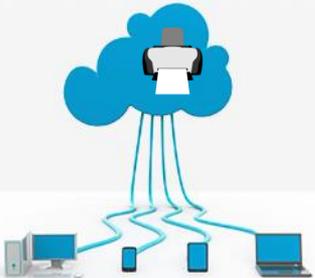
Input/Output Event	Description	Format / Type
<b>Verified Data</b>	인쇄정보, 다양한 Network 명령어들	Structure
	Username(Character):유저이름 Filename(Character):파일명 Command(Character):명령어	
<b>Account Data</b>	추가 또는 삭제할 사용자 아이디에 관한 정보, 유저목록 확인의 경우 유저들의 목 록배열	Chracter
	Username(Character) : 계정정보	
<b>Account Storage</b>	Account Data들의 모임	



# Data Flow Diagram

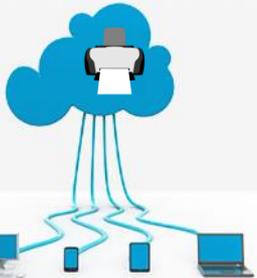
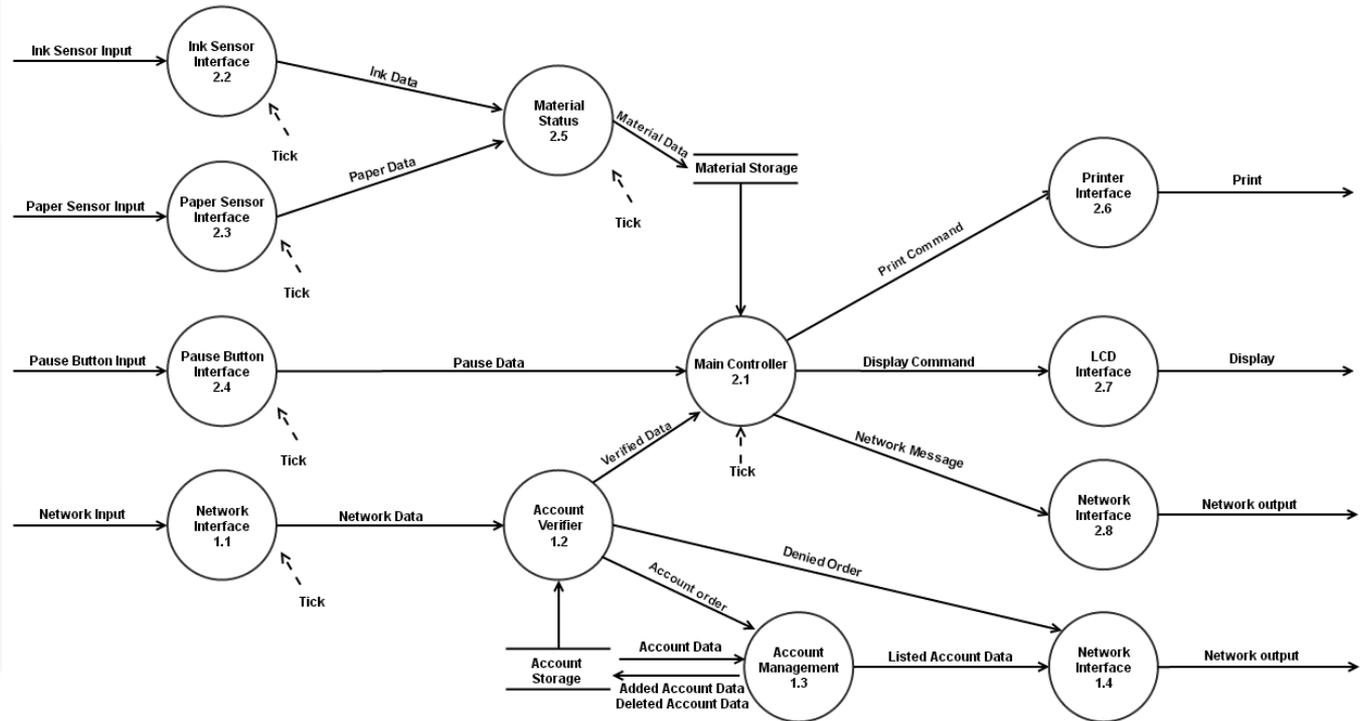
## Data Dictionary-Level 1

Input/Output Event	Description	Format / Type
<b>Netwrok Message</b>	잉크나 종이 등이부족하거나 대기열이 5를 초과할 경우의 출력불가 메시지	

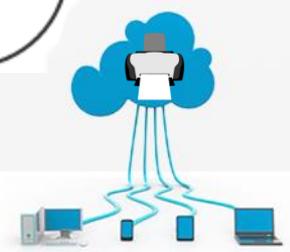
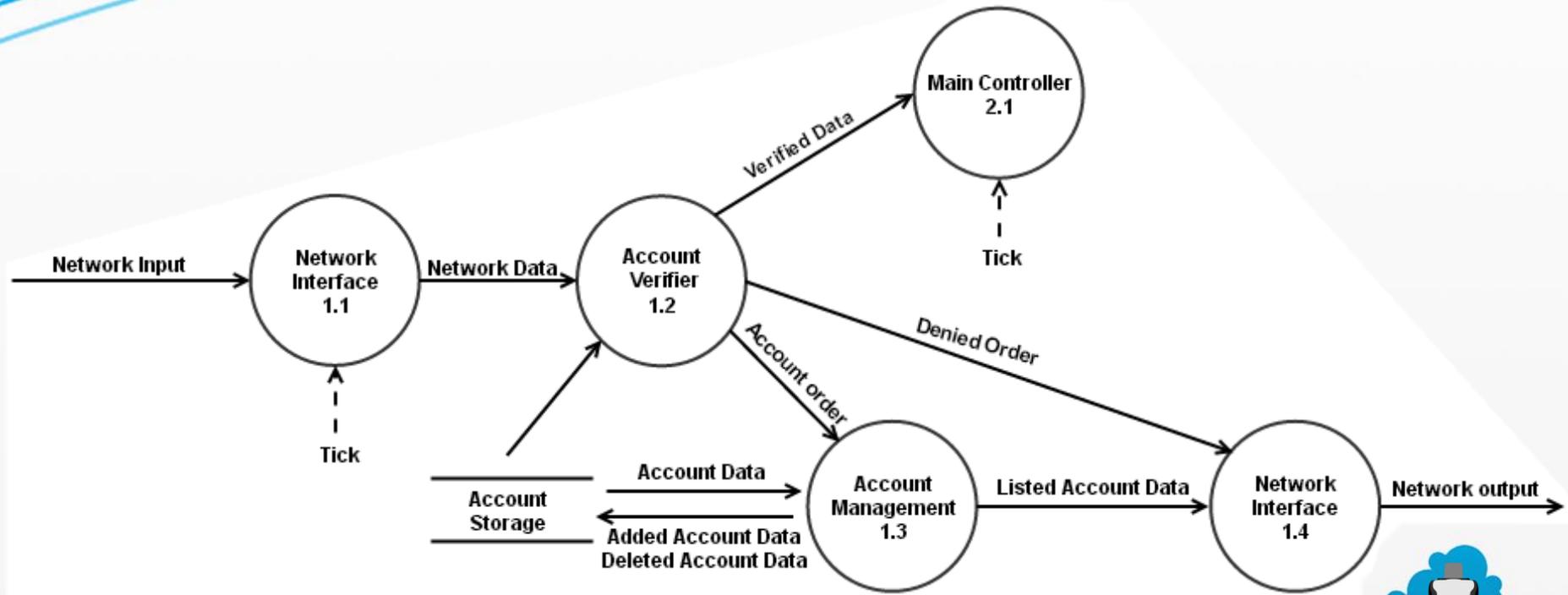


# Data Flow Diagram

## Level 2

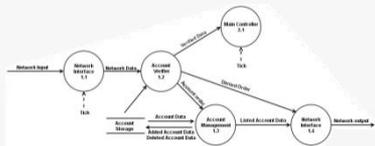


# Sliced DFD Level 2 Part.1

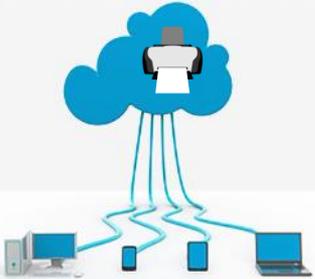


# Data Flow Diagram

## Process Specification-Level 2 Part.1

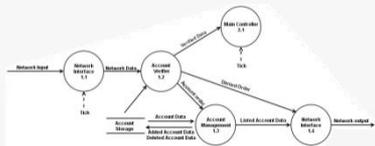


<b>Reference No.</b>	1.1
<b>Name</b>	Network Interface
<b>Input</b>	Network Input
<b>Output</b>	Network Data
<b>Process Description</b>	단말 Network에서 Network Input을 받아 Network Data로 변환하여 전달한다.

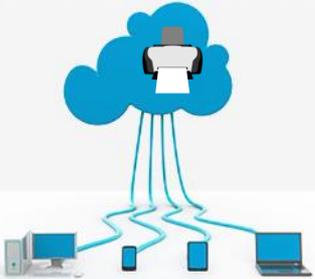


# Data Flow Diagram

## Process Specification-Level 2 Part.1

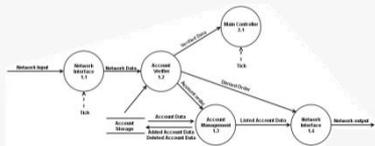


<b>Reference No.</b>	1.2
<b>Name</b>	Account Verifier
<b>Input</b>	Network Data, Account Data
<b>Output</b>	Account order, Verified Data, Denied Order
<b>Process Description</b>	Network Data를 받아 관리자명령어일 경우 Account Order를 전달하고 등록되지 않은 사용자일 경우 Denied Order를 전달한다 . 검증된 사용자일 경우 Verified Data를 Main Controller에 전달한다.

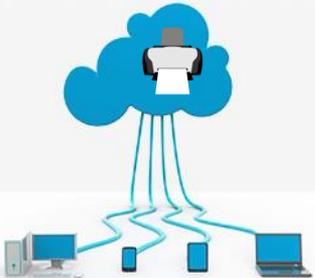


# Data Flow Diagram

## Process Specification-Level 2 Part.1

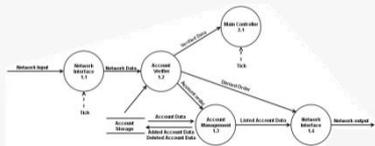


<b>Reference No.</b>	1.3
<b>Name</b>	Account Management
<b>Input</b>	Account order, Account Data
<b>Output</b>	Listed Account Data, Added Account Data, Deleted Account Data
<b>Process Description</b>	Account Order에 따라 유저등록명령의 경우에는 Added Account Data를 Accounted Storage로 보내고 유저삭제명령의 경우에는 Deleted Account Data를 Account Storage로 보내고 User Check 명령의 경우에는 Account Storage에서 확인된 유저목록(Account Data)를 Listed Account data형태로 Network Interface로 보낸다.

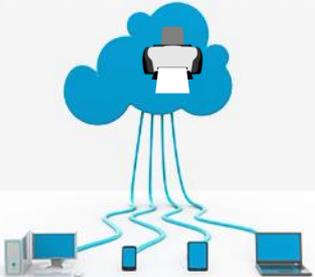


# Data Flow Diagram

## Process Specification-Level 2 Part.1



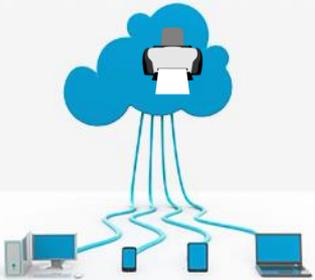
<b>Reference No.</b>	1.4
<b>Name</b>	Network Interface
<b>Input</b>	Listed Account Data, Denied Data
<b>Output</b>	Network Output
<b>Process Description</b>	사용자 계정 목록(Listed Account Data)을 받아 Network Console에 출력한다. 승인되지 않은 사용자의 경우 "승인되지 않은 사용자"라는 글자를 출력한다.



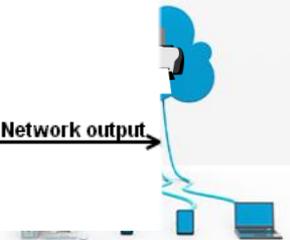
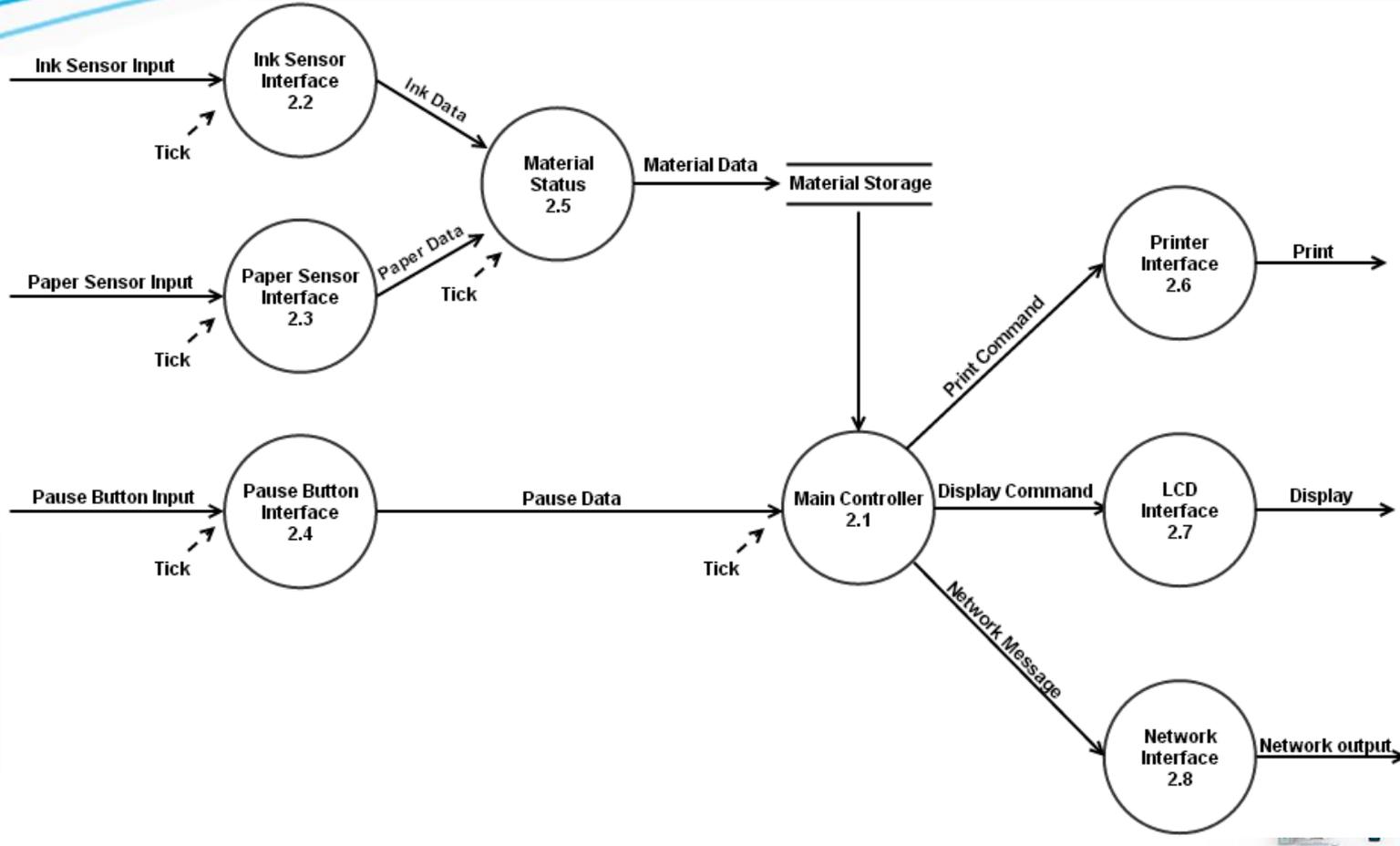
# Data Flow Diagram

## Data Dictionary-Level 2 Part.1

Input/Output Event	Description	Format / Type
<b>Verified Data</b>	인쇄정보, 다양한 Network명령어들	Structure
	Username(Chracter):유저이름 Filename(Character):파일명 Command(Chracter):명령어	
<b>Account Data</b>	사용자 계정에 관한 정보	Chracter
	Username(Chracter) : 계정정보	
<b>Account Storage</b>	Account Data들의 모임	



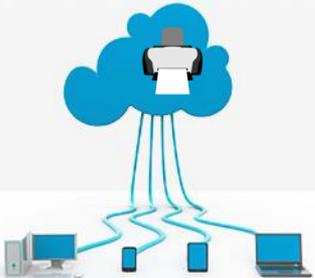
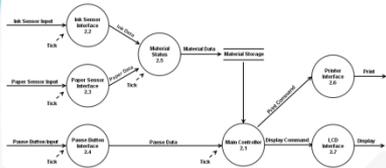
# Sliced DFD Level 2 Part.2



# Data Flow Diagram

## Process Specification-Level 2 Part.2

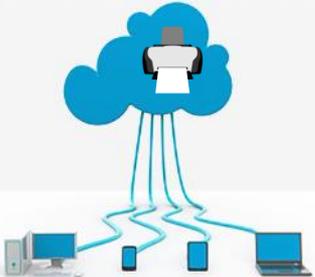
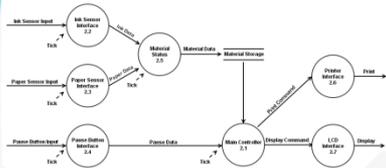
<b>Reference No.</b>	2.1
<b>Name</b>	Main Controller
<b>Input</b>	Material Data, Pause Data, Verified Data
<b>Output</b>	Print Command, Display Command, Network Message
<b>Process Description</b>	Material Data, Pause Data, Verified Data를 받아 출력가능 불가능여부, 정지, 리필 여부를 판단하고 Print, Display Command, Network Message를 보낸다.



# Data Flow Diagram

## Process Specification-Level 2 Part.2

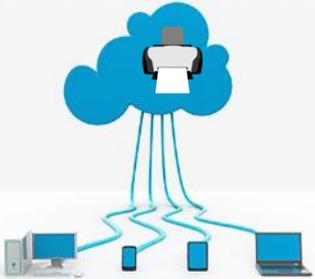
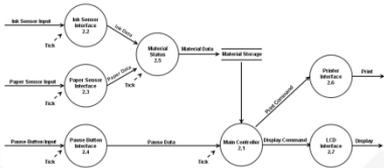
<b>Reference No.</b>	2.2
<b>Name</b>	Ink Sensor Interface
<b>Input</b>	Ink Sensor Input
<b>Output</b>	Ink Data
<b>Process Description</b>	Ink Sensor Input을 Ink Data로 변환하여 Material Status로 전달한다.



# Data Flow Diagram

## Process Specification-Level 2 Part.2

<b>Reference No.</b>	2.3
<b>Name</b>	Paper Sensor Interface
<b>Input</b>	Paper Sensor Input
<b>Output</b>	Paper Data
<b>Process Description</b>	Paper Sensor Input을 Paper Data로 변환하여 Material Status로 전달한다.

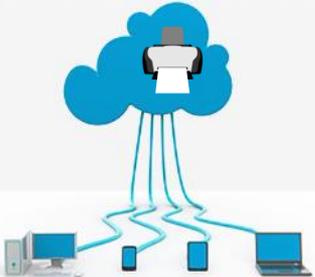
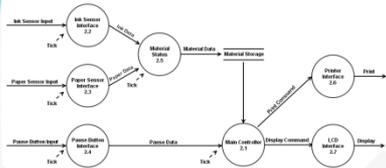




# Data Flow Diagram

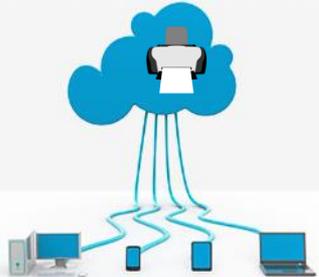
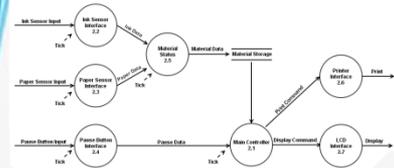
## Process Specification-Level 2 Part.2

<b>Reference No.</b>	2.5
<b>Name</b>	Material Status
<b>Input</b>	Ink Data, Paper Data
<b>Output</b>	Material Data
<b>Process Description</b>	Ink Data와 Paper Data를 받아 취합하여 Material Data로 변환하여 전달한다.



# Data Flow Diagram

## Process Specification-Level 2 Part.2

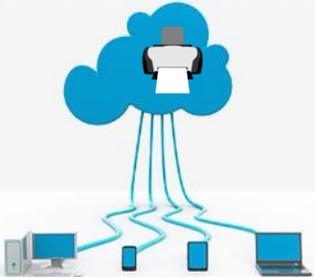
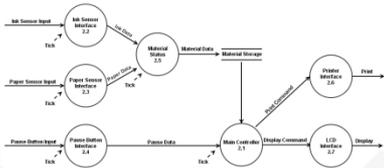


<b>Reference No.</b>	2.6
<b>Name</b>	Printer Interface
<b>Input</b>	Printer Command
<b>Output</b>	Print
<b>Process Description</b>	Printer Command를 받아 하드웨어적 신호 Print로 변환하여 전달한다.

# Data Flow Diagram

## Process Specification-Level 2 Part.2

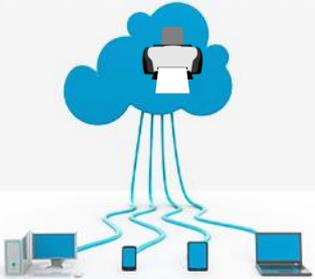
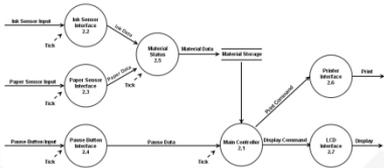
<b>Reference No.</b>	2.7
<b>Name</b>	LCD Interface
<b>Input</b>	Display Command
<b>Output</b>	Display
<b>Process Description</b>	Display Command를 받아 하드웨어적 신호 Display 로 변환하여 전달한다.



# Data Flow Diagram

## Process Specification-Level 2 Part.2

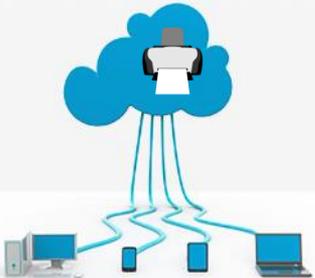
<b>Reference No.</b>	2.8
<b>Name</b>	Network Interface
<b>Input</b>	Network Message
<b>Output</b>	Network Output
<b>Process Description</b>	Network Message를 받아 하드웨어적 신호 Network Output으로 변환하여 전달한다.



# Data Flow Diagram

## Data Dictionary-Level 2 Part.2

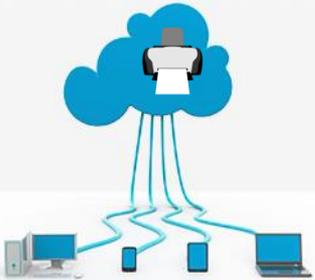
Input/Output Event	Description	Format / Type
<b>Pause Data</b>	Pause 버튼의 상태	pauseinput(Boolean): 정지여부
<b>Ink Data</b>	Ink의 양	Ink(Int):잉크량
<b>Paper Data</b>	Paper 의 양	Paper(Int):종이량
<b>Material Data</b>	Ink, Paper의 양을 취합한 것	Ink(Int):잉크량 Paper(Int):종이량 /Structure
<b>Material Storage</b>	Material Data의 저장소	Ink(Int):잉크량 Paper(Int):종이량 /Structure



# Data Flow Diagram

## Data Dictionary-Level 2 Part.2

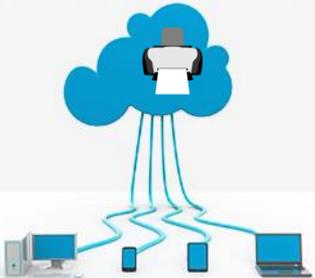
<b>Network Data</b>	네트워크 요청과, 프린트 할 데이터.	Command(Character) : 명령어 Filename(Character):파일명/Structure
<b>Print Command</b>	Main Controller에서 Printer Interface로 이동할 정보	Structure
<b>Display Command</b>	프린터의 상태, 잉크와 용지의 상태를 Main Controller 에서 받아 LCD interface로 이동할 데이터	Structure



# Data Flow Diagram

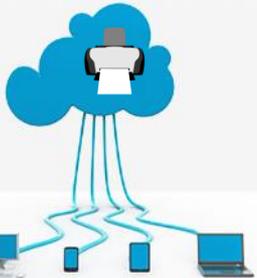
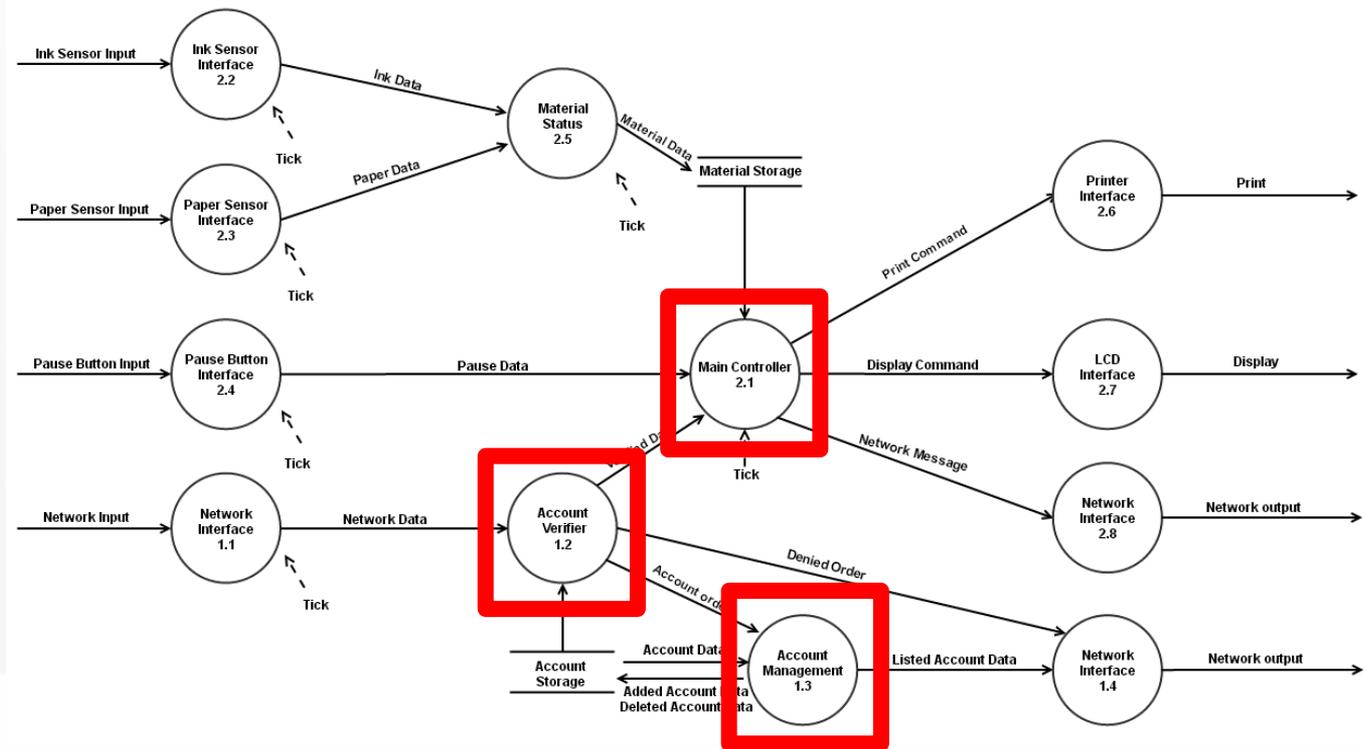
## Data Dictionary-Level 2 Part.2

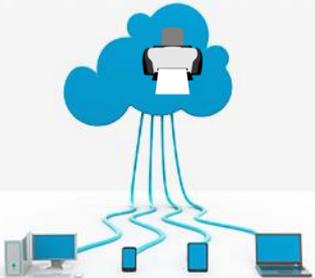
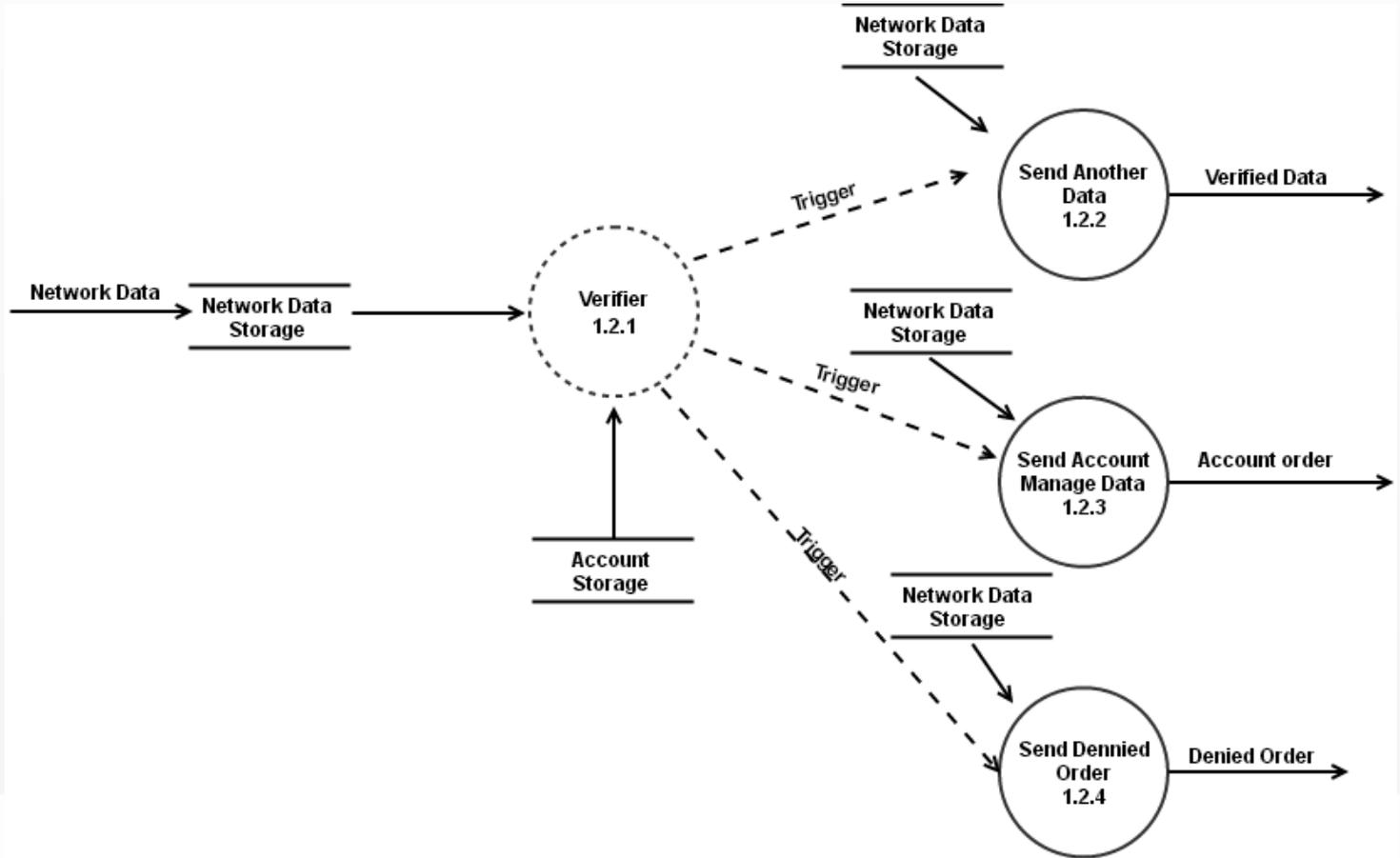
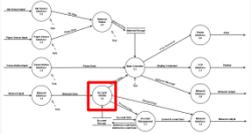
<b>Listed Account Data</b>	Account Data에 있는 사용자들의 목록	Structure
<b>Account Order</b>	관리자만이 할 수 있는 명령	Structure
<b>Denied Order</b>	승인되지 않은 사용자의 명령	Structure
<b>Add Account Data</b>	추가할 사용자의 이름	Character
<b>Delete Account Data</b>	삭제할 사용자의 이름	Character



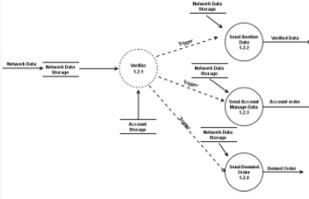
# Data Flow Diagram

## Level 3

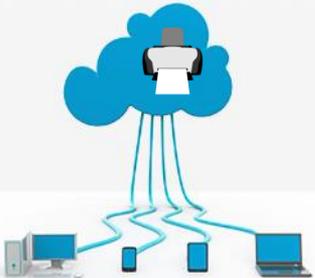




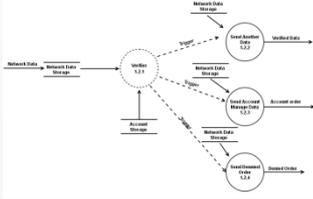
# Process Specification-Account Verifier



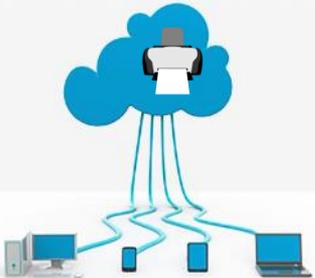
<b>Reference No.</b>	1.2.1
<b>Name</b>	Verifier
<b>Input</b>	Account Storage, Network Data
<b>Output</b>	Tick,T rigger
<b>Process Description</b>	Account Storage에서 계정목록들을 확인한 후 관리자인 경우 미승인된 사용자인 경우 검증된 사용자인 경우로 나누어서 해당 프로세스를 동작시킨다.



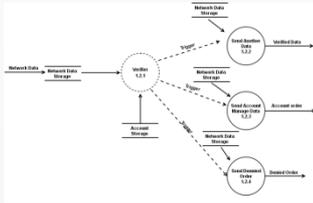
# Process Specification-Account Verifier



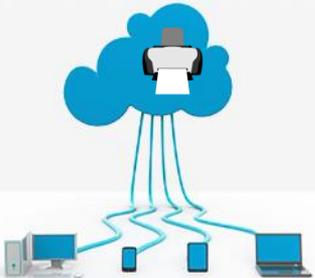
<b>Reference No.</b>	1.2.2
<b>Name</b>	Send Another Data
<b>Input</b>	Tick, Trigger
<b>Output</b>	Verified Data
<b>Process Description</b>	Network Data Storage에 있는 데이터를 Verified Data로 보낸다.



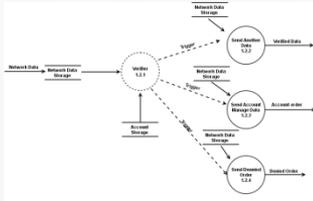
# Process Specification-Account Verifier



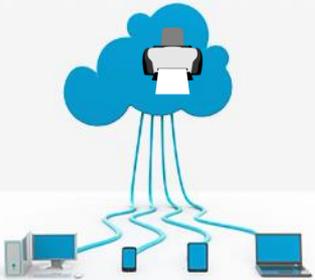
<b>Reference No.</b>	1.2.3
<b>Name</b>	Send Account Manage Data
<b>Input</b>	Tick, Trigger
<b>Output</b>	Account order
<b>Process Description</b>	Network Data Storage에 있는 데이터를 참조하여 Account order로 보낸다.

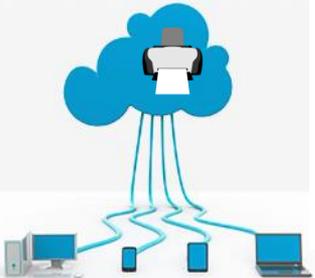
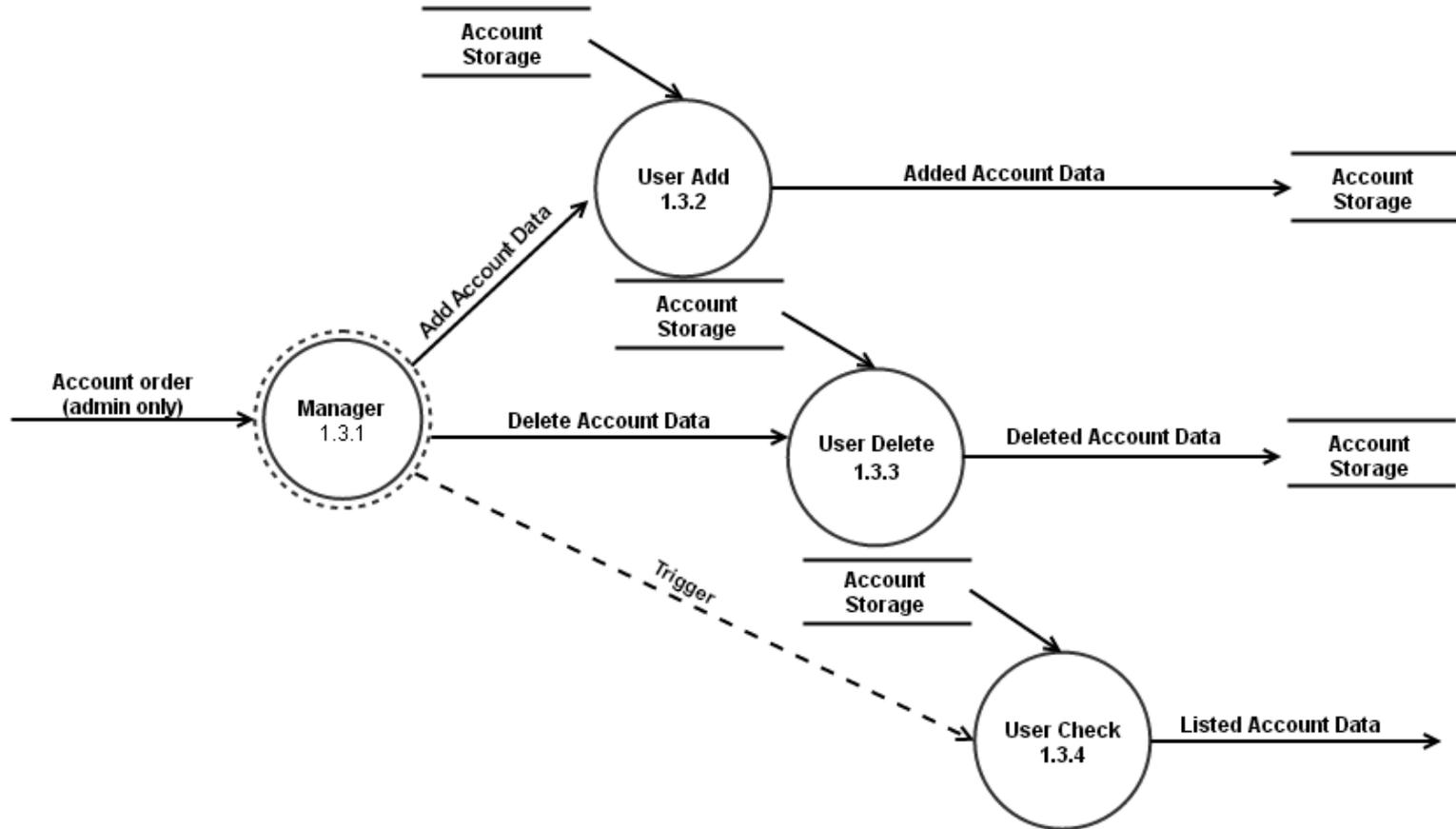
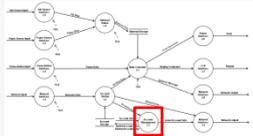


# Process Specification-Account Verifier

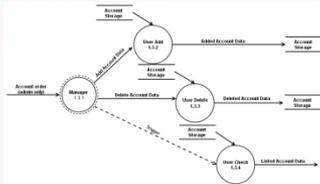


<b>Reference No.</b>	1.2.4
<b>Name</b>	Send Denied order
<b>Input</b>	Tick, Trigger
<b>Output</b>	Dinied Order
<b>Process Description</b>	콘솔창에 제한된 사용자라는 정보를 보내주기 위해 Network Interface로 Denied Order를 보내준다.

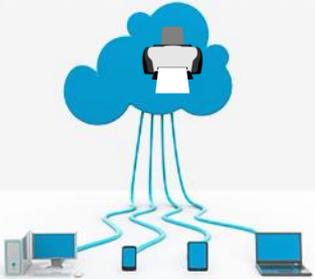




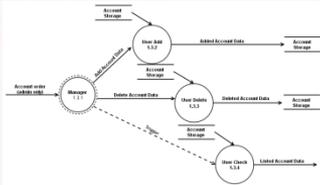
# Process Specification-Account Management



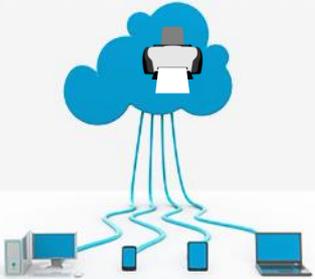
<b>Reference No.</b>	1.3.1
<b>Name</b>	Manager
<b>Input</b>	Account Order
<b>Output</b>	Add Account Data, Delete Account Data, Trigger
<b>Process Description</b>	Account Order를 받아 등록, 삭제를 해주고 유저확인 명령의 경우에는 Trigger를 발생시킨다.



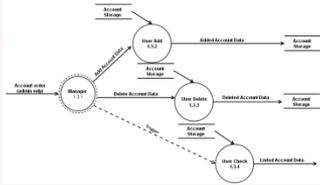
# Process Specification-Account Management



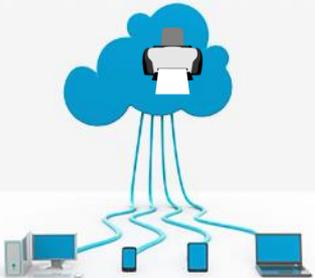
<b>Reference No.</b>	1.3.2
<b>Name</b>	User add
<b>Input</b>	Add Account Data, Account Data
<b>Output</b>	Added Account Data
<b>Process Description</b>	추가할 데이터(Added Account Data)와 Account Data를 받아 병합한 후 Account Storage에 다시 저장한다.



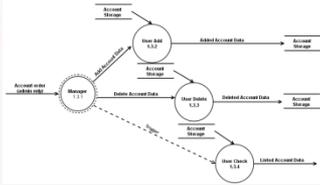
# Process Specification-Account Management



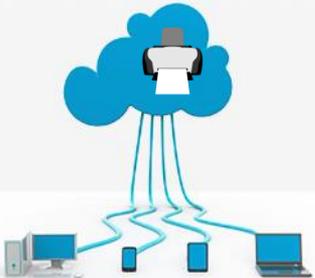
<b>Reference No.</b>	1.3.3
<b>Name</b>	User Delete
<b>Input</b>	Delete Account Data, Account Data
<b>Output</b>	Deleted Account Data
<b>Process Description</b>	삭제할 데이터(Deleted Account Data)와 Account Data를 받아 확인한 후 데이터를 삭제하고 Account Storage에 다시 저장한다.

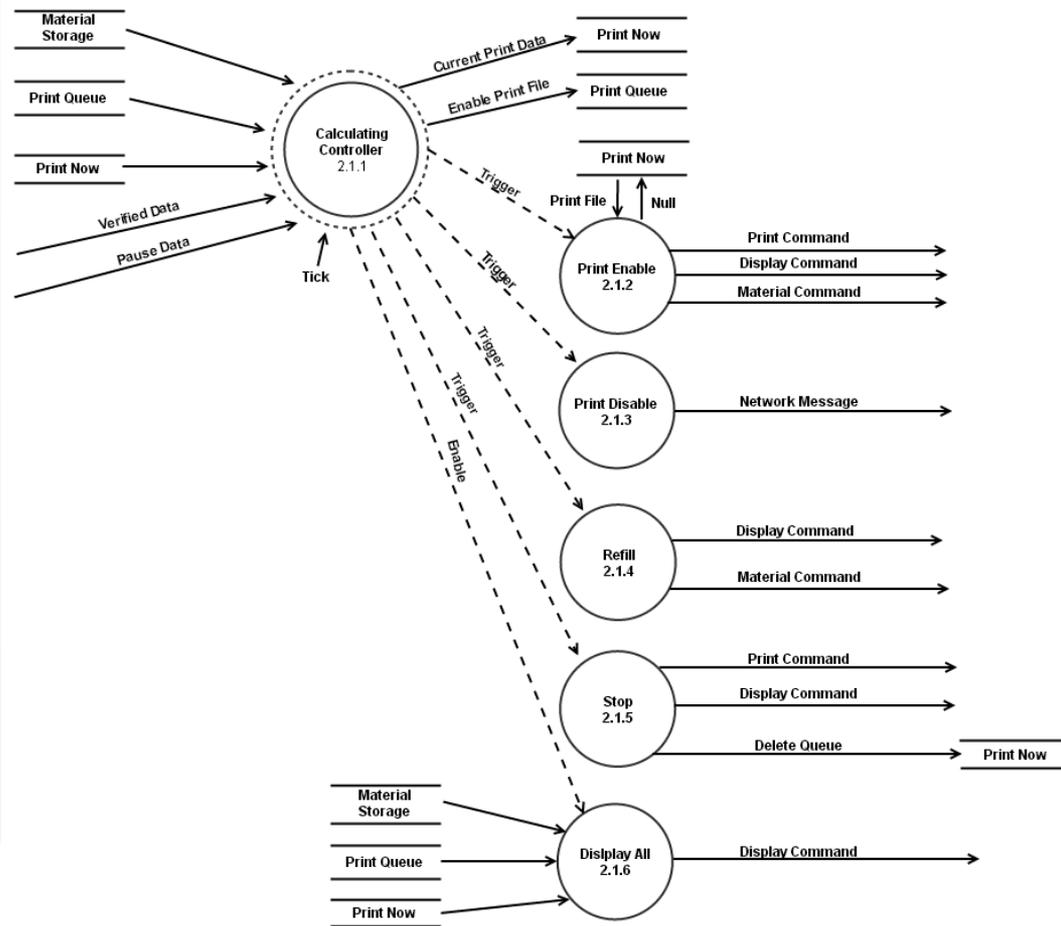
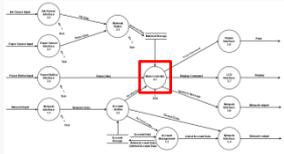


# Process Specification-Account Management

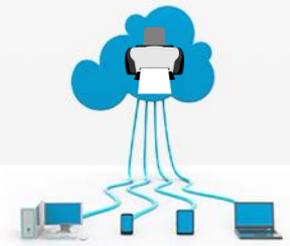
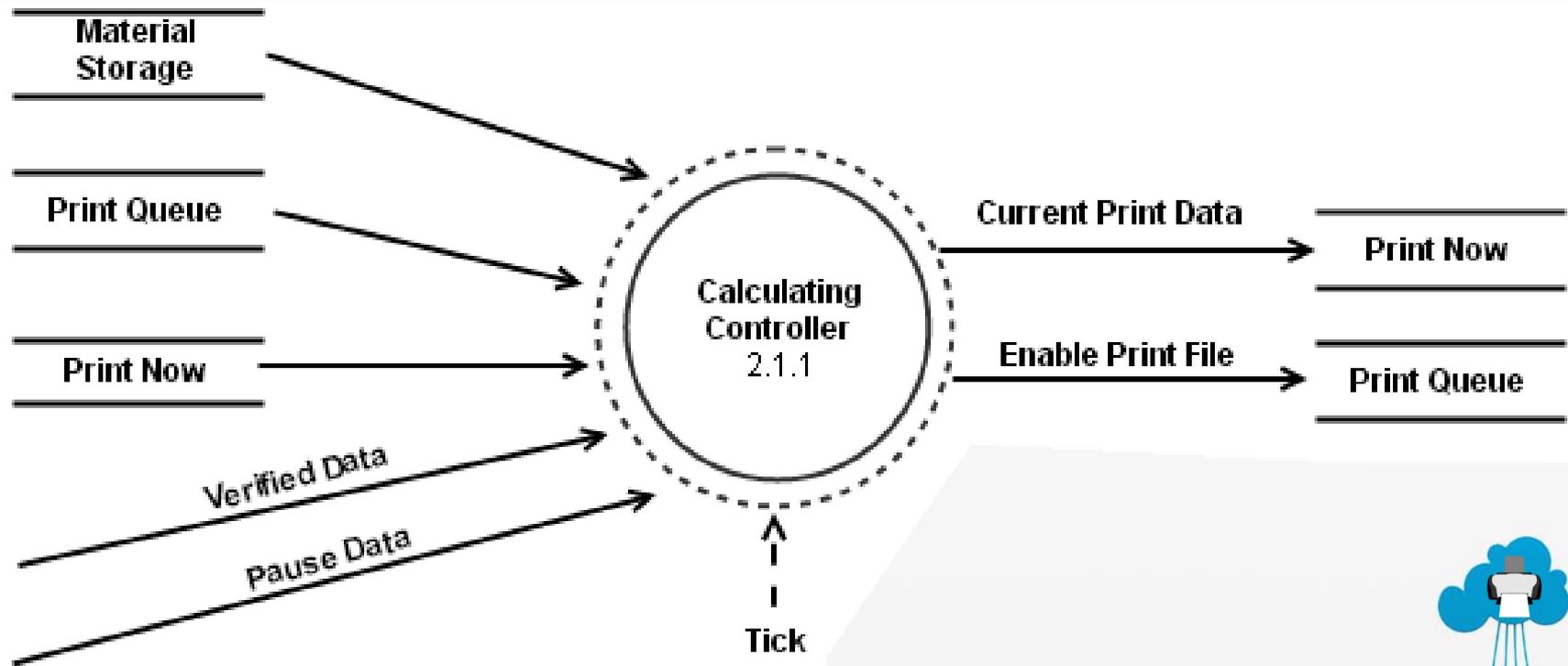


<b>Reference No.</b>	1.3.4
<b>Name</b>	User check
<b>Input</b>	Tick, trigger, Account Data
<b>Output</b>	Listed Account data
<b>Process Description</b>	User check라는 명령어를 받으면 계정목록들을 Network Interface로 보내준다.



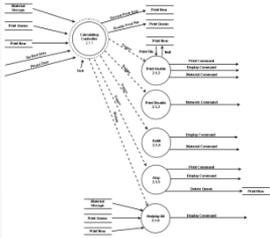


# Sliced Main Controller Part.1

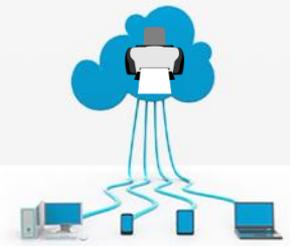
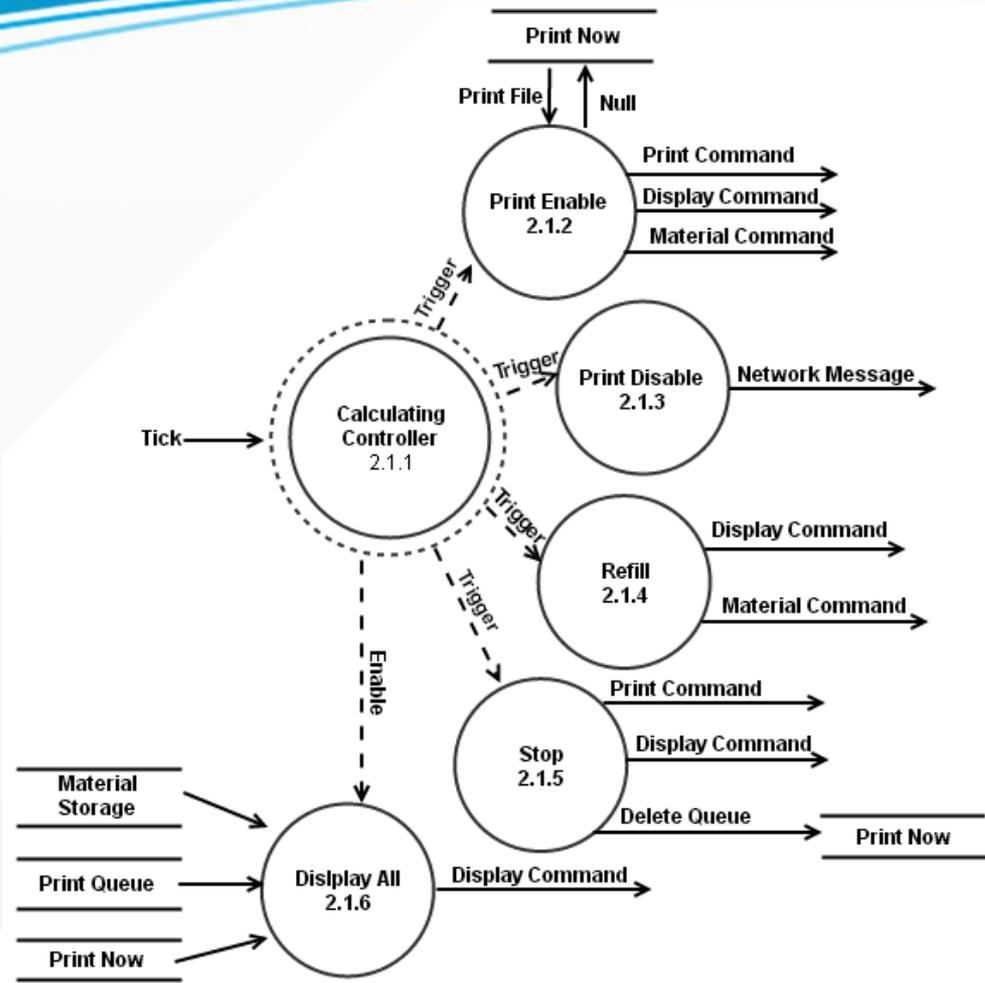


## Process Specification-Sliced Main Controller Part.1

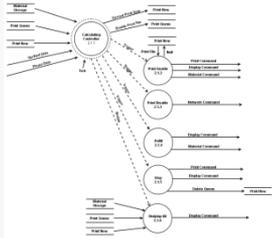
<b>Reference No.</b>	2.1.1
<b>Name</b>	CalculatingController
<b>Input</b>	Material Storage, Verified data, Pause Data, Printing Now, Print Queue, tick
<b>Output</b>	Trigger, Printing Now, Print Queue, Enable
<b>Process Description</b>	<p>데이터들을 받아 프린트할 잉크, 종이량이 충분한지 대기열에 대기자수가 얼마만큼 있는지 등을 파악하여 출력이 가능할 경우 Print Queue에 저장한다.</p> <p>또 Print Now를 확인하여 Null일 경우 Print Queue의 맨 앞 파일을 가져와 Print Now에 저장하고 각 조건에 맞추어 해당 프로세스를 작동한다.</p>



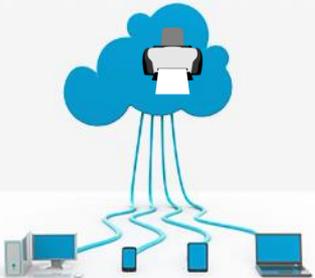
# Sliced Main Controller Part.2



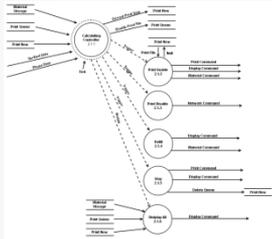
# Process Specification-Sliced Main Controller Part.2



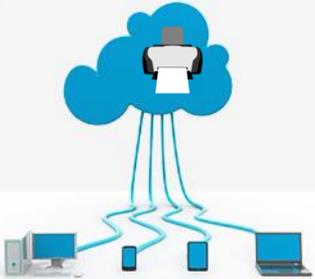
<b>Reference No.</b>	2.1.2
<b>Name</b>	PrintEnable
<b>Input</b>	Tick, Trigger
<b>Output</b>	Printing now, Print command, Display command, Material command
<b>Process Description</b>	<p>대기열이 꽉 차지 않고 용지,잉크가 인쇄 가능한 만큼 있을 때 Printing now에서 출력물데이터를 참조하여 출력 명령을 보내고, 출력중 상태를 display command로 보낸다.</p> <p>현재까지 사용한 잉크 양과 종이 양을 보여주기 위해서 material command 를 보낸다.</p>



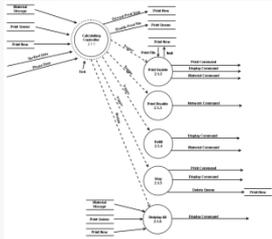
# Process Specification-Sliced Main Controller Part.2



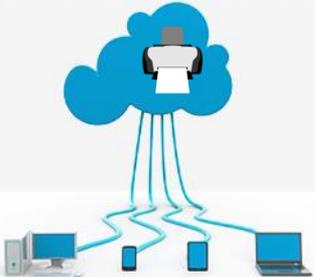
<b>Reference No.</b>	2.1.3
<b>Name</b>	PrintDisable
<b>Input</b>	Tick, Trigger
<b>Output</b>	Network Message
<b>Process Description</b>	대기열이 꽉 찼거나 용지, 잉크가 충분하지 못할 때 출력 불가능한 상태를 Network Message로 보낸다.



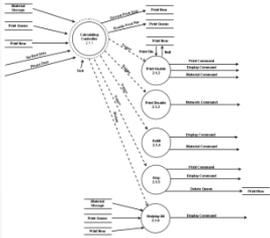
# Process Specification-Sliced Main Controller Part.2



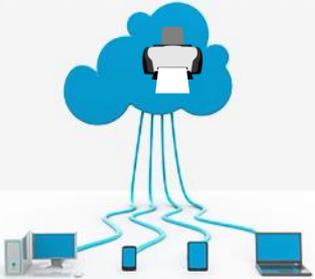
<b>Reference No.</b>	2.1.4
<b>Name</b>	Refill
<b>Input</b>	Tick, Trigger
<b>Output</b>	Display command, Material command
<b>Process Description</b>	리필 요청을 받았을 때 리필 중 이라는 상태를 display command로 보내고, 리필을 완료한 후 종이와 잉크의 상태를 갱신하기 위해 Material command를 보낸다.



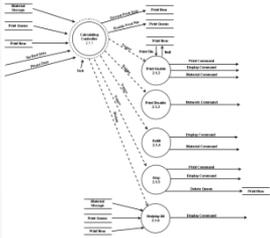
## Process Specification-Sliced Main Controller Part.2



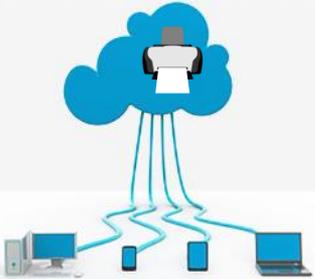
<b>Reference No.</b>	2.1.5
<b>Name</b>	Stop
<b>Input</b>	Trigger, Tick
<b>Output</b>	Print command, Display command, Delete command
<b>Process Description</b>	pause버튼이 눌리거나 stop명령이 들어왔을 때 display command를 보내 대기 중 상태를 표시하고, 멈춤 명령을 Print command로 보내고 Delete Queue명령을 통하여 현재 출력중인 큐를 비워준다.



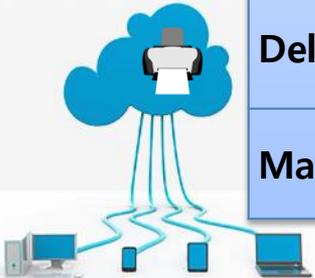
## Process Specification-Sliced Main Controller Part.2



<b>Reference No.</b>	2.1.6
<b>Name</b>	Display All
<b>Input</b>	Material storage, Printing queue, Trigger, Tick, clock
<b>Output</b>	Display command
<b>Process Description</b>	잉크 종이 잔량, 현재시간, 출력중인 사용자 및 실시간 인쇄상태 및 대기자들의 정보를 Display command로 보낸다.



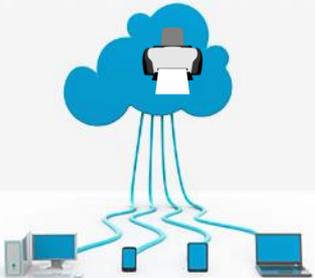
Input/Output Event	Description	Format / Type
<b>Printing now</b>	현재 프린트중인 문서를 저장하고 있는 저장소	File
<b>Print Queue</b>	유저네임, 파일명, 명령 등을 저장하고 있는 큐 저장소	Username(Chracter): 유저명 Filename(Chracter): 파일명 Command(character): 명령어/Structure
<b>Network command</b>	네트워크 명령들을 저장하고 있는 저장소	Chracter
<b>Delete Queue</b>	stop명령이 들어왔을 경우 현재 인쇄중인 큐를 비워주는 명령	Chracter
<b>Material Command</b>	잉크를 리필할 경우나 현재 잔량을 파악하기 위한 명령	Chracter



# State Transition Diagram

## Data Dictionary

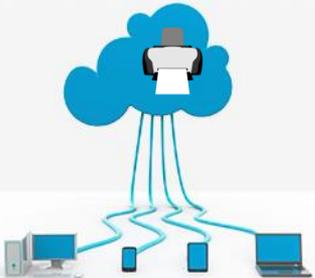
Input/Output Event	Description	Format / Type
PA	대기열이 5이하인 경우	True/False
PN	현재 인쇄중인 문서가 있는경 우	True/False
R	리필 상태 일경우	True/False
I	잉크량 충분한 경우	True/False
PAPER	종이량 충분한 경우	True/False



# State Transition Diagram

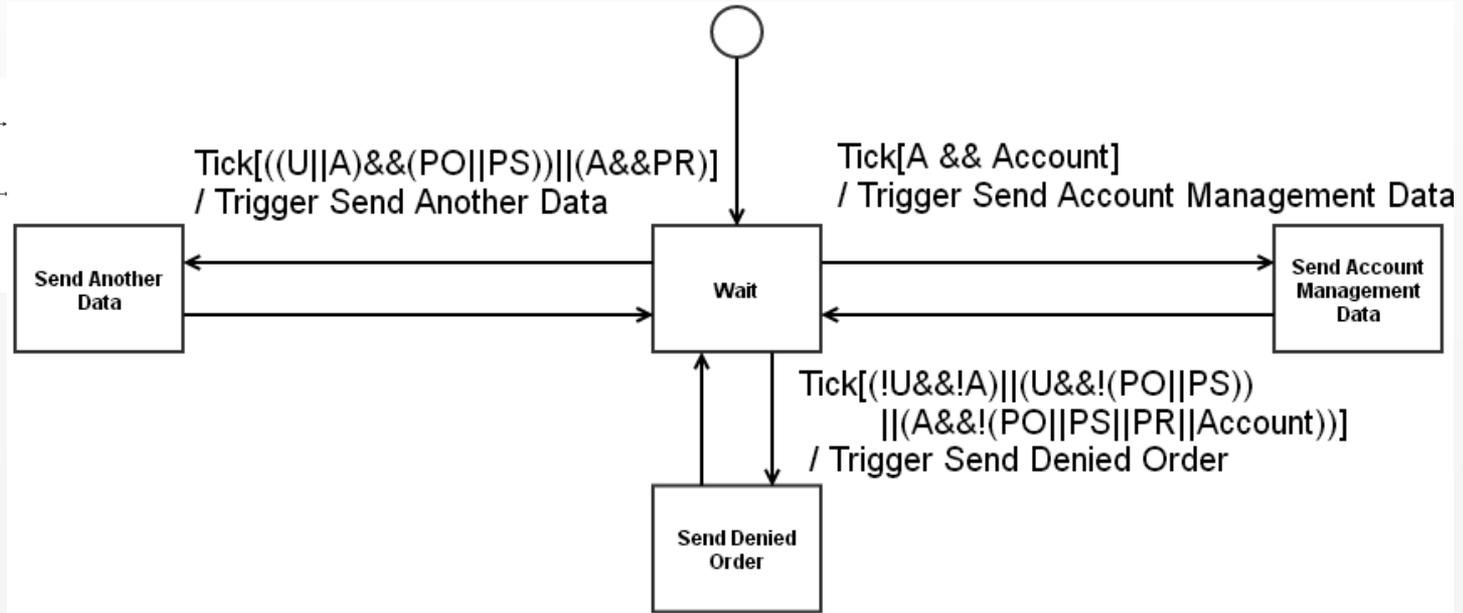
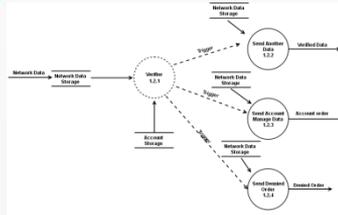
## Data Dictionary

Input/Output Event	Description	Format / Type
PO	프린트 명령	
PS	스탑 명령	
SB	스탑 버튼	
PR	리필 명령	
Account	계정관련 명령	
U	사용자	
A	관리자	



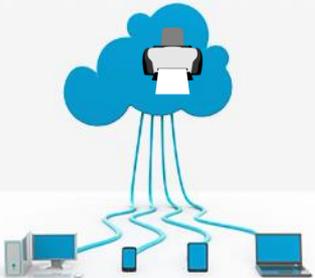
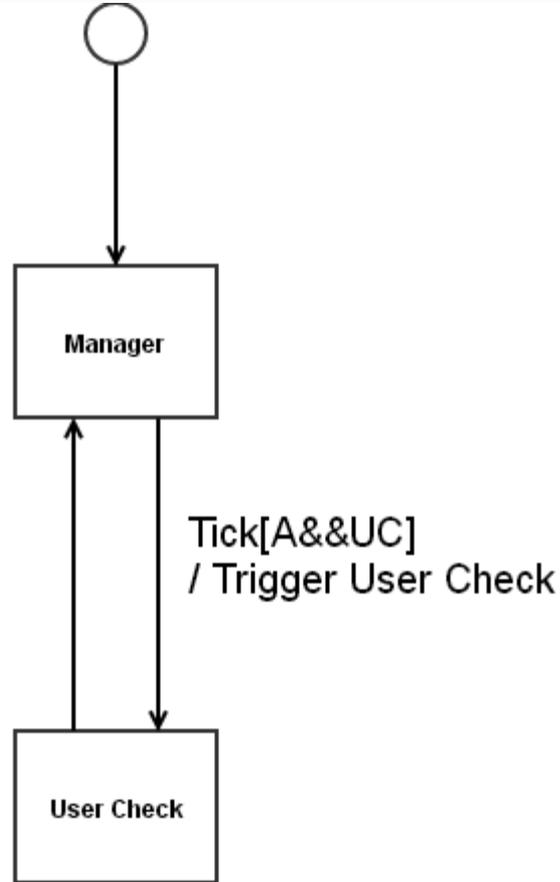
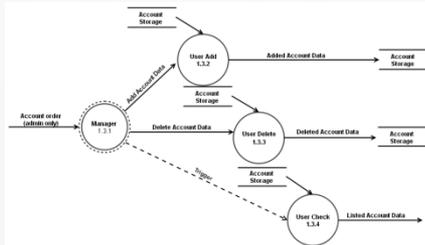
# State Transition Diagram

Verifier 1.2.1



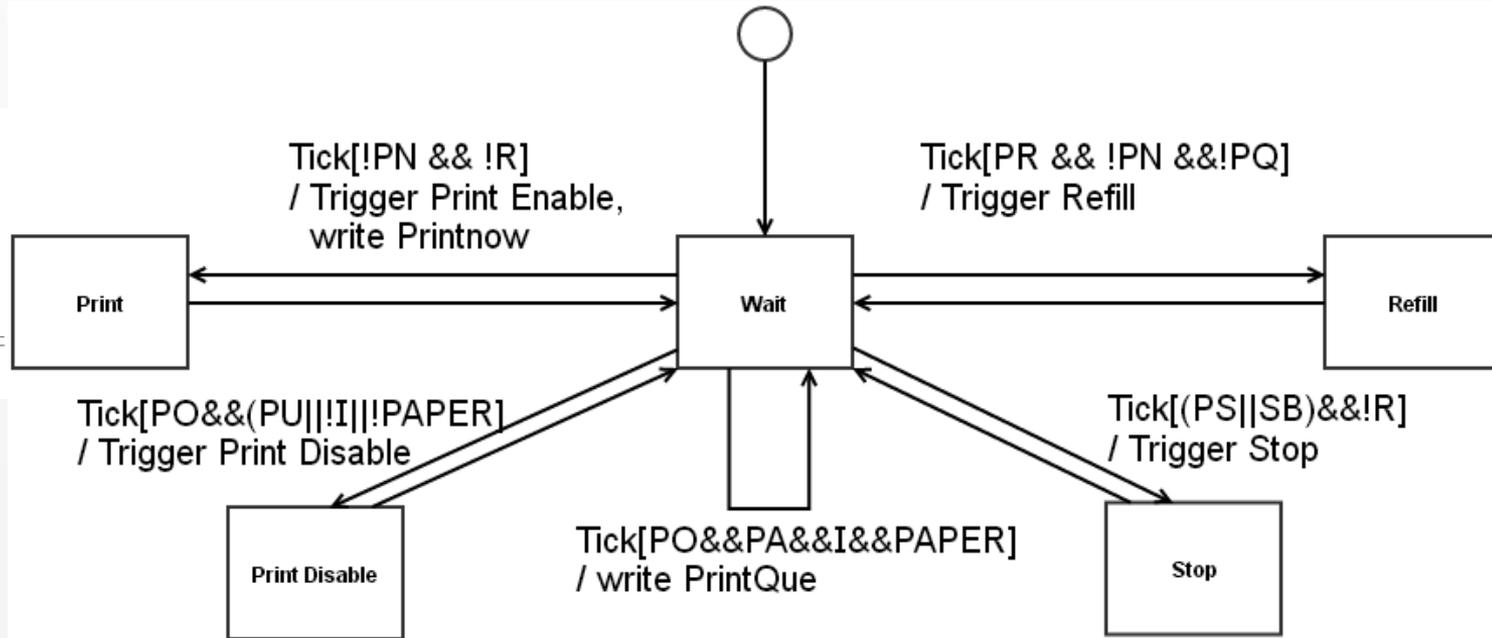
# State Transition Diagram

Manager-1.3.1



# State Transition Diagram

Calculating Controller-2.1.1



Overview

