DATA FLOW DIAGRAMS

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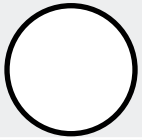
System Design

- System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture.
- The basic structural design is done with the help of Data Flow Diagram (DFD)
- DFD provides the logical design of a system

Data Flow Diagrams (DFD)

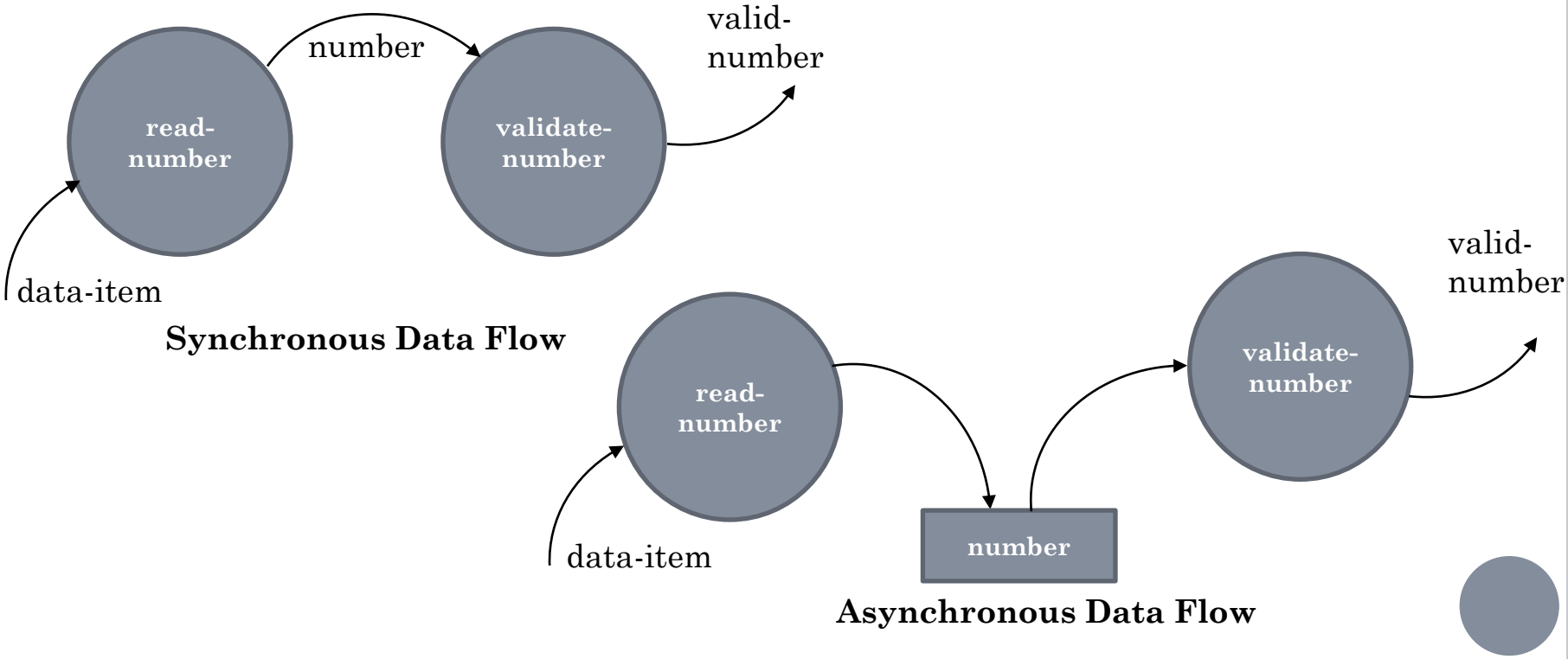
- Graphical representation for a system, in terms of:
  - Input data
  - Processing
  - Output data
- DFD is simple which is very easy to understand and use
- Any process on a DFD can be split into different sub-processes – collective view makes up that process

Symbols for Making DFDs

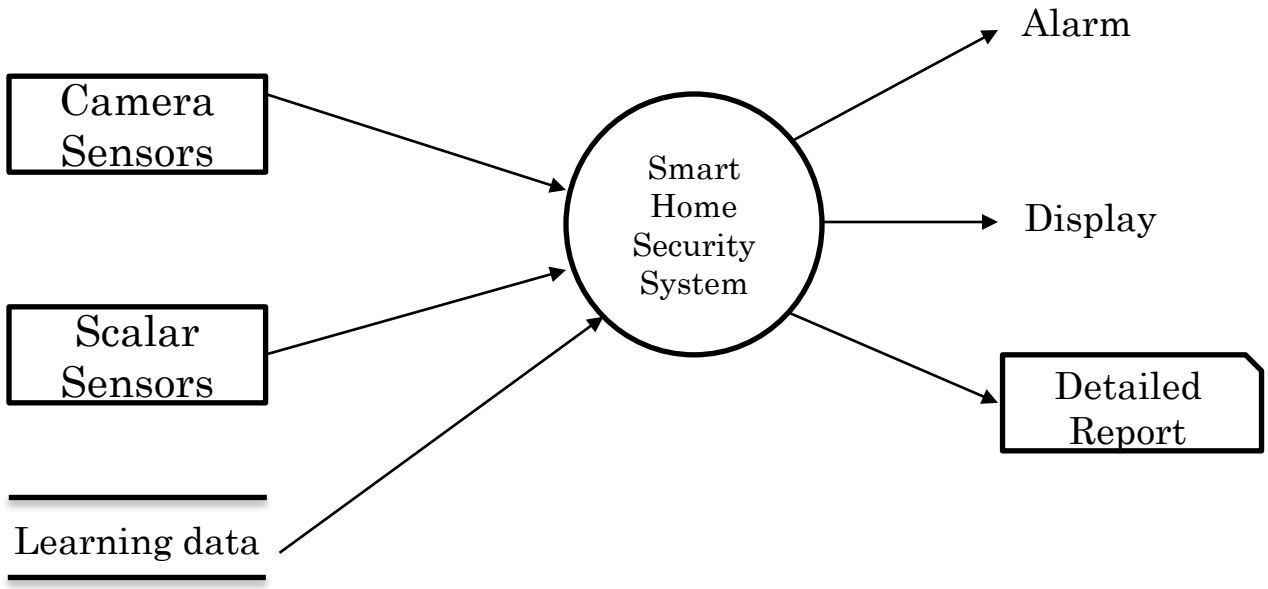
Symbol	Name	Description
	External entity	• Physical entities, external to the system. • Interact with the system by inputting data
	Process	• Function representation • Sometime called bubble
	Data store	• Represents logical files • Data structure or physical file on disk
	Data flow	• Shows the data flow between two processes • Can be synchronous and asynchronous
	Output	• Used when a hard copy is produced

Synchronous and Asynchronous Data Flow

- Data-item **number** flowing from the process **read-number** to **validate-number**, data-item flowing into read-number, and valid number flowing out of validate-number



DFD: A Smart Home Security System



Context Level Diagram/Level 0 DFD

- Logical representation of all the processes involved in overall system
- Shows how data flows among process
- Adds data stores

Level 1 DFD

- Represents all the processes that involved in single process on the Context level/Level 0 diagram
- Shows how data flows among these processes
- More detailed representation of content of higher level process

Level 2 DFD

- Represents all processes those are comprised a single process in a level 1 DFD
- Depicts the data flows from and to each of these processes
- Level 2 DFD may not be essential for all level 1 processes
- By correct numbering of each process, user easily understand where the process need to fits into the overall system

Coffee Making Stall : DFD

- The operations of a simple coffee making stall will be used to demonstrate the creation of dataflow diagrams.
- Steps
  1. List the activities required to involved in the system
  2. Create Context Level/ Level 0 DFD: Identify source and sink
  3. Create Level 1 to m: Feasible sub-processes in the system and identify actual data flow and data store
  4. Create Level 2 to n: Elaborate the data flow for the processes highlighted in Level 1 DFD

Coffee Making Stall : DFD

- Think the possible basic activities that take place for coffee making stall
- List of activities (Step 1)
  - Customer Order
  - Serve Product
  - Collect Payment
  - Produce Product
  - Store Product
  - Order Raw Materials
  - Pay for Raw Materials
  - Pay for Labor

Also, try to think of the additional activities, which are required to support the basic activities.

Coffee Making Stall : DFD

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- List of activities (Step 1)
  - Customer Order
  - Serve Product
  - Collect Payment
  - Produce Product
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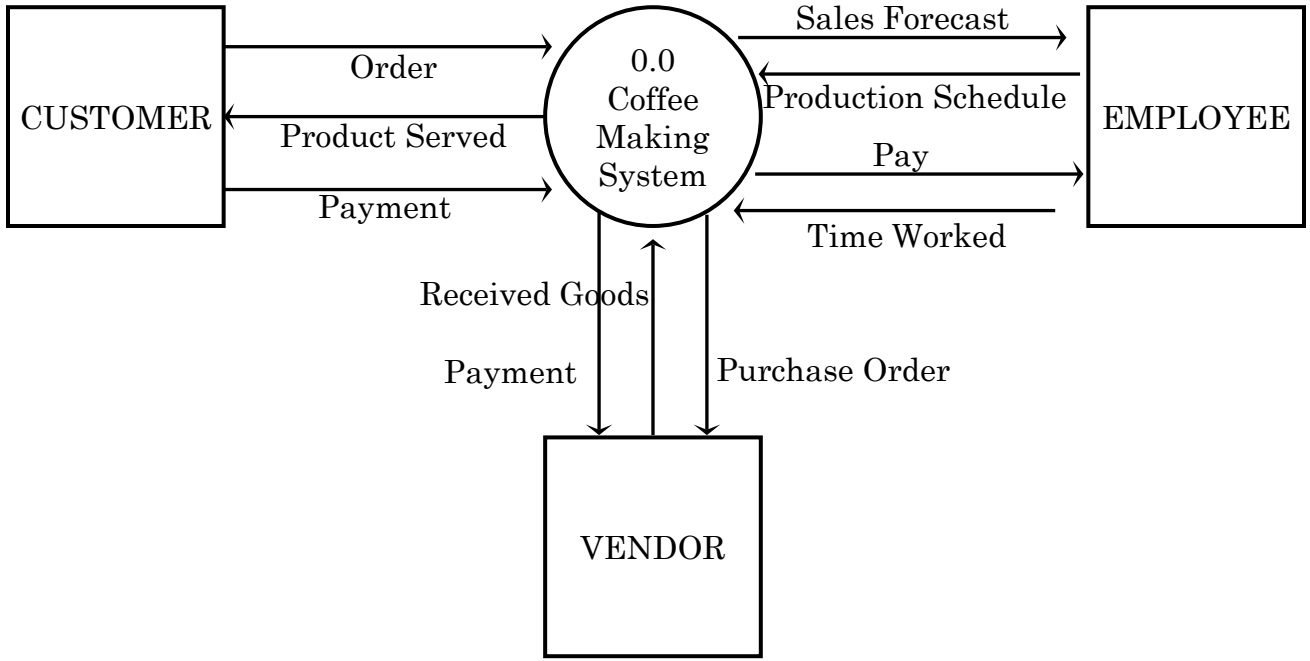
Logical grouping of these activities, possible functional areas

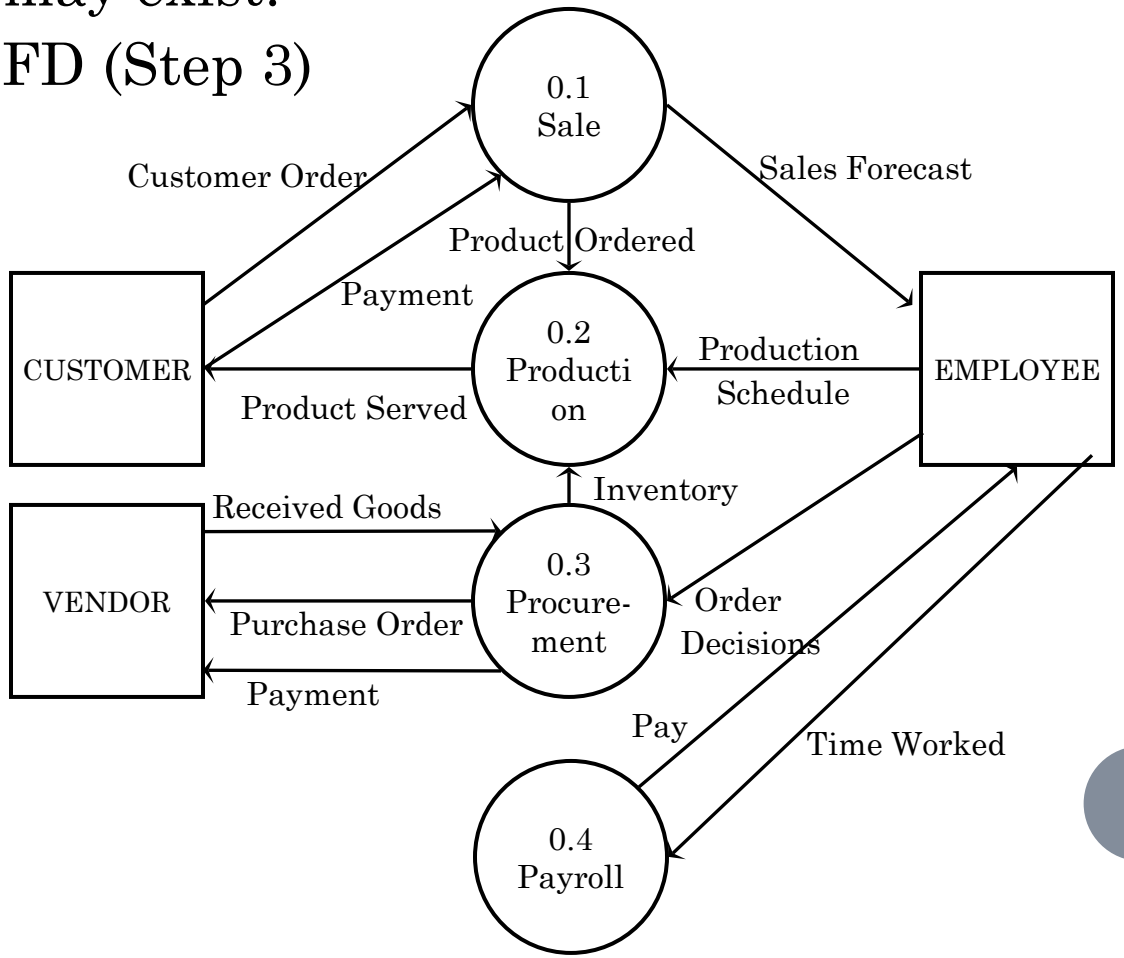
COFFEE MAKING STALL : DFD

- Identify sources and sink (users)
- Create Context Level/Level 0 DFD (Step 2)



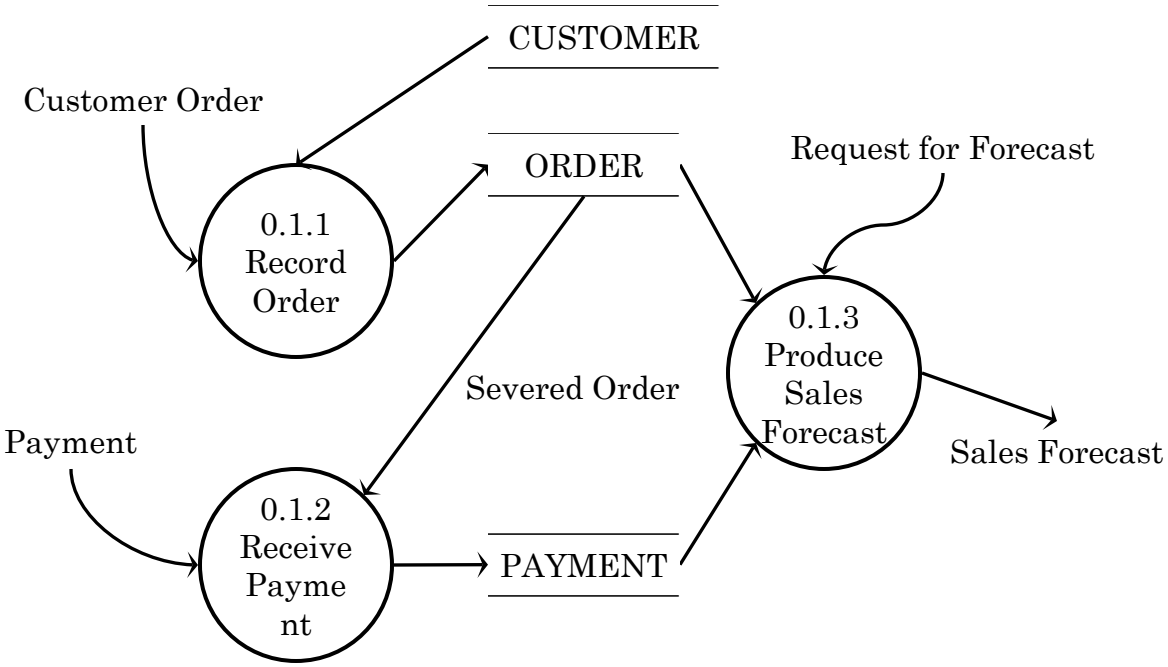
Coffee Making Stall : DFD

- Create a Level 1 diagram identifying the logical subsystems that may exist.
- Create Level 1 DFD (Step 3)



COFFEE MAKING STALL : DFD

- Create a level 2 decomposing the processes in level 0 and identifying data stores.
- Create Level 2 DFD (Step 4)



- Customer Order
- Collect Payment

Coffee Making Stall : DFD

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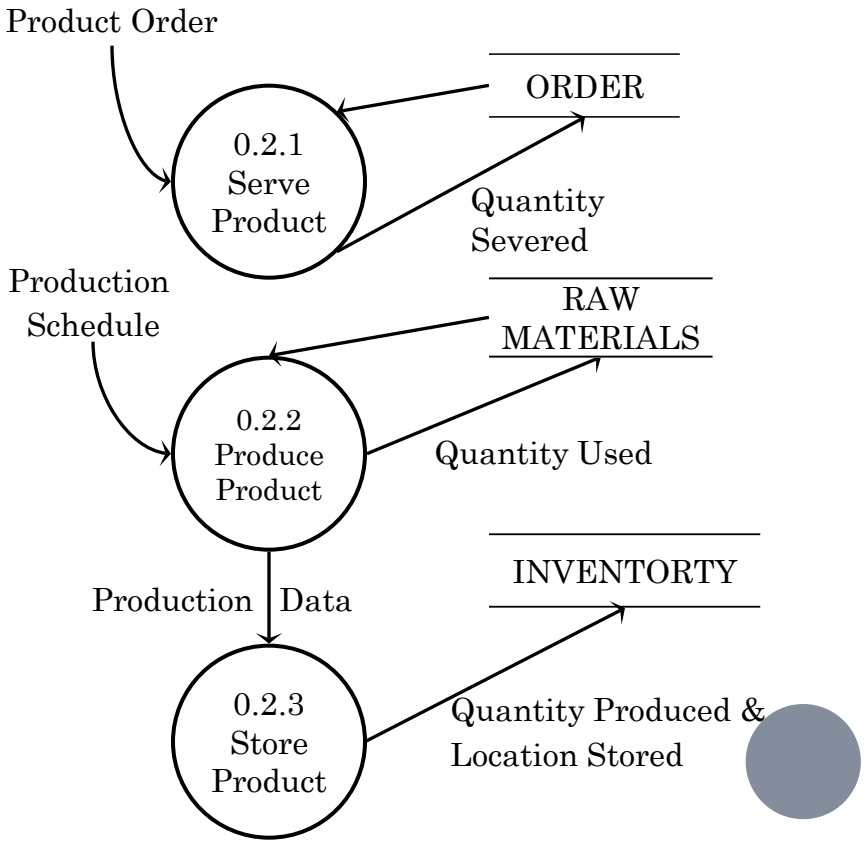

- Serve Product
- Produce Product
- Store Product

Coffee Making Stall : DFD

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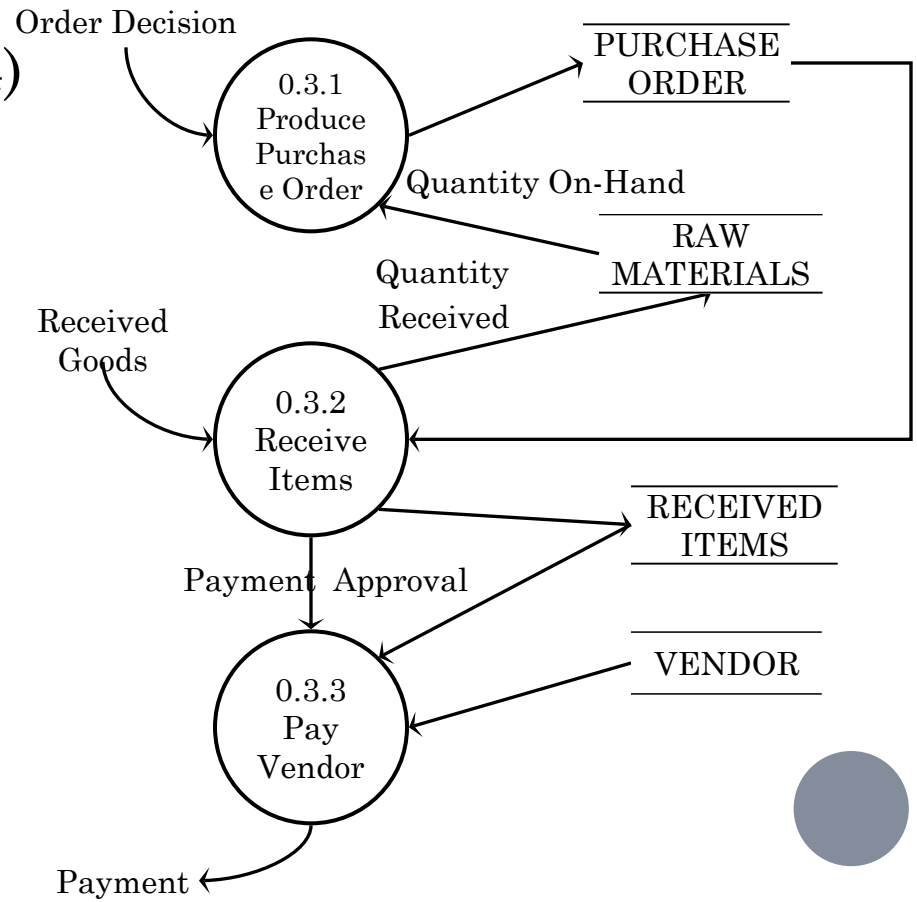
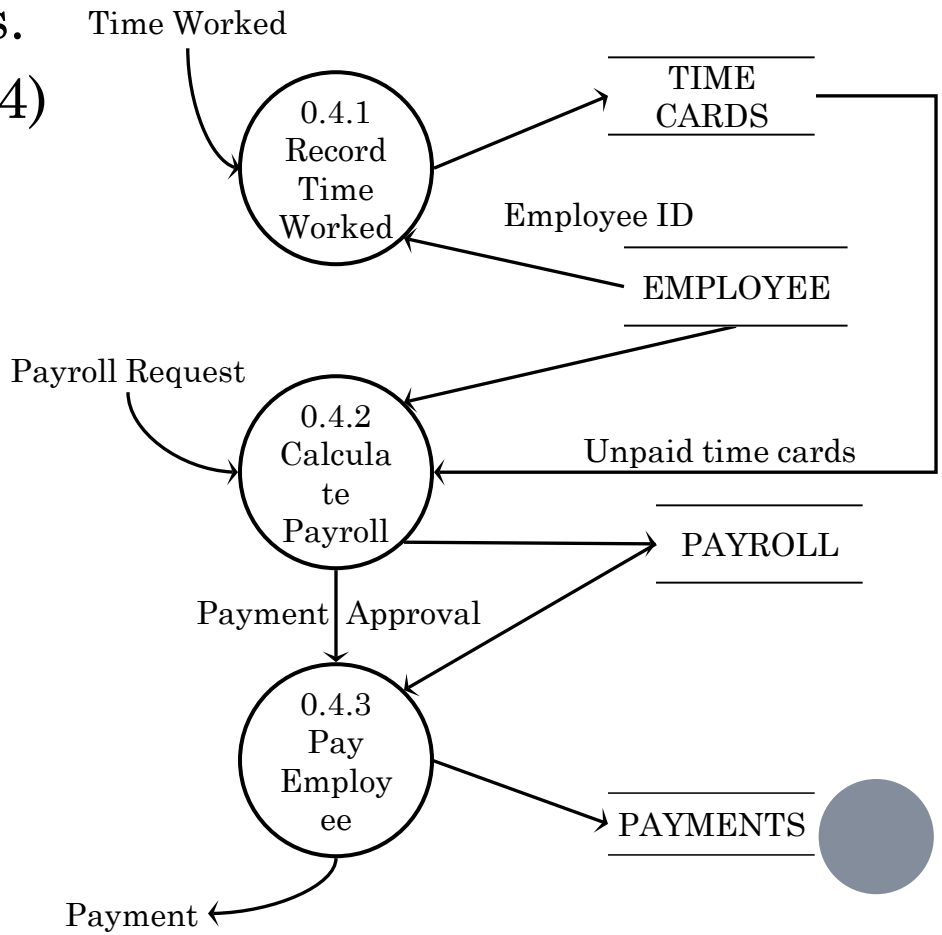


- Order Raw Materials
- Pay for Raw Materials

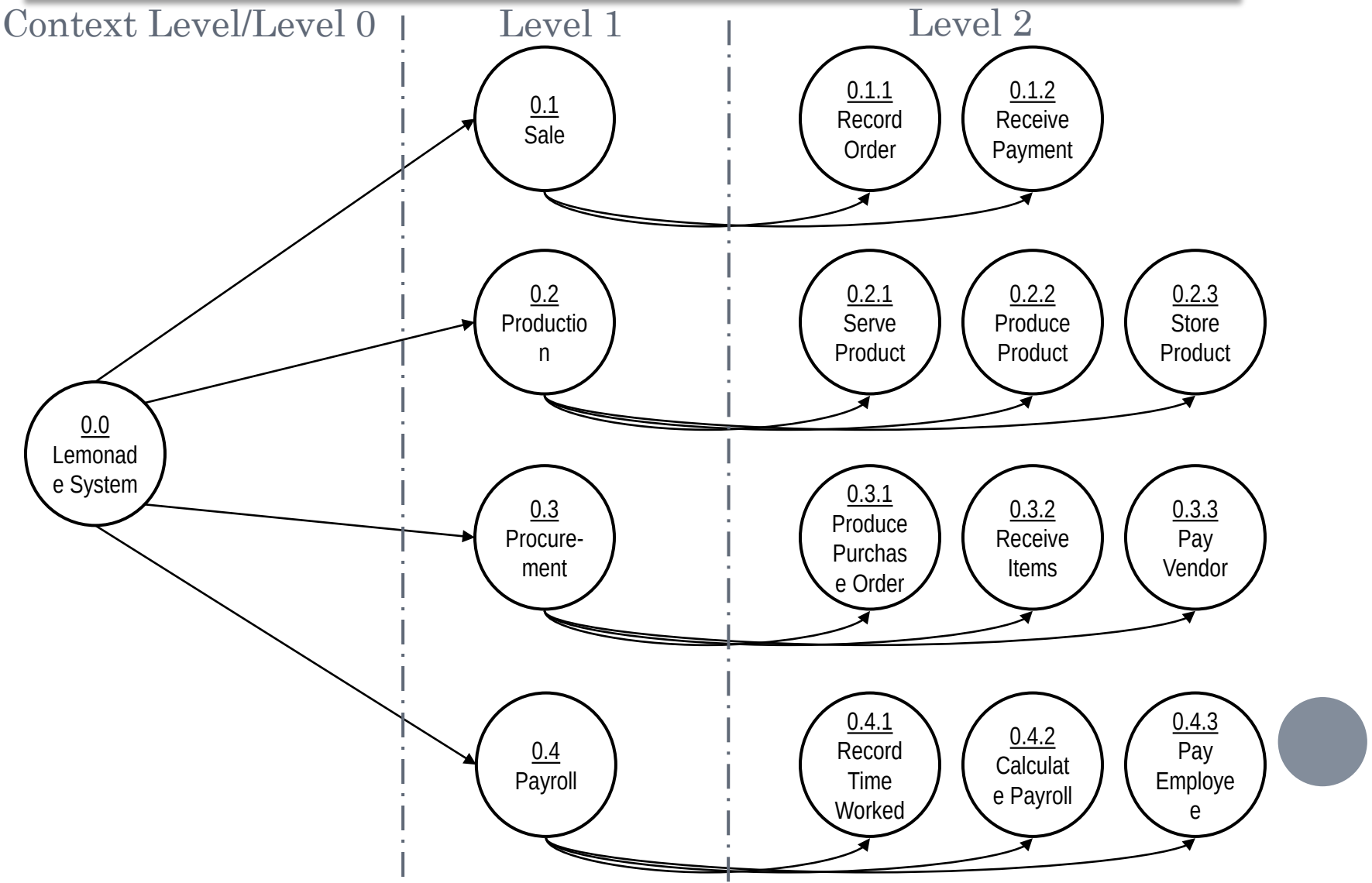
Coffee Making Stall : DFD

- Create a level 2 decomposing the processes in level 0 and identifying data stores.
- Create Level 2 DFD (Step 4)



- Pay for Labor

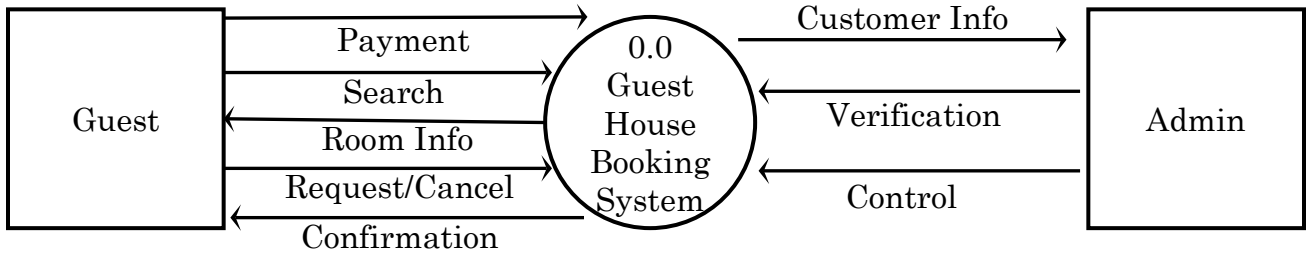
Coffee Making Stall : Process Decomposition



Assignment: DFD for Guest House Booking System

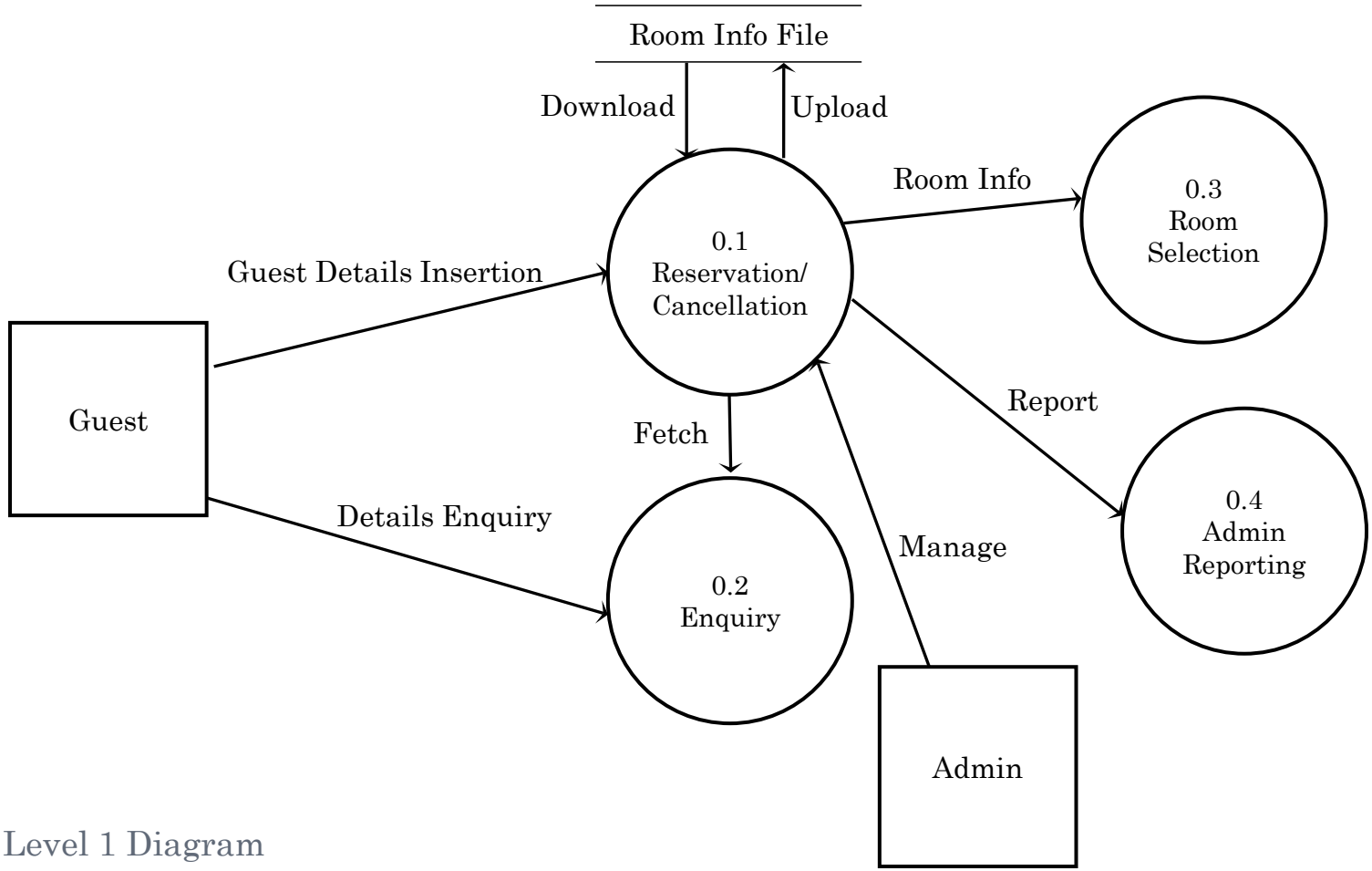
- Draw Context Level/ Level 0 diagram, Level 1 and Level 2 DFD for a Guest House Booking System
- Assume only two external entities – Guest and Admin

Solution: DFD for Guest House Booking System



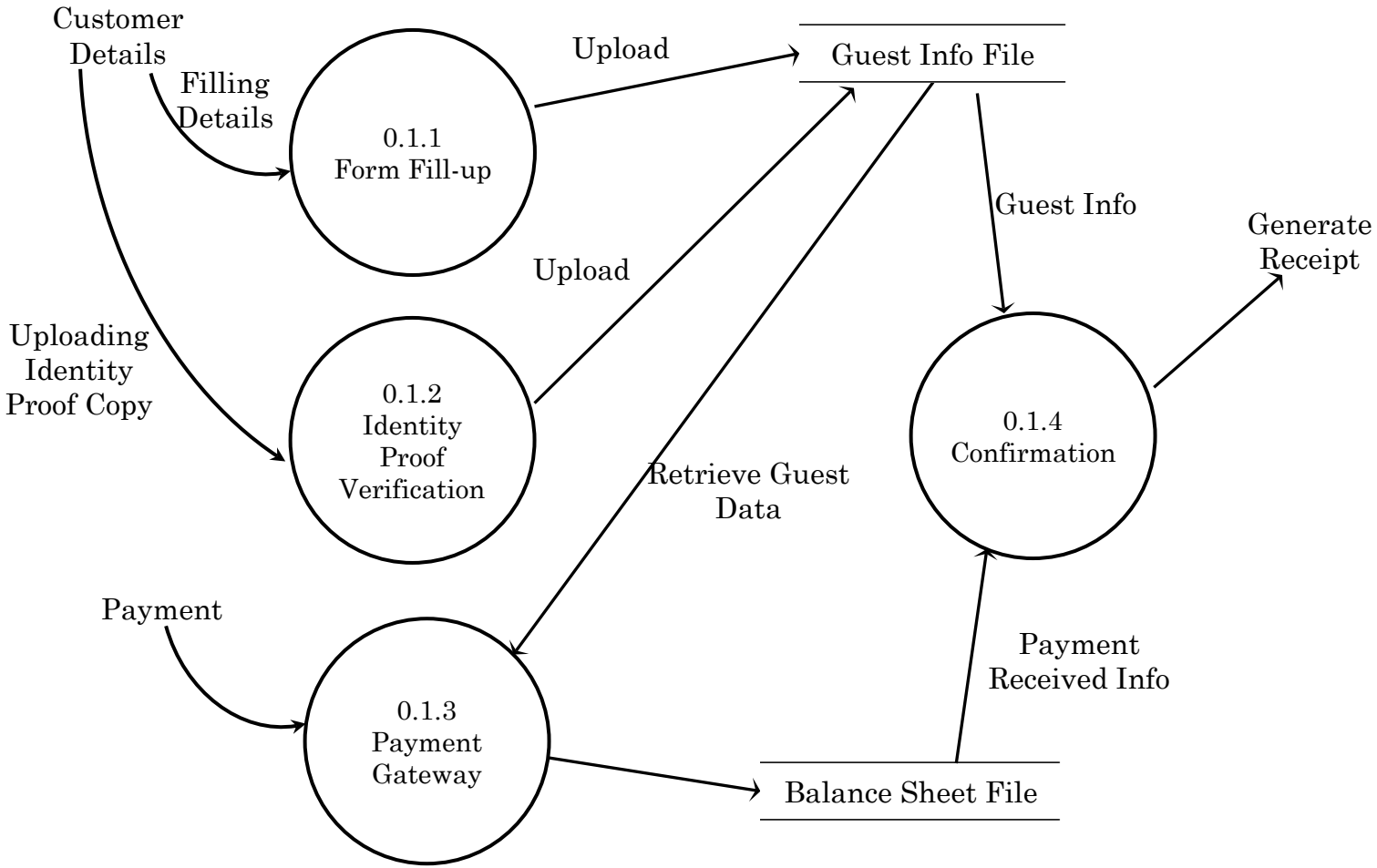
Context Level/Level 0 Diagram

Solution: DFD for Guest House Booking System



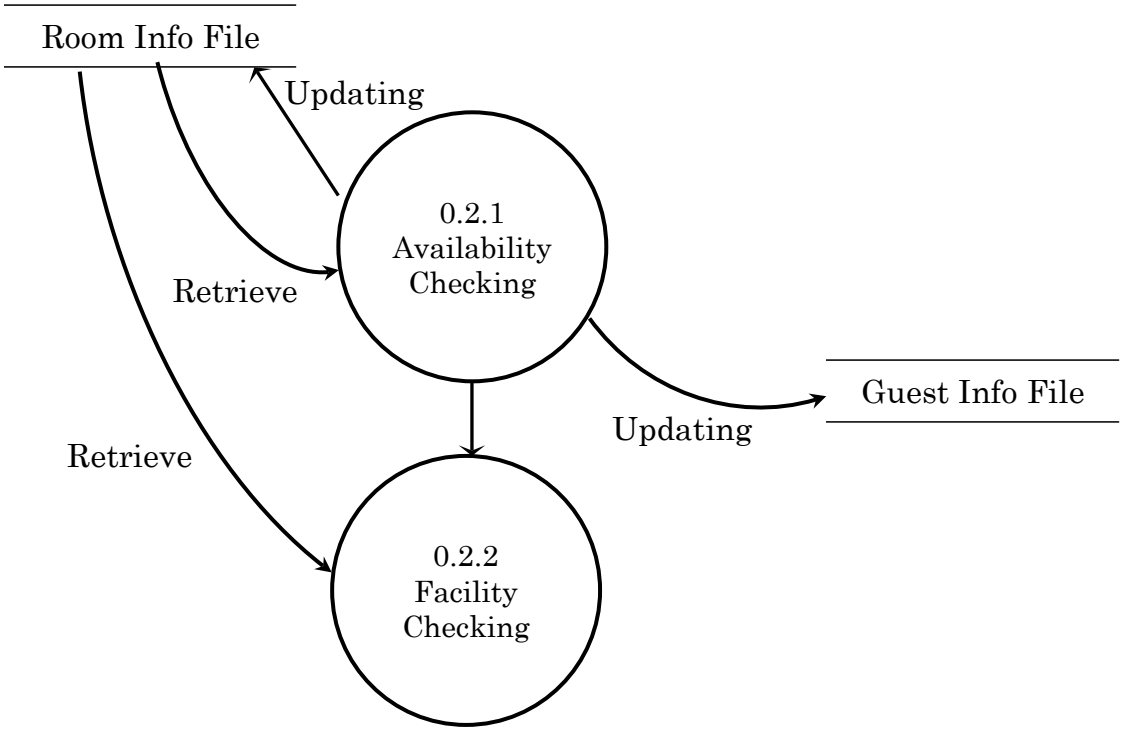
Level 1 Diagram

Solution: DFD for Guest House Booking System



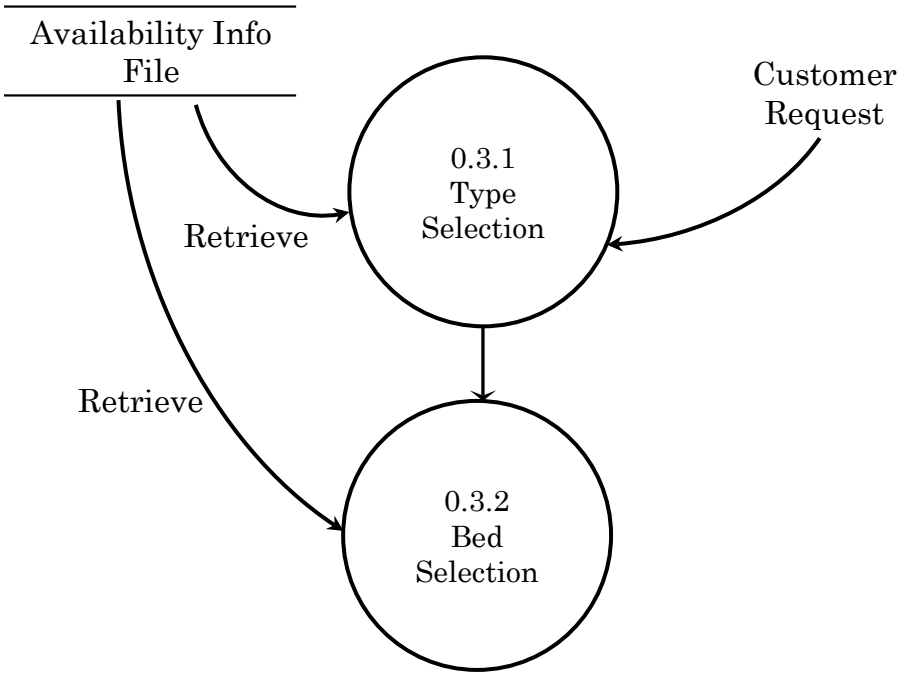
Level 2 Diagram: Reservation/ Cancellation

Solution: DFD for Guest House Booking System



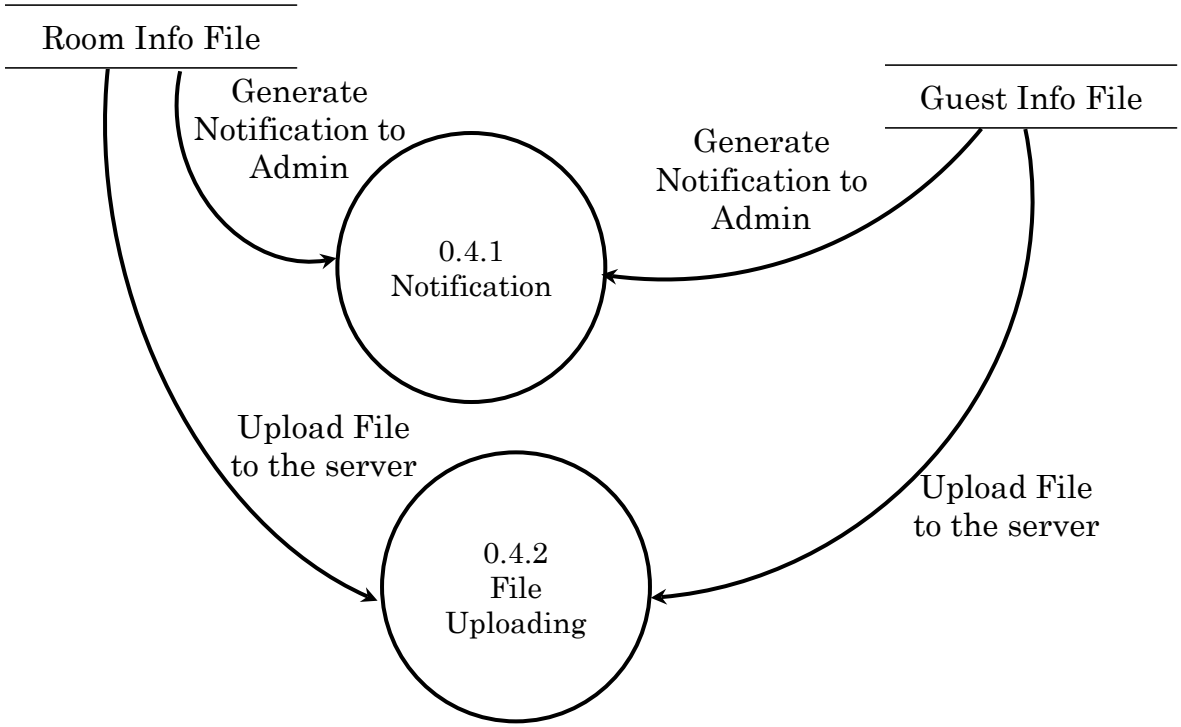
Level 2 Diagram: Enquiry

Solution: DFD for Guest House Booking System



Level 2 Diagram: Room Selection

Solution: DFD for Guest House Booking System



Level 2 Diagram: Admin Reporting

THANK YOU