DATA LEAKAGE DETECTION
[DLD]

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AGENDA

- PROBLEM DEFINITION
- PROBLEM SETUP AND MATHEMATICAL NOTATION
- SYSTEM ARCHITECTURE DESIGN
- SOFTWARE AND HARDWARE REQUIREMENT
- SCREEN SHOTS
- UML DIAGRAMS
- ADVANTAGES
- FUTURE SCOPES
- CONCLUSION
- REFERENCES

PROBLEM DEFINITION

- In the course of doing business, sometimes sensitive data must be handed over to supposedly trusted third parties.

- **Our goal** is to detect when the distributor's sensitive data has been leaked by agents, through probability calculation using number of download for a particular agent.

PROBLEM SETUP AND NOTATION

Mathematical model

Title:-

DATA LEAKAGE DETECTION.

Problem statement: -

To build a application that helps in **Detecting the data** which has been leaked. Also it helps in finding **Guilty Agent** from the given set of agents which has leaked the data using **Probability Distribution through number of Downloads.**

Problem description:

Let,

DLD is the system such that DLD={A,D,T,U,R,S,U*,C,M,F}.

1. {**A**} is the Administrator who controls entire operation's performed in the Software
2. {**D**} is the Distributor who will send data T to different agents U.
3. **T** is the set of data object that are supplied to agents.
   T can be of any type and size**, e.g**., they could be tuples in a relation, or relations in a database. **T**= $\{t_1,t_2,t_3,...t_n\}$
4. **U** is the set of Agents who will receive the data from the distributor A
5. **R** is the record set of Data objects which is sent to agents
   R=$\{t_1,t_3,t_5..t_m\}$ **R is a Subset of T**

6. **S** is the record set of data objects which are leaked.

   S=$\{t_1,t_3,t_5..t_m\}$ **S is a Subset of T**

7. **U*** is the set of all agents which may have leaked the data

   U*=$\{u_1,u_3,...u_m\}$ **U* is a subset of U**

8. **C** is the set of conditions which will be given by the agents to the distributor.

   C=$\{cond_1,cond_2,cond_3,...,cond_n\}$

9. **M** is set of data objects to be send in Sample Data Request algorithm

   M=$\{m_1,m_2,m_3,...,m_n\}$

ACTIVITY:

SAMPLE is a function for a data allocation for any m_i subset of records from T. The transition can be shown as:

Ri =SAMPLE(T, m_i)

EXPLICIT is a function for a data allocation for which satisfies the condition.

Ri =EXPLICIT(T,$cond_i$)

SELECTAGENT is the function used in EXPLICIT algorithm for finding the agent .

SELECTAGENT(R1,R2….Rn)

SELECTOBJECT is the function used in SAMPLE algorithm for selecting the data Objects

SELECTOBJECT(i,Ri)

SIMPLE ENCRYPTO is the function used to ENCRYPT the file to be sent to the Agent

DATA STRUCTURES USED:

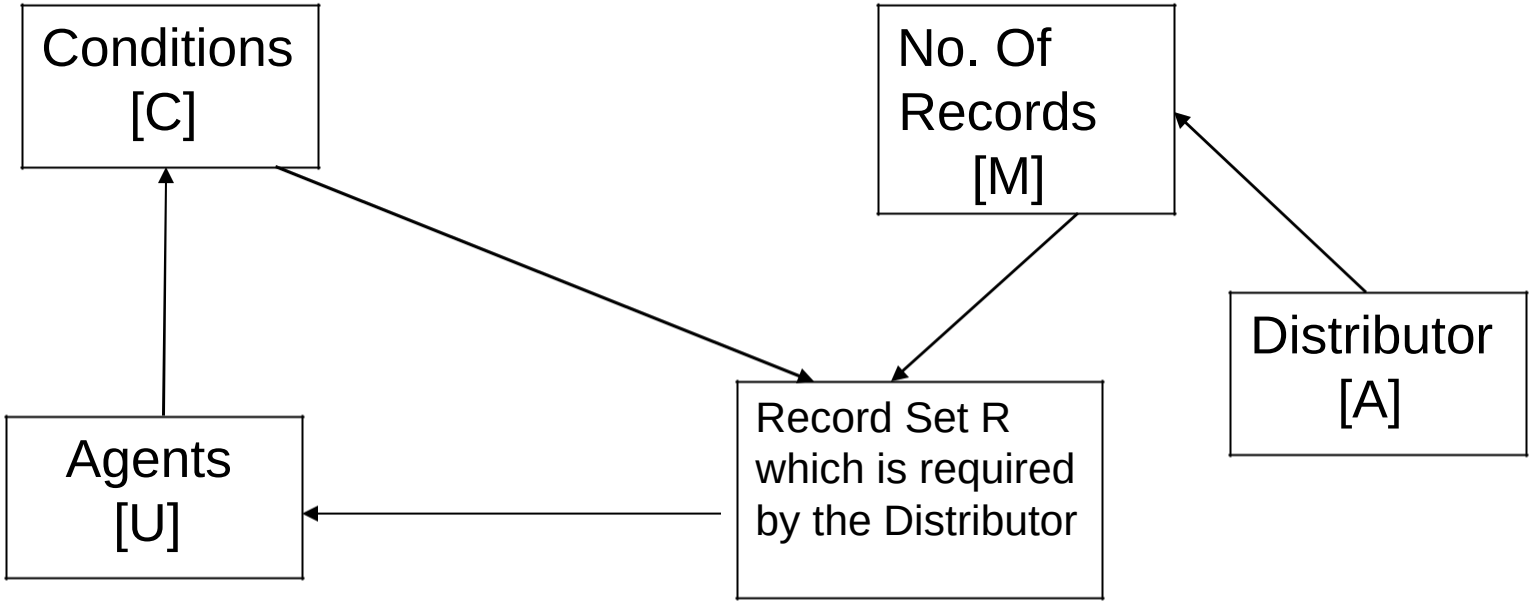
Array: To store the no of data objects T ,No of agents U , record set R and to display the particular output.

Execution of functions：

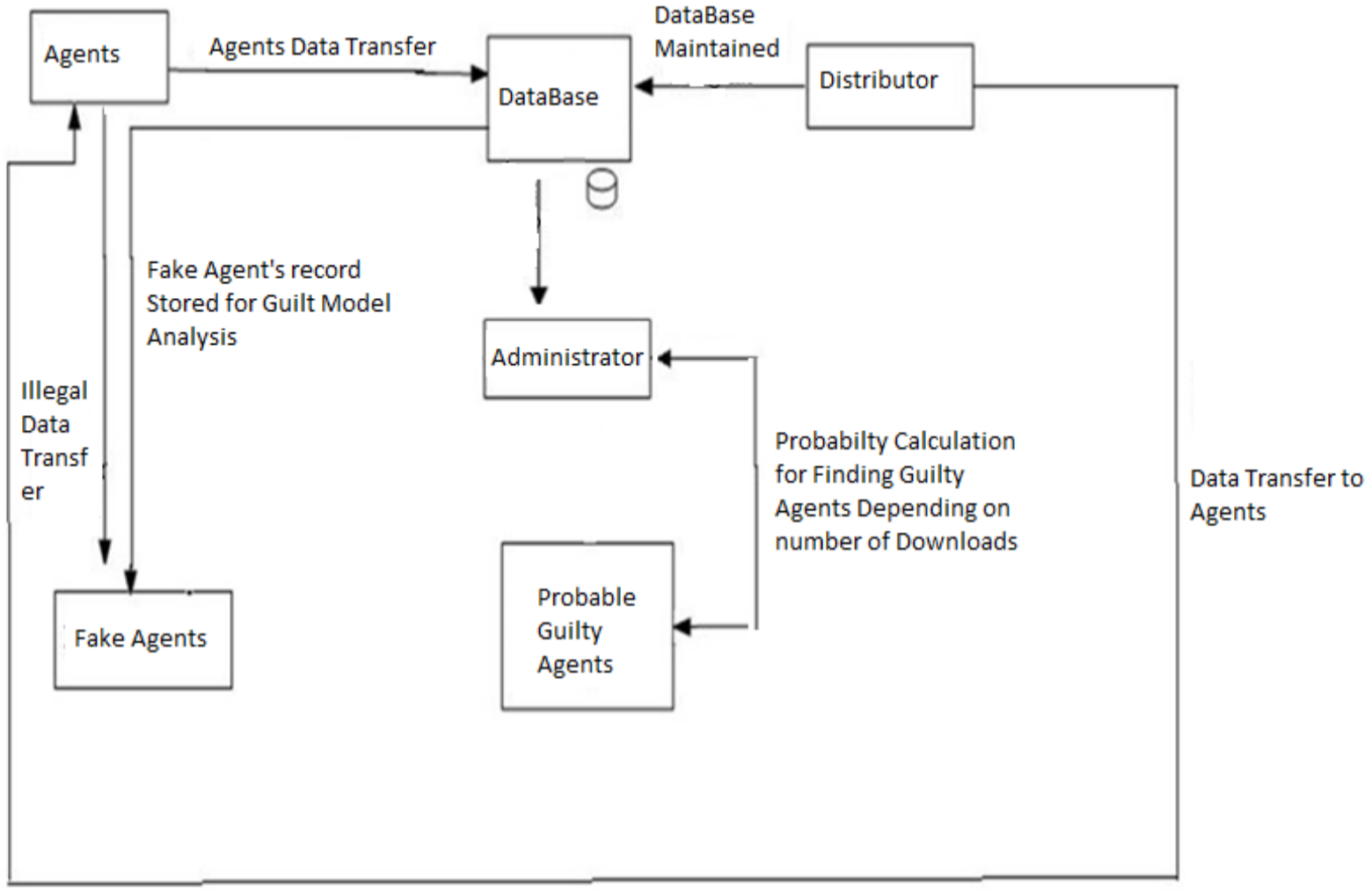
The functions will be executed on a daily basis for number of times whenever distributor wants to send the data to the agent and vice versa using C and M.

FUNCTIONAL DEPENDENCY DIAGRAM:

The functional dependency of the system depends upon the conditions which are given by the agent and no of records which distributor decides to send to the agents.



SYSTEM ARCHITECTURE DIAGRAM



SOFTWARE AND HARDWARE REQUIREMENT

Hardware Interfaces

- 2.4 GHZ, 80 GB HDD for installation.
- 512 MB memory.
- Users can use any PC based browser clients with IE 5.5 upwards.

Software Interfaces

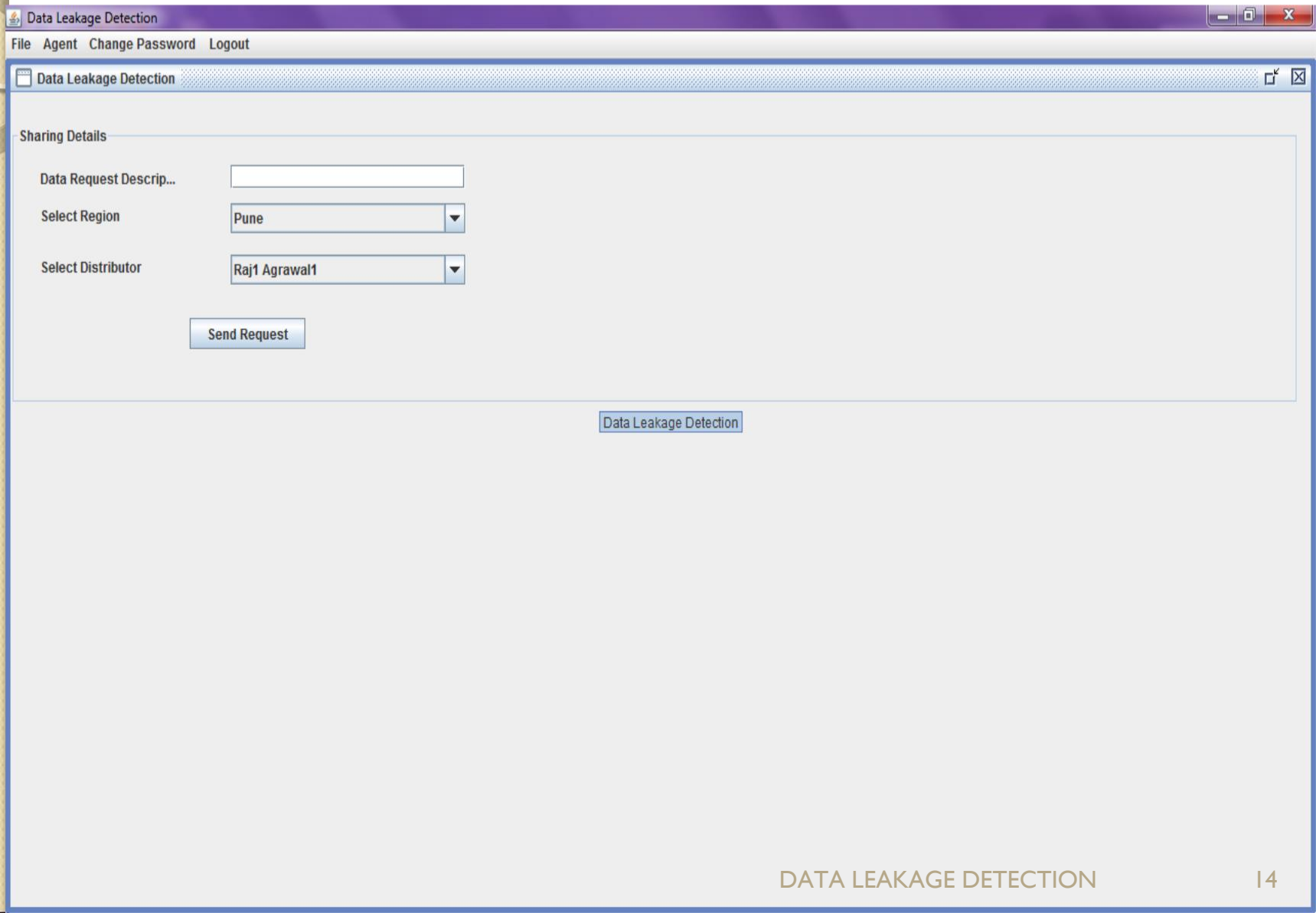
- JDK 1.6
- Java Swing
- Net beans 6.5
- Socket programming
- Triple AES algorithm

SCREEN SHOTS

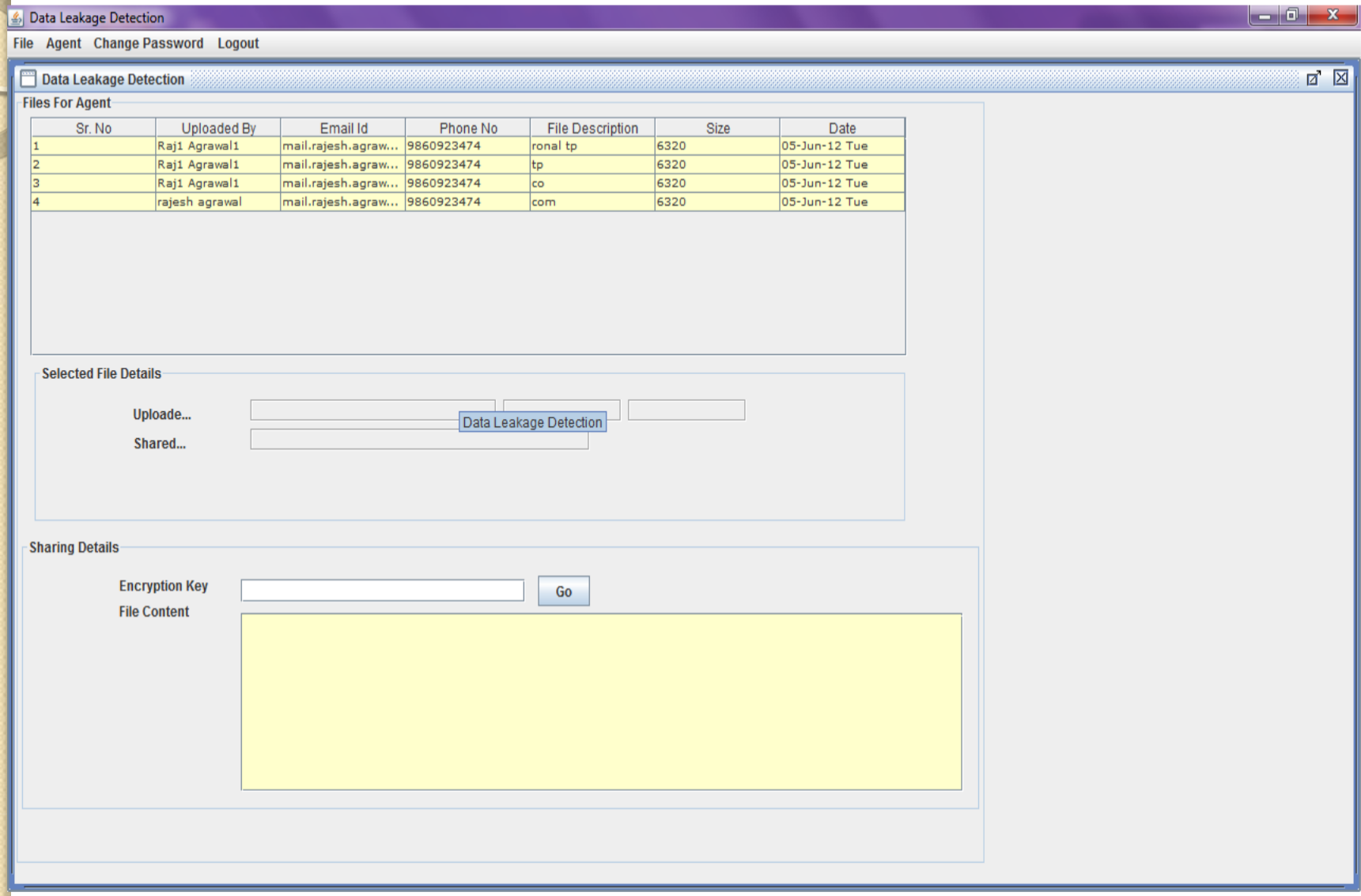
1.User Login


Data Leakage Detection System
LOGIN
Login Name
Password
Login
Register

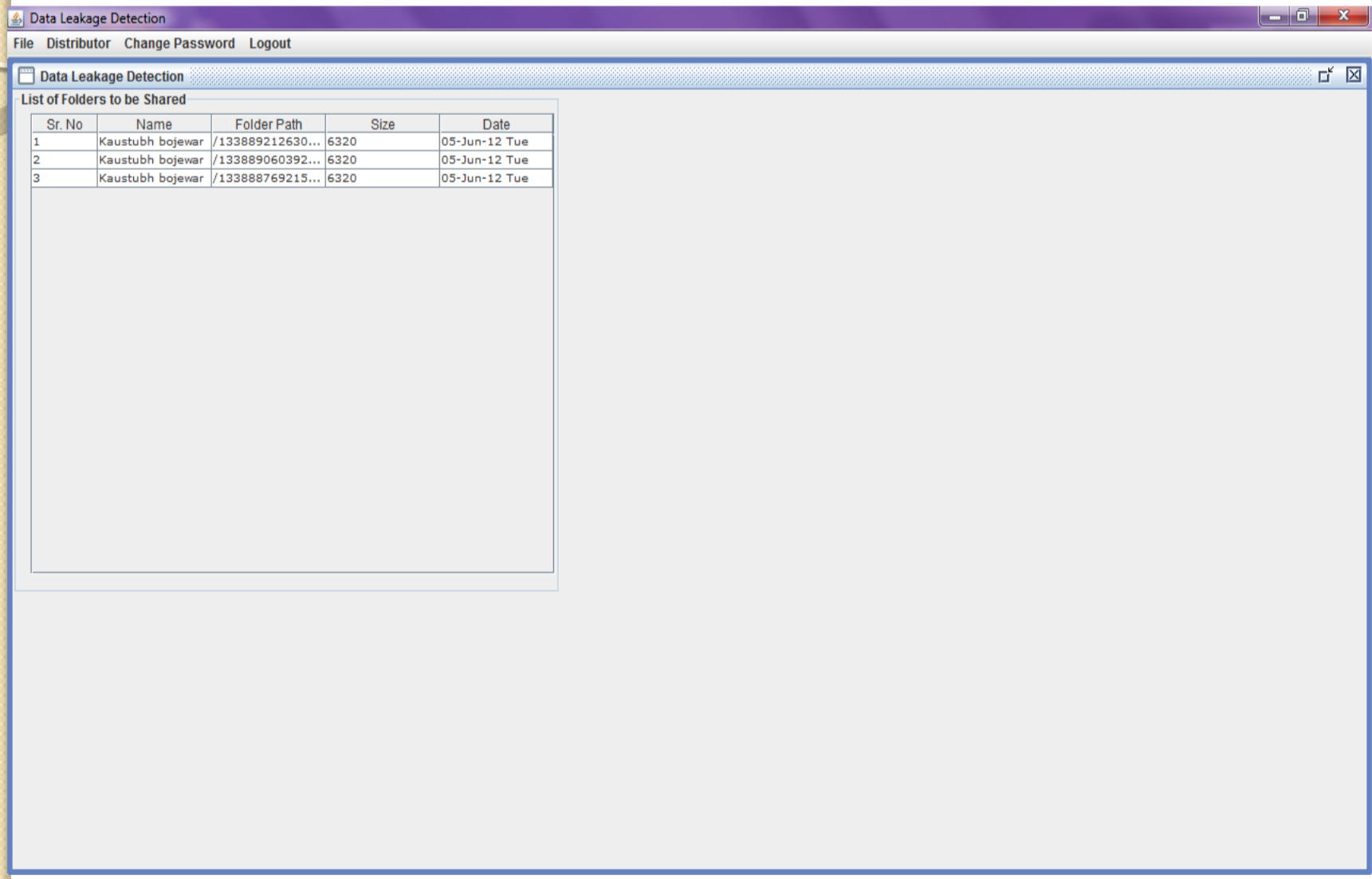
2. Agent Form(Request)



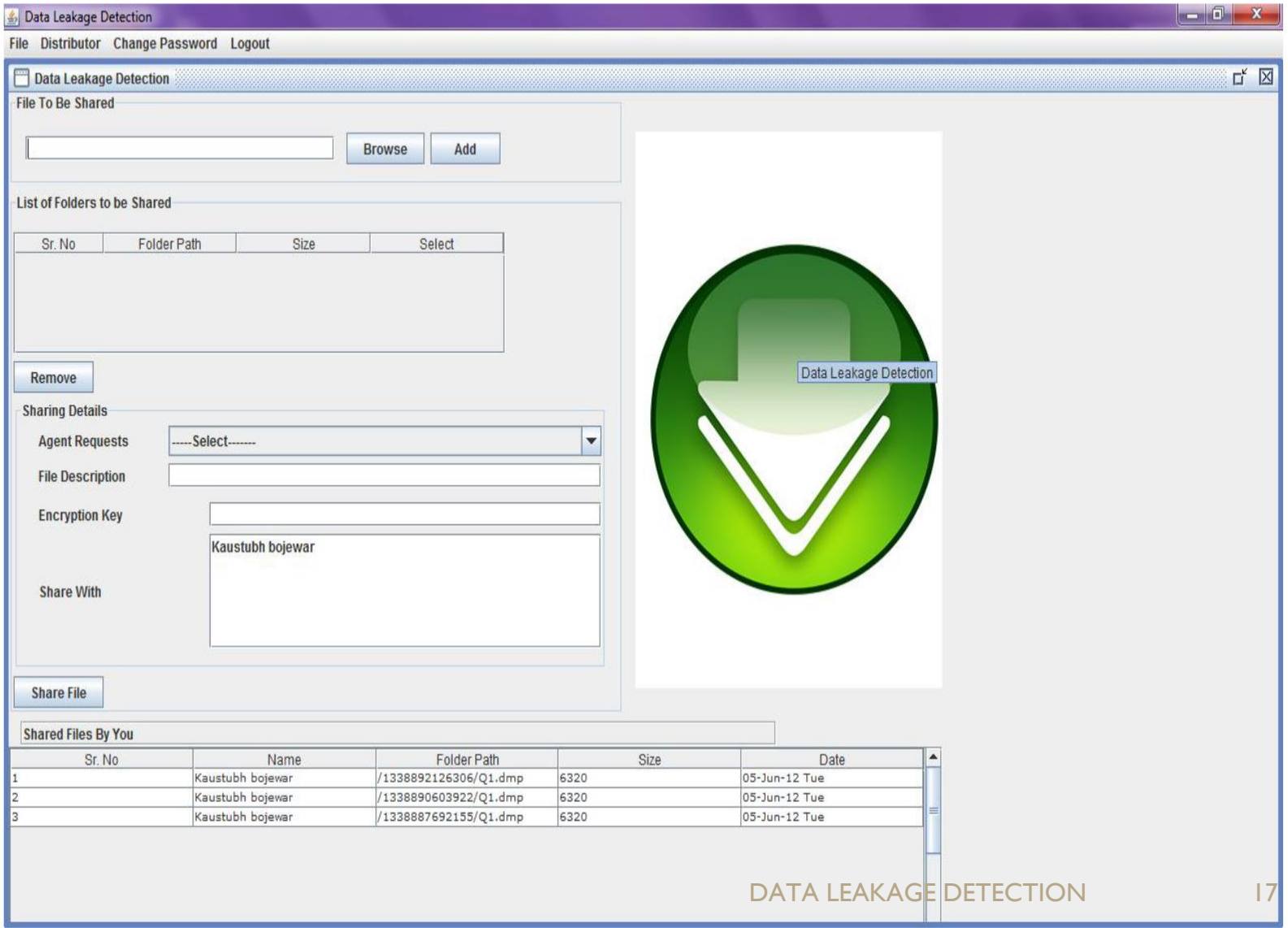
3. Agent Form(Download Form)



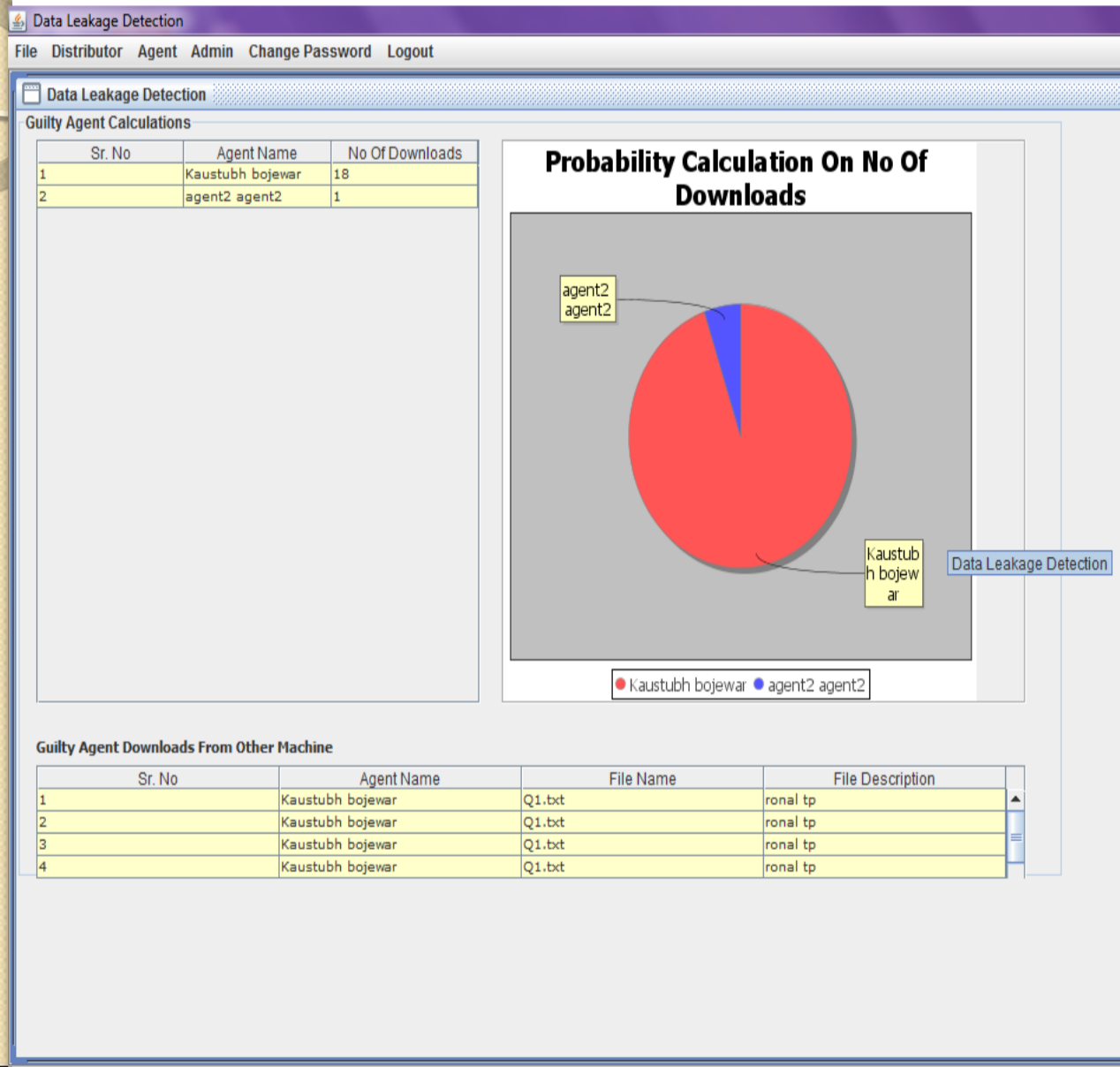
4.Distributor(View shared files)



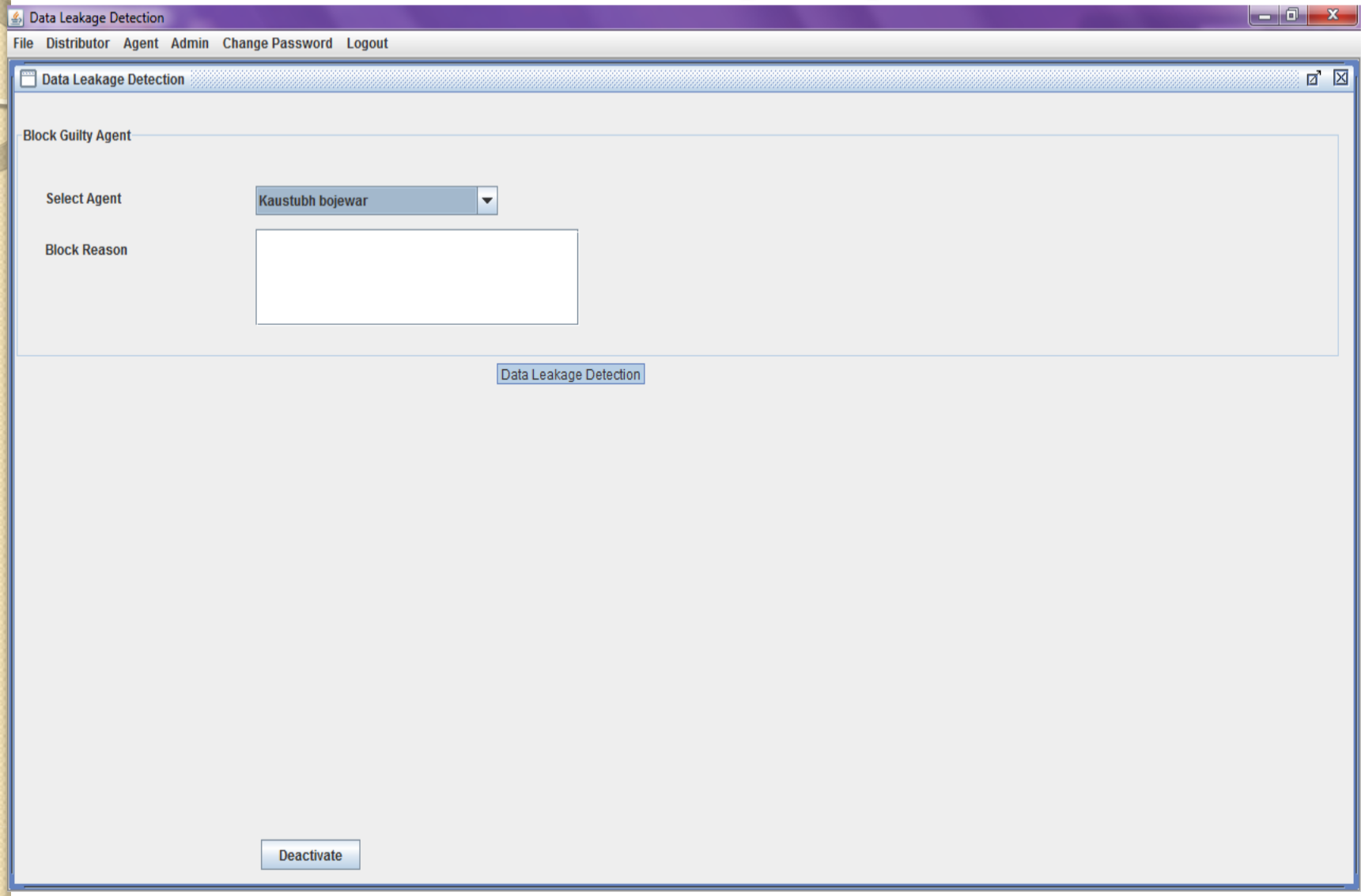
5.Distributor(Upload Files)



6. Administrator (Probability Calc)



7. Administrator (Manage Agents)

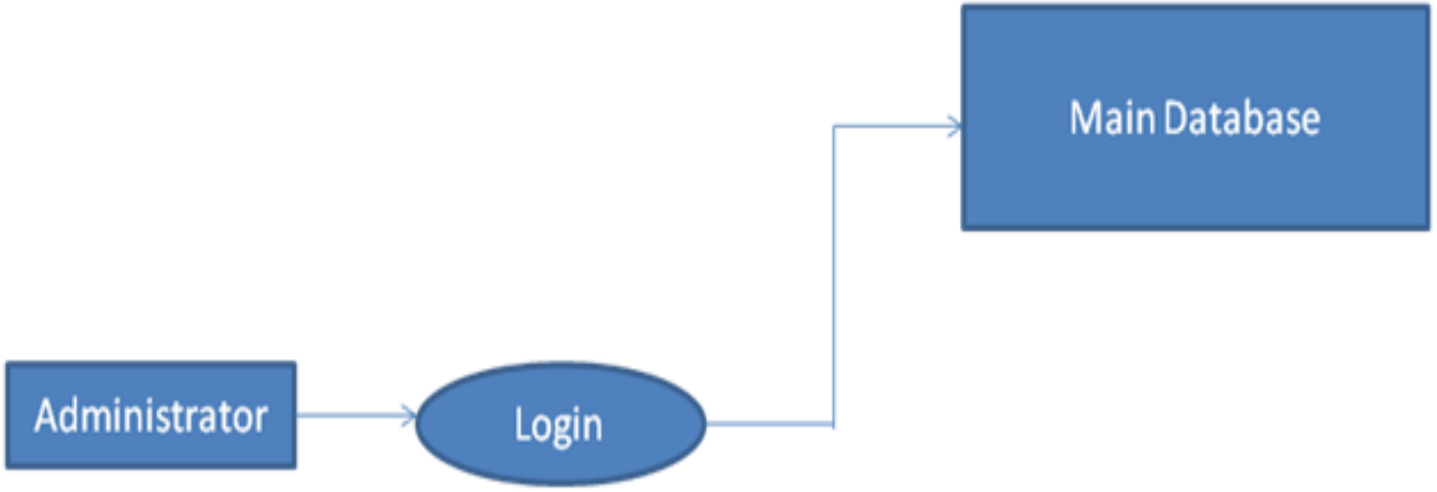


UML DIAGRAMS

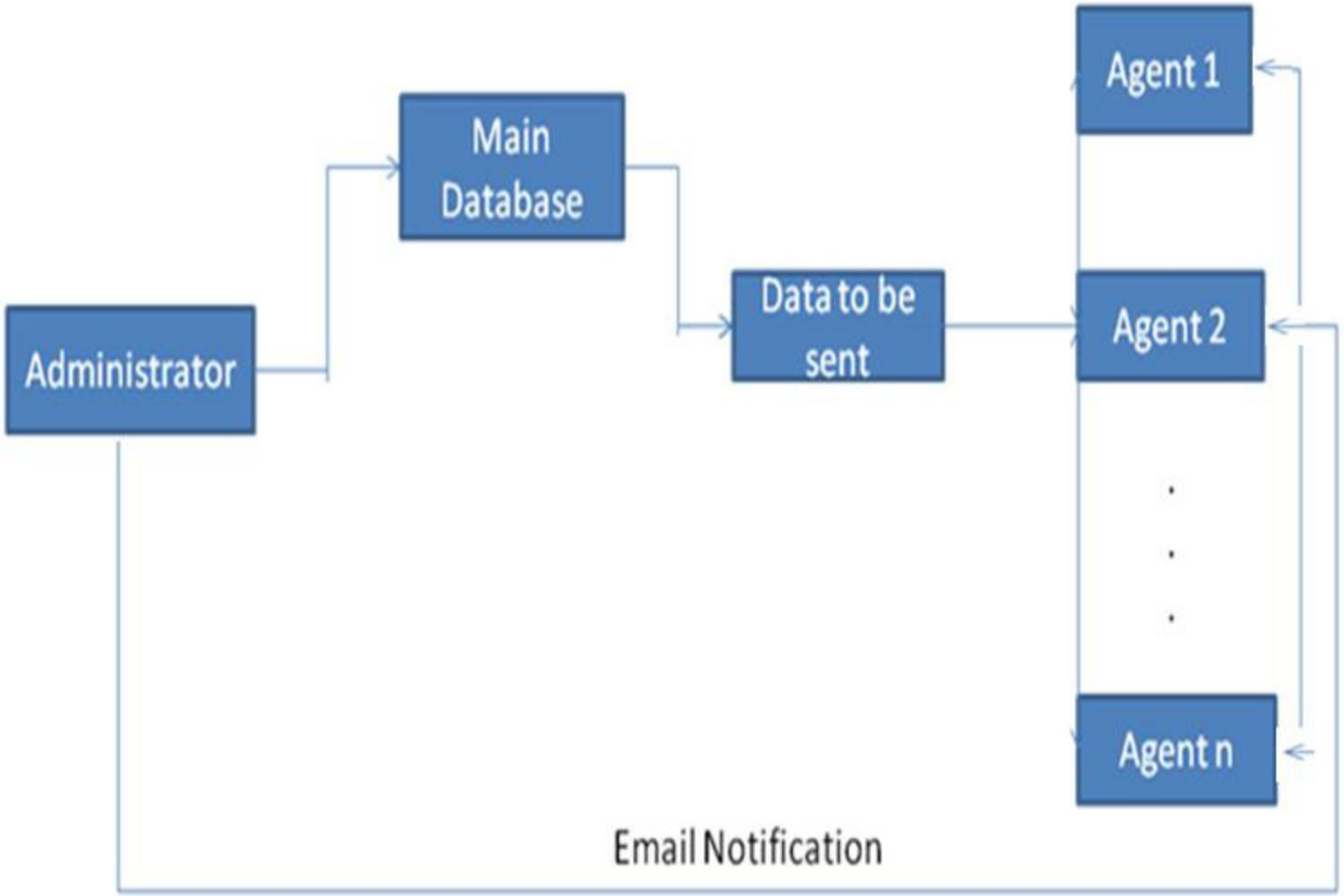
- Data Flow Diagram
- Use Case Diagram
- Class Diagram
- Sequence Diagram
- Activity Diagram

1. Data Flow Diagram

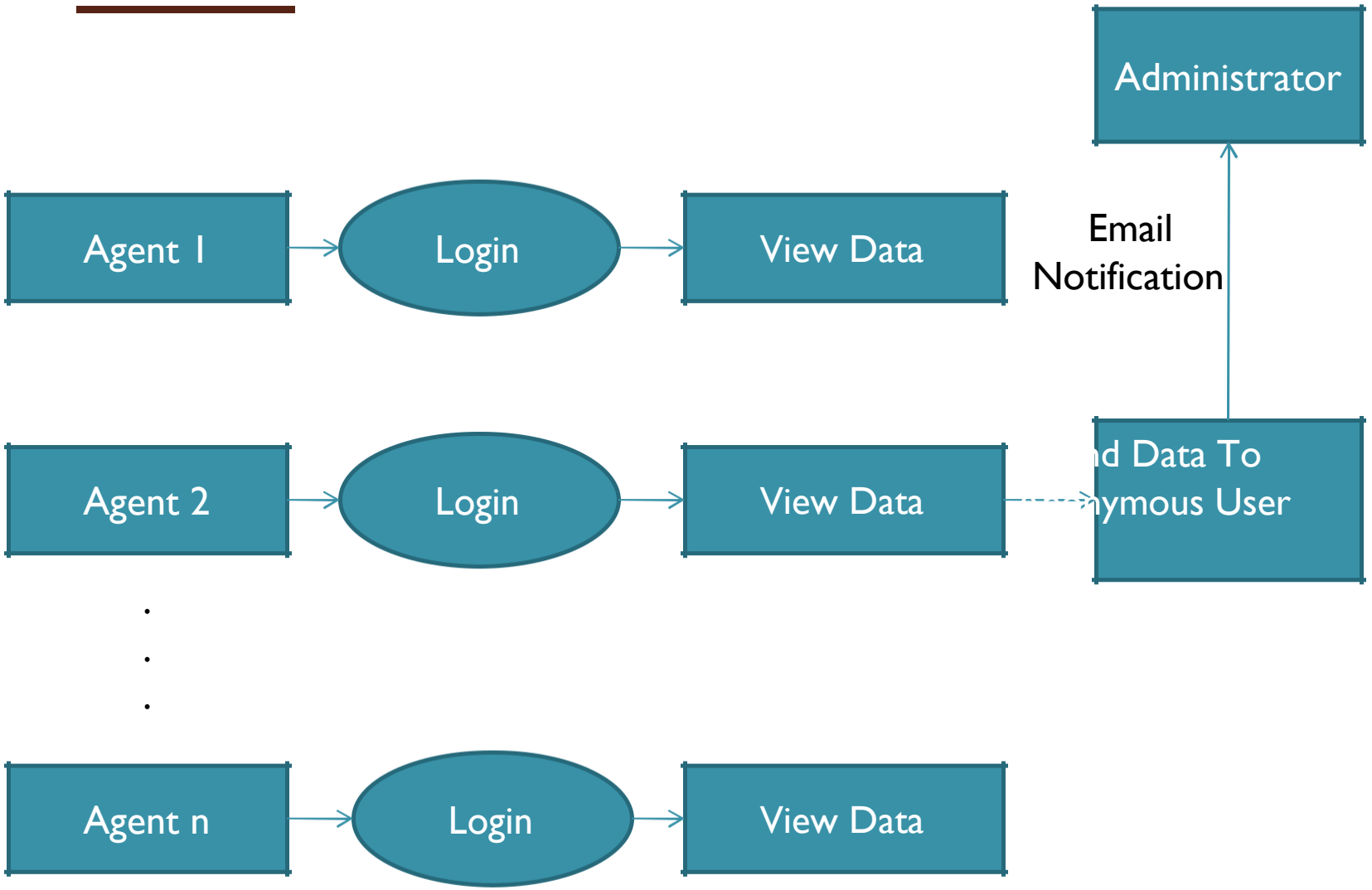
Level 0



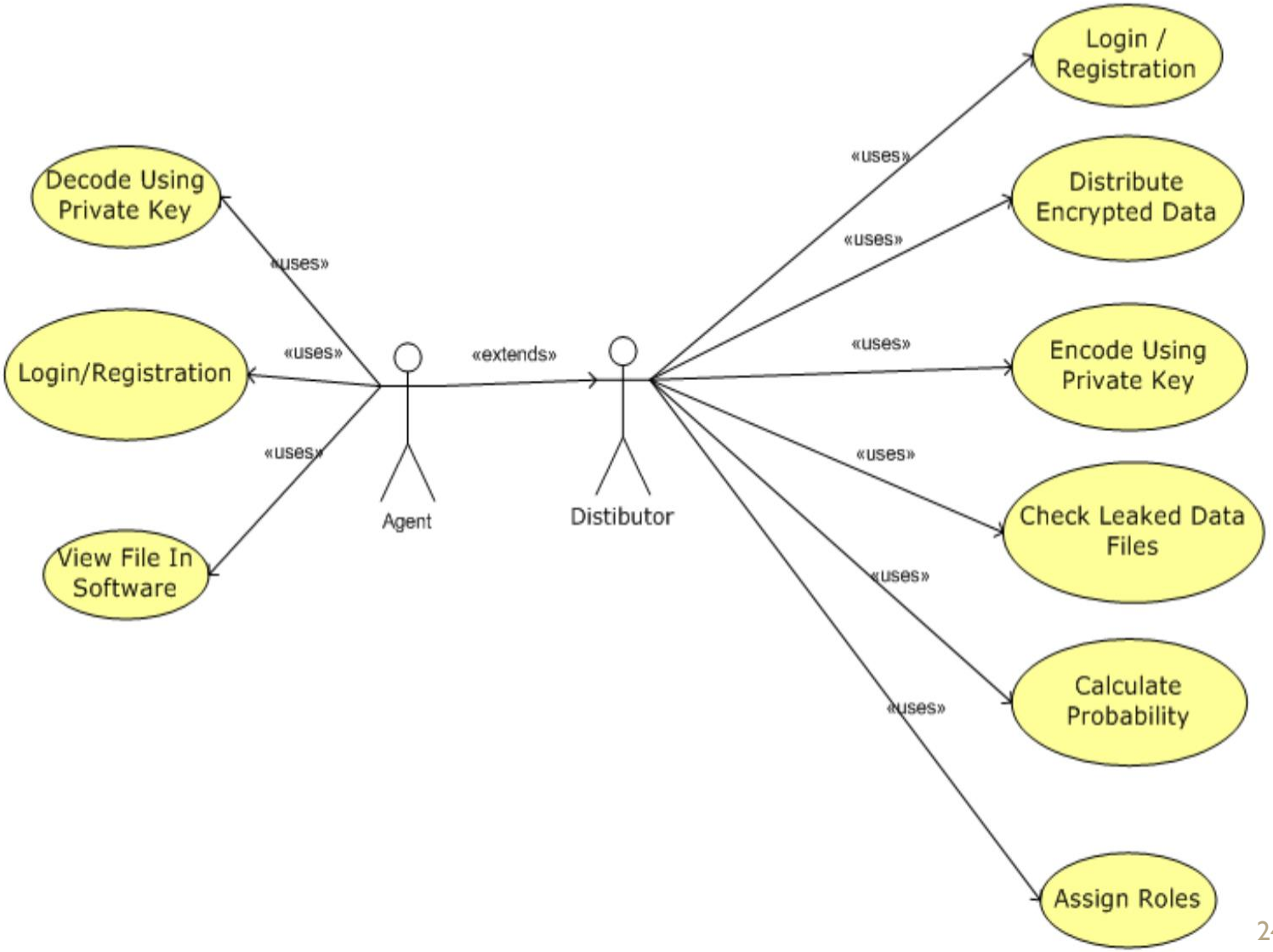
Level 1


Agent 1
Main Database
Data to be sent
Agent 2
Administrator
Agent n
Email Notification

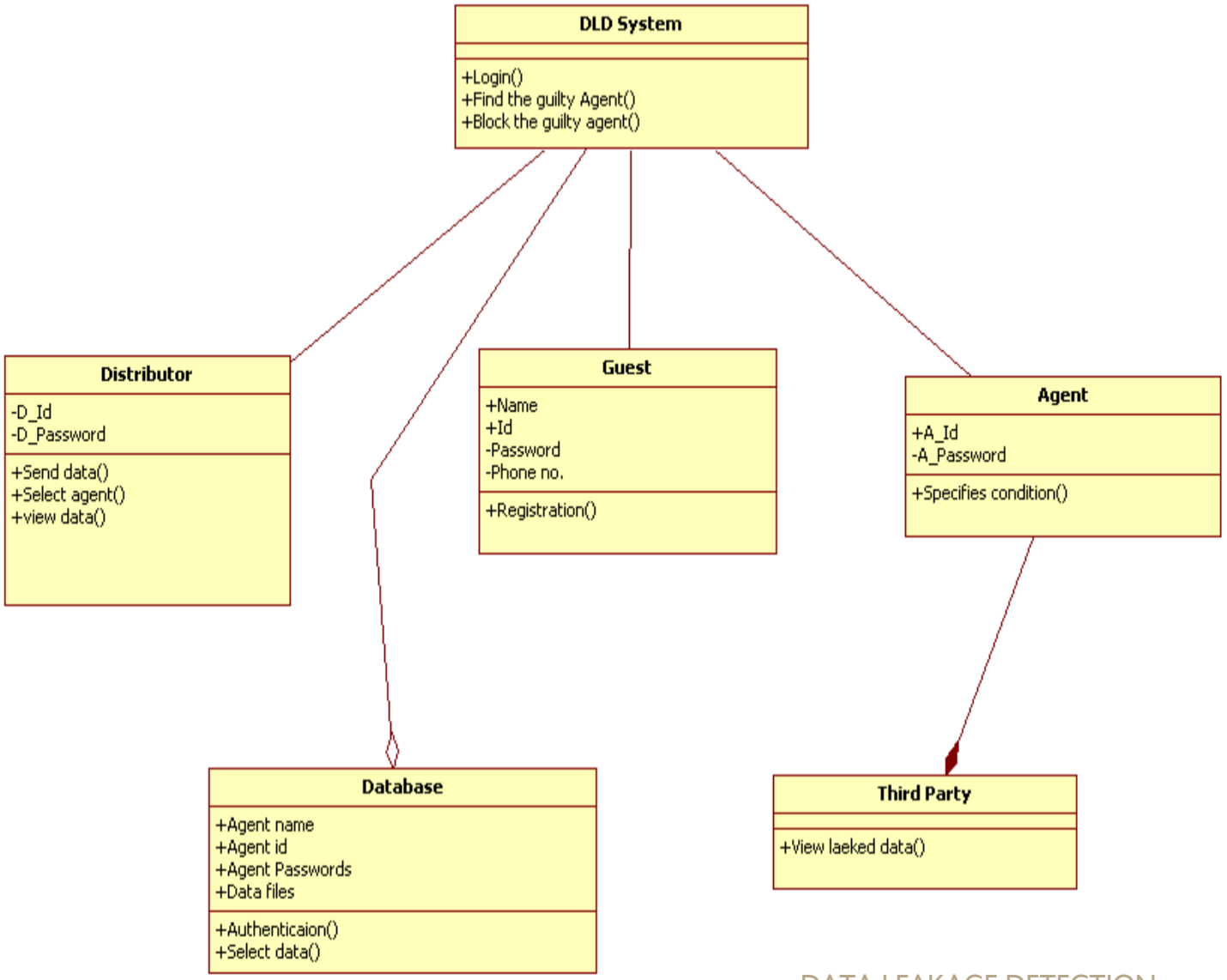
Level 2


Administrator
Agent 1
Login
View Data
Email
Notification
Agent 2
Login
View Data
d Data To
ymous User
Agent n
Login
View Data

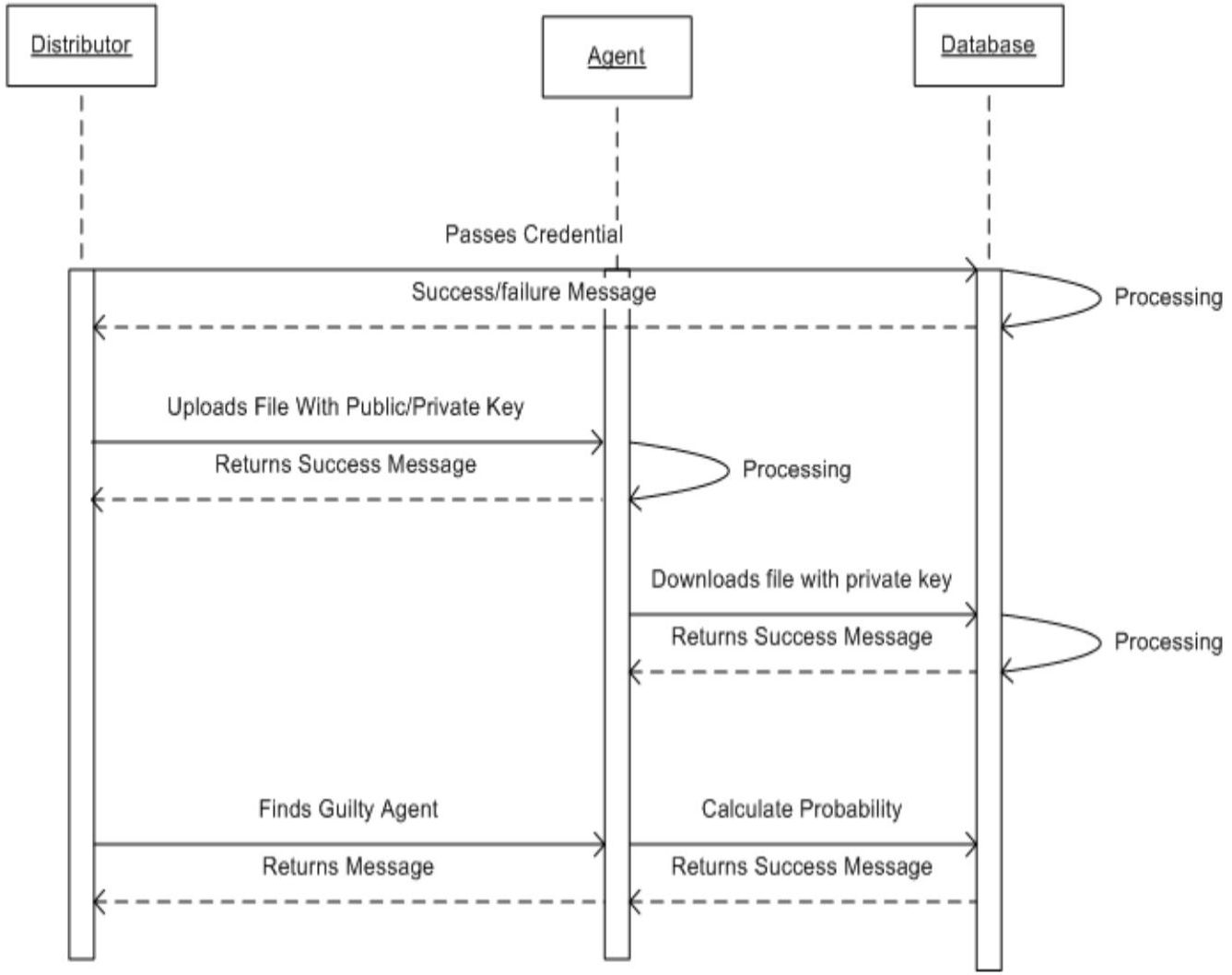
2. Use Case Diagram



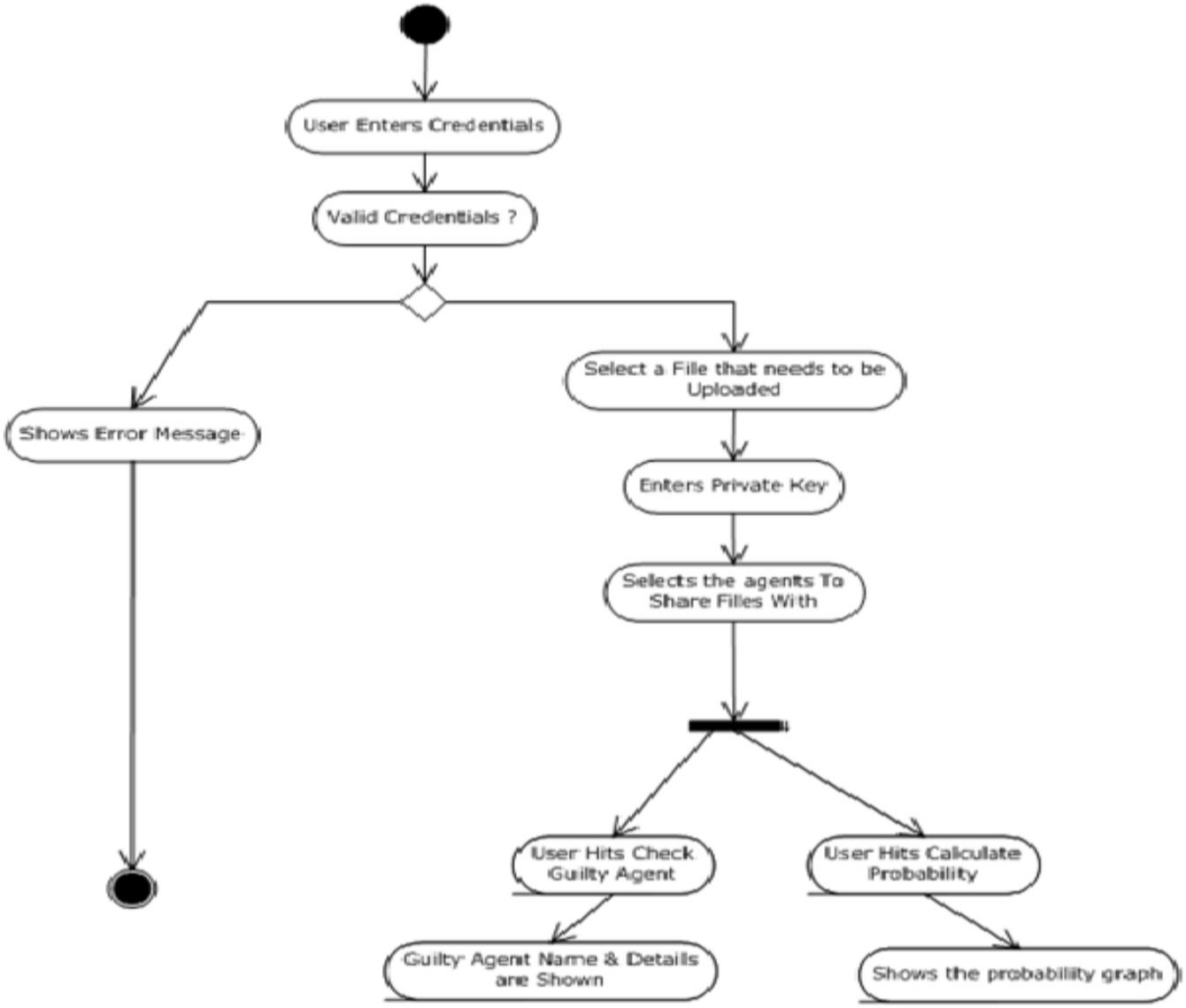
3.Class Diagram



4.Sequence Diagram



5. Activity Diagram



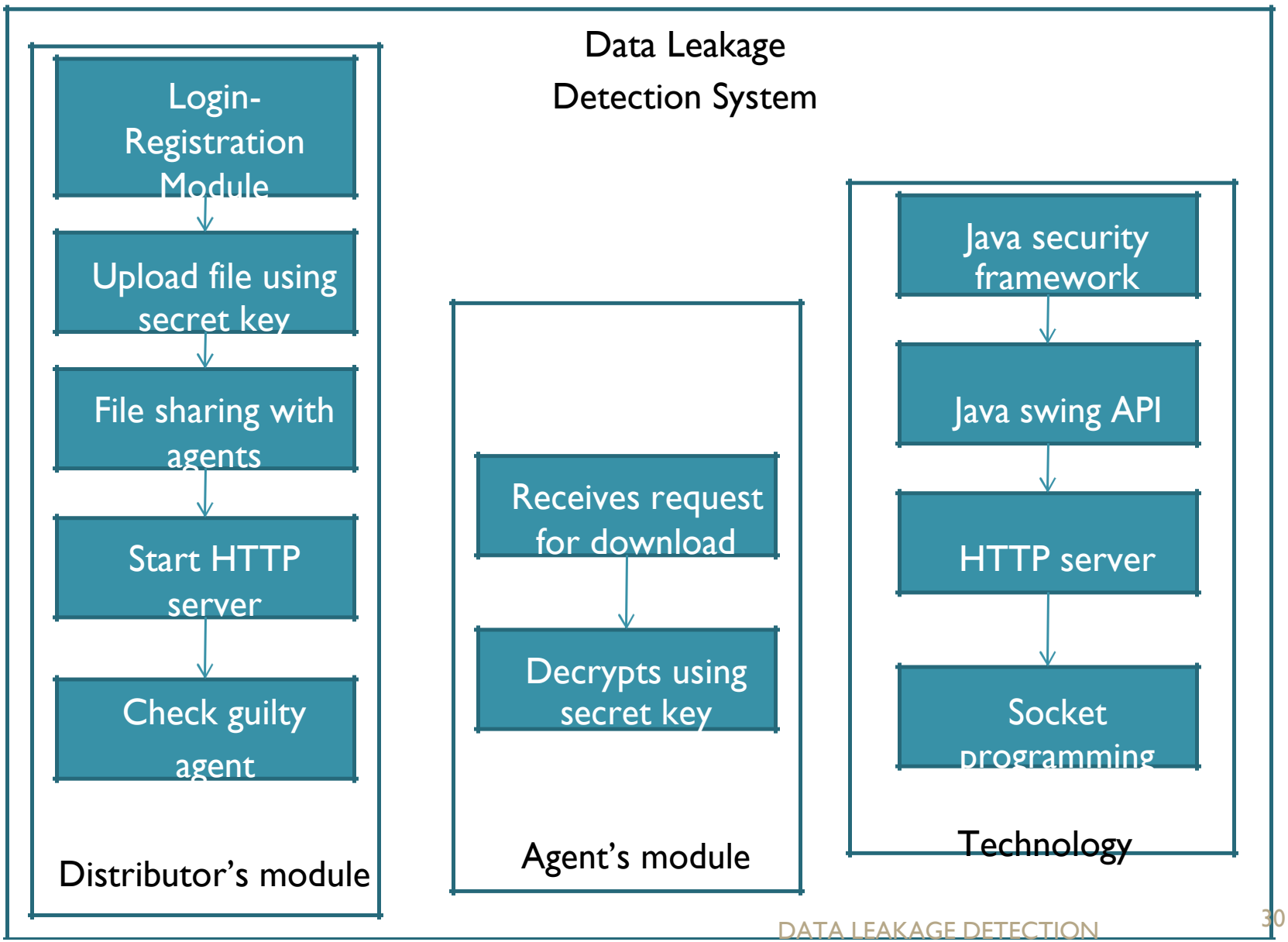
ADVANTAGES

- This system includes the *data hiding* along with the provisional software with which only the data can be accessed.
- This system gives *privileged access to the administrator (data distributor) as well as the agents* registered by the distributors. Only registered agents can access the system. The user accounts can be activated as well as cancelled.
- The exported file will be accessed only by the system. The agent has given only the permission to access the software and view the data. If the data is leaked by the agent' system the path and agent information will be sent to the distributor thereby the identity of the leaked user can be traced.

FUTURE SCOPE

- Currently, we are dealing with only text files in this project but in future we will try to deal with all types of files.
- Recent research papers say that it is not possible to find the exact guilty agent who has leaked the data. Instead, we are finding out the probability of the agent being guilty or who has leaked the data through calculation of number of downloads.
- For more security, we will also provide a verification code on the agent's mobile in future.

CONCLUSION


Data Leakage
Detection System
Login-Registration Module
Upload file using secret key
File sharing with agents
Start HTTP server
Check guilty agent
Distributor's module
Receives request for download
Decrypts using secret key
Agent's module
Java security framework
Java swing API
HTTP server
Socket programming
Technology

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THANK YOU...