Introduction:

The Gate Management System is a leading technology used in managing access to gated communities and gated offices. The Gate Management System (GMS) is a complete system, which can manage, control and monitor an entire item gate logs and all related equipment.

A Gatepass is a simple document containing the detail of items while making any product movement outside the warehouse. It is defined to secure the outbound transactions and ensure a smarter way of managing and keeping a track of the inventory for those products which were not dispatched for fulfilling an order.

Gate Pass Management System (GPMS) Allow you to manage all Incoming and Outgoing items from your office or company. Gate Pass Management System is available for use and it is easy to use and manage. This system is defined as a gate pass security system.

Aims: -

- Aim is to implement an integrated and user-friendly system which tracks all transactions of material, employee and visitors, which occurs through the gate. To improve the efficiency and accountability of security process by using an automated system. To establish a system which will align with other automated systems to increase the traceability and compliance of records, to the requirements of the organization.

Objectives:

- To automate the issuance and approval of gate passes.
- To enhance security by accurately tracking the movement of individuals and materials.
- To improve efficiency by reducing manual paperwork and administrative tasks.
- To provide real-time visibility into gate pass activities and generate comprehensive reports for analysis.
- To ensure compliance with organizational policies and regulations related to access control and security.

DIFFERENT TYPES: -

- **Employee Gate Pass:** This is intended for employees who wish to exit the premises. It can be for personal or professional reasons. The employee must complete the employee gate pass and submit it for approval to the Head of Department (HOD). If the HOD approves the reason, the pass will be sent to HR. After marking down the movement, the HR department will sign off on the form.
- **Material Gate Pass:** This is used for transporting items. Three copies of the gate pass are created for this purpose. The authorized person signs the passes. Two copies of the

pass are handed to the person in charge of the movement, typically the driver, and one copy is kept by the security team at the gate.

- **Visitor Gate Pass:** This type of gate pass is used for visitors who need access to the premises.

PROBLEM IDENTIFIED: -

- In all organizations, irrespective of their capacity, many movements take place every day at the gate level. It may be employees moving in or out, visitors entering the premises, movement of materials etc. All these movements occur at the organization's premises, factories and companies needs to be monitored and controlled. This is where the concept of a gate pass comes into play. Gate pass can be used to authorize the movements of humans, materials and machines to or from the premises of the organization. It will help to monitor and track all the movements happening in an organization.

Scope: -

- Employee Gate Pass Management System will track employees who are moving in and out of the organization during working hours. This is ideally laid out to give the best safety feature, solving all the security issues. Even though in and out time is tracked by the employee ID card there is no documented process to verify the acceptance of movement of the employee. This act as an Employee Self Service (ESS) facility. Employees, who have ESS facility, can make a request to go outside during the working hours or to departure early through Employee Gate Pass Request. Employees, who don't have the ESS facility, must request through Human Resource (HR) department. HR department will generate an EGPR on behalf of the employee. The request will be reviewed and approved by an authorized person. The next step is the creation of Gate Pass by HR division based on the approved request. The departure stage comes next with the involvement of security desk. Departure is marked and the Gate Pass will be printed and issued by the security desk. Final stage of the procedure is the return acceptance; returns could also include people who did departure with a returnable gate pass. Visitor Gate Pass Management System has always been the best security feature that has been utilized to track visitors who visit to the organization premises for the official purpose. This system allows keeping track of all the individuals who entered and exit the premises and can trace all the details according to the date, time and purpose. First the employee from respective division would beforehand put a request for the attendance of visitor(s) who comes with prior notice. The requests will be confirmed by an authorized person, and it will convert to a Visitor Gate Pass. When visitor arrives at the gate, the security desk will acquire the information from the visitor and will cross check with the details entered in the system. After conforming, the security desk will issue a printed Gate Pass for the visitor. After visiting the respective employee, visitor will take the belongings from the security desk; will report at the gate for exit. Security desk will update the system accordingly after the visitor signed off

the gate pass. Visitors, who come without prior notice, will inform security desk about the person he/she needs to meet. Security desk informs the responsible employee and verify the details of visitor through telecommunication. Once the visitor is verified, security desk informs employee to meet the visitor at the visitors' room. The required records will be maintained in the Visitors' Room Log form. If the visitor needs to visit the organization premises, then security desk asks relevant employee to generate Gate Pass as per above procedure.

KEY FEATURES: -

- **Reducing Paperwork:** The system reduces the paperwork done by giving the paper gate pass and provides an electronic version of it.
- **User Monitoring:** The system allows the admin to monitor all the users and the system.
- **Gate pass Issuance:** Users can request gate passes for themselves or others, specifying the purpose, duration, and additional details.
- **Approval Workflow:** Gate pass requests are routed through an approval workflow based on predefined rules and hierarchies.
- **QR Code Generation:** Each gate pass is assigned a unique QR code for easy scanning and verification.
- **Check-In/Check-Out:** Users can check-in and check-out using their gate passes, with timestamps recorded for tracking purposes.
- **Notifications:** Automated notifications are sent to users and approvers at various stages of the gate pass process.
- **Search and Reporting:** Admins can search for gate pass records based on various criteria and generate reports for analysis.
- **Integration:** Integration with existing security systems (e.g., access control systems, CCTV cameras) for enhanced security and monitoring.

BENEFITS: -

A Gate Pass Management System (GPMS) offers several benefits:

- Efficiency: A GPMS automates the entire gate pass process, eliminating the need for cumbersome paperwork and time-consuming processes.
- Flexibility: It allows you to add or remove any levels of approving authorities as per requirement.
- Remote Approval: An approver can approve a pass from anywhere in the world.
- Real-Time Tracking: You can efficiently and effectively track any number of materials in real-time.
- Security: It enhances security by monitoring the entry and exit of company vehicles, employees, visitors, and materials.
- Transparency: It increases transparency and information sharing between people and departments involved in the gate pass process.
- Timesaving: It saves time via instant notifications and approvals.

- Record Keeping: It helps in generating returnable and non-returnable passes and keeps a record of the original gate pass transaction.
- Monitoring: It does effective monitoring of user traffic and waiting duration.
- Digital Badges: It assigns digital badges to the visitor to keep the identity of every single visitor unique.
- Notifications: It notifies the host about the visitor's arrival with his details and timings.

Implementation Plan:

- **Requirements Gathering:** Conduct workshops and interviews with stakeholders to gather requirements and define use cases.
- **System Design:** Design the system architecture, database schema, user interface wireframes, and workflow diagrams.
- **Development:** Develop the frontend, backend, and database components according to the design specifications.
- **Testing:** Perform unit testing, integration testing, and user acceptance testing to ensure the system meets functional and non-functional requirements.
- **Deployment:** Deploy the system to a staging environment for final testing, and then to the production environment for live usage.
- **Training and Rollout:** Provide training to users and administrators on how to use the system effectively, and gradually roll out the system across the organization.

Maintenance and Support:

- **Bug Fixes and Enhancements:** Address any issues or bugs reported by users, and continuously improve the system based on feedback and evolving requirements.
- **Security Updates:** Regularly update the system to address security vulnerabilities and ensure compliance with data protection regulations.
- **User Support:** Provide ongoing support to users through helpdesk services, FAQs, and user documentation.

Waterfall Model:

- **Description:** The Waterfall Model follows a linear and sequential approach to software development, with distinct phases such as requirements analysis, design, implementation, testing, deployment, and maintenance.
- **Suitability:** This model could be suitable if the requirements are well-defined and unlikely to change significantly throughout the project. It provides a structured approach and is suitable for projects with clear and stable requirements upfront.

- **Requirements Analysis:**
    - Gather requirements through stakeholder interviews, workshops, and documentation review.

    - Define user roles, features, and functional requirements for the Gate pass Management System.
    - Document the requirements in a detailed Functional Requirements Document.
- **Design:**
    - Based on the requirements, design the system architecture, database schema, and user interface.
    - Create wireframes and prototypes to visualize the user interface and workflow.
    - Define the data model and relationships for storing user information, gate pass records, and configuration settings.
    - Document the technical design in a Technical Design Document.
- **Implementation:**
    - Develop the frontend, backend, and database components based on the design specifications.
    - Implement user management features, gate pass issuance workflows, approval mechanisms, and reporting functionality.
    - Conduct code reviews and unit testing to ensure quality and adherence to coding standards.
- **Testing:**
    - Perform comprehensive testing of the system to verify its functionality and identify any defects.
    - Execute test cases derived from the functional requirements, covering positive and negative scenarios.
    - Conduct integration testing to ensure seamless interaction between system components.
    - Address any issues or bugs identified during testing and perform regression testing as needed.
- **Deployment:**
    - Deploy the Gate pass Management System to a staging environment for final testing and validation.
    - Obtain feedback from stakeholders and make any necessary adjustments or fixes.
    - Once approved, deploy the system to the production environment for live usage.
    - Provide training to users and administrators on how to use the system effectively.
- **Maintenance:**
    - Monitor the system for any issues or performance concerns in the production environment.
    - Address any user-reported issues and provide ongoing support as needed.
    - Perform regular maintenance tasks such as database backups, software updates, and security patches.
    - Continuously evaluate the system for opportunities to enhance functionality or improve efficiency.

Abstract:-

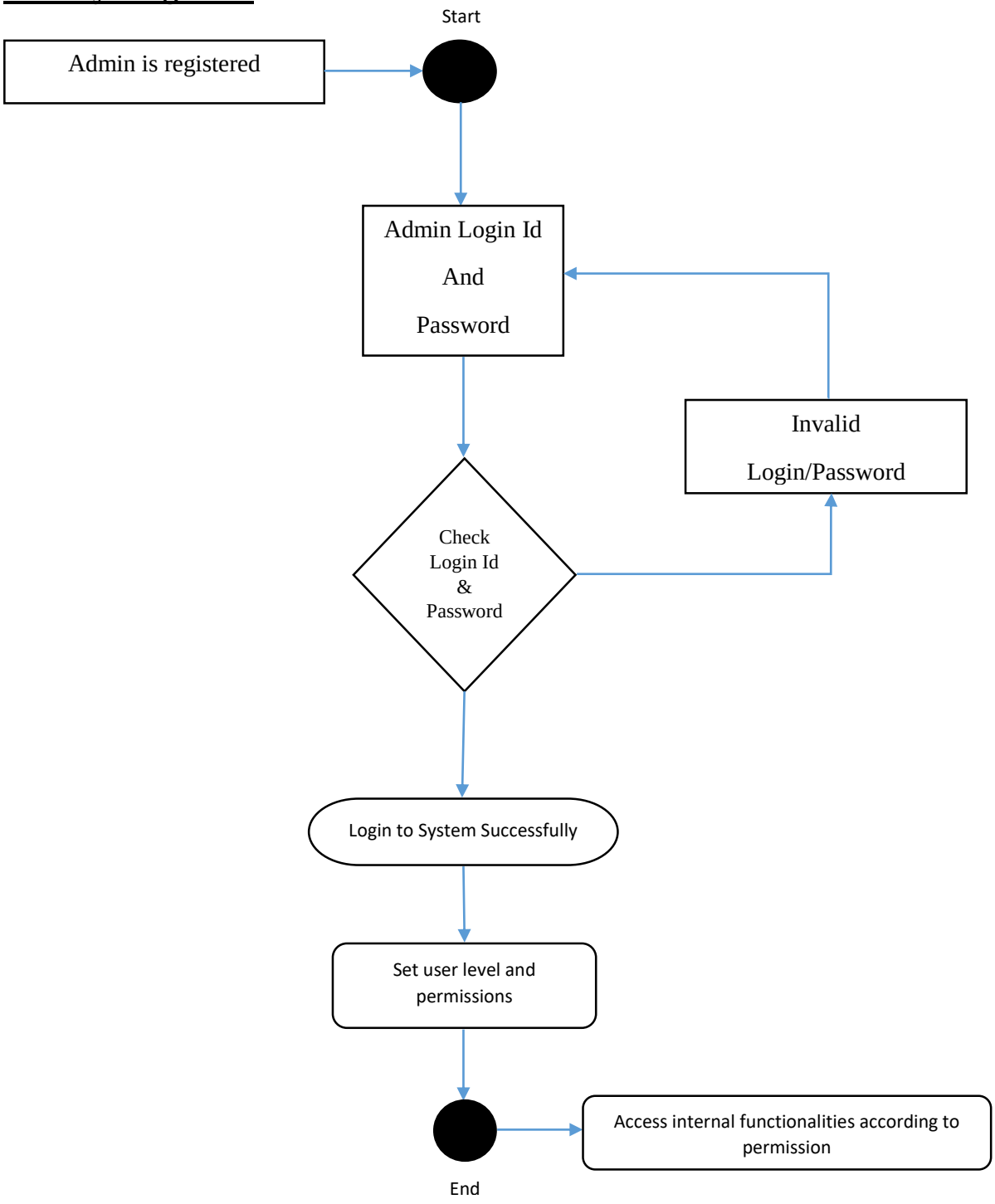
The Gatepass Management System is a comprehensive digital solution designed to streamline and automate the process of managing gate passes within organizations. Traditional manual methods for issuing, tracking, and managing gate passes for employees, visitors, and vehicles are often inefficient, prone to errors, and lack real-time visibility. The Gatepass Management System addresses these challenges by providing a centralized platform for requesting, approving, and monitoring gate passes, thereby enhancing security, improving efficiency, and reducing administrative overhead.

The system offers a range of features including user management, gate pass issuance, approval workflows, QR code generation, check-in/out functionalities, notifications, and reporting capabilities. Users can easily submit gate pass requests, specifying the purpose, duration, and additional details, while administrators can efficiently manage user accounts, configure approval workflows, and monitor gate pass activities in real-time. Integration with existing security systems allows for enhanced security measures and seamless monitoring of gate pass activities.

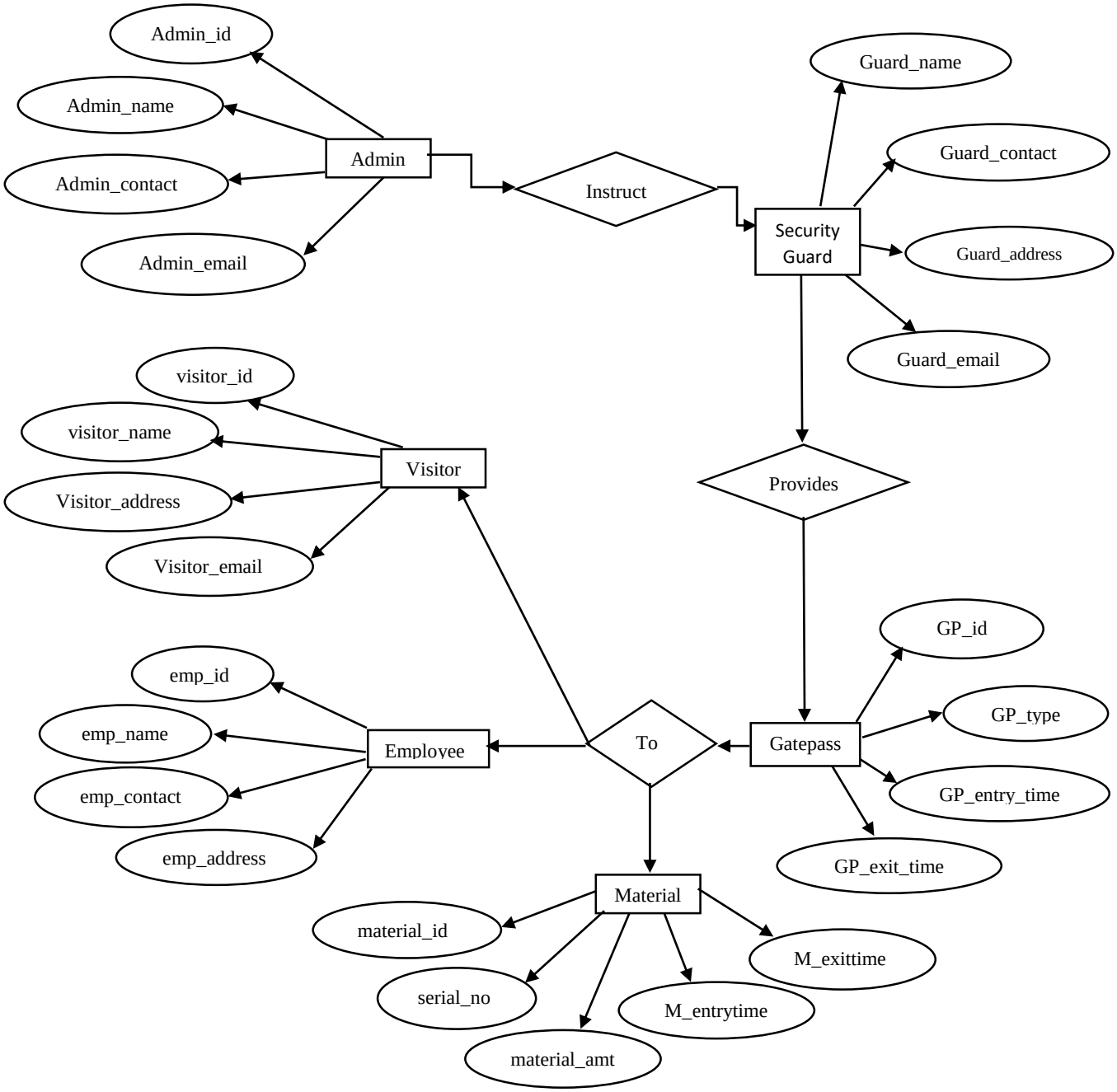
The development of the Gatepass Management System follows the Waterfall Model, with distinct phases including requirements analysis, design, implementation, testing, deployment, and maintenance. This structured approach ensures thorough planning, documentation, and validation at each stage of the project lifecycle, resulting in a robust and reliable system that meets the needs of organizations of all sizes.

Overall, the Gatepass Management System represents a significant advancement in access control and security management, offering organizations a scalable and user-friendly solution to effectively manage gate passes and ensure compliance with organizational policies and regulations.

Activity Diagram:-



ER Diagram:-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Admin
Instruct
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Visitor_email
Visitor
Provides
GP_id
GP_type
GP_entry_time
GP_exit_time
Gatepass
emp_id
emp_name
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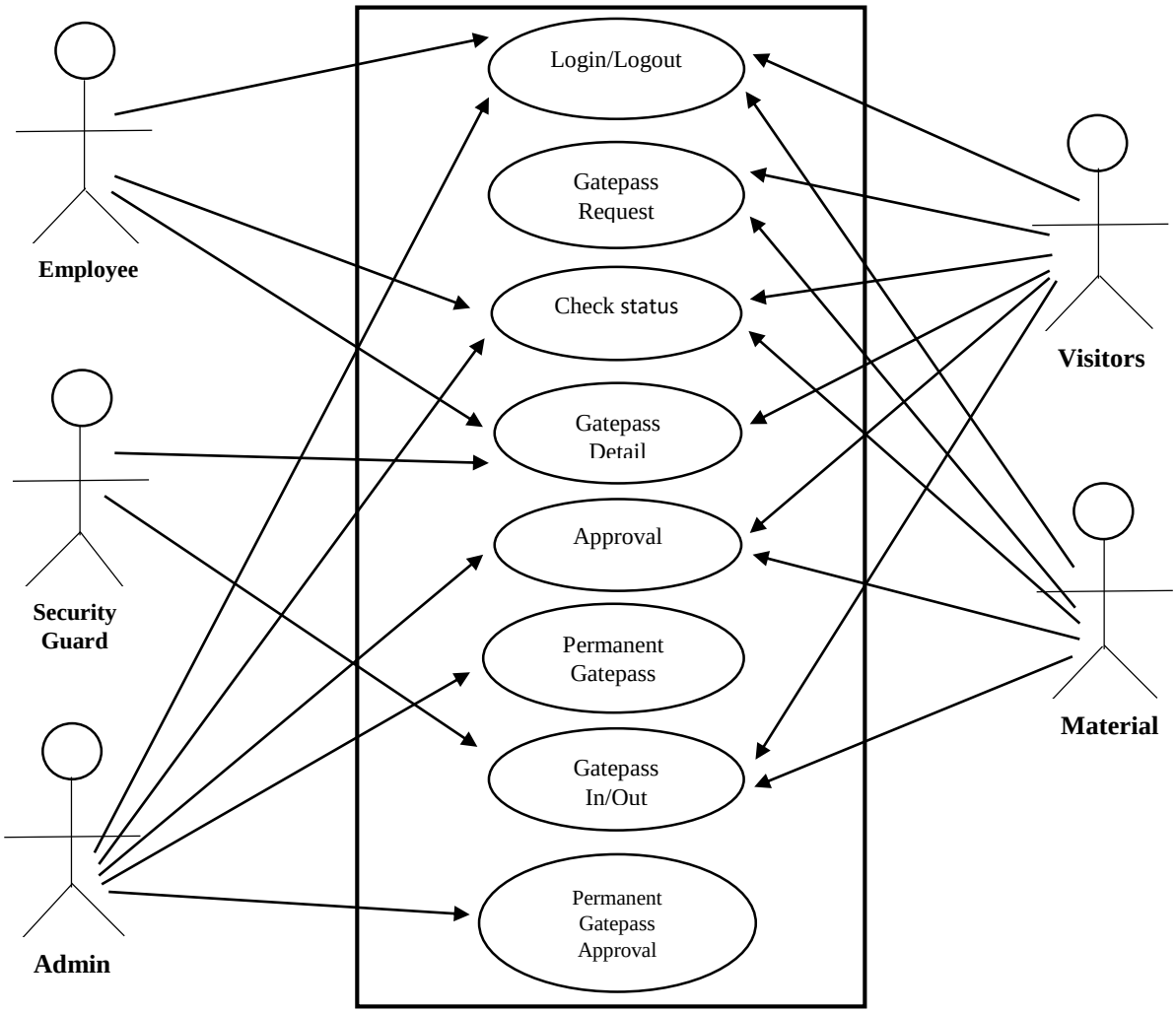
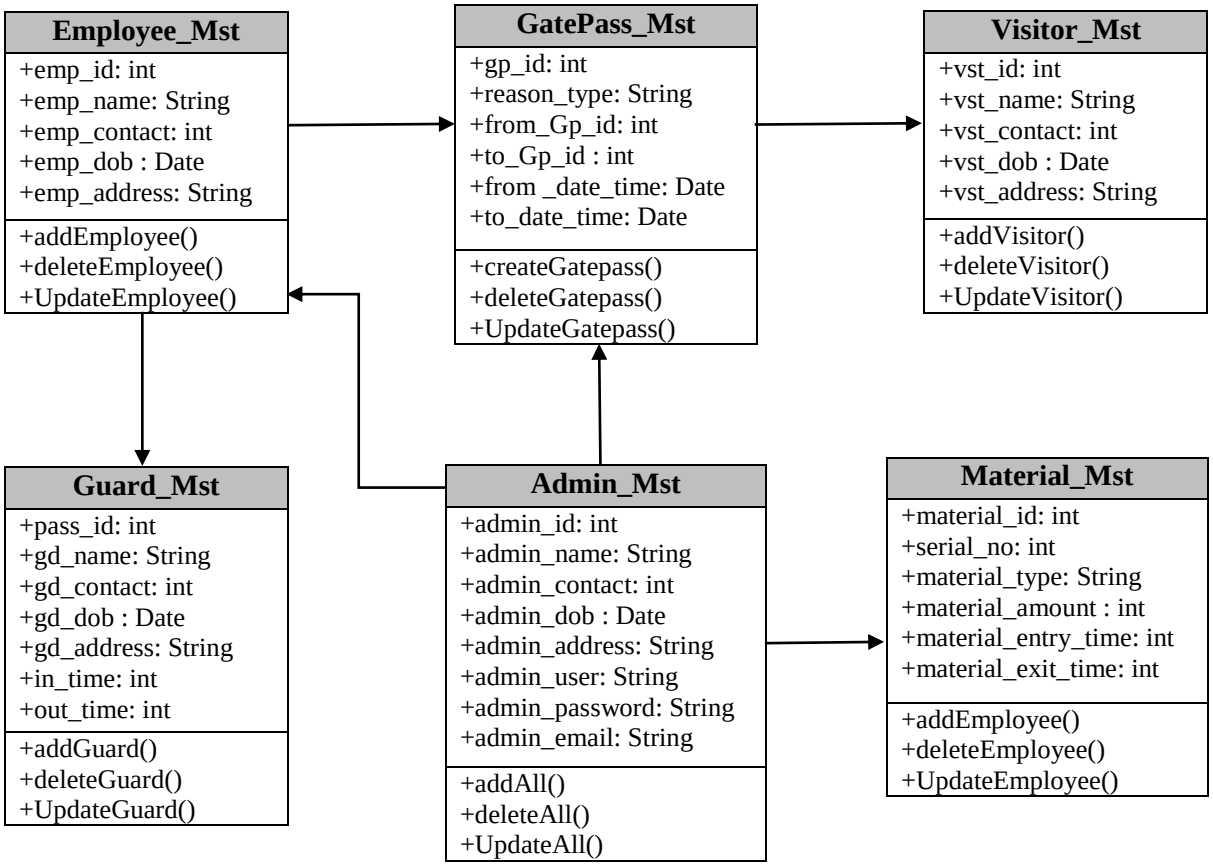
emp_address
Employee
To
Material
material_id
serial_no
material_amt
M_entrytime
M_exittime

Use Case Diagram:-

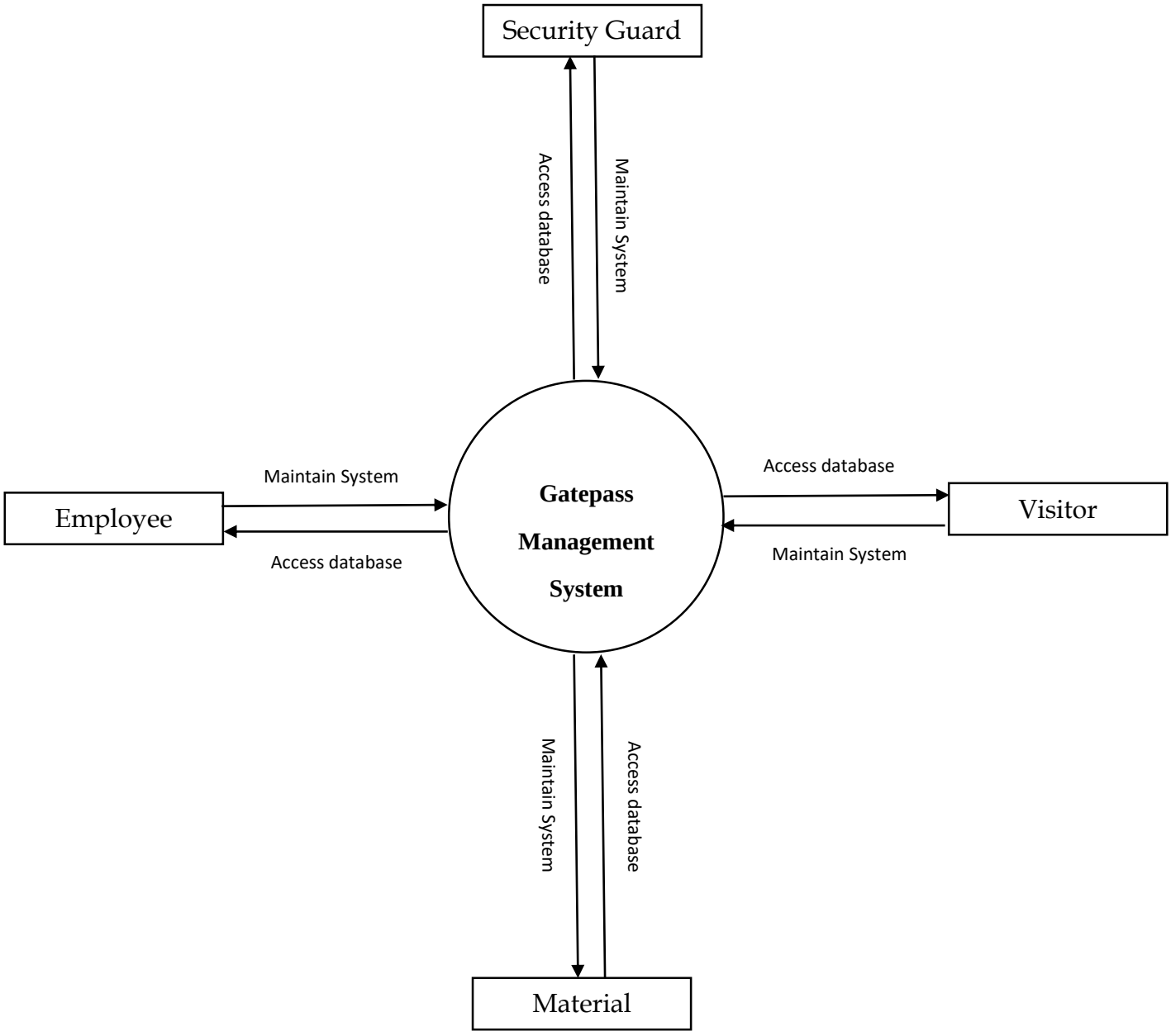


Class Diagram:-



DFDs:-

Context level DFD: -



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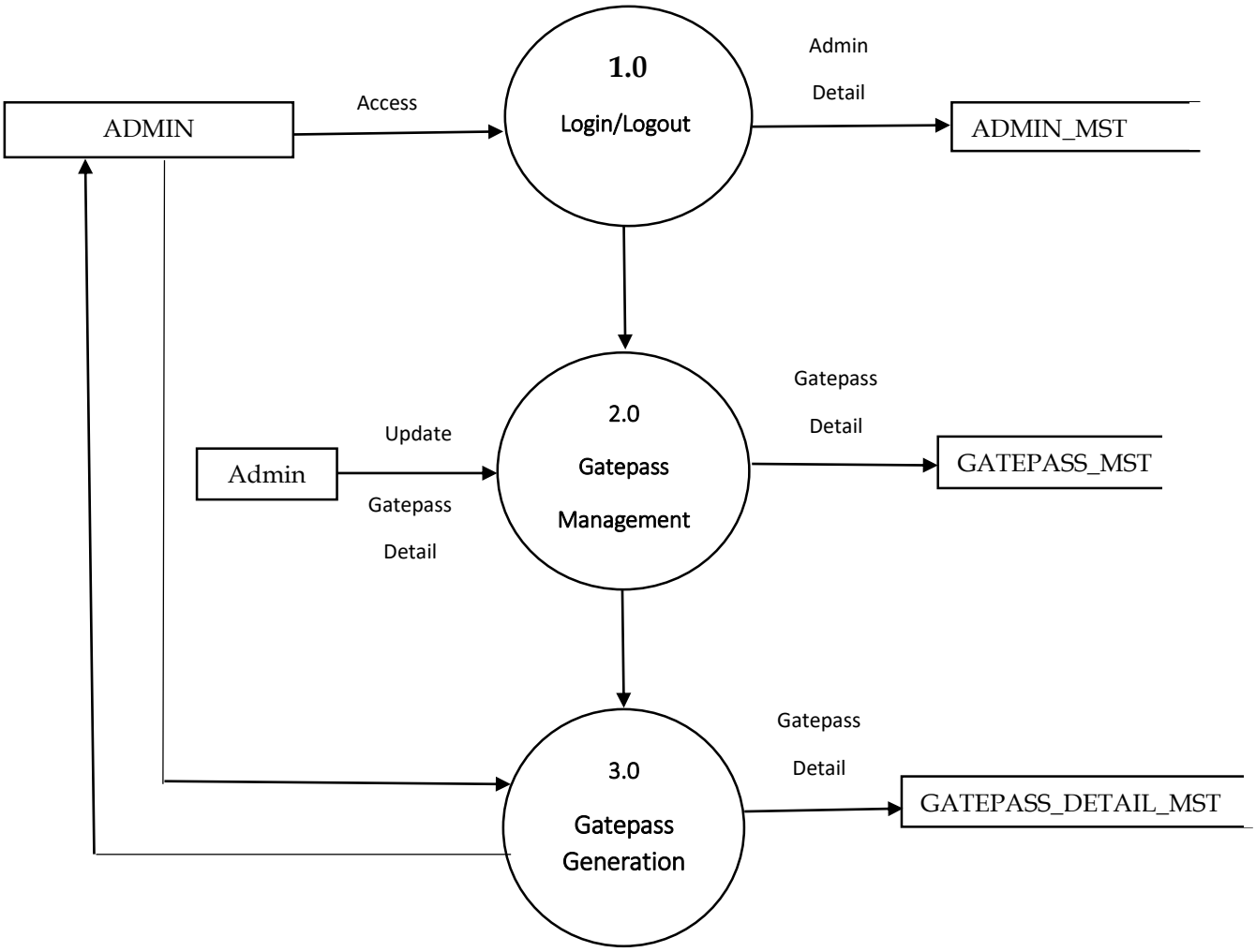

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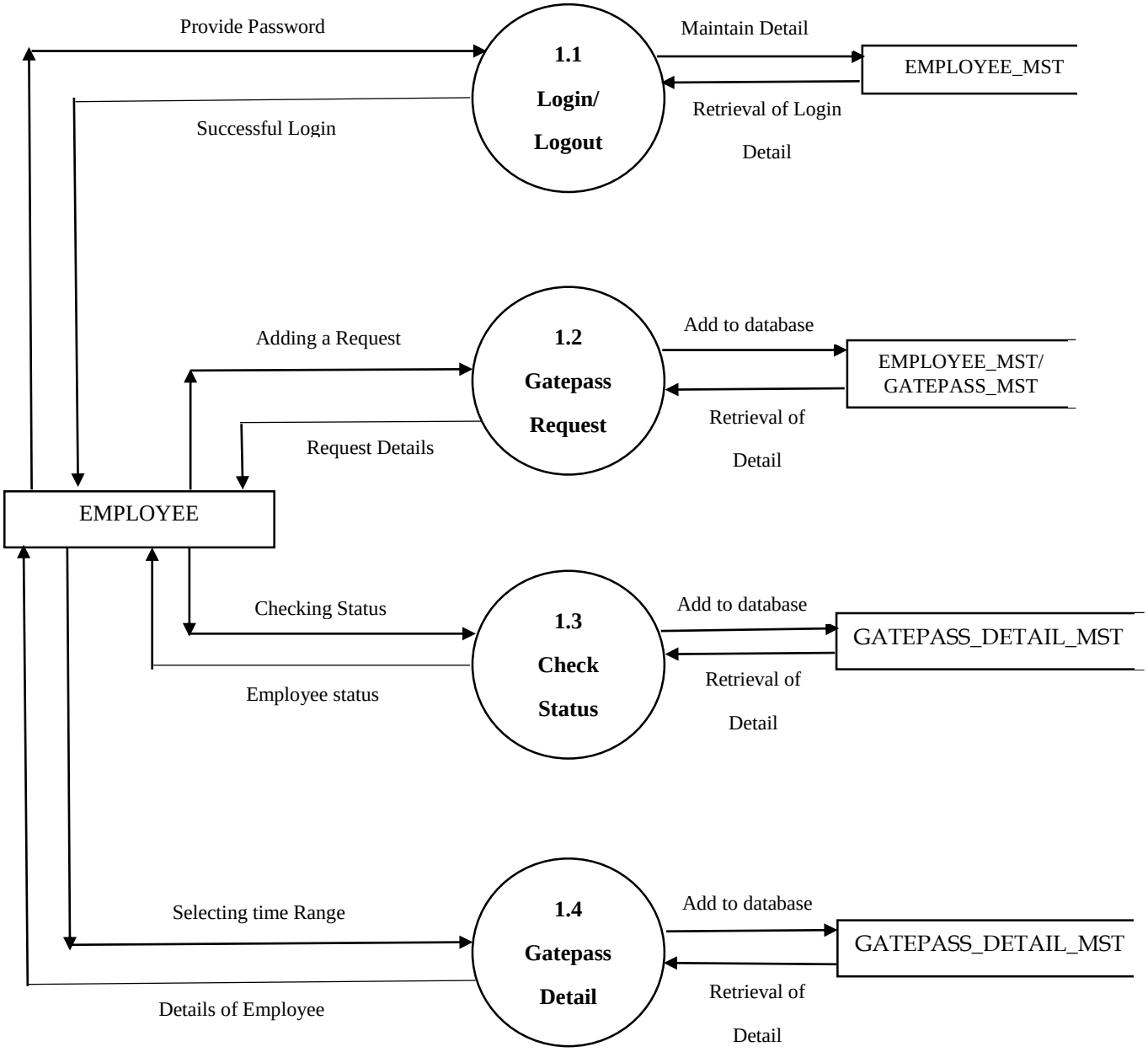

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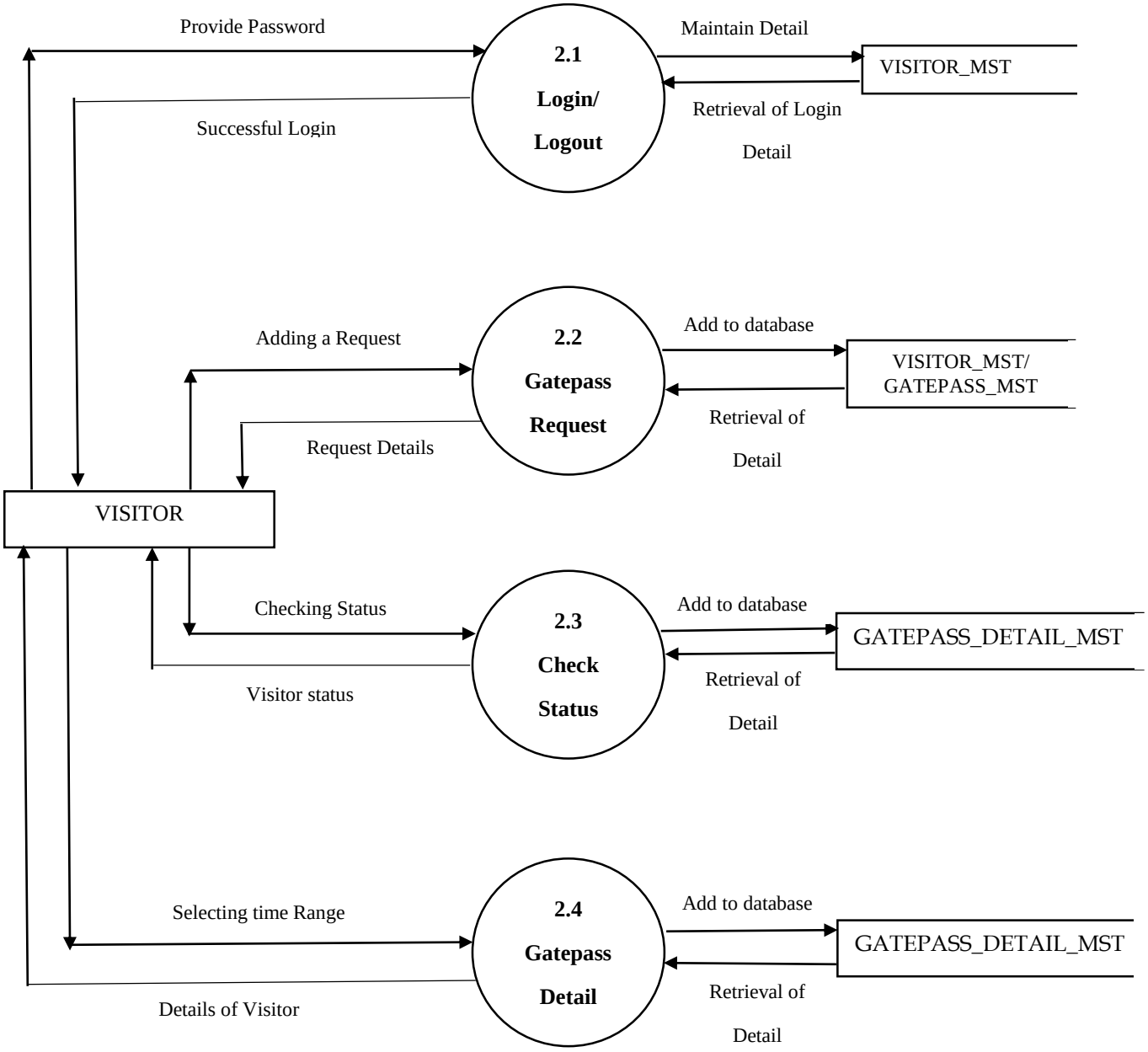

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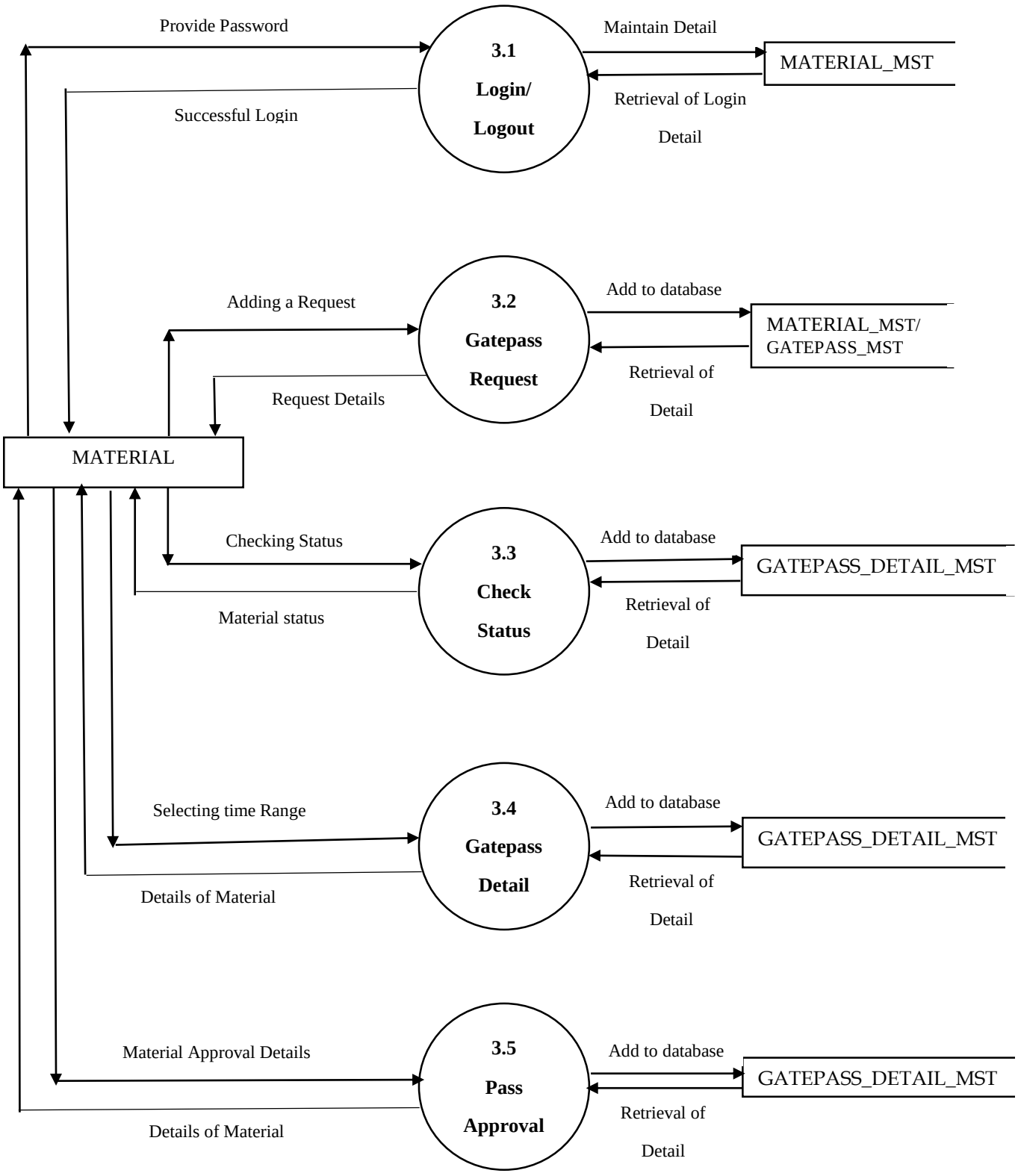
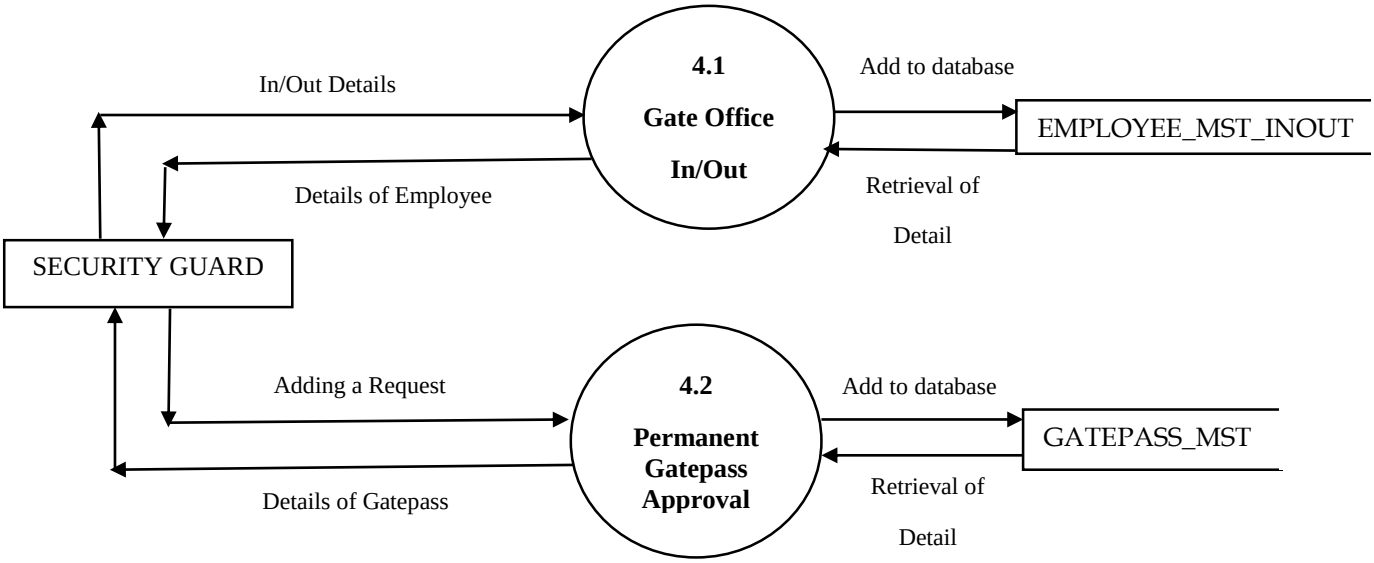


First Level DFD (4.0):-



Database Layout:-

1. Admin_master:

Sr No.	Field Name	Data Type	Constraints
1	id	Int	Primary Key
2	emp_id	Varchar2(10)	Not Null
3	password	Varchar2(50)	Not Null
4	emp_name	Varchar2(50)	Not Null
5	emp_contact	Varchar2(10)	Not Null
6	emp_email	Varchar2(50)	Not Null
7	emp_code	Varchar2(50)	Not Null
8	emp_guard_id	Int	Not Null
9	emp_guard_name	Varchar2(50)	Not Null
10	emp_guard_email	Varchar2(50)	Not Null
11	emp_guard_address	Varchar2(50)	Not Null
12	emp_vst_id	Int	Not Null
13	emp_vst_name	Varchar2(50)	Not Null
14	emp_vst_email	Varchar2(50)	Not Null
15	emp_vst_address	Varchar2(50)	Not Null
16	emp_mtl_id	Int	Not Null
17	emp_mtl_serialno	Varchar2(20)	Not Null
18	emp_mtl_amount	Int	Not Null
19	emp_mtl_entrytime	Int	Not Null
20	emp_mtl_exittime	Int	Not Null

2. Gatepass_master:

Sr No.	Field Name	Data Type	Constraints
1	id	Int	Primary Key
2	emp_id	Varchar2(10)	Not Null
3	reason_type	Varchar2(50)	Not Null
4	from_gate_id	Varchar2(50)	Not Null
5	to_gate_id	Varchar2(50)	Not Null
6	from_date_time	Datetime	Not Null
7	to_date_time	Datetime	Not Null

3. Gatepass_Permanent:

Sr No.	Field Name	Data Type	Constraints
1	id	Int	Primary Key
2	emp_id	Varchar2(10)	Not Null
3	start_date	Date	Not Null
4	end_date	Date	Not Null

4. Gatepass_Details:

Sr No.	Field Name	Data Type	Constraints
1	id	Int	Primary Key
2	gp_master_id	Int	Not Null
3	status	Date	Not Null
4	sanctioned_emp_id	Varchar2(10)	Not Null

5. Gatepass_InOut:

Sr No.	Field Name	Data Type	Constraints
1	id	Int	Primary Key
2	gp_master_id	Int	Not Null
3	id_datetime	Datetime	Not Null
4	out_datetime	Datetime	Not Null