



STEEL AUTHORITY OF INDIA LIMITED  
**A**

**PROJECT REPORT ON  
E-MATETIAL GATE PASS  
SYSTEM**

**(Training period: 16<sup>th</sup> May to 16<sup>th</sup> June)**

*Submitted by:*

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STEEL AUTHORITY OF INDIA LIMITED

**BONAFIDE CERTIFICATE**

Certified that this project report title “E-MATERIAL PASS SYSTEM” Is the Bonafede work of **Vaibhav Prakash, Yash Shankaram** and who carried out the project work under my supervision.

**SIGNATURE**

**Guided By**

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R&D Center for Iron &Steel  
SAIL



# ACKNOWLEDGEMENT

We express our sincere gratitude and thanks to the management of Research and Development Centre for Iron and Steel (RDCIS), SAIL, Ranchi for providing us this opportunity to work in “Computer and Information Technology” department in course of our implant/ organizational training at RDCIS, SAIL, Ranchi.

No project is created entirely by an individual. Many people have helped to create this project and each of their contributions has been valuable. The timely completion of this project is mainly due to the interest and persuasion of Mr. Ayan and Mr. Shree Prakash, who is not only our guide but also a good teacher.

Our sincere thanks are to Mrs. Archana Sharan for allowing us to work on and to facilitate in pursuing this project.

## **SAIL AT A GLANCE**

### ***Company Profile***

**Steel Authority of India Limited (SAIL)** is the leading steel-making company in India. It is a fully integrated iron and steel maker, producing both basic and special steels for domestic construction, engineering, power, railway, automotive and defence industries and for sale in export markets.



Ranked amongst the top ten public sector companies in India in terms of turnover, SAIL manufactures and sells a broad range of steel products, including hot and cold rolled sheets and coils, galvanized sheets, electrical sheets, structural, railway products, plates, bars and rods, stainless steel and other alloy steels. SAIL produces iron and steel at five integrated plants and three special steel plants, located principally in the eastern and central

regions of India and situated close to domestic sources of raw materials, including the Company's iron ore, limestone and dolomite mines. The company has the distinction of being India's largest producer of iron ore and of having the country's second largest mines network. This gives SAIL a competitive edge in terms of captive availability of iron ore, limestone, and dolomite which are inputs for steel making.

SAIL's wide ranges of long and flat steel products are much in demand in the domestic as well as the international market. This vital responsibility is carried out by SAIL's own Central Marketing Organization (CMO) and the International Trade Division. CMO encompasses a wide network of 34 branch offices and 54 stockyards located in major cities and towns throughout India.

SAIL has a well-equipped Research and Development Centre for Iron and Steel (RDCIS) at Ranchi which helps to produce quality steel and develop new technologies for the steel industry. Besides, SAIL has its own in-house Centre for Engineering and Technology (CET), Management Training Institute (MTI) and Safety Organization at Ranchi. Our captive mines are under the control of the Raw Materials Division in Kolkata.



## **MAJOR UNITS OF SAIL**

---

### **Major Units**

#### **Integrated Steel Plants**

- Bhilai Steel Plant (BSP) in Chhattisgarh
- Durgapur Steel Plant (DSP) in West Bengal
- Rourkela Steel Plant (RSP) in Orissa
- Bokaro Steel Plant (BSL) in Jharkhand
- IISCO Steel Plant (ISP) in West Bengal

#### **Special Steel Plants**

- Alloy Steels Plants (ASP) in West Bengal
- Salem Steel Plant (SSP) in Tamil Nadu
- Visvesvaraya Iron and Steel Plant (VISL) in Karnataka

### **Joint Venture**

#### **NTPC SAIL Power Company Pvt. Ltd**

A 50:50 joint venture between Steel Authority of India Ltd. (SAIL) and National Thermal Power Corporation Ltd. (NTPC Ltd.), it manages the captive power plants at Rourkela, Durgapur and Bhilai with a combined capacity of 314 megawatts (MW)

#### **Bokaro Power Supply Company Pvt. Limited**

This 50:50 joint venture between SAIL and the Damodar Valley Corporation formed in January 2002 is managing the 302-MW power generation and 1880 tonnes per hour steam generation facilities at Bokaro Steel Plant.

#### **Mjunction Services Limited**

A joint venture between SAIL and Tata Steel on 50:50 basis, this company promotes e-commerce activities in steel and related areas.

#### **SAIL-Bansal Service Center Ltd.**

SAIL has formed a joint venture with BMW industries Ltd. on 40:60 basis to promote



a service centre at Bokaro with the objective of adding value to steel.

### **Bhilai JP Cement Ltd**

SAIL has also incorporated a joint venture company with M/s Jaiprakash Associates Ltd to set up a 2.2 MT cement plant at Bhilai.

## **BACKGROUND HISTORY OF RDCIS**

### **SAIL's Background and History A Rich Heritage**

#### **The Precursor**

SAIL traces its origin to the formative years of an emerging nation - India. After independence the builders of modern India worked with a vision - to lay the infrastructure for rapid industrialization of the country. The steel sector was to propel the economic growth. Hindustan Steel Private Limited was set up on January 19, 1954. The President of India held the shares of the company on behalf of the people of India.

#### **Expanding Horizon (1959-1973)**

Hindustan Steel (HSL) was initially designed to manage only one plant that was coming up at Rourkela. For Bhilai and Durgapur Steel Plants, the preliminary work was done by the Iron and Steel Ministry. From April 1957, the supervision and control of these two steel plants were also transferred to Hindustan Steel. The registered office was originally in New Delhi. It moved to Calcutta in July 1956 and ultimately to Ranchi in December 1959.

A new steel company, Bokaro Steel Limited, was incorporated in January 1964 to construct and operate the steel plant at Bokaro. The 1 MT phases of Bhilai and Rourkela Steel Plants were completed by the end of December 1961. The 1 MT phase of Durgapur Steel Plant was completed in January 1962 after commissioning of the Wheel and Axle plant. The crude steel production of HSL went up from .158 MT (1959-60) to 1.6 MT. The second phase of Bhilai Steel Plant was completed in



September 1967 after commissioning of the Wire Rod Mill. The last unit of the 1.8 MT phase of Rourkela - the Tandem Mill - was commissioned in February 1968, and the 1.6 MT stage of Durgapur Steel Plant was completed in August 1969 after commissioning of the Furnace in SMS. Thus, with the completion of the 2.5 MT stage at Bhilai, 1.8 MT at Rourkela and 1.6 MT at Durgapur, the total crude steel production capacity of HSL was raised to 3.7 MT in 1968-69 and subsequently to 4MT in 1972-73.

### **SAIL Today**

SAIL today is one of the largest industrial entities in India. Its strength has been the diversified range of quality steel products catering to the domestic, as well as the export markets and a large pool of technical and professional expertise. Today, the accent in SAIL is to continuously adapt to the competitive business environment and excel as a business organization, both within and outside India.

### **FUTURE OF RDCIS (SAIL)**

#### **SAIL - Into the Future**

#### **SAIL's Growth Plan 2010**

Much has happened ever since SAIL's Corporate Plan was announced in 2004. Investment plans for the three specialty steel plants have been firmed up. Company has grown in size with the amalgamation of IISCO (now renamed as IISCO Steel Plant). Production targets have been revised from 19 million tons (MT) of steel to about 24 MT. Estimated investment has increased from Rs 25,000 crore to around Rs 40,000 crore. And the time period has been squeezed by two years, bringing the targeted year of completion of major projects from 2012 to 2010.

#### **Prevailing Scenario**

True, SAIL is looking into the future and the journey has begun. As of now, projects worth around Rs 28,000 crore are in various stages of implementation. This includes ongoing 28 numbers of projects worth more than Rs 2,800 crore spread over six production units across the country. The tendering for the rest of the approved projects worth around Rs 25,000 crore is presently under progress. More importantly, three new production facilities have recently been commissioned at a total cost of Rs



187 crore at Bhilai Steel Plant (BSP).

In a significant development, the company now obtains consolidated approval for the major projects instead of piece meal approvals. For instance, the SAIL board has in the last one year granted ‘in-principle’ approval for the entire package of Rs 1,553 crore of projects for Sales Steel Plant (SSP), Rs 9,592 crore for IISCO Steel Plant (ISP) and Rs 9,265 crore for Bokaro Steel Plant (BSL).

Some of the important ongoing projects include Installation of Slab Caster at Bhilai Steel Plant, Installation of Bloom Caster at Durgapur Steel Plant, Installation of Pipe Coating Plant at Rourkela Steel Plant, Rebuilding of Coke Oven Battery No. 5 and Upgradation of Automation System of Tandem Mill in CRM Complex at Bokaro Steel Plant and Installation of Argon Oxygen Decarburizations (AOD) and High-Powered Electric Arc Furnace (EAF) at Alloy Steels Plant.

#### **Technology Marketing, Consultancy and Contract Research: -**

RDCIS has introduced several innovations in the SAIL plants towards improvement in the technological performance, cost reduction, quality improvement and development of value-added products R & D inputs have contributed significantly towards consistent improvement in the techno economic parameters of SAIL plants.

In recognition of its noteworthy achievements, RDCIS has begged several national awards such as DSIR award, FICCI award, Golden Peacock National Quality award, NRDC award, Rajbhasa award, NMD awards, SAIL Gold Medal, Visvesvaraya Gold Medal, MECON award, Steel Eighties award, Kamani Gold Medal, Essar Gold Medal, National Mineral Award etc.

Having established its credentials within the company and in the iron & steel industry, RDCIS offers technological services to various organizations in the form of:

- Know-how transfer of technologies developed by RDCIS
- Consultancy services
- Specialized testing services





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# ABOUT THE PROJECT

## 1. Introduction: -

### REQUIREMENT ANALYSIS

#### ANALYSIS AND DESIGN

##### *Reviewing Organization Documents:*

Upon reviewing the documents of the institution, the following problems were identified:

- **Difficulty in Tracking Material:** With manual register maintenance, it is challenging to track which employee has taken which material.
- 
- **Searching Difficulties:** Searching for materials and tracking their usage is cumbersome and prone to errors.

##### *Interviewing:*

Interviews with employees revealed several issues:

1. **Difficulty in Tracking Material Usage:** It is often difficult to determine which material was issued to whom and when.
2. **Time Delays:** Searching records manually results in significant delays.
3. **Record Maintenance:** Maintaining records of material issuance and return is challenging, especially with the number of materials and employees involved.
4. **Manual Data Entry:** Delays in issuing materials due to the need for handwritten data entry.
5. **Operational Challenges:** Employees face difficulties in maintaining accurate and up-to-date records

##### *Feasibility Study:*

Three types of feasibility studies were conducted to determine the feasibility of implementing the material management system:

1. **Technical Feasibility:**
  - **Client/Server System:** Based on the requirements, a client/server system was selected. This is technically feasible for the institution

because everything is manually maintained. With a client/server system, tracking material issuance is much faster and more efficient.

- 
- **Enhanced Search:** The system will provide immediate search capabilities, even for data that is many years old.
- 
- **Validated Data:** The system will ensure only validated and useful data is entered, reducing errors.
- 
- **User-Friendly Interface:** The system will be user-friendly, requiring only minimal training for employees.
- 
- **Communication Facility:** The system will allow communication between clients, enabling easy sharing of required information.
- 
- **High Volume Processing:** The system will be capable of processing a certain volume of transactions at a particular speed, ensuring timely responses.

## 2. Operational Feasibility:

- **Reduced Errors:** The system will reduce the burden on employees by minimizing the chances of mistakes.
- **Decision-Making:** The system will provide useful data that can assist in important decision-making processes.
- **Training:** Employees will be able to work efficiently on the system after receiving one or more days of training.
- **Output Production:** The system will have the capability to produce outputs within a given time frame, ensuring timely and accurate reporting.
- **Response Time:** The system will provide a quick response time under various conditions, enhancing operational efficiency.

## 3. Economic Feasibility:

- **Cost-Saving Benefits:** Previously, many clerical staff were required to perform tasks manually, leading to slow processes and higher operational costs. The new system will reduce the need for extra staff, thus saving costs.
- **Cost Avoidance Benefits:** With an increase in workload, management previously hired additional staff on a casual basis. The new system will eliminate the need for future operational costs by automating processes.

- **Improved Information Benefits:** The system will provide better information for decision-making, leading to improved services for all employees. Better information management will facilitate more efficient material tracking and usage.

By implementing the Material Management System, which includes functionalities for employees and security personnel to log material information and generate QR codes for respective materials, the institution will experience significant improvements in operational efficiency, cost savings, and data accuracy. The system will streamline the process of material issuance, tracking, and return, ensuring a more organized and efficient material management process.

## SOFTWARE ENGINEERING PARADIGM APPLIED

### Software Engineering Paradigm Applied for Material Management System

#### *Why Prototype Paradigm?*

Often, a customer defines a set of general objectives for software but does not identify detailed input, processing, or output requirements. In other cases, the developer may be unsure of the efficiency of an algorithm, the adaptability of an operating system, or the form that human/machine interaction should take. In these, and many other situations, the prototyping paradigm may offer the best approach.

The prototyping paradigm begins with requirement gathering. The developer and customer meet to define the overall objectives for the software, identify known requirements, and outline areas where further definition is mandatory. A "quick design" focuses on a representation of those aspects of the software that will be visible to the customer/user (e.g., input approaches and output formats). The prototype is evaluated by the construction of a prototype. The prototype is evaluated by the customer/user and used to redefine requirements for the software to be developed. Iteration occurs as the prototype is refined to satisfy the customer's needs, while at the same time enabling the developer to better understand what needs to be done.

Ideally, the prototype serves as a mechanism for identifying software requirements. If a working prototype is built, the developer attempts to use existing program fragments or applies tools (e.g., report generation) that enable working programs to be generated quickly.

It is true that both customers and developers like the prototyping paradigm. Users get

a feel for the actual system, and developers get to build something immediately.

In the context of the material management system, the prototype paradigm can significantly improve the project's quality and long-term maintainability. The institution maintains very large data, and the prototype helps ensure that employees and security personnel can manage materials efficiently, track material information accurately, and generate QR codes for respective materials. It is also beneficial for management in making decisions.

Since data are scattered across different files, preparing reports becomes a major problem. The management can get only the report of a particular department at a time. Quality management can change the complete project structure. The prototype paradigm is also useful for report generation and window management, enabling working programs to be generated quickly. In the prototyping paradigm, users get a feel for the actual system, and developers get to build something immediately. It includes a large number of elements to enable individuals to use the proposed system to determine what they like and to identify features to be added or changed.

Application prototyping, the process of developing and using the prototype, has the following characteristics:

1. The prototype is a live, working application.
2. Its main purpose is to test out the assumptions made by the analysts and users about the features of the required system.
3. Prototypes can be quickly created.
4. They follow an iterative process.
5. They are relatively inexpensive.

Application prototyping has two primary uses:

1. **Clarifying User Requirements:** It is an effective device for clarifying user requirements. When specifications are typically created as a vehicle for defining application features and requirements, they must be satisfied.
2. **Verifying Feasibility:** Application prototyping helps verify the feasibility of a system design. Analysts can experiment with different application characteristics, evaluating user reactions and responses.

The rationale for application prototyping is a direct outgrowth of the need to design and develop information systems quickly, efficiently, and effectively. Application prototyping is a proven technique that improves the overall effectiveness of the development effort for the benefit of the user, analyst, and organization as a whole.

#### *Prototype Paradigm in Material Management System:*

After studying all the features of the prototype model, we decided to follow this model for the development of the Material Management System. We followed these

steps:

1. **Listen to the Customer:** We met with the relevant authorities and staff members to understand the system's requirements. They provided us with a lot of content and directed us to the registration counter. At the registration counter, we asked many questions and obtained material registration files.
2. **Build/Revise Mock-up:** Based on the information and forms we collected, we designed the system and created a demo. This demo included the functionality for employees and security personnel to log material information and generate QR codes.
3. **Customer Test-Drives Mock-up:** We presented the demo to several employees and managers, who provided valuable feedback. We incorporated their suggestions and made the necessary changes.

These steps were repeated several times, ensuring that the prototype evolved to meet user expectations and requirements. This iterative process allowed us to refine the system and ensure that it satisfied the customer's needs.

By using the prototype paradigm, we were able to develop a robust Material Management System that meets the requirements of the institution efficiently and effectively. This approach enabled us to create a user-friendly system that provides accurate material tracking and reporting capabilities, thereby improving operational efficiency and decision-making processes.

# E-Material Gate Pass Management System for SAIL

The E-Material Gate Pass Management System for SAIL (Steel Authority of India Limited) is designed to streamline and automate the process of managing materials, facilitating the issuance and return of materials, tracking inventory, and generating reports. This system ensures the efficiency and accuracy of material management, enhancing the overall workflow within SAIL's facilities.

## *Features of the E-Material Gate Pass Management System:*

1. **Creating New Entries:** The system allows for the creation of new material entries, recording all relevant information such as material type, quantity, and recipient details.
2. **Deleting Entries:** Users can delete material entries that are no longer needed or have been issued incorrectly, ensuring the database remains clean and accurate.
3. **Issuing Material:** The system facilitates the issuance of materials, generating a gate pass that includes a QR code for easy tracking and verification.
4. **Receiving Material:** When materials are returned, the system records the return, updates the inventory, and ensures all records are accurate.
5. **Showing Entries:** Users can view all material entries, including detailed information about each material, its status, and its history.
6. **Report Generation:** The system can generate various reports on materials, usage, inventory levels, and other processes. These reports help in monitoring and managing materials efficiently.

## Tools and Environment for E-Material Gate Pass Management System

The tools used in the software/project inform the end-user about the necessary tools and the environment required for the project to run properly on any type of system. This ensures the software is compatible with all types of systems.

## *Minimum Project/Software Requirements:*

For the "E-Material Gate Pass Management System," we used HTML, CSS, JavaScript, and Python for the backend.

## *Hardware Requirements:*

- **Operating System:** Windows 7
- **Hard Disk:** 40GB
- **RAM:** 256 MB



### Software Requirements:

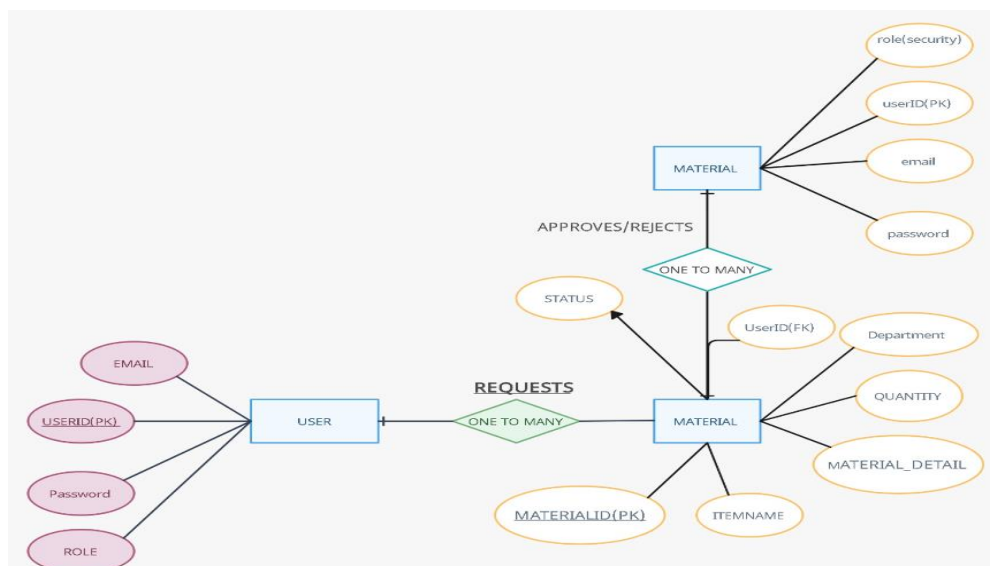
- **HTML:** For structuring the web pages.
- **CSS:** For styling the web pages and ensuring a user-friendly interface.
- **JavaScript:** For adding interactivity and dynamic features to the web application.
- **Python:** For backend development, handling data processing, and server-side operations.
- ORACLE10g

## E-R DIAGRAM

### Explanation:

- **User:** The primary entity with attributes `userId`, `email`, `password`, and `role`.
- **Material:** The entity representing materials with attributes `materialId`, `itemName`, `materialDetails`, `quantity`, `department`, `priorityLevel`, and `status`.
- **Relationships:**
  - **User-Request-Material:** A user (employee) requests multiple materials.
  - **Security Personnel-Approve/Reject-Material:** A security personnel (user with role 'security') can approve or reject materials.

The diagram ensures that each material request and approval/rejection is linked back to a user, facilitating efficient tracking and management of materials within the system.





## **CODING AND PROGRAMME PRESENTATION**

### **LOGIN.HTML**

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <title>SAIL RDCIS Login</title>
  <link
href="https://cdn.jsdelivrivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.m
in.css" rel="stylesheet" integrity="sha384-
QWTKZyjpPEjISv5WaRU90FeRpok6YctnYmDr5pNlyT2bRjXh0JMhjY6hW+ALEwIH"
crossorigin="anonymous">
  <link rel="stylesheet" href="{ { url_for('static',
filename='css/styles.css') } }">
```

```

</head>
<body>
  <section class="h-100 gradient-form" style="background-color:
#eee;">
    <div class="container py-5 h-100">
      <div class="row d-flex justify-content-center align-items-
center h-100">
        <div class="col-xl-10">
          <div class="card rounded-3 text-black">
            <div class="row g-0">
              <div class="col-lg-6">
                <div class="card-body p-md-5 mx-md-4">
                  <div class="text-center">
                    
                    <h4 class="mt-1 mb-5 pb-1">We
are The RDCIS Team of SAIL</h4>
                  </div>
                  <form method="POST" action="/">
                    <p>Please login to your
account</p>
                    <div class="form-outline mb-4">
                      <select class="form-select"
id="userRole" name="userRole">
                        <option selected>Select
your role</option>
                        <option
value="employee">Employee</option>
                        <option
value="security">Security Personnel</option>
                      </select>
                    </div>
                    <div class="form-outline mb-4">
                      <input type="email"
id="form2Example11" class="form-control" name="email"
placeholder="Phone number or email address" required/>
                      <label class="form-label"
for="form2Example11">Username</label>
                    </div>
                    <div class="form-outline mb-4">
                      <input type="password"
id="form2Example22" class="form-control" name="password" required/>
                      <label class="form-label"
for="form2Example22">Password</label>
                    </div>
                    <div class="text-center pt-1

```



## MATERIAL\_REQ.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <title>Material Requisition Form</title>
  <link
href="https://cdn.jsdelivrivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.m
in.css" rel="stylesheet">
  <link rel="stylesheet" href="{ { url_for('static',
filename='css/req_css.css') } }">
</head>
<body>
  <nav class="navbar navbar-expand-lg navbar-light bg-light">
    <div class="container-fluid">
      <a class="navbar-brand" href="#">SAIL RDCIS</a>
      <button class="navbar-toggler" type="button" data-bs-
toggle="collapse" data-bs-target="#navbarNav" aria-controls="navbarNav"
aria-expanded="false" aria-label="Toggle navigation">
        <span class="navbar-toggler-icon"></span>
      </button>
      <div class="collapse navbar-collapse" id="navbarNav">
        <ul class="navbar-nav ms-auto">
          <li class="nav-item">
            <a class="nav-link" href="#profile">Profile</a>
          </li>
          <li class="nav-item">
            <a class="nav-link" href="#previous-
requests">Previous Requests</a>
          </li>
        </ul>
      </div>
    </div>
  </nav>

  <section class="h-100 gradient-form">
    <div class="container py-5 h-100">
      <div class="row d-flex justify-content-center align-items-
center h-100">
        <div class="col-xl-8">
          <div class="card shadow-lg">
            <div class="row g-0">
              <div class="col-lg-6">
```



**STEEL AUTHORITY OF INDIA LIMITED**

```

<div class="card-body p-md-5">
    <div class="text-center mb-4">
        <h4 class="card-title mb-
0">Material Requisition Form</h4>
    </div>
    <form id="materialForm"
method="POST" action="{{ url_for('material_request') }}">
        <div class="mb-4">
            <label for="materialId"
class="form-label">Material ID</label>
            <input type="text"
id="materialId" name="materialId" class="form-control"
placeholder="Enter Material ID" required>
        </div>
        <div class="mb-4">
            <label for="itemName"
class="form-label">Item Name</label>
            <input type="text"
id="itemName" name="itemName" class="form-control" placeholder="Enter
Item Name" required>
        </div>
        <div class="mb-4">
            <label
for="materialDetails" class="form-label">Material Details</label>
            <textarea
id="materialDetails" name="materialDetails" class="form-control"
placeholder="Enter Material Details" rows="3" required></textarea>
        </div>
        <div class="mb-4">
            <label for="quantity"
class="form-label">Quantity</label>
            <input type="number"
id="quantity" name="quantity" class="form-control" placeholder="Enter
Quantity" required>
        </div>
        <div class="mb-4">
            <label for="department"
class="form-label">Department</label>
            <input type="text"
id="department" name="department" class="form-control"
placeholder="Enter Department" required>
        </div>
        <div class="mb-4">
            <label for="priorityLevel"
class="form-label">Priority Level</label>
            <select class="form-select"

```

```
id="priorityLevel" name="priorityLevel" required>
                                <option selected
disabled>Select Priority Level</option>
                                <option
value="low">Low</option>
                                <option
value="medium">Medium</option>
                                <option
value="high">High</option>
                                </select>
                            </div>
                            <div class="d-grid">
                                <button class="btn btn-
primary btn-block" type="submit">Submit</button>
                            </div>
                        </form>
                    </div>
                </div>
            <div class="col-lg-6 d-flex align-items-
center">
                
            </div>
        </div>
    </div>
</div>
</div>
</div>
</div>
</div>
</section>
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
<script>
    document.addEventListener('DOMContentLoaded', function() {
        const materialForm =
document.getElementById('materialForm');
        materialForm.addEventListener('submit', function(event) {
            event.preventDefault();
            // Perform form submission
            fetch(materialForm.action, {
                method: materialForm.method,
                body: new FormData(materialForm)
            }).then(response => {
                if (response.ok) {
                    materialForm.reset(); // Reset the form
```



```

        alert('Material submitted'); // Display alert
    }
}).catch(error => {
    console.error('Error submitting form:', error);
});
});
});
</script>
</body>
</html>

```

## SECURITY.HTML

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Material Approval Page</title>
    <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.m
in.css" rel="stylesheet" integrity="sha384-
QWTKZyjpPEjISv5WaRU90FeRpok6YctnYmDr5pNlyT2bRjXh0JMhY6hW+ALEwIH"
crossorigin="anonymous">
    <style>
        body {
            background-color: #f8f9fa;
            padding-top: 50px;
        }
        .container {
            margin-top: 50px;
        }
        .card {
            background-color: #ffffff;
            border-radius: 10px;
            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
            margin-bottom: 20px;
        }
        .card-body {
            padding: 20px;
        }
        .card-title {
            font-size: 1.5rem;
            font-weight: bold;

```

```

        margin-bottom: 15px;
    }
    .card-text {
        font-size: 1rem;
        margin-bottom: 10px;
    }
    .btn {
        margin: 5px;
    }
    .qr-code {
        margin-top: 15px;
        text-align: center;
    }
    #materialList {
        max-width: 1000px;
        margin: auto;
    }
</style>
<script
src="https://cdnjs.cloudflare.com/ajax/libs/qrcodejs/1.0.0/qrcode.min.js"></script>
</head>
<body>
    <div class="container">
        <h1 class="text-center mb-4">Material Approval</h1>
        <div id="materialList" class="row"></div>
    </div>
    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js" integrity="sha384-
YvpcrYf0tY3lHB60NNkmXc5s9fDVZLESaAA55NDzOxhy9GkcIdslK1eN7N6jIeHz"
crossorigin="anonymous"></script>
    <script>
        document.addEventListener('DOMContentLoaded', function() {
            fetch('/material_approval_data')
                .then(response => response.json())
                .then(data => {
                    if (data.error) {
                        alert(data.error);
                        return;
                    }
                    const materialList =
document.getElementById('materialList');
                    materialList.innerHTML = '';
                    data.materials.forEach(material => {
                        const materialCard =

```



```

document.createElement('div');
    materialCard.className = 'col-md-6';
    materialCard.innerHTML =
        <div class="card">
            <div class="card-body">
                <h5 class="card-title">Material ID:
${material.materialId}</h5>
                <p class="card-text"><strong>Item
Name:</strong> ${material.itemName}</p>
                <p class="card-
text"><strong>Material Details:</strong>
${material.materialDetails}</p>
                <p class="card-
text"><strong>Quantity:</strong> ${material.quantity}</p>
                <p class="card-
text"><strong>Department:</strong> ${material.department}</p>
                <p class="card-
text"><strong>Priority Level:</strong> ${material.priorityLevel}</p>
                <div
id="qrCodeContainer${material.materialId}" class="qr-code"></div>
                <button class="btn btn-success"
onclick="approveMaterial('${material.materialId}')">Approve</button>
                <button class="btn btn-danger"
onclick="rejectMaterial('${material.materialId}')">Reject</button>
            </div>
        </div>
    ;
    materialList.appendChild(materialCard);

    new
QRCode(document.getElementById(`qrCodeContainer${material.materialId}`)
, {
        text: JSON.stringify(material),
        width: 128,
        height: 128,
        colorDark: "#000000",
        colorLight: "#ffffff",
        correctLevel: QRCode.CorrectLevel.H
    });
});
})
    .catch(error => console.error('Error fetching
materials:', error));
});

function approveMaterial(materialId) {

```

```

        fetch('/approve_material', {
            method: 'POST',
            headers: {
                'Content-Type': 'application/x-www-form-
urlencoded',
            },
            body: new URLSearchParams({
                'material_id': materialId
            })
        }).then(response => {
            if (response.ok) {
                window.location.reload();
            }
        });
    }

    function rejectMaterial(materialId) {
        fetch('/reject_material', {
            method: 'POST',
            headers: {
                'Content-Type': 'application/x-www-form-
urlencoded',
            },
            body: new URLSearchParams({
                'material_id': materialId
            })
        }).then(response => {
            if (response.ok) {
                window.location.reload();
            }
        });
    }
}
</script>
</body>
</html>

```

### APP.PY

```

from flask import Flask, render_template, request, redirect, url_for,
session, jsonify
import mysql.connector

app = Flask(__name__)
app.secret_key =
b"tq5\x1c\xd7\xc2E\x16\xd3\xfa\xd8'\xd7\x1a/\xd9\x03\xc3!\x13\x00'\d"

```



```

# Database configuration
db_config = {
    'user': 'root',
    'password': 'yashsql12!',
    'host': 'localhost',
    'database': 'sail'
}

def get_db_connection():
    connection = mysql.connector.connect(**db_config)
    return connection

@app.route('/', methods=['GET', 'POST'])
def login():
    if request.method == 'POST':
        user_role = request.form['userRole']
        email = request.form['email']
        password = request.form['password']

        connection = get_db_connection()
        cursor = connection.cursor(dictionary=True)

        if user_role == "employee":
            cursor.execute("SELECT * FROM employees WHERE email = %s
AND password = %s", (email, password))
        elif user_role == "security":
            cursor.execute("SELECT * FROM security_personnel WHERE
email = %s AND password = %s", (email, password))

        user = cursor.fetchone()
        cursor.close()
        connection.close()

        if user:
            session['user'] = user
            if user_role == "employee":
                return redirect(url_for('material_request'))
            else:
                return redirect(url_for('material_approval'))
        else:
            return "Invalid credentials"

    return render_template('login.html')

@app.route('/dashboard')

```

```

def dashboard():
    if 'user' in session:
        user = session['user']
        return f"Welcome {user['username']}!"
    return redirect(url_for('login'))

@app.route('/material_req', methods=['GET', 'POST'])
def material_request():
    if 'user' in session and session['user']['role'] == 'employee':
        if request.method == 'POST':
            materialId = request.form['materialId']
            itemName = request.form['itemName']
            materialDetails = request.form['materialDetails']
            quantity = request.form['quantity']
            department = request.form['department']
            priorityLevel = request.form['priorityLevel']

            connection = get_db_connection()
            cursor = connection.cursor()
            cursor.execute("INSERT INTO materials (materialId,
itemName, materialDetails, quantity, department, priorityLevel) VALUES
(%s, %s, %s, %s, %s, %s)",
                        (materialId, itemName, materialDetails,
quantity, department, priorityLevel))
            connection.commit()
            cursor.close()
            connection.close()
            return redirect(url_for('material_request'))

        return render_template('material_req.html')
    return redirect(url_for('login'))

@app.route('/material_approval')
def material_approval():
    if 'user' in session and session['user']['role'] == 'security':
        return render_template('security.html')
    return redirect(url_for('login'))

# backend code
@app.route('/material_approval_data', methods=['GET'])
def material_approval_data():
    if 'user' in session and session['user']['role'] == 'security':
        connection = get_db_connection()
        cursor = connection.cursor(dictionary=True)
        cursor.execute("SELECT * FROM materials WHERE status IS NULL")
        materials = cursor.fetchall()
        cursor.close()
        connection.close()

```

```

        return jsonify({'materials': materials})
    return jsonify({'error': 'Unauthorized access'}), 403

@app.route('/approve_material', methods=['POST'])
def approve_material():
    material_id = request.form['material_id']
    connection = get_db_connection()
    cursor = connection.cursor()
    cursor.execute("UPDATE materials SET status = 'approved' WHERE
materialId = %s", (material_id,))
    connection.commit()
    cursor.close()
    connection.close()
    return '', 200

@app.route('/reject_material', methods=['POST'])
def reject_material():
    material_id = request.form['material_id']
    connection = get_db_connection()
    cursor = connection.cursor()
    cursor.execute("UPDATE materials SET status = 'rejected' WHERE
materialId = %s", (material_id,))
    connection.commit()
    cursor.close()
    connection.close()
    return '', 200

if __name__ == '__main__':
    app.run(debug=True)

```

### SECRET KEY.PYHTON

```

import os
secret_key = os.urandom(24)
print(secret_key)

```

### WSGI.PY

```

from app import app

if __name__ == "__main__":
    app.run()


```

## FORM DESIGN

### PROJECT RUN

#### Design View

This is the first view when user runs the application.

  
**सेल SAIL**  
We are The RDCIS Team of SAIL

Please login to your account

Security Personnel

Username  
vaibhav@example.com

Password

[Log in](#) [Forgot password?](#)

**We are more than just a company**

The Research & Development Centre for Iron & Steel (RDCIS) at Ranchi is the corporate R&D unit of SAIL. Set up in 1972, the Centre has ISO: 9001 certification to its credit. It undertakes R&D projects in diverse realms of Iron & Steel Technology under the categories of Plant Performance Improvement (PPI), Product Development (PD), Scientific Investigation and Development (SID), Basic Research (BR) and Technical Services (TS). RDCIS has around 180 dedicated and competent scientists and engineers and its laboratory is equipped with around 300 sophisticated diagnostic research equipment and 5 pilot plant facilities.



## **SOFTWARE SCOPE:**

□ □ **Extensibility:** This software is extendable in ways that its original Developers may not expect. The following principles enhances Extensibility like hide data structure, avoid traversing multiple links or methods, avoid case statements on object type and distinguish public and private operations.

□ □ **Reusability:** Reusability is possible as and when require in this application. We can update it next version. Reusable software reduces design, coding and testing cost by amortizing effort over several designs. Reducing the amount of code also simplifies understanding, which increases the likelihood that the code is correct. We follow up both types of reusability: Sharing of newly written code within a project and reuse of previously written code on new projects.

□ □ **Understandability:** A method is understandable if someone other than the creator of the method can understand the code (as well as the creator after a time lapse). We use the method, which small and coherent helps to accomplish this.

□ □ **Cost-effectiveness:** Its cost is under the budget and make within given time period. It is desirable to aim for a system with a minimum cost subject to the condition that it must satisfy the entire requirement.

Scope of this document is to put down the requirements, clearly identifying the information needed by the user, the source of the information and outputs expected from the system.

## **Conclusion**

From a proper analysis of positive points and constraints on the component, it can be safely concluded that the product is a highly efficient GUI based component. This application is working properly and meeting to all user requirements. This component can be easily plugged in many other systems.