PUBLIC TRANSPORT OPTIMIZATION

The Public Transport Optimization is a Social Project to improvise the security for the passengers who use public transports (Bus, Taxi, …) to travel from places to places. On installation and implementation of this project people can feel safe and even in emergency situation, we can reduce their panic. As our vehicles and more optimized and safer for travelling, the Emergency Services like Fire, Police, Medical departments can be called to the spot at the fastest time.

The Optimization

Smoke Detection – Fire Safety

The smoke detector in the bus is a vital safety feature designed to monitor the smoke level within the vehicle. In the event of a potential fire, it can automatically trigger a water sprinkler system, utilizing a tank inside the bus to suppress the flames and protect passengers. Additionally, the system records and reports these incidents, ensuring swift response and accountability for safety measures.

Audio and Video Recording

Recording audio and video during emergency situations in buses serves as a crucial safety measure to detect and assess incidents as they unfold. The placement of cameras and microphones at both ends of the bus enables comprehensive coverage, ensuring that any potential issues can be thoroughly documented. These recordings not only aid in understanding the situation but also assist in generating detailed reports for post-incident analysis, helping authorities take necessary actions to enhance passenger safety and overall bus security..

Smooth Driving

The rear camera installed at the back of the bus is a vital safety feature, providing drivers with an additional field of vision to ensure the safe transportation of passengers. This camera helps drivers in navigating tight spaces, making turns, and parking with increased precision, reducing blind spots and enhancing overall road safety. Its role in promoting safe driving practices is invaluable, making it an essential tool for bus operators and a reassurance for passengers.

Alarm System – Siren to Alert

The alarm system integrated into the bus, under the control of the driver or conductor, is a comprehensive safety feature designed to respond swiftly and effectively in emergency situations. This sophisticated system is interconnected with cameras, microphones, and the smoke detector, ensuring a multi-faceted approach to incident detection and reporting. In the event of an emergency, it compiles all relevant data, including recorded audio and video footage, reports from the smoke detector, and real-time location information. Once consolidated into a single package, it automatically triggers an emergency alert to the appropriate services, such as the police, medical teams, and fire department, providing them with precise incident details and location coordinates. Additionally, the system activates a loud siren to draw the attention of nearby individuals, further increasing the chances of a rapid response. This technology not only enhances passenger safety but also plays a pivotal role in minimizing response times during critical situations, ensuring the well-being of everyone on board.

Database – Store details on server

The database servers play a critical role in the bus's safety and surveillance system. They are responsible for collecting and storing all the information generated by the alarms, cameras, microphones, and sensors, including audio and video recordings, incident reports, and location data. This data is securely retained for a period of three to six months, allowing for post-incident analysis, investigations, and the maintenance of historical records. The database servers ensure that a comprehensive and retrievable record of safety-related information is readily available for review and reference when needed.

The Installation of IoT devices

Smoke Detector
The smoke detector installation in the bus is a vital safety feature, designed to swiftly detect any signs of smoke or fire within the vehicle. In the event of smoke detection, it triggers immediate responses, including alerting the driver, activating a water sprinkler system, and recording incident details, enhancing passenger safety and fire prevention measures.

Rear Camera
The installation of a rear camera in a bus is a crucial safety measure, providing the driver with enhanced visibility of blind spots and the area directly behind the vehicle. This technology significantly reduces the risk of accidents while reversing or changing lanes, contributing to passenger safety and accident prevention.

Camera with Microphone
In the bus, cameras and microphones are strategically installed to activate and record only during emergency situations, ensuring that critical audio and visual data is captured when incidents occur, providing valuable information for safety and accountability. This selective recording approach enhances both passenger security and the efficiency of incident analysis while preserving privacy during routine operations.

Alarm System
The alarm system with siren installation in the bus provides a robust security mechanism, alerting passengers and nearby individuals in case of emergencies. This audible alert system enhances safety measures, ensuring swift responses and increased awareness during critical situations on board.

Testing before Deployment

After the installation of all the aforementioned safety and surveillance facilities in the public bus, a rigorous testing phase is crucial to ensure the seamless functioning of these devices. Technicians and experts meticulously check and verify the proper operation of cameras, microphones, smoke detectors, alarms, and any other integrated components. User interfaces are also tested to ensure that drivers and conductors can effectively control and manage these systems. Moreover, thorough user training is conducted to acquaint bus staff with the functionalities of the new equipment. This comprehensive testing and training process ultimately guarantees that the bus is fully equipped to provide a safe and secure transportation experience for the public, with all safety measures and devices working harmoniously to protect passengers and prevent potential incidents.

Training the Workers / Developers / Users

Training users, including drivers, conductors, control center officers, developers, and other personnel, is a fundamental step in ensuring the effective utilization of the advanced facilities integrated into the bus. This comprehensive training program equips these individuals with the knowledge and skills to operate and respond to the various features in a professional and efficient manner. Drivers and conductors are trained to handle emergency situations and use the alarm system, cameras, and microphones to ensure passenger safety. Control center officers learn to monitor and respond to alerts and incidents. Developers are educated on the maintenance and improvement of the integrated technology. This holistic approach not only enhances safety on the bus but also promotes a coordinated and proactive response to any unforeseen circumstances, fostering a secure and reliable public transportation system.

The Deployment – Making it a Practice

The deployment of this comprehensive project, which encompasses advanced safety and surveillance features in public buses, marks a significant stride towards modernizing and enhancing the public transportation system. The process begins with careful planning and design, followed by the installation of various components, such as cameras, microphones, smoke detectors, alarms, and a robust database infrastructure. Extensive testing is undertaken to ensure the seamless integration and functionality of these elements, while users, including drivers, conductors, control center officers, and developers, undergo thorough training to maximize the effectiveness of the system. Once implemented, this project enhances the overall safety and security of public transportation, providing passengers with a reliable and secure travel experience, while also enabling swift responses to emergencies. This deployment underscores the commitment to innovation and passenger well-being in the realm of public transit.

Maintenance – After deployment

The maintenance of this integrated project after its implementation is paramount to its long-term success. Regular upkeep of the safety and surveillance system involves routine checks, software updates, and equipment servicing to ensure all components continue to function optimally. Periodic inspections of cameras, microphones, alarms, and database servers are essential to identify and address any issues promptly. User feedback and incident data should inform refinements and improvements to the system. Equally important is the continuous training of staff to keep them up-to-date with the latest developments and to ensure they are well-prepared for any situation. This ongoing commitment to maintenance ensures that the project remains a reliable and effective tool in ensuring passenger safety and enhancing the overall quality of public transportation services.

The Programs - Using HTML, CSS, and more

The Logging in - Only for developers and Maintenance officers

HTML

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="stylesheet" href="log.css">
    <title>Document</title>
</head>
<body id="blu">
    <div>
        <div id="tit">
<p> <span id="t"> T O</span><br>
    <span id="to">TRANSPORT OPTIMIZER</span></p>
</div>
    <div id="main">
        <h2>JUST LOGIN</h2>
        <hr><br><br>
        <div id="all">
        USERNAME : <input type="text" id="un"> <br><br><br>
        PASSWORD : <input type="password" id="pw"> <br><br><br>
        <button id="btn">LOGIN</button>
    </div>
    </div>
    </div>
</body>
</html>
```
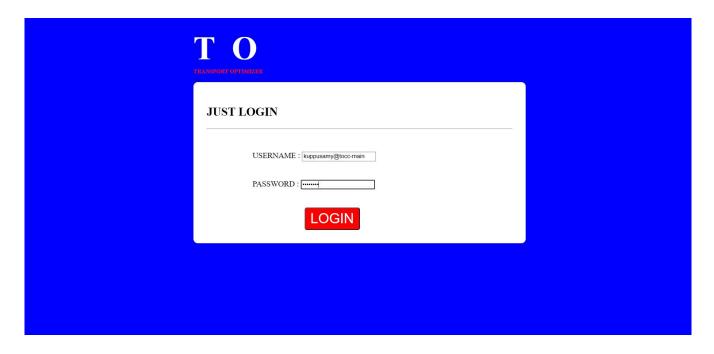
CSS

```css
#main
{
    margin-left: 25%;
    margin-right: 25%;
    border:5px;
    border-radius: 10px;
    padding: 2%;
    font-size: large;
    background-color: white;
}
#blu
{
    background-color: blue;
}
#btn
{
    color: white;
```

```css
    background-color: red;
    font-size: xx-large;
    padding: 1%;
    padding-left: 2%;
    padding-right: 2%;
    border-radius: 5px;
    margin-left: 20%;
}
#to
{
    color:red;
    font-size: small;
}
#all
{
    margin-left: 15%;
}
#t
{
    color: white;
    font-size: 75px;
}
#tit
{
    margin-left: 25%;
    margin-top: 2%;
    font-weight: bolder;
}
```

The Sample Output :

The Emergency Page

HTML

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
    <link rel="stylesheet" href="fe.css">
</head>
<body id="tot">
    <div id="hed">
        <div id="tit">
        <p> <span id="t"> T O</span><br>
        <span id="to">TRANSPORT OPTIMIZER</span></p>
    </div>
    </div>
    <h1 style="color: white;">   Hi, Kuppusamy !</h1>
    <div id="alr">
        <div id="hd"><h2>New Alert !</h2></div>
        <div id="mn">
            <table id="tab">
                <tr>
                    <th>BUS NUMBER</th>
                    <th>LOCATION</th>
                    <th>SMOKE LEVEL</th>
                    <th>TANK (5 ltr)</th>
                    <th>VIDEOS</th>
                    <th>AUDIOS</th>
                    <th>BATTERY CHARGE</th>
                    <th>LEVE CAMERA</th>
                    <th>SIREN (On / Off)</th>
                </tr>
                <tr>
                    <td> </td>          <td> </td>          <td> </td>
                    <td> </td>          <td> </td>          <td> </td>
                    <td> </td>          <td> </td>          <td> </td>
                </tr>
                <tr>
                    <td>G 55</td>
                    <td>Kaala Kulam</td>
                    <td>Low</td>
                    <td>Almost Full</td>
                    <td>-</td>
                    <td>No</td>
                    <td>28%</td>
                    <td>-</td>
                    <td>On</td>
                </tr>
            </table>
        </div>
```

```html
        <div id="cll">
            <span id="f">INFORM  </span>
            <button id="cal">Fire Safety Department</button>
            <button id="cal">Medical Department</button>
            <button id="cal">Police Department</button>
            <button id="cal">Call all Departments</button>
        </div>
    </div>
</body>
</html>
```

CSS
```css
#tot
{
    background-color: rgb(80, 80, 255);
    margin: 0;
}
#hed
{
    background-color: blue;
    color: white;
    margin-top: -2%;
    border-bottom: 5px solid red;
}
#alr
{
    margin-left: 15%;
    margin-right: 15%;
    color: white;
    margin-top: 5%;
    /*background-color: rgb(71, 71, 71);*/
}
#hd
{
    background-color: black;
    color: red;
    border-top-left-radius: 10px;
    border-top-right-radius: 10px;
    padding-left: 2%;
    padding-right: 2%;
    padding-top: 0.5%;
    padding-bottom: 0.5%;
}
#to
{
    color:red;    font-size: small;
}
#t
{
    color: white;
    font-size: 75px;
}
```

```css
#tit
{
    margin-left: 5%;    margin-top: 2%;
    font-weight: bolder;
}
#mn
{
    background-color: rgb(55, 55, 55);
    color: white;    padding: 2%;
    text-align: center;
}
#tab
{
    border-collapse: collapse;    width: 100%;
}
#cll
{
    background-color: rgb(0, 0, 0);
    color: white;
    border-bottom-left-radius: 10px;
    border-bottom-right-radius: 10px;
    padding: 2%;    text-align: center;
    font-size: x-large;
}
#cal
{
    font-size: large;
    padding: 1%;
    background-color: red;
    color: white;    border-radius: 5px;
    margin-right: 1%;
}
```

The Sample Output :

BUS NUMBER	LOCATION	SMOKE LEVEL	TANK (5 ltr)	VIDEOS	AUDIOS	BATTERY CHARGE	LEVE CAMERA	SIREN (On / Off)
G 55	Kaala Kulam	Low	Almost Full	-	No	28%	-	On

INFORM   Fire Safety Department   Medical Department   Police Department   Call all Departments