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DYSMECH COMPETENCY SERVICES PVT. LTD.

PRODUCT DEVELOPMENT AT INVERTIS UNIVERSITY

SMART WASHROOM

ABOUT DYSMECH

Dysmech Competency Services Pvt. Ltd. (DCS) founded in 2000, bags to its name a charismatic aggregation of professionals from diverse verticals, excelling the four Pillars that help flourishing business and taking it to newer horizons. Beneath the advisory ship of Mr. Vijay Kumar, a prominent IIT (Kharagpur) alumnus possessing extensive exposure and experience in the industrial world, the company's management has been honoured and dignified to place the company as one of the leading consultants in India with its nationwide presence in more than 15 cities.

The company pursues, as its aim to use the experience gained by its personnel & skilled experts to service clients maintaining high standards of quality while respecting time schedules.

Company Website: http://dysmech.com/

PRODUCT DEVELOPMENT INVITATION LETTER

Dear Students,

We are excited to announce an incredible opportunity for you to be part of an innovative and interdisciplinary Product Development program focused on the development of a Smart Washroom IoT Device. This internship will offer hands-on experience in working with cutting-edge technologies, including sensor-based odour detection, IoT cloud connectivity, automated exhaust fan and perfume dispenser control, and real-time dashboard monitoring.

This program is designed to engage students across various branches, including B.Tech, BCA, and MCA, and will involve collaboration across disciplines to successfully implement the project. With industries and organizations emphasizing hygiene and cleanliness, this internship will equip you with industry-relevant skills and prepare you for exciting career opportunities in IoT, smart automation, and embedded systems.

We invite enthusiastic and talented students to take part in this project, where you will have the chance to work on real-world engineering problems, develop innovative solutions, and collaborate in teams to bring this Smart Washroom IoT Device to life.

SMART WASHROOM IoT DEVICE

1. OBJECTIVE

The Smart Washroom IoT Device internship aims to provide an in-depth, interdisciplinary learning experience that focuses on designing and implementing a commercially viable smart hygiene system. The project incorporates multiple aspects such as real-time odour detection, IoT-based data transmission, automated exhaust fan and perfume dispenser activation, and dashboard-based monitoring and notifications.

This internship program involves collaboration among different departments, offering students the opportunity to specialize in their areas of interest while working together to deliver a fully functioning smart washroom solution.

2. Involvement of Different Engineering Departments

1. **B.Tech (Engineering Branches):**

   1.1. **Embedded Systems Development & Hardware Design:** Students will focus on integrating hardware components, including gas sensors and control units, with embedded systems to enable real-time odour detection and response mechanisms.

   1.2. **IoT Device Integration:** Electronics students will work on designing circuits and interfacing sensors to create an efficient and energy-saving washroom automation system.

2. **B.Tech/BCA/MCA Students:**

   2.1. **IoT Cloud Connectivity:** Computer science students will develop cloud-based systems to transmit and monitor real-time odour data and hygiene status using industry-standard IoT protocols.

   2.2. **Data Analytics & Machine Learning:** BCA/MCA students will focus on analyzing sensor data to optimize the performance of the exhaust fan, perfume dispenser, and cleaning schedule.

   2.3. **Automated Control Systems:** They will also work on implementing automation protocols to trigger devices based on threshold-based decision-making models.

3. **B.Tech/BCA/MCA Students:**

   3.1. **Web and Mobile App Development:** B.Tech, BCA, and MCA students will develop user-friendly web and mobile applications for remote washroom monitoring, hygiene alerts, and performance analytics. These apps will interface with the IoT cloud platform and provide notifications to maintenance staff.

   3.2. **Data Visualization & Backend Development:** MCA students can contribute to developing dashboards that display real-time washroom hygiene data, generate reports, and support backend systems for handling sensor data from multiple locations.

3. Students Learning Outcomes

By participating in this internship program, students will develop critical skills in the following areas:

1. **Embedded Systems & Hardware Development**
   - 1.1. Learn how to design and implement embedded systems using microcontrollers, sensors, and real-time data communication protocols.
   - 1.2. Gain expertise in hardware integration for IoT-based automation.

2. **IoT Cloud Connectivity**
   - 2.1. Learn how to build IoT systems that transmit washroom hygiene data to the cloud in real time, ensuring seamless monitoring and analysis.

3. **Data Analytics & Machine Learning**
   - 3.1. Gain proficiency in analyzing sensor-generated data and developing machine learning models for predictive maintenance and automated odour control.

4. **Automation and Smart Control**
   - 4.1. Work on implementing smart control techniques to automate exhaust fans, perfume dispensers, and maintenance scheduling.

5. **Web and Mobile Application Development**
   - 5.1. Learn full-stack development by building interactive, real-time web and mobile applications for monitoring and managing smart washroom devices.

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4. Relevance with Placements and Industry Skills

This internship provides practical, real-world skills that are highly valued in the following industries:

1. **Smart IoT and Automation**
   - 1.1. Opportunities in developing smart automation solutions, sensor-based systems, and energy-efficient control mechanisms.

2. **Embedded Systems & IoT**

   2.1. Skills in sensor integration, real-time data transmission, and cloud-based monitoring will prepare students for careers in IoT, smart devices, and connected systems.

3. **Data Science & AI**

   3.1. Practical experience in data analytics and machine learning models will open doors to careers in AI-driven automation, predictive maintenance, and smart monitoring solutions.

4. **Full-Stack Development**

   4.1. Web and mobile development skills are essential for software engineering roles, particularly in industries that focus on real-time system control and monitoring.

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5. Conclusion

The Smart Washroom IoT Device Internship Program is a collaborative effort that brings together students from multiple disciplines, allowing them to apply their knowledge in real-world scenarios. Participants will work on state-of-the-art technologies in embedded systems, IoT, automation, machine learning, and software development, gaining valuable skills and experience that will enhance their employability in the evolving fields of smart hygiene systems, AI-driven automation, and IoT-based monitoring.

Additionally, this project aligns with the Swachh Bharat Abhiyan initiative, contributing to hygiene and cleanliness in industries and organizations while supporting the Make in India campaign.

We invite you to join this unique program and be part of the future of smart washroom technology.

6. Revenue Potential

The product developed through this project could generate billings of approximately ₹ 8,00,000.00 to ₹ 9,00,000.00 for Invertis University.

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SMART AUTONOMOUS EV – RESEARCH & PRODUCT DEVELOPMENT ROAD MAP

INVERTIS CSED SMART WASHROOM

PRODUCT DEVELOPMENT ROAD MAP

DCS Mentor : Mr. Rahul Chaple

Approximate Product Timeline: 75 Working Days

TASK	LINE OF ACTION	ORGANISER	ASSIGNED DAYS
1	Team Discussion – Industry Standard Product Development & Applications Meeting – CSED Management, Assigned Invertis Staff & DCS Mentors	Talha Khan	1
2	List of Students Interested to Join	Talha Khan	7
3	Team Formation Meeting – Students, Assigned Invertis Staff & DCS Mentors	Avadhesh Sharma	2
4	Web Research & Practical Visit to Public Washrooms - To Study & Understand User Challenges and Smart Requirements	Talha Khan	3
5	Smart Washroom – Market Standards, Requirements, Product Design & Smart Features	Mani Shankar (DCS)	2
6	Smart Washroom – Research on Required Hardware Materials	Rahul Chaple	4
7	Smart Washroom - Product Development Planning, Road Map, Task Breakup & Timeline Sheet (Meeting with Team)	Mani Shankar (DCS)	3
8	Permission to Work on Campus Washrooms - Feasibility Study, Install IoT Devices for Testing, Provide Wi-Fi Range inside Washroom, Connect Exhaust fan via IoT Device	Talha Khan	2
9	Compose Hardware & Software Requirements BOM	Mani Shankar (DCS)	1

10	Invertis CSED - BOM Approval - Place Order	Avadhesh Sharma	1
11	Hardware BOM – Delivery to Invertis Campus	Avadhesh Sharma	15
12	**Phase 1 (IoT & Cloud Connectivity) Task & Timeline Execution**	Avadhesh Sharma/ Rahul Chaple (DCS)	15
13	Get A postpaid Airtel Sim card – Device 4G Connectivity	Avadhesh Sharma	1
14	Device Enclosures & Mechanical Fixtures - 3D Design & Manufacturing	Sandeep (DCS)	10
15	Install IoT Smart Washroom Device inside Campus Washroom, Testing, Validation & Documentation Electrician & Plumber Requirement – Invertis CSED Need to Arrange	Rahul Chaple (DCS)	4
16	Team Discussion on Mobile Application Features Meeting – Students, Assigned Invertis Staff & DCS Mentors	Chaudhary Ravi Singh	2
17	Mobile/Web application Requirements, Task Breakup & Timeline	Mani Shankar (DCS)	3
18	Compose App Development Software & Paid Subscriptions Budgeting	Rushikesh Pande (DCS)	2
19	Invertis CSED - Purchase Approval - Place Order	Chaudhary Ravi Singh	1
20	**Phase 3 (Mobile App) Task & Timeline Execution**	Chaudhary Ravi Singh/ Rushikesh Pande (DCS)	45
21	Final Product Testing	Rahul Chaple (DCS)	4
22	Product Validation	Mani Shankar (DCS)	2

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SMART WASHROOM – PRODUCT DEVELOPMENT TEAM FORMATION

INVERTIS CSED SMART WASHROOM – PRODUCT DEVELOPMENT TEAM FORMATION

Sr. No	PRODUCT DEVELOPMENT STAGES	STUDENTS		STUDENTS	MENTORS
		BRANCH	CSED PREREQUISITE		
1	IOT APPLICATION DEVELOPMENT	B. Tech (EE, ETC)	IT_1	5	**DCS** MR. RAHUL CHAPLE **INVERTIS** Dr. Chaudhary Ravi Singh, CSE Department
2	DEVICE ENCLOSURE – DESIGN & MANUFACTURING	B. Tech (Mech)	Module 1 & 2	5	
3	DATA SCIENCE MODEL DEVELOPMENT	B. Tech, BCA	IT_5 & IT_6	5	
4	APPLICATION DEVELOPMENT	B. Tech, BCA, MCA	IT_5	5	

1. IOT APPLICATION DEVELOPMENT

Sr. No	STUDENT NAME	BATCH	CONTACT
1			
2			
3			
4			
5			

2. DEVICE ENCLOSURE – DESIGN & MANUFACTURING

Sr. No	STUDENT NAME	BATCH	CONTACT
1			
2			
3			
4			
5			

3. DATA SCIENCE MODEL DEVELOPMENT

Sr. No	STUDENT NAME	BATCH	CONTACT
1			
2			
3			
4			
5			

4. APPLICATION DEVELOPMENT

Sr. No	STUDENT NAME	BATCH	CONTACT
1			
2			
3			
4			
5			