COLLEGE OF ENGINEERING & MANAGEMENT, KOLAGHAT

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Subject: A comprehensive technical report on the participation of **Team Eureka 2.0** in the Smart India Hackathon (SIH) 2025 **Grand Finale** held at QIS College of Engineering & Technology, Ongole, Andhra Pradesh.

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1.0 Executive Summary

The **Smart India Hackathon (SIH) 2025**, an initiative by the Ministry of Education's Innovation Cell and the All India Council for Technical Education (AICTE), stands as the world's premier open innovation model. **Team Eureka 2.0**, representing the **College of Engineering & Management, Kolaghat (CEMK)**, successfully qualified for the Grand Finale of this distinguished competition.

The team was deployed to the Nodal Center at **QIS College of Engineering & Technology** in Ongole, Andhra Pradesh. It is a matter of institutional pride that **Team Eureka 2.0 secured the distinction of being the sole representative from the state of West Bengal** at this specific Nodal Center, competing against elite technical teams from across the nation. The team addressed **Problem Statement SIH25131**, engineering a scalable solution in the domain of **Assistive Technology and Artificial Intelligence**.

2.0 National Scale & Competition Statistics

The 2025 edition of the Smart India Hackathon witnessed record-breaking participation, establishing it as one of the most competitive technical events globally. The magnitude of the competition underscores the achievement of Team Eureka 2.0 in securing a finalist position.

Key National Statistics:

- **Total Student Participation:** Over **8,26,635** students engaged in the ecosystem, including **3,34,456** female students, highlighting massive gender diversity in tech.
- **Participating Institutes:** A staggering **2,587** colleges and universities conducted internal hackathons to shortlist their best teams.
- **Total Teams:** The initial rounds saw participation from **1,42,715** teams across India.
- **Idea Submissions:** The Innovation Cell received **72,165** unique technical ideas.
- **Problem Statements:** Teams tackled **271** complex problem statements posed by various ministries and industries.

This statistical backdrop highlights that qualifying for the Grand Finale placed Team Eureka 2.0 in the **top tier of student innovators** in the country.

3.0 Problem Statement & Proposed Solution

- **Problem Statement ID:** SIH25131
- **Theme:** Swadeshi for Atmanirbhar Bharat (MedTech / HealthTech)
- **Organization:** All India Council for Technical Education (AICTE)

The Challenge: Systemic Communication Barriers The problem statement identified a critical deficit in accessibility infrastructure: over **63 million individuals** in India grapple with hearing and speech impairments. The acute scarcity of certified interpreters precipitates severe exclusion in critical sectors such as **education, healthcare, and professional employment**. Conventional solutions remain cost-prohibitive or hardware-dependent, failing to provide the real-time interactivity required for seamless integration.

Our Solution: Project 'Ishaara' In response, Team Eureka 2.0 architected **'Ishaara'**, an AI-driven mobile application designed to democratize communication.

- **Core Technology:** The system integrates advanced **Computer Vision** pipelines with **Natural Language Processing (NLP)** algorithms to facilitate bidirectional communication.
- **Technical Approach:** Distinct from cloud-dependent alternatives, 'Ishaara' employs a **proprietary Edge AI architecture**, enabling high-performance inference directly on mobile devices. This "Offline-First" capability ensures zero-latency operation and accessibility in low-bandwidth environments.
- **Scalability:** The modular codebase is designed to be language-agnostic, allowing for the seamless future integration of regional Indian dialects and diverse sign language syntaxes.

4.0 The 36-Hour Grand Finale: Event Timeline

The Grand Finale was executed as a rigorous, sleepless **36-hour continuous development cycle** held on December 8-9, 2025. The event tested not just technical skills, but resilience, teamwork, and crisis management.

Phase 1: The Launch & Ideation (Hours 0-12)

- **Inauguration:** The event commenced with a strategic address via video conferencing by the Hon'ble Minister of Education, who underscored the critical role of student innovation in national development.
- **Environment Setup:** Team Eureka 2.0 rapidly deployed their development environment, setting up local servers and version control systems to ensure smooth collaboration.
- **Initial Mentoring:** The first round of mentoring involved domain experts validating the proposed workflow. The team received approval to proceed with the "Edge-Computing" architecture.

Phase 2: Core Development & Iteration (Hours 13-24)

- **The Coding Marathon:** This phase involved the most intense coding activity. The team worked in shifts to ensure continuous progress on the Android frontend and the ML backend simultaneously.
- **Critical Evaluation:** A mid-event scrutiny was conducted by the jury. The experts challenged the team on "Data Privacy" and "Offline Capabilities."
- **Rapid Refactoring:** Based on mentor feedback, the team re-engineered the data pipeline and successfully optimized it for real-time inference, achieving low latency on mobile devices during demo testing.

Phase 3: Final Polish & Pitch (Hours 25-36)

- **UI/UX Refinement:** As fatigue set in, the team focused on polishing the User Interface to ensure it was accessible for disabled users (high contrast, clear navigation).
- **Final Pitch Preparation:** The technical lead prepared the demonstration flow, ensuring the "Live Translation" feature would work flawlessly during the demo.
- **Final Judging:** The project was subjected to multi-stage scrutiny by an expert jury panel. It achieved high performance as observed during live demo and internal validation, innovation quotient, and potential for social impact.

Valedictory Ceremony: Following the 36-hour sprint, the event concluded with a grand Valedictory Ceremony where participants were felicitated for their endurance and innovation.

[The team engaged in rigorous discussions and continuous improvement of the prototype throughout the 36-hour development phase.]

[The judges conducted a rigorous technical evaluation of the project and provided constructive feedback to the team members.]

5.0 Strategic Partners & Sponsors

The Smart India Hackathon 2025 was orchestrated with the support of premier industry and government entities, ensuring a world-class ecosystem for innovation.

- **Organizing Partners:** Ministry of Education's Innovation Cell, AICTE, and **SBI Foundation**.
- **Technology Partner: Claude** (providing advanced AI infrastructure support).
- **Knowledge Partners: Tata Consultancy Services (TCS)** and **Persistent Systems**.
- **Media Partners: Doordarshan (DD News)** and **All India Radio (Akashvani)**.

6.0 Key Highlights & Institutional Achievement

- **Exclusive Regional Representation:** Team Eureka 2.0 successfully upheld the academic reputation of West Bengal on a national platform, serving as the state's sole representative at the Ongole Nodal Center.
- **Technical Validation:** The proprietary AI model received validation from industry evaluators for its superior accuracy and low-latency real-time performance during demo evaluation.
- **Media Recognition:** The team's participation and the innovative caliber of Project 'Ishaara' featured in the coverage by **DD News Ongole**, highlighting the technical acumen of CEMK students.

[Team representing the college at the Nodal Center, QIS College of Engineering & Technology]

Key Takeaways

- Real-time mobile AI deployment using Edge inference
- Android app development with optimized UI/UX for accessibility
- Dataset preparation and model testing under hackathon constraints
- Working with mentors/jury feedback and rapid iteration
- Team collaboration and version control under 36-hour deadline


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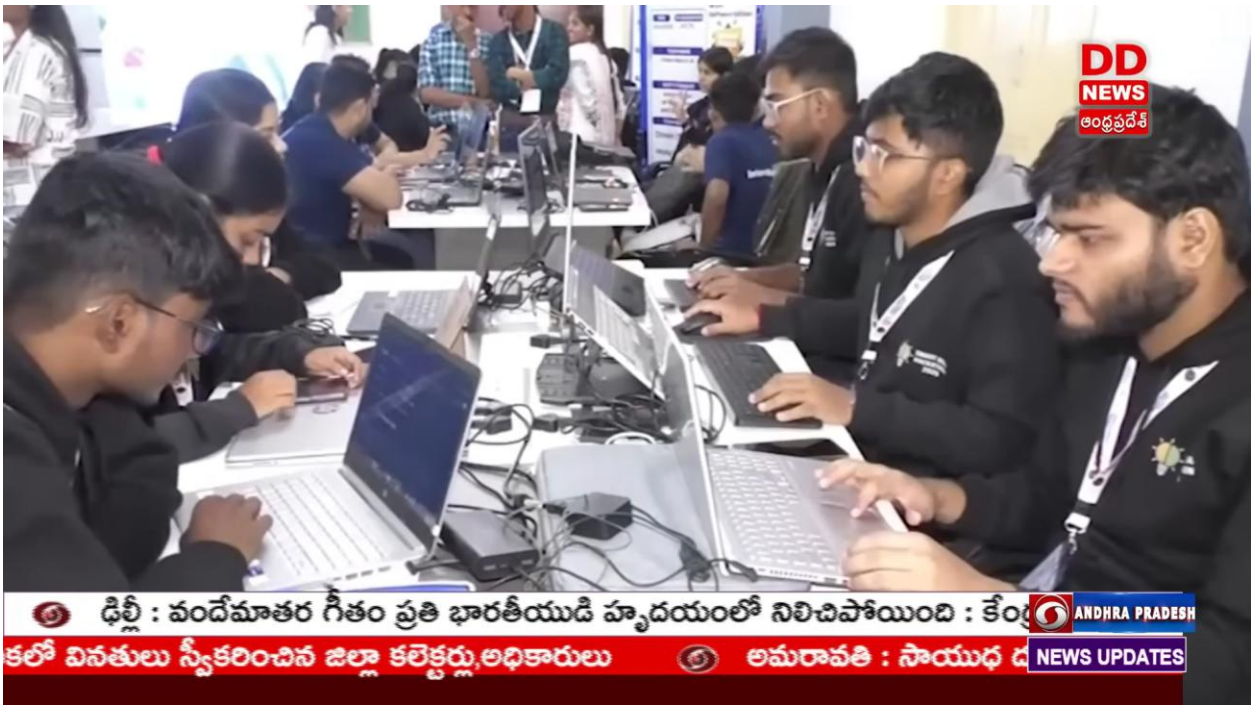

[Media coverage of the Smart India Hackathon 2025 Grand Finale by **DD News Ongole** at the Nodal Center.]

[Team Eureka 2.0 receiving their participation certificates from the dignitaries during the Valedictory Ceremony of the SIH 2025 Grand Finale.]

[Participants visiting Madanur Beach, Ongole, as part of the hospitality program arranged by the host institution.]

7.0 Team Composition

[Official Team Standee for **Team Eureka 2.0**, displaying the problem statement (ID: SIH25131) and team composition for the Smart India Hackathon 2025 Grand Finale.]

8.0 Certificate of Participation

9.0 Conclusion & Future Outlook

The participation of Team Eureka 2.0 in the Smart India Hackathon 2025 marked a significant milestone in the institution's academic journey. Representing West Bengal at the QIS College of Engineering & Technology Nodal Center was both a privilege and a testament to the technical proficiency of our student body.

The event provided critical exposure to national-level competition standards, industry mentorship, and real-time problem-solving dynamics. The expert validation received for Project 'Ishaara' has established a robust foundation for its future evolution. The team has successfully demonstrated that advanced technology can be effectively leveraged for social empowerment, reinforcing the College of Engineering & Management, Kolaghat's commitment to fostering a culture of innovation and entrepreneurship.

The host institution, QIS College of Engineering & Technology, provided excellent hospitality and a highly supportive environment throughout the event. The volunteers and coordinators ensured smooth facilitation and round-the-clock assistance, contributing significantly to the successful execution of the Grand Finale.

The College of Engineering & Management, Kolaghat extends its best wishes to Team Eureka 2.0 for their future endeavors. Their participation has paved the way for future teams to represent the institute at national-level platforms, and the institution looks forward to encouraging and supporting student participation in more such prestigious innovation events in the future.