Shri Aillak Pannalal Digamber Jain Pathashala's

WALCHAND INSTITUTE OF TECHNOLOGY

(An Autonomous Institute)

- Accredited by **NAAC A+ Grade**and **NBA, New Delhi** for all ~~six~~ UG courses
- Winner of AICTE-CII Survey 2013, 2014 & 2018 Award for Best Industry–Linked Institute.
- Recognized by **AICTE**, New Delhi
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1. Title of the Practice:

"Incorporating Hackathons into Engineering Education: A Best Practice to foster innovations and enhance Problem-Solving Skills"

2. Objectives of the Practice

1. To introduce engineering students to the concept of hackathons and the benefits.
2. To develop strategies and recommendations for maximizing the benefits of hackathons including guidance on how to prepare for and participate in hackathons.
3. To foster innovation, enhance problem-solving skills, and provide practical exposure to real world challenges.
4. To build the soft skills amongst the students.

3. The Context

The concept of hackathons has a long history that dates back to the late 1990s. A hackathon is a collaborative event where participants come together to solve problems or create new products or solutions. Hackathons often involve participants working together in teams to develop prototypes, test ideas, and create solutions to specific challenges or problems. Hackathons can last for a few hours or several days, and they are often structured to involve a series of challenges or tasks that participants must complete. Hackathons are a great way for participants to learn new skills, connect with others, and develop new ideas and solutions. Hackathons are now a common feature of the tech industry and are often used as a way for companies to generate new ideas and solutions, develop prototypes, and test new technologies. As a result, hackathons are incorporated by universities and other organizations as a way to encourage innovation and problem-solving among students. Hackathons have become increasingly popular in engineering colleges in recent years. Hackathons are an important part of the current landscape and are likely to continue to play a significant role in the development of new ideas and solutions in the future. Thus, hackathons have been widely encouraged at Walchand Institute of Technology as a way to foster innovation.

3.1 Potential benefits of Hackathons for engineering colleges:
● **Encouraging problem-solving skills**: Hackathons can be a great way for engineering students to develop and practice problem-solving skills. By working on real-world challenges and problems, students can gain valuable experience in finding and implementing solutions.
● **Promoting innovation and creativity**: Hackathons can encourage engineering students to think creatively and come up with innovative solutions to problems. This can be a valuable skill

in the field of engineering, where the ability to think creatively and come up with new ideas is often critical.

● **Building teamwork and collaboration skills**: Hackathons often involve students working in teams, which can be a great way for them to develop teamwork and collaboration skills. These skills are often critical in the engineering field, where projects are often complex and require the contributions of many different people.

● **Connecting with industry professionals**: Hackathons can provide opportunities for engineering students to connect with industry professionals and experts, which can be a valuable learning experience and can help students to build their networks.

4. The Practice

At Walchand Institute of Technology, the process of incorporating hackathons into engineering education follows a well-defined framework that encompasses several stages from planning to execution. The institute recognizes the value of hackathons as a means to foster innovation, enhance problem-solving skills, and provide practical exposure to real-world challenges. The following are the stages involved in the execution of this best practice:

I. Pre-Hackathon preparation:

A. Planning Stage:
i. Identify the objectives: The institute sets clear objectives for conducting hackathons, such as promoting creativity, collaboration, and practical learning among students.
ii. Define the scope: Determine the scope of the hackathon, including the theme, problem statement, and desired outcomes. iii. Formulate teams: Create diverse teams comprising students from different disciplines to encourage cross-functional collaboration and the exchange of ideas.

B. Preparatory Stage:
i. Provide guidance and resources:
Conduct in house pre-hackathon workshops to equip participants with the necessary technical skills, tools, and methodologies required for problem solving.
ii. Mentoring and support:
Assign faculty mentors to guide and support the student teams throughout the hackathon process, providing insights, expertise, and advice.

C. Execution Stage:
i. Kick-off event: Organize a formal kick-off event to inspire participants, introduce the problem statements, and explain the evaluation criteria and rules.
ii. Time-bound competition: Allocate a specific time frame for teams to work on their solutions, simulating a competitive environment to enhance focus and productivity.
iii. Collaborative workspace: Provide a well-equipped workspace where teams can brainstorm, design, develop, and test their solutions.
iv. Continuous evaluation: Conduct regular check-ins and progress reviews to monitor the teams' development and provide constructive feedback.

D. In house Presentation Stage:

i. Final solution showcase: Allocate a specific time for teams to present their solutions to a panel of judges, faculty members, and industry experts.

ii. Evaluation and feedback: Assess each team's solution based on predefined criteria, including innovation, technical proficiency, feasibility, and impact. Provide constructive feedback to help teams improve their ideas and implementations.

E. Learning and Reflection:

i. Post-hackathon debrief: Conduct a debriefing session to reflect on the hackathon experience, discuss lessons learned, and identify areas for improvement.

ii. Knowledge sharing: Encourage participants to share their experiences, insights, and learnings with the wider engineering community through presentations, papers, or workshops.

iii.**Recognize achievements:** Acknowledge and appreciate the efforts and achievements of the participating teams through certificates, awards, or public recognition.

II. Finale Hackathon preparation:

A. Practice and prepare: Mentors can help students to practice and prepare for the presentation and showcase of their projects at the end of the hackathon.

This could involve rehearsing the presentation, developing visual aids or materials, and getting feedback and guidance on the content and delivery of the presentation.

B. Onsite support: During the hackathon, mentors can provide ongoing support and guidance to students as they work on their projects. This could involve helping students to troubleshoot technical issues, offering suggestions and ideas, and providing feedback and guidance on the progress of the project.

C. Focus on key areas: Mentors can help students to identify the key areas that will be most important for winning the hackathon, such as innovation, problem-solving, or technical expertise. They can provide guidance and support to help students focus on these areas and develop their skills and knowledge in these areas.

D. Debrief and reflect: After the hackathon, mentors can help students to debrief and reflect on the experience. This could involve discussing the challenges and successes of the hackathon, assessing the skills and knowledge gained, and identifying any areas for improvement in future hackathons. By following this process, the institute effectively incorporates and train students for participating in hackathons, helping them to develop important skills, make connections, and gain valuable experience that will serve them well in their careers.

5. Evidence of Success

Students have participated in various hackathons organized at state/national/international level and won various prizes including Smart India Hackthon 2023, **All India 2D Animation Hackathon and hackathon Competition at National Level Techno- Social Symposium.**

1. **All India 2D Animation Hackathon**

   Since 2020, our students have actively participated in the All India 2D Animation Hackathon using Synfig Studio organized by FOSSEE and Spoken Tutorial projects based at IIT Bombay. Additionally, we have been organizing hands-on workshops annually to train students in utilizing Synfig Studio effectively. Each year, our students have demonstrated their skills and creativity, with one team consistently receiving a completion certificate. Notably, in 2021, our students' efforts were recognized with a completion certificate, and in 2022, Sumeet Babanagare and Hrishikesh Rathod received a good submission certificate for their project titled "Fox and the Drum." This consistent engagement highlights our institute's commitment to fostering talent and innovation in 2D animation.

2. **Smart India Hackathon (SIH 2023)**

   Since 2018, our institute has actively participated in the Smart India Hackathon (SIH), following the guidelines set forth by the Ministry of Human Resource Development (MHRD). We began by organizing internal hackathons and submitting idea proposals. Over the years, our involvement has grown steadily. In 2018, 2019, and 2020, one, two, and three teams respectively made it to the grand finale.

   Notably, in SIH 2020, Team BUGZERO from our institute clinched the first prize for their tagline. Fast forward to SIH 2022, where a remarkable seven teams—five for the software edition and two for the hardware edition—qualified for the grand finale. Among them, three software teams and one hardware team emerged victorious, each receiving a cash prize of Rs. 1,00,000. Out of the above winner teams 5 students qualified and participated in UNESCO-India-Africa Hackathon 2022. One student is member of winning team for this Hackathon and received price of Rs. 3 Lakhs.

   Continuing our streak of success, in the Smart India Hackathon 2023 organized by the Ministry of Education, AICTE, and MoE's Innovation Cell, our institute's teams once again showcased their prowess. This year, five of our teams secured a spot in the grand finale, with one software team claiming the top spot. As a testament to their hard work and innovation, the winning team received a cash prize of Rs. 1,00,000.

   In SIH, our students have consistently demonstrated their talent, creativity, and commitment to solving real-world problems through technology and innovation.

   3. The awards secured at different hackathons include clinching the top spot in the FDD International Hackathon on November 15, 2022, and securing the third position in the 'Embedded You Know' National Level Hackathon hosted by Marathwada Mitra Mandal College Of Engineering, Pune on October 15, 2022.

6. Problems Encountered and Resources Required

Encountering numerous hurdles during hackathons has been a common experience for us, including:

1. Managing time amidst other commitments such as classes or work proved challenging.

2. Negotiating team dynamics proved challenging due to varying skills, personalities, and work methods among team members, leading to communication and decision-making obstacles.
3. Progress on complex projects was hindered by limited resources or support, necessitating creative problem-solving and alternative approaches.
4. Technical difficulties arose when grappling with unfamiliar technologies or techniques, demanding troubleshooting and debugging efforts.
5. The competitive atmosphere of hackathons added pressure as we strove to meet judges' and sponsors' expectations. Nonetheless, by devising strategies and fostering effective collaboration, we successfully navigated these challenges to achieve favorable outcomes.

7. Notes

Throughout this journey, Walchand Institute of Technology prioritizes an environment of support and inclusivity, nurturing collaboration, teamwork, and the exchange of ideas. With a focus on aligning the hackathon experience with overarching educational objectives, the institute equips students to tackle real-world engineering challenges while honing their innovation and problem-solving capabilities.