



Shri Aillak Pannalal Digamber Jain Pathashala's

WALCHAND INSTITUTE OF TECHNOLOGY

(An Autonomous Institute)

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Seth Walchand Hirachand Marg, Ashok Chowk, Post Box No.634, SOLAPUR – 413006.

☎ : 2651388, 2652700, 2653040 ●Fax: (0217) 2651538 ●Email: principal@witsolapur.org ●Website: www.witsolapur.org

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:

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

- Identify the objectives:** The institute sets clear objectives for conducting hackathons, such as promoting creativity, collaboration, and practical learning among students.
- Define the scope:** Determine the scope of the hackathon, including the theme, problem statement, and desired outcomes.
- 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 an 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, Toycathon, Assam Police Hackathon, Synfig Studio 2D animation Hackathon and other various hackathons organized by industries and institutes.

- **Smart India Hackathon (SIH) 2022**

Institute has started participation in SIH since 2018. As per rules & regulations stated by MHRD, institute organized internal hackathon and submitted idea proposals. No of teams participated in SIH Grans finale are 1, 2 and 3 in the year 2018,2019 and 2020 respectively. In SIH 2020, First prize for tagline is awarded to the Team BUGZERO of WIT.

This year our 7 teams (5 teams for software Edition and 2 teams for hardware edition) got qualified for grand finale. Three teams in software edition and one team in hardware edition are winners. Each team received cash prize of Rs. 1,00,000/-

- **UNESCO-India-Africa Hackathon 2022**

Out of winning teams 2 students qualified for UNESCO-India-Africa Hackathon 2022 and one student was the winner for the same. His team received cash prize of Rs. 3,00,000/-

- **Toycathon 2022 Physical Edition**

One Team is winner for Toycathon 2022 Physical Edition Grand Finale at Galgotias University nodal centre. Team received Cash prize of Rs. 25000, trophy and certificates.

- **RIT HACKATHON**

Two teams won at national level event RIT-Hackathon 2022 .

6. Problems Encountered and Resources Required

Problems Encountered

We have encountered several challenges during hackathons, including:

1. Time constraints, as we had to juggle hackathon tasks with other commitments like classes or work.
2. Team dynamics posed difficulties due to the diverse skills, personalities, and work styles of team members, leading to communication and decision-making challenges.
3. Limited resources or support affected our progress on complex projects, requiring us to be resourceful and find alternative solutions.
4. Technical challenges arose when working with unfamiliar technologies or techniques, requiring troubleshooting and debugging efforts.
5. The pressure to perform was present as we aimed to meet the expectations of judges and sponsors in competitive hackathon environments. Despite these challenges, we developed strategies and collaborated effectively to overcome them and achieve successful outcomes.

Here are some potential strategies for overcoming the challenges that may be encountered when participating in a hackathon:

1. **Time management:** To overcome time constraints, it is important to prioritize tasks and work efficiently. This may involve breaking the project down into smaller, more manageable tasks and using tools such as project management software to track progress.
2. **Resourcefulness:** To overcome a lack of resources, participants can be creative and resourceful in finding ways to get what they need. This could involve improvising with available materials, using open-source software or equipment, or seeking out sponsors or partners who can provide support.
3. **Troubleshooting:** To overcome technical difficulties, it is important to be proactive and seek out solutions to problems as they arise. This could involve seeking help from mentors or experts, using online resources or forums, or testing and debugging code.
4. **Communication:** To overcome communication challenges, it is important to establish clear roles and responsibilities within the team, hold regular meetings and check-ins, and use tools such as project management software to stay organized and on track.
5. **Self-care:** To overcome a lack of sleep and food, it is important to prioritize self-care during the hackathon. This could involve taking breaks to rest and recharge, getting adequate sleep, and eating healthy meals.

6. **Managing pressure:** To overcome the pressure to perform, it is important to focus on the learning and growth that can be gained from the hackathon experience, rather than just the end result. It can also be helpful to set realistic goals and expectations and to seek out support from mentors or team members if needed.

Resources Required

Resources varies as per the problem statement. It requires specific hardware, software, huge amount of data etc. Apart from Infrastructural resources human resources i.e. mentors and domain experts are very much needed from the development and deployment perspective.

7. Note:

Throughout this entire process, Walchand Institute of Technology emphasizes a supportive and inclusive environment, fostering collaboration, teamwork, and the exchange of ideas. The institute ensures that the hackathon experience aligns with the overall educational goals, preparing students for real-world engineering challenges and nurturing their innovation and problem-solving skills. By incorporating hackathons as a best practice in engineering education, Walchand Institute of Technology aims to create a dynamic and enriching learning environment that empowers students to develop innovative solutions and excel in their engineering careers.