Guidelines for Organizing Hackathon

1. Introduction

The Bureau of Indian Standards (BIS) is organizing a Hackathon for participation from student teams of Institutes who have entered into a Memorandum of Understanding (MoU) with BIS. This event aims at fostering innovation, problem-solving skills, and collaboration among students by addressing real-world challenges identified by BIS.

2. Objectives

This initiative seeks to strengthen the collaboration between BIS and educational Institutions, providing a platform for students to engage with BIS officials and industry experts and other stakeholders of BIS. By promoting standards through practical application, the hackathon not only highlights the importance of standards in innovation, but also offers students a unique opportunity to contribute to the development of solutions that align with BIS objectives and industry needs. The participants are also rewarded with Certificates, and monetary awards.

3. Roles and Responsibilities

3.1 Preparation of Problem Statement

The objective of this phase is to identify and finalize relevant, impactful problem statements that align with BIS objectives and address real-world challenges. Problem Statement shall be created focussing on outcomes like developing real-world solutions to various issues faced in executing various activities or achieving various goals of BIS. This process ensures that hackathon participants work on meaningful problems with practical applications that contribute to the enhancement of BIS Activities like Standardization, Conformity Assessment, Testing, Standards Promotion, Market Survey, etc. Nodal Departments of BIS, desirous of organizing hackathon for solving their problems, shall develop Problem Statements that are relevant, challenging, and aligned with BIS's strategic goals. Each problem statement shall be clearly defined, with specific expected outcomes, solutions and criteria for success.

The Problem Statements shall be documented, including background information, objectives, expected outcomes, and evaluation criteria. These Problem Statements will then be reviewed and approved by the Competent Authority, ie., Director General-BIS, to ensure alignment with activities and objectives of BIS.

3.1.1 Expected Outcome

During a hackathon, teams work intensively to develop innovative hardware and/or software solutions that address specific challenges or demonstrate new ideas. The expected outcomes of the Hackathon are:

i) **Hardware solutions** involve creating physical devices or systems that leverage technology to solve problems or enhance functionality. These solutions can range from developing new gadgets and wearable technology to constructing complex robotics and embedded systems. The focus is on creating tangible products that can interact with the environment or users in innovative ways.

ii) **Software solutions** focus on creating applications and tools that operate on digital platforms. These include web and mobile applications designed for various purposes, from facilitating communication to managing data. Software solutions also encompass artificial intelligence and machine learning tools that perform tasks like data analysis and pattern recognition, as well as game development projects aimed at providing infotainment or educational experiences.

iii) **Integrated solutions** combine both hardware and software to create comprehensive systems that offer more advanced functionality. These projects involve synchronizing physical devices with digital platforms, enabling real-time data analysis, remote control, and automation. Integration enhances the usability and effectiveness of the solutions, allowing them to address more complex challenges and provide seamless user experiences.

3.2 Announcement of Problem Statements

The approved Problem Statements shall be announced on BIS Website/Portals with a well-designed Hackathon webpage for participation of student teams from the Institutions. The Nodal Officers shall further communicate the announcement of the Problem Statements to the concerned Institutes. The participants may do brainstorming and research at their end for effective solutions to the practical situations of Problem Statements floated, as individuals or as teams.

3.3 Implementation of Software Solutions

The participants shall also be involved in putting the software/application into final use at BIS subsequent to Final Round of Hackathon, to provide the requisite support, updates and

upgrades to the software application. This may be included in the problem statements accordingly. ITSD shall coordinate with the participants during and after the Hackathon for the same.

4. Eligibility/Registration

Regular students from the Institutions who have entered into MoU with BIS shall be eligible to participate in the Hackathon as individuals or as teams. Each individual/team may participate in the Hackathon by registration for one or more Problem Statements through BIS Website/Hackathon Portal/Page. The individual/team shall obtain an approval from Head of the Department/Head of the Institution regarding their participation in the BIS Hackathon. Participants may register only once for participation in multiple Problem Statements.

5. Structure of Hackathon

Hackathon shall comprise of two rounds, Preliminary and Final Rounds which shall be completed within the prescribe timelines as per these guidelines. The Proposals received in Preliminary Round within specified timelines are evaluated initially by Screening Panel. The Final Round shall consist of submission of all the deliverables with detailed project reports along with a presentation at NITS/suitable Venue. The timelines may vary for various Problem Statements and shall be communicated along with the Problem Statements.

5.1 Preliminary Round (Ideation):

After the announcement of Problem Statement by BIS and Registration by Participants, the Preliminary round begins. Each individual/team of students shall thoroughly go through the Problem Statement announced by BIS. Further, the participants shall work on these Problem Statements and prepare a proposal for the solution. Each participant can submit only one proposal per Problem Statement but can submit proposals for multiple Problem Statements.

5.1.1 Submission of Proposals

Submissions will include detailed descriptions of expected solutions, implementation plans, methodology and any preliminary illustration or prototypes relevant to the problem statements. The proposals shall be submitted through BIS Portal.

5.1.2 Screening of Proposals

This process will involve a detailed review of each submission, including technical feasibility, innovation, impact, and alignment with Problem Statements. Teams will be shortlisted for the final round based on the quality, impact, and feasibility of their solutions.

5.1.3 Screening Panel(s)

The Proposals submitted by the student teams from the Institutes shall be reviewed by one or more Screening Panels nominated by DDG(PRT). Each Panel may comprise of the following members:

i. One BIS Officer of the level Sc E or above - Chairperson
ii. Two BIS Officers of the level Sc C / Sc D
iii. One BIS Officer from ITSD or having good IT knowledge
iv. Members from other relevant organizations/government departments like NIC, CDAC, MyGov, NCERT etc.

About ten Proposals per Problem Statement shall be shortlisted for further advancement to Final Round. The proposals may further be scrutinized through joint sitting of the above panels for uniformity, if felt necessary.

5.2 Support before Final Round

The shortlisted proposals from the participants shall be communicated to the concerned by the nodal department which has floated the problem statement. These teams shall be guided by the Nodal department which has issued the problem statement to further improve the submitted proposals into final deliverables with detailed project reports for final submission.

5.3 Final Round (Prototype)

The primary goal of Final Round is to make prototype of hardware/software or build a functional version of the hardware/software which is the proposed solution for the Problem Statement (like working prototype of Test Equipment, for hardware based Problem Statement, Software/Application/Module for software-based Problem Statement etc.). The individuals/teams shall submit a fully functional solution to the problem statement ready for implementation at BIS along with a detailed project report covering aspects like mechanism, methodology, model, source code, etc. clearly explained through flowcharts, figures, etc. where necessary.

The Final round shall also include detailed presentation on the working solution and report submitted based on which the final scoring will be made. The hardware or software based solution shall also be demonstrated to the Board of Assessment as the part of final presentation.

5.4 Board of Assessment for Final Round

The participants shall be invited to NITS/suitable venue as scheduled by BIS with Presentation of work done/project report. The detailed presentations delivered by participants shall be assessed by Board of Assessment nominated by DG. BIS comprising of the following officials for final assessment and scoring:

i) One BIS Officer of the level Sc G or above - Chairperson
ii) Two BIS Officers of the level Sc E / Sc F
iii) Head (ITS)
iv) Members from other relevant organizations/government departments like NIC, CDAC, MyGov, NCERT etc.
v) Official from the Nodal Department which has floated the Problem Statement – Member Secretary

The criteria for assessment may be based on criteria such as innovation, technical simplicity/complexity, functionality, and user experience.

BIS may suggest modifications and changes to the working solution/prototype developed and demonstrated during the final round. The participants shall include, incorporate the suggestions and modifications subsequent to the final presentation.

6. Rewards

Certificate of participation shall be provided to all the participating teams including those who participated in Preliminary Round. Teams selected for final round shall be rewarded with cash prize of Rs. 2 Lakhs per Problem Statement subject to fulfilment of Terms and Conditions (see Cl. **7**).

7. Terms and Conditions

The following conditions shall be adhered to up on by the participants for obtaining reward in the Hackathon.

i) The participants shall adhere to the specified timelines.

ii) The participants shall submit all the deliverables in the Final Round along with prototypes, detailed reports etc to BIS.

iii) Copyrights/Intellectual Property rights related to the material, concept, etc. submitted through this Hackathon shall be transferred to BIS.

iv) BIS reserves the right to reject any proposal at any stage of the Hackathon.

v) BIS retains all rights, title, and interest in the software/application/hardware, including all modifications, enhancements, and derivative works created by participant or BIS. The participant agrees to assign any and all rights, title, and interest in such modifications to the BIS upon submission.

vi) The solutions shall be original work, innovative and shall not be copied from pre-existing solutions.

vii) For software related solutions, the use of pre-existing code or projects is not allowed, except for open-source libraries or frameworks.

viii) The decision of the evaluators at any stage, i.e. Screening Panel and Board of Assessment will be final decision and no reevaluation shall be entertained.

ix) Participants must adhere to ethical standards and abide by the rules and regulations set by the organizers. Any form of cheating, plagiarism, or unfair practices will result in immediate disqualification.

x) Bureau of Indian Standards holds no liability for any damages, losses, or injuries incurred during the Hackathon. Participants are responsible for their own safety, equipment, and actions.

xi) Bureau of Indian Standards reserve the right to make changes to the Hackathon conditions, structure, or rewards at any stage during or after the Hackathon.

8. Timelines

The teams shall get adequate time for brainstorming and research for submission of preliminary round proposals. The tentative timelines for organizing these rounds for the teams for preparation of proposals, detailed project report, final deliverables and presentations are as given below:

- **Problem Statement Creation, Approval and Release**: 7 days
- **Communication to the Institute/participants/Nodal Officers:** 7 days
- **Preliminary Round Proposals Submission**: 30 days
- **Shortlisting by Screening Panel**: 10 days
- **Submission of Detailed Project Reports**: 45 days

The timelines for the Hackathon may be communicated to the participants during the initial communication of Hackathon and Problem Statement.

9. Travel and Stay arrangements for Screening Committee members and Participants

Travel and stay entitlements for participants who have been shortlisted and attending the Final Round shall be as per Level 9 as applicable to BIS Employees and that for Screening Committee member shall be as applicable to Level 12 of BIS Employees.

10. Power to Relax

Where Director General, BIS is of the opinion that it is necessary or expedient so to do, he/ she may, for reasons to be recorded in writing, relax any of the provisions of these guidelines in respect of any class or category of persons.

11. Saving

Nothing in these guidelines shall affect implementation of BIS Act, 2016 and BIS Rules, 2018 as amended from time to time.

Problem Statement

Nodal Department: TNMD

Category (Hardware/Software): Software

Title: Design and development of a platform for organizing online activities/games to develop interest, knowledge and awareness on Indian Standards and its importance for ensuring quality and safety among the general public/BIS stakeholders.

Background: Bureau of Indian Standards (BIS) is the National Standards Body of India involved in Standardization, Conformity Assessment, Laboratory Testing, Training and other related activities. Through its activities, BIS ensures the products available in the market are complying to the requirements of Indian Standards, thereby ensuring quality, health, and safety of common consumers. BIS also carries out Standards Promotion activities for creating awareness among common consumers, industries, students on Indian Standards and BIS certified products. Occasionally BIS has been conducting Quiz on the theme of Quality and Standards for creating awareness. To further create mass awareness among the stakeholders, more online activities are envisaged.

Description: The awareness of quality and standards is very important in infrastructural and social development of the country. For Standards Promotion, BIS engages with the stakeholders broadly classified as Government Stakeholders, Industries, Consumers and Academia through various activities and programs like Quality Connect, Manak Mahotsav, Manak Manthan, Capsule Course, Gram Panchayat Sensitization, State Level Committee on Standardization, District Level Official Sensitization, State Level Officials Sensitization, Consumer Awareness Programs, Resident Welfare Association Sensitization, Licensee meets, Industry and Industry Association Meetings, Standards Clubs and its activities, Exposure Visits, Mentor Training, Resource Personnel Training, Science Teacher Training, etc. To engage various stakeholders, BIS has also been organizing online activities like Quiz Competitions for students and general public alike.

Online activities help engage large number of stakeholders with activities of BIS with the comfort of their location, while also disseminating useful information regarding quality and standards. BIS has conducted few online Quiz Competitions on the topic of Quality

and Standards. More attractive and though-provoking online activities should further increase the awareness and understanding of quality and Indian Standards.

The online activity may include various aspects of BIS activities in its effort to increase awareness and quality consciousness. The activities, games can be time bound, or perpetual. The activity could be held by BIS on various special occasions like World Standards Day, World Consumer Rights Day, Foundation Day etc with or without rewarding system. The participation in these activities may be in excess of 5 Lakhs.

Expected Solution: To develop an innovative, interactive, engaging, awareness creating, knowledgeable online activity or game with participation from general public, students, consumers etc. which includes aspects of regular activities of BIS, like Standardization, Conformity Assessment, Testing etc. which can be hosted on website.

Platform/Software: The software/application may be developed for use on existing website, or android and iOS mobile phones, or as a standalone portal.

The software may be developed using open-source platforms with source codes. The participants should indemnify BIS in case of any legal conflict arising due to their submissions. The software should comply to all safety standards, Government of India laws, regulations, guidelines, etc. The software/application may be tested using real use case scenarios. The declaration in this regard shall be submitted by each team member.

Deliverables: Preliminary round proposal shall contain detailed concept note highlighting, among other things, the idea, background, approach, implementation plan, software and hardware requirements, and the end goal that can be achieved.

Final round submissions shall include the following:

a. A functional working solution/prototype of the application/software/module, demonstrating all features and functionality which can be upscaled to ready-to-use enterprise level software application.
b. Sample online activities for various stakeholder groups such as Academia, Industry, Standards Clubs, Consumers etc.
c. Software Package: The actual software files, source code, including executables, libraries, and any necessary dependencies etc.

d. Documentation: Comprehensive user manuals, configuration, installation guides, and API documentation etc.
e. User testing and feedback data, indicating the effectiveness and usability of the platform.
f. Platform: Details on the hardware requirements, such as CPU, RAM, disk space, etc.
g. A comprehensive report (in the given template Annexure-1 for guidance) and a presentation on the development process, including design decisions, technical challenges, and ethical considerations, security aspects, documentation etc.

BIS may suggest modifications and changes to the working solution/prototype developed and demonstrated during the final round. The participants shall include, incorporate the suggestions and modifications subsequent to the final presentation.

Timelines:

Last Date for Registration: 15 Aug 2024

Last date for submission of Proposal: 15 Sep 2024

Communication of shortlisted proposals to Final round: 07 Oct 2024

Last date for Final submission of deliverables/Presentation: 21 Nov 2024

Note: The Problem Statement is to be read in conjunction with the guidelines for Hackathon.

Annexure – 1 Template for Submission of Final Report

Title Page, Title of the Report, Name of the Software, Author/Developer/Team Name

Table of Contents

1. Introduction
2. Walkthrough of Software/Application
3. Software Overview
    a. Description
    b. Features
    c. System Requirements
4. Development Process
    a. Methodology
    b. Tools and Technologies
    c. Version Control
5. Implementation Details
    a. Key Algorithms
    b. Code Structure
    c. Data Structures
6. Testing and Quality Assurance
    a. Test Cases
    b. Bug Tracking
    c. Performance Metrics
7. Deployment
    a. Deployment Process
    b. Environment Setup
    c. Post-Deployment Checklist
8. User Guide
    a. Installation Instructions
    b. User Interface Overview
    c. How to Use the Software
9. Maintenance and Support
    a. Troubleshooting Guide
10. Appendices
    a. Glossary of Terms
    b. References
    c. Additional Resources
    d. Mandatory Declarations (To be signed and submitted by all team members)