

TERMS OF REFERENCE FOR THE R&D (PROJECT 1- LITD 31)

1. Title of the Project: Study of Data Centre infrastructure in India.

2. Background:

a) India has experienced significant growth in data centre infrastructure due to the increasing digitalization of various industries. Several international and domestic companies operate data centres in India, providing a range of services including cloud computing, co-location, and managed hosting. The Indian government has recognized the importance of data centres and is working on policies to promote their growth. Policies related to data localization and data sovereignty have been subjects of discussion.

b) IS/ ISO/IEC 30134 series of standards on Key performance indicators of Data centres have been published by BIS. These standards have been adopted as Indian standards, however, as per the information available, these standards are not being referred by the Data centres for implementation.

c) The establishment of standards for various aspects of data centres and their sustainability is imperative to ensure efficient, reliable, and environmentally responsible operations. This research proposal outlines a comprehensive study aimed at evaluating the existing standards, assessing their suitability for implementation in Indian data centres and identifying domains and issues related to data centres in India which require immediate standardization.

3. Objective: To gather technical data, assess the landscape, and identify requirements for standardization in the context of data centers in India.

4. Scope:

a) Study and comparative analysis of existing literature which includes international standards such as standards published by ISO/IEC JTC 1/SC 39 and NIST, research papers, SOPs/instruction/guidelines/laws applicable to data centres, any other study report available. Study of international standards may be done specifically keeping in view their suitability for implementation in data centres set up in India.

b) Collection of the following data regarding data centres in India:

- i. Size and growth trends of the data centre industry in India, Key players and market share.
- ii. Location and distribution of data centres.
- iii. Hardware and software technologies used, Cloud computing services and adoption.
- iv. Network connectivity and bandwidth, Connectivity with undersea cables and global networks.

- v. Analysis of the demand for data centre services, Types of clients and industries served.
 - vi. Government policies impacting data centre operations, Standards and certifications followed by data centres.
 - vii. Data security protocols and measures, Physical security features, Compliance with international security standards.
 - viii. Details of periodic assessment conducted at the facility.
 - ix. Measures taken for energy conservation and efficiency, Use of renewable energy sources, Sustainable practices and environmental impact.
 - x. Strategies and plans for disaster recovery, Business continuity measures in place.
 - xi. Challenges faced by the industry.
 - xii. Anticipated technological advancements and market shifts.
 - xiii. Broader impact of data centres on the local economy.
- c) Feedback from users of data centre facilities in India.

5. Research Methodology:

- a) Review and analyze the literature as per the details mentioned scope.
- b) Collect feedback/information through structured questionnaire.
- c) During the visit of data centres:
 - a. Observe the facilities for collection of data.
 - b. Conduct focused group discussion in a structured format.

6. Sampling Plan:

- a) Two data centres from large, medium and small scale each shall be visited.
- b) Feedback from atleast 10 users shall be sought.

7. Deliverables: The following should be submitted in hard copy and soft copy format to BIS:

- a) Study report covering all the aspects mentioned in the scope.
- b) Questionnaire and response received to them.

8. Requirement for the CVs: CVs of the following members to be shared by the organization conducting the research:

- a) Project leader for the R&D project.
- b) Team members to be engaged for the project.

9. Timeline and Method of Progress Review:

- a) The timeframe for completing the study and submission of the final report is 3 months from the date of award of the project.
- a) Mid-term review of the project: Mid-term report covering the review of the literature and survey conducted to be submitted within 45 days from the date of award of the project.
- b) Draft final report: To be submitted with 75 days from the date of award of the project.

- c) In case of delay in submission of final draft report, the justification shall be given by the project proposer for consideration by the Sectional Committee.
- d) d) The proposer shall comply to the provisions given in the BIS guidelines for Research & Development Projects for Formulation and Review of Standards, i.e., **doc no. SCMD/R&D Guidelines/20230909.**
- e) e) The proposer taking up the project shall clear all doubts on provisions of research including ToR and BIS guidelines before acceptance of the project and signing agreement.

10. Support BIS will Provide: Following will be provided by BIS on request

- a) Any national/international standard relevant to the project.
- b) Assistance by introducing researchers to third parties wherever suitable.

Contact details: Ms. Ankita Srivastava, Scientist-D and Member secretary of LITD 31, litd@bis.gov.in