

TERMS OF REFERENCE FOR THE R&D PROJECT
(LITD 16, Identification & Data capture techniques, Cards and Security Devices
Sectional Committee)

1. **Title of the Project:** Analysis of ISO/IEC 23941:2022 Rectangular Micro QR Code (rMQR) bar code symbology specification, and its suitability for adoption as Indian Standard.
2. **Background:**
 - a. Rectangular Micro QR Code (rMQR) is a matrix symbology. The symbol consists of an array of nominally square modules, arranged in a rectangular pattern. Included is a unique finder pattern located at a single corner which is intended to assist in easy location of the symbols position, size, and inclination. A wide range of sizes of symbol is provided for, together with two levels of error correction. Module dimensions are user-specified to enable symbol production by a wide variety of techniques.
 - b. Bureau of Indian Standards (BIS) technical committee, LITD 16, Identification & Data capture techniques, Cards and Security Devices Sectional Committee, is the committee for standardization in the area of Data formats, data syntax, data structures, data encoding, and technologies for the process of automatic identification and data capture and of associated devices utilized in inter-industry applications and international business interchanges and for mobile applications.
 - c. The standard, ISO/IEC 23941:2022, Rectangular Micro QR Code (rMQR) bar code symbology specification, defines the requirements for the symbology known as rMQR. It specifies the rMQR symbology characteristics, data character encoding methods, symbol formats, dimensional characteristics, error correction rules, reference decoding algorithm, printing quality requirements and user-selectable application parameters.
 - d. The outcome of this study will enable in identifying the changes required in the said standard and adoption as Indian Standard, if found suitable.
3. **Scope:** Study and Analysis of the standard and other existing documents to gather technical data, identify standardization requirements, usability of ISO/IEC 23941:2022, implementation status and challenges in its implementation, changes, if any, required.
4. **Expected Deliverables:** The research activity during the project duration should result into compilation of the following documents:
 - a. A report regarding suitability for adoption as Indian Standards as per National Industrial Ecosystem. If not suitable for adoption, a draft proposal for new standard(s), if required, based on the study for, to be provided
 - b. Detailed report on Research methodology adopted during the project and details of documents/reports reviewed, experts interviewed, industries reached out to, articles analysed etc.
 - c. A detailed review of report of the existing standard including but not limited to:
 - i. Usability of this standard- whether the said standard is being used at large by the

- industry and businesses and if any problems faced while using these Standards.
- ii. If any standards, other than above mentioned are being used by the stakeholders related to the subject, both Indigenous and International.
 - iii. Gap Analysis- A detailed report identifying the gaps in the already existing Standards and suggestions that could be made to address these gaps.

5. Research Methodology:

- a. Literature Review: A comprehensive literature review to be done to understand the existing standards and other relevant existing documents.
 - i. ISO/IEC 23941:2022 Rectangular Micro QR Code (rMQR) bar code symbology specification
 - ii. ISO/IEC 19762, Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary
 - iii. ISO/IEC 8859 series 8-bit single-byte coded graphic character sets
 - iv. ISO/IEC 15415, Automatic identification and data capture techniques — Bar code symbol print quality test specification — Two-dimensional symbols
 - v. ISO/IEC 15416, Bar code print quality test specification — Linear symbols
 - vi. IS/ISO/IEC 18004 : 2015 QR Code bar code symbology specification
 - vii. Any other relevant national/international document
- b. Data Collection: Gathering data from stakeholders based on interactions and surveys.
- c. Interaction with Industry, Consumers and Regulators and other stakeholders.
- d. Feedback and Expert Consultation with experts and committee members.
- e. Any other research methodology to address the expected deliverables for this project.

6. Requirement for the CVs:

- a. CVs of the following members to be shared by the organization conducting the research:
 - i. Project leader for the R&D project.
 - ii. Team members to be engaged for the project

7. Timeline and Method of Progress Review:

- a. Progress report of the ongoing project, use cases compiled, recommendations- By end of each month vide written reports and a mid-term review to assess progress and adjust methodologies as necessary in the 4th Month from the date of assignment.
- b. Final reports and deliverables by end of 6th month from the date of assignment received from BIS.
- 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. 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. 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.

8. Support BIS will provide:

- a. BIS will offer access to existing standards (Indian and ISO/IEC standards) and publications such as journals, magazines, and research papers relevant to the subject.
- b. BIS will also facilitate introducing the researcher to the relevant stakeholders.
- c. BIS will also be providing financial support and other provisions as mentioned in the Guideline document.

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