Promoting Technology Adoption by MSMEs – Mission Document

(Convergence of the efforts of various stakeholders for the technology up-gradation of the MSMEs)

As per the recommendations of the RBI Committee (Sri U.K. Sinha) for MSMEs regarding encouraging Technology adoption for the MSMEs under the title Access to Technology, therein one of the recommendation is "Technology Mission: Technology Missions related to water, literacy, immunization, oil seeds, telecom, jute, cotton and dairy had been set up by the Government. A Technology Mission should be launched by the Ministry of MSME, for convergence of the efforts of various stakeholders for the technology up-gradation of the MSMEs across the country" (Shri U. K. Sinha-led RBI Expert Committee on MSMEs may be accessed on the RBI website https://www.rbi.org.in/scripts/PublicationReportDetails.aspx?ID=924#CH9).

2. In this context a draft discussion paper on "**Promoting Technology Adoption by MSMEs – Mission Document"** has been prepared and all the associations/ institutions involved in Technology sector/State Government/Technology Centres/MSME-DIs/etc. are requested to give comments/views **by 25.01.2020".**

3. The comments may focus on the following areas, but not limited to

- Key challenges to technology adoption with specific reference to MSMEs.
- Successful/not so successful models for mission implementation.
- Policy level suggestions for successful impact.
- Suggestions on effective stakeholder convergence.
- Other potential areas which the mission should focus on.

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Promoting Technology Adoption by MSMEs - Mission Document

(Draft Discussion Copy)

DRAFT VERSION 1.0

Introduction

Micro, Small and Medium Enterprises (MSMEs) are growth boosters of the economy. They are considered as engines of economic growth in both developed and developing countries and have immense potential to contribute to the overall development of the country. Micro, Small and Medium Enterprise (MSME) clusters are present worldwide and the success of these clusters is dependent upon the mutual support and efforts of MSMEs to share supply chains and resources. Governments across the countries have identified the potential that can be leveraged from MSMEs and have accordingly launched several programs and schemes to increase their overall competitiveness.

India has close to 63 million MSMEs providing employment to 111 million people,employing an average of 1.75 employees per enterprise. They contribute 8 percent to the country's GDP, 45 percent to manufacturing output and 40 percent to our exports[1].Close to 70% of them operate in the services sector covering trade, hotel andrestaurants, transport, storage and communication, financing, insurance, real estate, business services, community, social and personal services, and services associated with construction. Labor to capital ratioand the overall growth of MSMEs is much higher thanthe larger industries making them an important player for achieving national objectives of growth with equity and inclusion.

Technology for MSMEs: awareness, access and adoption

The MSME technologyeco-system in India is underdeveloped and underperforming, characterized by highly fragmented efforts and low levels of collaboration between industry and research/ technology/academic institutions. This is despite the fact that technology awareness and accessis becoming essential to retain and enhance a firm's competitiveness in today's scenario. While large firms have financial and human resources to carry out their technological advancement and innovation, Micro, Small and Medium Enterprises (MSMEs) including artisan and village industries suffer from capacity and capability constraints to identify and define their technological needs. Technology development and adoption on commercial basis further becomes a challenge due to inherent and structural weaknesses of MSMEs.

Despite the presence of many government-supported R&D organizations and support programs aimed at the promotion of applied research, technology transfer and commercialization, and social innovation, MSMEs particularly micro and village industries are not being adequately served. Though these institutions have been developing new technologies with commercialization potential, only a small fraction of these innovations are becoming useful for MSMEs in-terms of commercial and widespread adoption by the MSMEs, therefore, most innovations remain at "prototype/ proof of concept" stage. As a result, enterprises are not able to generate, absorb and integrate innovations in their day to day operations and take benefits of supporting services such as technology transfer and innovation offered by the Research and Technology Development (RTD) institutions.

Objective of the Mission

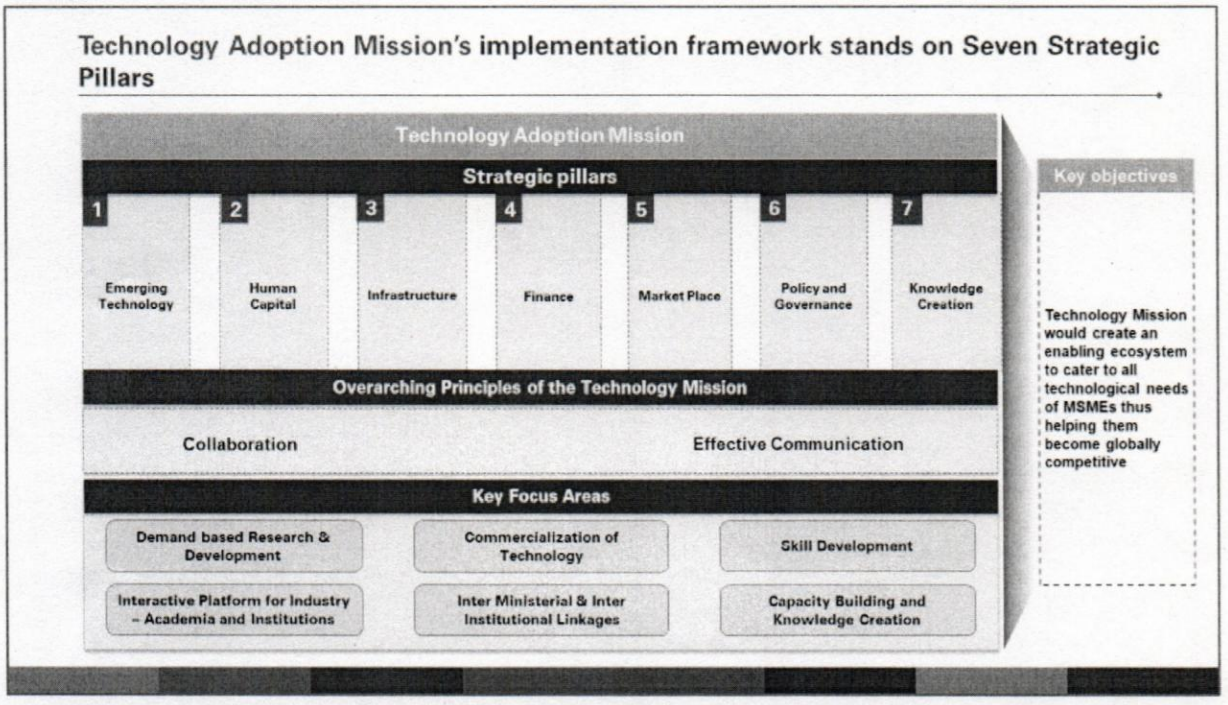
The National Technology Mission is a major initiative of the O/o DC, Ministry of MSME that aimsto ease the access to technology for the MSME sector through a focused & holistic

[1] RBI Expert Committee Report on MSMEs, June 2019

approach with provisioning of technology upgradation supportprogrammes, creation of common facilities, promoting centers of excellence and innovation, fostering a knowledge economy, industrial research, design & standardization. It will act as a major contributor in bridging the gap between the technology offerings i.e.the supplyside and the challenges faced by the demand side.

The technology mission will focus on activities modeled around 07 different pillars

- Emerging Technology
- Human Capital
- Access to Finance
- Infrastructure
- Market place
- Policy and Governance
- Knowledge Creation



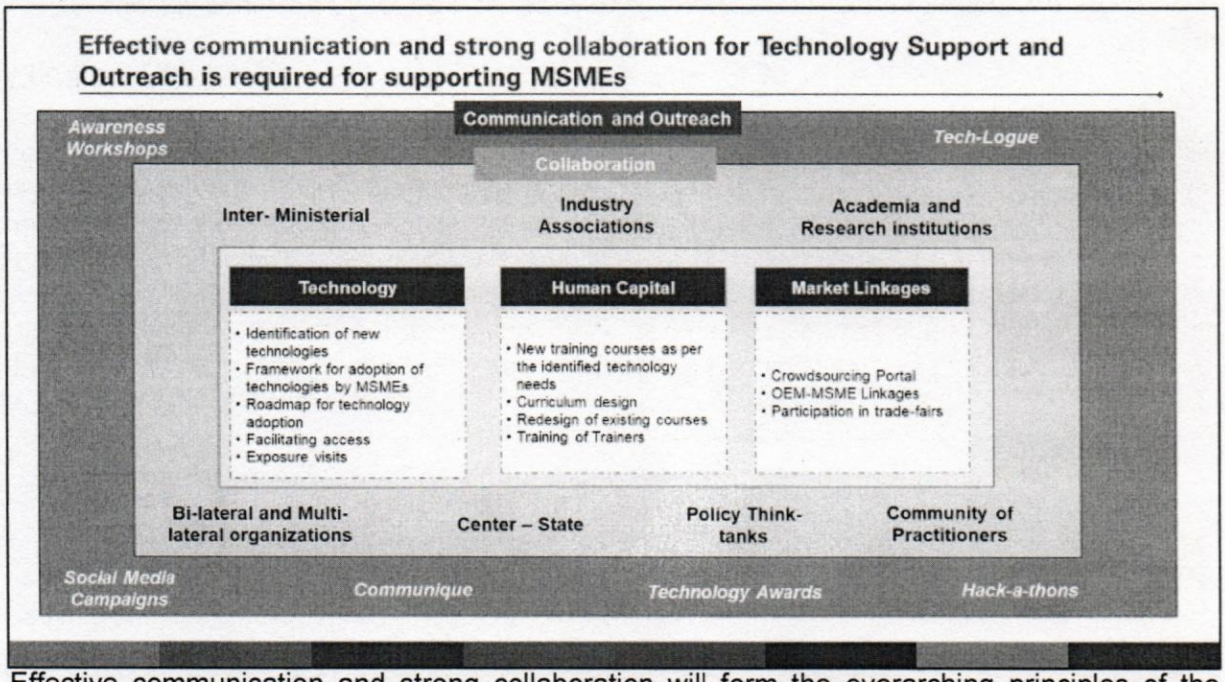
The mission aims to converge the efforts of various stakeholders for technology upgradation of the MSMEs across the country who have been hitherto operating in isolation. The focus will not just be on technology incubation and adoption but also on providing short term and long-term training programs, consultancy and facility support to MSMEs. This would be achieved by leveraging different schemes of Ministry of MSME, NITI Aayog, DST, and other Ministries/ Departments. The interplay between the central government, state governments, and other government bodies would be further strengthened and synergized for achieving the desired results. Through this mission, the Ministry will encourage R&D investment and support from global and domestic institutions with the intention of pushing the research and development towards the technology demands of MSMEs. The mission will also leverage the experience of large enterprises through mentoring support and by guiding MSMEs for using the latest technology and moving up the value chain. This will be achieved through effective

communication and strong collaboration among stakeholders which will form the base and the foundation of the technology mission. This will be achieved by focusing on

- A multi-stakeholder digital platform to provide end to end support for technology awareness, access and adoption (TECHSOP Portal)
- Research and technology development to be demand-basedrather than supply-based
- Research institutions to work on real-time issues with MSMEs
- Institutions – Technology Centers (erstwhile tool rooms) – Industry collaboration to be given more importance
- Technology support and outreach through collaborative inter-ministerial and inter-institutional linkages
- Technology centers can act as a bridge to bring various ecosystem stakeholders together

Mission Strategy

Larger economies around the world are increasinglyputting emphasis on linkages between collaboration, innovation, and advanced manufacturing. In the rapidly changing economic landscape, a few research universities and R&D institutes may not be able to cater to the technology requirements of 63 million MSME units in India. In the Indian context, it is imperative that developing new technologies is backed by rapid commercialization of technologies to ensure faster adoption. The emerging technologies have the potential to scale up the existing manufacturing capacity thereby making them competitive in the global market. Research institutes have a large role to play to coordinate the complex process of conceptualizing, developing and facilitating the adoption of these technologies.



Effective communication and strong collaboration will form the overarching principles of the technology mission to achieve its objectives. These are required from the purpose of setting up an effective and efficient support system for the MSMEs that would:

- Increase business opportunities for MSME through market linkages
- Provide Interactive Platform for Industry-Academia-Institutions

- Establish closer cooperation of key innovation stakeholders
- Facilitate closer cooperation amongst skill development and labor market stakeholders
- Connect MSMEs to the Global value chain for respective sectors.

Collaboration

For achieving the objectives and ensuring that the activities undertaken under the mission bring out the true benefits to the MSMEs, the ministry of MSME will identify different institutions and foster an ecosystem that will enable them to work closely and collaborate with each other. The identification of the institutions will be based on

- Contribution level towards ecosystem development for technology support
- Strong presence among MSMEs and frequent interaction with hard-to-reach ones
- Geographical and outreach advantages
- Willingness to become communication partners

These identified institutions will be Ministry's partners in this mission and will work together to create a community of technology practitioners that will work towards the following potential areas of collaboration.

1) **Commercialization of technologies:** Innovation and commercial adoption of technologies is a major challenge being faced by the MSMEs across sectors. Widespread adoption of commercially viable technologies is imperative for increasing the competitiveness of the MSMEs. This can be achieved by establishing a network of service providers that will address the needs of the MSMEs related to product enhancement and process innovation. This will be achieved by reducing the supply- demand gap between the technology providers and MSMEs. For this purpose, committees will be formed for different sectors that will comprise of representatives from the industry associations, technology providers, policy think tanks, applied research institutes, autonomous institutions and Ministry of MSME. These committees will work independently to identify major areas of concerns related to technology adoption and will come up with solutions that can be prototyped by research institutions and can be made scalable by technology providers. Following are the areas that would be stressed upon while focusing on this vertical

   - **Identificationof new technologies**: The committeewill specialize in specific industries/technologies and provide inputs on leadingpractices and techniques in proven technologies that can be adaptedto the Indian MSME context. The committee, in close coordination with different stakeholders,will identify competitive technological capabilities that can be made locallyadaptable and sustainable. This would require the applied research and development institutions to work in conjunction with industry associations and technology providers.

   - **Framework for adoption of technologies by MSMEs:** Once the technologies have been identified and a plan has been developed for their modification and prototype development, adoption framework will be developed with support from the technology service providers for ensuring widespread commercial adoption of the modified technology. The adoption framework will lay emphasis on the benefits of new technology over existing technology, use cases of their adoption by global and Indian MSMEs and

what support needs to be provided by academic and MSME institutions for their adoption.

- **Exposure Visits:** Understanding the usage of these new technologies in their actual environment will be important for throwing light on the challenges being faced by the front runners while adopting the technologies. For this purpose, the mission will also organize several exposure trips with the help of international institutions and technology service providers that would help in creating detailed roadmaps for enabling technology adoption

- **Roadmap for technology adoption:**A detailed implementation roadmap with a schedule of improvement programs consisting of different initiatives would be developed for identified needs/opportunities. The primary objective of the technology adoption plan would be towards increasing the overall adoption of the new technology by MSMEs. The technology adoption plan will:
    - Layout the roles and responsibilities of different stakeholders
    - Specify fixed timelines for the assigned tasks
    - Mention key performance indicators against the tasks and responsibilities assigned to different stakeholders
    - Define a robust monitoring and evaluation mechanism to ensure that activities taken up by the stakeholders are brought to a logical end

2) **Skill Development/Human Development:** Apart from focusing on the commercialization of technologies, there is aneed to develop/ upgrade relevant skills within the existing workforce andfresh workforce. For this purpose,academia, training institutions, and MSME technology centers must modify existing course curriculum and training courses to bring them in line with new developments and should come out withnew training programs that can be operated as modular training programs. This would include assessment and evaluation of existing training programs for augmentation and enhancement required to transform the workforce by keeping them up to date with the latest developments. Through this mission, the focus will not just be on theoretical learnings but also on practical exposure that must be imparted to the workforce. This will be achieved through enhanced collaboration between industry associations, technology service providers and training institutions to increase the opportunities of apprenticeships and live projects for the trainees. Following are the focus areas that would be stressed under this aspect

    - **New training courses as per the identified technology needs:**Focus will be on the development of curricula for the new technology needs of the industry. It will include training course, syllabus, lesson plan, instructor manuals, student manuals, exercise manuals, questions banks, examination/validation/ certification systems etc. The training courses will not just create a new operator class for the identified technological needs but will also look to impart managerial skills among the operators thus creating a new manager cum operator class that would help in reducing the overall production-related time

    - **Redesign of Existing Courses:** The introduction of new technologies must be backed by updation and redesign of existing courses to bring them in line with MSME requirements. Often it has been observed that the training curriculais not in line with the

requirements of the shop floor. Course redesign would be carried out after receiving inputs from the Industry, technology service providers and research institutions.

- **Training of Trainers:** Creation of new courses and redesign of existing courses will create a demand for a class of trainers equipped with training trainees on newly developed courses. Creating this class would require active support from developers of these new adaptable technology techniques. They will also support in creating handy and customizable tool kits for the trainees and trainers that would help in getting a better understanding of the new technologies

- **Roadmap for the launch of training programs:** The launch of training programs will be mapped with that of the new technology offerings. For ensuring wide coverage, it will be important to take advantage of synergies between different training providers. This will not only help in better roll-out but will also help in making the processes more cost-effective.

It will be important to ensure that the new courses that have been created have proper backing from the certifying agencies and statutory boards such as NSQF, AICTE, universities, technical education boards etc. This will be required for increasing the employability of the trainees.

3) **Market Linkages:** Apart from product development and technology adoption, developing a strong marketing strategy to develop sustainable revenue sources is another major challenge being faced by MSMEs. It is imperative to come up with solutions to alleviate this problem. Though National Small Industries Corporation (NSIC) through market assistance scheme, facilitates MSMEs to discover markets for their products and the Government e-Marketplace (GeM) portal has enabled MSMEs to connect with buyers from Public Sector Undertakings (PSUs) and Government Departments, the number of MSMEs availing benefits under the schemes are few. For example, the GeM portal had55,193 registered MSMEs on the platform as on October 2019[2].
   Under this vertical, activities will be undertaken to increase the customer base and enhance exports of the MSMEs. Establishing market linkages will gain more importance under the mission after the adoption of the newly developed technologies due to increased expectations of the MSMEs. Following activities would be undertaken under the mission to enhance market linkages of the MSMEs

   - **Organization of trade-fairs/Buyer-seller meets:** Buyer-sellermeets, and trade fairswould be arranged at regional, state and national level for different sectors on a frequent basis. Apart from giving MSMEs access to prospective buyers, these meets will also help the units in publicizing their improved technology and better products. To ensure wider participation in these meets, industry associations, ministry institutions, and different central and state-level agencies must inform MSMEs about the different government schemes and how they can be dovetailed with other schemes for seeking maximum gains. Improved co-ordination is required between MSME-DIs and State DICs

[2] Financial Express, October 12, 2019, "Govt's GeM portal partners with Union Bank of India; to facilitate funds transfer, payments, more"

to create a single platform/window for seeking benefits from different schemes for improving market access.

- **OEM-MSME Linkages:** Establishing long term tie-ups with OEMs is a major challenge faced by MSMEs. This is primarily due to unawareness among MSMEs about OEM vendor qualification criteria. To create awareness about the requirements of the OEMs and anchor industrial Units, MSME DI and DIC along with industry associations would partner with the anchor units to conduct quarterly/semi-annual industry interactions to comprehensively understand and document their requirements and the quality standard requirements from the MSMEs. As a part of these interactions, samples can be brought by the MSME units and can be corroborated by the OEMs and equipment manufacturers.

  MSME DI and DIC can publish manuals on best manufacturing practices required by the OEMs with a special focus on quality standards and certification requirements and can circulate them through the associations among their members. MSME DI and DIC through constant workshops and seminars will increase awareness about OEM requirements and will encourage them to take benefit of different central and state government schemes to meeting OEM requirements.
  - Enabling Manufacturing Sector to be Competitive through QMS & QTT
  - Zero Defect and Zero Effect
  - ISO 9000/ISO 140001 Certification Reimbursement
  - Building Design Expertise of MSMEs
  - Lean Manufacturing Competitiveness of MSMEs
  - Technology and Quality upgradation support to MSMEs
  - Odisha Industrial Policy– Quality Certification

NSIC through its vendor development programs has taken an initiative to conduct vendor development programs for different PSUs and inform MSMEs about their requirements. A similar program can be started with the help of private OEMs.

4) **Knowledge bank for technologies and processes and Government Offerings:**Central and State level authorities havetaken several initiatives for the benefit of the enterprises, but many enterprises are not able to draw benefits from these initiatives as they have limited or no knowledge about them. The primary source of information about such schemes and initiatives are either industry associations or different central and state level implementing agencies. Though these agencies conduct several events and workshops to spread the required information, the effort remains largely uncoordinated leading to either duplication/asymmetry of information. A similar challenge of limited awareness is faced by the units during raw material sourcing, maintenance of machines, accessing technology and finance etc. The mission aims to tackle this challenge of unawareness by launching a crowdsourcing portal- "TECHSOP Portal" that aims to be a one stop shop for MSMEs for getting information on different aspects for their businesses
   - **TECHSOP Portal:** The mission envisages to focus on developing mechanisms/platforms to support scaling-up of emerging technologies and promoting faster commercialization and adoption by MSME. In lieu of this, there is a need to develop a platform, ideally web based to bring different technologies, processes and other technology related consolidated information relevant to MSME at one place. The platform will become a common ground for providers and seekers of technology

solutions. Subsequently, the portal will be scaled up to identify and develop specific technology solutions on-demand basis for the benefit of MSMEs.

The portal will also act as a collaboration platform for research and academic institutions as scientific-based research projects will help develop solutions for specific challenges faced by MSMEs. It is crucial to transform scientific research into a competitive advantage for the benefit of MSMEs. This will, in turn, help academia/research institutes to create scientific knowledge with relevant industrial data of the clusters. The portal will provide information about following areas, but not limited to

- Manufacturing Processes
- Technology Providers
- Machine Providers and Maintenance support
- Raw Material Sources
- Government Schemes for the products
- Institutional Funding/VC Funding opportunities
- Business Plan
- Cost Benefit Analysis
- Mentoring Support – Udayam Saathi
- Key Markets
- Product testing labs
- Product innovation labs
- Incubation support
- Key sectoral trends and development

5) **Infrastructure:** Adoption of modern age technologies will require strong support infrastructure for reaping true benefits from technology. This would require adequate development of both IT and physical infrastructure.Setting up of common facility Centers, focusing on induction of new technologies into MSME eco-system, testing and design Centersare some initiatives for supporting the industry with infrastructure. These facilities could be set up in existing industrial areas or dovetailed with industrial park schemes.The mission will also try to facilitate support infrastructure wherever possible through State Governments and /or other Departmental schemes.Robust IT infrastructure is an area that would be given due consideration. With increasing digitalization, usage of modern age technologies and gradual shift towards data-driven manufacturing, there would be an increasing reliance on safe and secure IT infrastructure. This would require setting up of cost-effective data centers that would provide continuous access to information without lag and data packet loss

6) **Access to Finance:** Adoption of new technologies require access to timely and adequate credit by the MSMEs. Currently, the credit requirements of the MSMEs is met by Commercial Banks and Non-Banking Financial Companies. Apart from these, financial institutions like SIDBI and MUDRA under the Government of India provide financial support to the MSMEs. Several departments of both central and state governments have launched numerous funds under different schemes/programs to support the credit requirement of MSMEs. Central and State Governments have set up several start-up funds and incubation centers for supporting the start-up eco-system.Despite these policy measures, the rate of

credit lending is not able to match the growing MSME credit requirement. This has been primarily due to the following factors:

- The risk of lending in MSME sector is comparatively high because of the high NPA rate from this sector. This is primarily due to delayed payments that makes it difficult for the enterprises to pay back loans
- MSMEs, particularly micro and small units, have information asymmetry with respect to their financial performance. This makes it difficult to assess the credit risk of the enterprises leading to high cost of credit for the MSMEs

As access to finance is an important factor for ensuring adoption of new technologies by MSMEs, it is important for lending institutions, venture capitalists and angel investors to come out with new and innovative risk assessment techniques and products to increase the overall supply of credit in the sector.There have been some initiatives such asusage of the technologically advanced system for GST filing,using advanced data analytics tools, to process and use the vast amount of structured tax data that is obtained during filings. This data hence can be used by Public and Private Sector Banks, Micro Lending Institutions, NBFCs, and FinTechs for lending purposes. There is a need to ensure development and wider usage of Trades Receivables Discounting System (TReDs) for overcoming the challenges related to delayed payments which in turn can help in overcoming the working capital and repayment related issues. A plan needs to be put in place as suggested in the RBI report for MSMEs, June 2019 for ensuring its wider usage.

Communication and Outreach

Effective communication and Outreach are the other overarching principles that would determine the success of the technology mission. The coordinated effort of stakeholders in different verticals must be supported by strong and effective communication and outreach plan to reap wide benefits. For this purpose, multiple communication channels and mediums would be used for reaching out to the smallest of MSMEs.

- **Communique:**Quarterly newsletter- These quarterly newsletters would be sector-specific and would provide information on the latest trends, developments and new technology in the sector. It would further inform the enterprises about different events planned in that sector. The audience for these newsletters would be selected from the databases of MSME-DI, DICs, Industry associations and from the existing databases that have been prepared by collating attendees fromTECH SOP, TECH LOGUE, SME Award events, Udyam Sangam and other MSME events.

- **Technology Workshops:** Innovation and design of new technology and machines would be of limited use if there is no strategy to ensure its outreach among the mass entrepreneurs. For this purpose, several technology workshops would be organized on periodic basis for ensuring a cascading effect through a collaborative approach. Apart from disseminating knowledge about new technology, these workshops will also sensitize the attendees on how to adopt these technologies and bring them to use on a day to day basis. The key takeaways and action points from all the workshops would be shared with the large MSME groups through quarterly new letters, TECHSOP portal and other discussion portals to ensure that they have a wide-reaching benefit

- **Tech-Events:** The technical workshops and technical newsletters would also be accompanied by a series of technical events such as tech-award shows, national-level

conventions, conferences, and hack-a-thons among others. National level conferences and conventions would be conducted once every six months to provide a platform to brainstorm on the challenges faced by the MSMEs and ideate on an action plan that can be developed for overcoming these challenges. The national conferences and conventions would be followed up by Tech-awards which would be used as a platform to celebrate the innovative solutions developed by the research and development community for the ongoing challenges of the MSMEs.Apart from these, several Tech Challenges would be floated across engineering and diploma colleges and would be accompanied by the Hack-a-thons that would try solving real-time production problems faced by the MSMEs and interested participants. The calendar for these events would be published in all the sources of communication such as TECHSOP portal, quarterly letters, websites, and other media platforms

- **Media Presence:** Apart from conducting these events, it is important for the mission to leverage offline and online media. For this purpose, the mission will use different means such as publishing technology white papers in publications and journals; extensive paid and unpaid social media campaigns through Facebook, Instagram, Twitter, Google ad words etc.; dissemination of information through websites of the ministry and different partner institutions; formation of interest groups on WhatsApp, Telegrams and other similar channels; and spreading information through tech blogs by experts and community of practitioners through different blogging websites.

Successful outreach through these different media would require a coordinated effort from different implementing agencies such as MSME-DIs, State DICs, Industry Associations and other central and state government implementing agencies. These efforts would be spearheaded by DICs, due to their extensive network in different districts, and would be under the purview of MSME DIs. This would require the empowerment of the DICs so that they can act upon their initial objective of serving as a single-window agency at the district level for providing service and support to small entrepreneurs. Further as mentioned in RBI Expert committee report on Micro, Small and Medium Enterprises, DICs should be made more effective before undertaking this exercise.

- Entrepreneurship Development Centers (EDCs) planned in DICs must have the operational flexibility to partner with the private sector, particularly in the areas of skilling and technology development. Contribution of companies to capacity building via EDCs must be eligible for CSR spending.

- The need of training for entrepreneurs in various fields assessed by the different committees must be included in the action plans of DICs. The training should be based on contemporary requirements and should be relevant to the needs of the entrepreneurs. As much as possible, training must be imparted by corporates engaged in the relevant field and practitioners rather than to staff of DIC only.

- DICs should be given more powers for providing tangible services such as arranging terms, and other inputs including technologies for the development of industries and artisans.

- The data banks created by the DICs should be strengthened and trained persons to be deployed to keep the data up-to-date. Proper collection of statistics on the requirements of entrepreneurs should be undertaken by DICs.

- DICs need to be professionalized and corporatized into not for profit entities. This would enable DICs to engage in partnerships with private sector for delivering extension services to MSMEs. *(Source: Report of the Expert Committee on Micro, Small and Medium Enterprises, 25 June 2019)*

Technology Mission Synergies with other Ministry of MSME Initiatives

The MSME Ministry, through the Office of the Development Commissioner (O/o DC, MSME), currently operates Eighteen (18) Technology Centers (TCs): ten for the tooling industry and eight for other industries such as ESDM (electronics system design and manufacturing), medical engineering, industrial robotics, designer & decorative glass, footwear & leather and fragrance &flavor etc. Half of these eighteen TCs are in Low Income States (Uttar Pradesh, Madhya Pradesh, Odisha, Jharkhand and Assam).Technology Centers (TCs) primarily focus on improving access to technologies and providingtechnical advisory support for entrepreneurs in the given industry cluster they serve. TCsalso serve workers and youth by offering opportunities for hands-on technical training andskill development in varied trades with a view to improve employability and livelihoodopportunities.

These Technology Center are largely self-sustaining entities that have been providing:

- Design & Manufacturing
  - Design & manufacturing of tools, dies, molds and precision components
  - Product development
- Skill Development
  - Long & short-term training programs
  - Areas include CAD, CAM, CNC, automation, RPT, mechatronics etc.
  - International, modular and customized programs
- Consultancy
  - Inspection, calibration facilities and quality systems facilities
  - Turnkey assignments
  - Course curriculum developments
  - Engineering solutions for component manufacturing and process development

Apart from the existing 18 Technology Centers, the ministry is also setting up 15 new Technology Centers with the support of the World Bank under the Technology Center Systems Program (TCSP). The Program will increase the capacity and incentives of TCs to support private sector actors (as opposed to competing with them) and will consult regularly with the private sector to ensure it is not being crowded-out.

TCSP will also upgrade technology capabilities of 18 existing TCs and develop linkages with Indian and international research institutes, leading manufacturers. The Program will connect leading practices that will contribute to advanced technology, knowledge and innovation that can be transferred to MSMEs served by each TC, thereby creating an ecosystem that fosters manufacturing competitiveness through a national system of technology centers across the country.

The program focusses on building on the main strength of the current TCs by complementing and reinforcing hundreds of public and private providers of vocational training (e.g. the ITIs, the Polytechnics and the ATIs), helping them to improve theircurricula and training their trainers by placing more emphasis on learning and problem solving skills, and being more practical and adapted to local conditions and needs. For this purpose, the proposed program will develop linkages between the TCs and the Training Institutes being set up by other ministries (e.g. Ministry of Labor). The development of such synergies and linkages will also be supported by existing World Bank programsaimed at improving vocational training in India.

As a part of this program, **the Ministry has constituted a committee** comprising of members from esteemed academic and research institutions (IIT Delhi, IISc Bengaluru, CSIR-CEERI Pilani, National Innovation Foundation, DST etc.), industry associations and industry representatives. The committee will work closely with Ministry of MSME and act as a think tank for overcoming the challenges faced by the MSMEs in technology adoption. The committee will primarily focus on the following areas, but not limited to.

- Validate the technology and modernization roadmaps for the Technology Centers (TCs) set up under the Ministry of MSME
- Identify technical institutions which could mentor the TCs in their technology adoption journey. Each TC could be mapped to one premier technical institution
- Explore the possibility of setting up experiential centers at TCs for real time exposure of MSMEs with regards to data visualization, big data analytics, IoT, AR, VR, AI etc.
- Identify avenues for technology support and outreach through collaborative inter-ministerial and inter-institutional linkages