

*Expression of Interest (EoI)*  
*for*  
*Selection of Technology Provider*  
*to setup*  
*Centre of Excellence (CoE)*  
*for*  
*Advance Manufacturing Centre*  
*at*  
*O/o C-DAC New Delhi*  
*FC-33, Plot No. 20, Institutional Area,*  
*Jasola, New Delhi – 110025*



**Expression of Interest (EoI) for selection of Technology Provider**  
**to setup Centre of Excellence (CoE) for Advance Manufacturing Centre**  
**at O/o C-DAC, New Delhi**



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**SECTION-I**

**Date: 14/10/2022**

C-DAC, New Delhi invites Expression of Interest (EoI) from eligible firms for “Selection of Technology Provider to setup a Centre of Excellence (CoE) for Advance Manufacturing Centre.”

**1.1 The Participating Agencies must fulfill the following pre-requisites**

<b>S. No.</b>	<b>General Conditions</b>
a	The Technology Partner (TP) should be a company recognized for providing Technological products in the areas listed in the Section 6. The TP may execute the task of setting up the Centre of Excellence (CoE) directly or through their Authorized Partner. The chosen Authorized partner would be designated as the Execution Partner (EP). In case TP wish to execute the project directly they will be called as EP for Execution Purpose.
b	The Technology Partner (TP) and the Execution partner (EP) should be entities registered in India under the Companies Act/ LLP Act/s Societies Registration Act or as a Trust.
c	The Technology partner should have been in existence for at least Ten years (10 years) in India.
d	The Technology partner (TP) or the Execution partner (EP) should not have been blacklisted by any Government/ Department/ Body in India.

1.2 The bidding document may be downloaded free of cost from the website <https://eprocure.gov.in/> and <https://www.cdac.in/>

1.3 Interested firms shall submit the EOI in the prescribed format on or before 07/11/2022

1.4 The proposal shall be submitted online on to <https://eprocure.gov.in/>.

1.5 All amendments, time extension, clarifications etc. will be uploaded on the above website only and will not be published in newspapers. The bidders should regularly visit the above website to keep themselves updated.

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1.6 Key dates:

Sl.	Description	Important Information
1.6.1	Date of Invitation for EoI	14/10/2022
1.6.2	Due date & time for submission of proposal	07/11/2022

**1.2 Definitions:**

- a) “Applicable Guidelines” means the policies of C-DAC governing the selection and Contract award process as set forth in this EoI.
- b) “Applicable Law” means the laws and any other instruments having the force of law in India, as they may be issued and in force from time to time.
- c) “Site or Lab Site or Institute” means technical or vocational training provider/Entity/institution selected by the Department.
- d) “Client or Department” means C-DAC, New Delhi
- e) “Technology Partner (TP)” means a legally- established firm or an entity which is also an OEM or their designated System Integrator (The OEM authorization will be required in this case) of technological products (Software & Hardware) supplied under this Contract. Technology Partner (TP) may execute the task of setting up the CoE directly or through their designated Execution Partner (EP) or “Contractor”.
- f) “Contract” means a legally binding written agreement signed between the Client and the Technology Partner (TP)/Execution Partner (EP) or Contractor and includes all additional documents as may be specified by the Client.
- g) “ITL” means the Instructions to TPs/EPs that provides the TPs/EPs with all information needed to prepare their Proposal.
- h) “Data Sheet” means an integral part of the Instructions to TP/EP that is used to reflect specific assignment conditions to supplement, but not to over- write, the provisions of the ITL.
- i) “Day” means a calendar day.
- j) “Experts” means, collectively, Key Experts, Non-Key Experts, or any other personnel of the TP, EP, Sector Partner or Consortium member(s).
- k) “Government” means the Government of India.
- l) “Key Expert(s)” means an individual professional whose skills, qualifications, knowledge and experience are critical to the performance of the Services under the Contract.

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- m) “Non-Key Expert (s)” means an individual professional provided by the TP /EP or its Sector Partner and who is assigned to perform the Services or any part thereof under the Contract.
- n) “Services” means the work to be performed by the TP pursuant to the Contract.
- o) “TOR” means the Terms of Reference that explain the objectives, scope of work, activities, and tasks to be performed, respective responsibilities of the Client and the TP, and expected outcomes.

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**SECTION – II**

**2.1 Objectives**

The CoE should bridge the skill gap of industries and help in fulfilling the needs and impart state-of-the-art industry-oriented training to help foster significant innovation and learning in Technical Education and Industrial segment. It should also give exposure to the state-of-the-art technologies prevailing in Industry to the students, faculty members & Professionals. It should also assist the institute (Academic/Industrial) to bridge the Industry Institute connect. The mission of the Centre of Excellence is to promote implementation and advancement of knowledge in the domains of Product Innovation, Manufacturing Process & Production, Asset Lifecycle Management, Predictive Engineering Analytics, Asset Performance Management & Innovative Manufacturing, through research and education partnership with the industry. The following key points must be addressed in the proposed CoE:

- a. The Centre is being set up with the aim of conducting Industry connected skill development programs, Industrial Consultancy and Industry focused Research and Development projects. It would be necessary to sign a MoA with the Execution Partner (EP) which will be selected after completion of the bidding process.
- b. This Centre should be on Build, Operate and Transfer (BOT) Mode.
- c. All the Hardware should be of industrial standards.
- d. The software should not be restricted to educational limits. It should be equipped with industrial features allowing the Institute to offer Industrial consultancy and research as well, apart from the skill development.
- e. The Executing partner (EP) for executing the CoE in terms of installation of hardware/software and running the Centre on a day to day basis. However, the identities of the Technology Partner and Execution partner should be clearly specified.

In this Expression of Interest (EoI), C-DAC, New Delhi invites a potential Technology Partner (TP) to set up a Centre of Excellence in Advance manufacturing to address industrial needs of Skill Development, Consultancy and Industry focused Research in the areas listed below:

- Product Innovation Centre
- Manufacturing Process & Production Centre
- Research Centre for Asset Lifecycle Management
- Predictive Engineering Analytics Centre

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- Research Centre Asset Performance Management
- Innovative Manufacturing Lab

**2.2 Scope of Work**

C-DAC, New Delhi is inviting Expression of Interest for “Selection of Technology Partner (TP)” to setup a “Centre of Excellence in Advance Manufacturing at C-DAC, New Delhi”.

This would be a turnkey project where the Technology Partner (TP) will be responsible for the supply of the technological product / lab Hardware and software as well as commissioning of entire hardware/ software set up. The Technology Partner (TP) either directly or through its Execution partner (EP) (if any) should run the laboratories set up under this turnkey project along with the institute faculty for a period of three (3) Years. The equipment and software installed under this project must be state-of-the-art and industry relevant and should cater to the current and futuristic requirements of the industry. The CoE will be under the overall administration of C-DAC, New Delhi.

C-DAC, New Delhi will provide building space to setup the Centre of Excellence. The Execution Partner (EP) once selected shall sign a Memorandum of Agreement (MOA) with the Institute. The services proposed in the CoE can be provided directly by the Technology Partner (TP)’s or authorized Execution Partner (EP).

The Centre of Excellence should be an interdisciplinary, industry backed Centre focused on developing skill and excellence in the fields of **Product Innovation, Manufacturing Process & Production, Asset Lifecycle Management, Predictive Engineering Analytics, Asset Performance Management & Innovative Manufacturing.**

Through training and implementation of industry-relevant technology and processes, the Centre should facilitate the creation of a multi-disciplinary learning environment across Technology and Engineering. The Centre should possess the necessary infrastructure and expertise to train students to adapt to the need of industries to be ever-evolving and help build skills around collaboration and innovation. The Centre should leverage the Technology Partner’s capability to draw upon the expertise from various areas of Electronics-Manufacturing, Automotive, Aerospace, Defense and Industrial Machinery. The Technology Partner should also work to connect the Institute to organizations operating in the fields of Industrial Engineering as Electronics Industries, Food and Beverage Industries, Chemical

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Industries, Aerospace Industries, Automotive Industries etc. with the aim strengthening the Industry-Institute connect.

**2.3 Instructions to Technology Partner**

2.3.1 Introduction	<ul style="list-style-type: none"> <li>a. The Client C-DAC, New Delhi intends to select a Technology Partner (TP).</li> <li>b. The TPs along with their EPs should familiarize themselves with the local conditions and take them into account in preparing their Proposal.</li> </ul>
2.3.2 Conflict of Interest	<ul style="list-style-type: none"> <li>a. The EP is required to provide services, at all times holding the Client’s interest paramount, strictly avoiding conflicts with other assignments or its own corporate interests and acting without any consideration for future work.</li> <li>b. The TP/EP has an obligation to disclose to the Client any situation of actual or potential conflict that impacts its capacity to serve the best interest of its Client. Failure to disclose such situations may lead to the disqualification of the TP or the termination of its Contract and/or sanctions by the Client.</li> <li>c. Conflicting Relationship: Relationship with the Client’s staff: a TP/EP (including its Experts) that has a close business or family relationship with a professional staff of the Client, who are directly or indirectly involved in any part of <ul style="list-style-type: none"> <li>i. the preparation of the Terms of Reference for the assignment,</li> <li>ii. the selection process for the Contract, or</li> <li>iii. the supervision of the Contract, may not be awarded a Contract, unless the conflict stemming from this relationship has been resolved in a manner acceptable to the Client throughout the selection process and the execution of the Contract.</li> </ul> </li> </ul>

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<p>2.3.3 Corrupt and Fraudulent Practices</p>	<p>a. Client requires compliance with its policy with regard to corrupt and fraudulent practices.</p> <p>b. In further pursuance of this policy, TPs/EPs shall permit and shall cause their Experts, Partners, sub-contractors, services providers or suppliers to permit the Client to inspect all accounts, records, and other documents relating to the submission of the Proposal and contract performance (in case of an award), and to have them audited by auditors appointed by the Client.</p>
<p>2.3.4 Eligibility</p>	<p>a. The Client permits TPs (individuals and firms) from India to offer services under this EoI unless otherwise blacklisted.</p> <p>b. Furthermore, it is the TP's responsibility to ensure that its experts, partners, agents (declared or not), sub-contractors, service providers, suppliers and/or their employees meet the eligibility requirements as established in this document.</p> <p>c. Government officials and civil servants in India are not eligible to be included as Experts in the TP's Proposal unless such engagement does not conflict with any of the provisions of this engagement or employment or other laws, regulations, or policies of India.</p> <p>d. Government / Government-owned enterprises or institutions in India shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) that they are not dependent agencies of the Client. To establish eligibility, the government-owned enterprise or institution should provide all relevant documents (including its charter) sufficient to demonstrate that it is a legal entity separate from the government; it does not currently receive any substantial subsidies or budget</p>

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	<p>support; it is not obligated to pass on its surplus to the government; it can acquire rights and liabilities, borrow funds, and can be liable for repayment of debts and be declared bankrupt; and it is not competing for a contract to be awarded by the government department or agency which, under the applicable laws or regulations, is its reporting or supervisory authority</p>
<p>2.3.4 Cost of Preparation of Proposal</p>	<p>a. The TP/EP shall bear all costs associated with the preparation and submission of its Proposal, and the Client shall not be responsible or liable for those costs, regardless of the conduct or outcome of the selection process. The Client is not bound to accept any proposal, and reserves the right to annul the selection process at any time prior to Contract award, without thereby incurring any liability to the TP/EP</p>
<p>2.3.5 Language</p>	<p>a. The Proposal, as well as all correspondence and documents relating to the Proposal exchanged between the TP/EP and the Client, shall be written in the English</p>
<p>2.3.6 Proposal Validity</p>	<p>a. The period during which the TP/EP's Proposal must remain valid after the Proposal submission deadline.</p> <p>b. During this period, the TP/EP shall maintain its original Proposal without any change.</p> <p>c. If it is established that any Key Expert nominated in the TP/EP's Proposal was not available at the time of Proposal submission or was included in the Proposal without his/her confirmation, such Proposal shall be disqualified and rejected for further evaluation.</p>
<p>2.3.7 Extension of Validity Period</p>	<p>a. The Client will make its best effort to complete the negotiations within the proposal's validity period. However, should the need arise, the Client may request, in writing, all TPs who submitted Proposal prior to the submission deadline to extend their Proposal' validity.</p>

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	<p>b. If the TP agrees to extend the validity of its Proposal, it shall be done without any change in the original Proposal.</p> <p>c. The TP has the right to refuse to extend the validity of its Proposal in which case such Proposal will not be further evaluated</p>
2.3.8 Revenue Sharing	<p>a. CoE will be used to conduct different training programs, Industrial Consultancy and research work. The Institute will have full share/rights on the revenue generated and IPR out of these activities</p>
2.3.9 Availability Key Experts	<p>a. The invited TP shall confirm the availability of all Key Experts included in the Proposal as a pre-requisite to the negotiations. Failure to confirm the Key Experts' availability may result in the rejection of the TPs Proposal and the Client proceeding to negotiate the Contract with the next-ranked TP.</p> <p>b. Notwithstanding the above, the substitution of Key Experts at the negotiations may be considered if due solely to circumstances outside the reasonable control of and not foreseeable by the TP, including but not limited to death or medical incapacity. In such case, the TP shall offer a substitute Key Expert within the period of time specified in the letter of invitation to negotiate the Contract, who shall have equivalent or better qualifications and experience than the original candidate</p>

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**SECTION – III**

**3.1 Eligibility Criteria**

<b>Sl.</b>	<b>Evaluation Metric</b>	<b>Documentary Proof</b>
1	Technology partner (TP) Authorizing their Executing partner (EP) with a minimum Turnover of 25 Cr in each of Last 3 years.	Authorization letter from the Technology partner (TP).  Audit Financial Statement of last three F. Y. i.e. 2019-20, 2020-21 & 2021-22 Annual Report of the Execution Partner (EP).
2	Technology Partner (TP) and Executing Partners (EP) should be such entities registered in India under the Companies Act/ LLP Act/ Societies Registration Act or as a Trust.	Certificate of Incorporation / Registration Certificate
3	Technology partner (TP) should have been in existence for at least 5 years in India.	The Certificate of Incorporation of the (Technology Partner) TP should be submitted.  The Technology Partner (TP) must have registered office in India.
4	TP and Executing partner should not have been blacklisted by any Government/ Department/ Body.	Self-declaration to be provided by TP and the Executing partner.
5	Existing CoE Setup	The Technology Partner (TP) must have similar experience of setting up COE's for at least 3 years directly or through one of its EP (Not – necessary the EP bidding).  The Technology Partner (TP) should have executed minimum 5 such COE's within India.

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6	Domain Expertise	The Technology Partner (TP) should be in the domain, in at least 80% of the mentioned labs as per the technical scope.
7	Training Expertise of Executing Partner (if Any)	The Executing Partner should be a company working in the field of software implementation/Automation Software implementation for a period of at least five (5) Years.
10	Customer Feedback	Customer feedback on the CoE in the form of appreciation letters or public domain information such as website/published report on similar CoE should be submitted.

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**3.2 Details of Forms to be submitted**

**A. EoI SUBMISSION FORM**

[Location, Date] To

\_\_\_\_\_

\_\_\_\_\_

Dear Sir/ Madam,

We, the undersigned, intend to participate as a Technology Partner (TP) for setting up of Centre of Excellence in accordance with your EoI dated [Insert Date].

We will/ (Our execution Partner will) participate in the bidding process and on selection, will execute the project activities on timely basis. {Insert a list with full name and the legal address}.

We have attached a copy {insert: "Authorization Letter"} authorizing our Channel Partner to execute the project. (Choose the correct option)

We hereby declare that we have read the Instructions to TP included in the EoI, and abide by the same, and specifically to conditions mentioned in Instruction to interested parties. [In case of any declaration, reference to concerned document attached must be made]. We hereby declare that all the information and statements made in this Proposal are true and we accept that any misleading information contained in it may lead to our disqualification.

We undertake, if we will be selected in the bidding process, we will/our execution partner sign the MoA and initiate the project as per the timelines prescribed.

Yours faithfully,

Authorized Signature [In full and initials]: Name and Title of Signatory:

Name of Firm: Address:

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- B. Authorization letter from the technology partner to the Execution partner (firm can use its own format to prepare this document)**
- C. Certificate of registration/ incorporation of the Technology Partner and execution partner (firm can use its own format to prepare this document)**
- D. Self-Declaration against blacklisting of TP and the Execution partner (firm can use its own format to prepare this document)**

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**SECTION – IV**

**4.1 Technical Scope**

**Concept**

The overall plan, as part of this program is to encourage a TP to setup a Centre of Excellence (CoE) in Advance Manufacturing. The CoE is being setup to offer an interrelated high technology, modular, skilling facility and offer demand driven courses.

The CoE, to be designed by the Technology Partner (TP), is envisioned to be setup as a State of the Art Centre of Excellence (CoE) in which the Technology Partner (TP) brings in their best-in-class equipment/ tools/ machines/ simulators (commonly referred to as equipment) to be used for training purposes. The COE will be located in an appropriate space offered by the client. The CoE will be managed professionally by the EP. The infrastructure for the CoE will be made ready by the client as per the specifications given by the TP or its Execution Partner.

The CoE will run under the overall operational management of the EP and the Institute. The Technology Partner or the Execution Partner (EP) (if any), under the Guidance of the TP, will be responsible for devising and implementing a two-year rolling plan and ensuring that the CoE is constantly upgraded and provides a high technology ecosystem for skilling/ up- skilling/ re-skilling/ cross-skilling and multi-skilling. The Execution Partner (EP), will be expected mobilize students for training which will help generate revenues at the CoE which can help offset the overall costs of the CoE.

Overall administrative, quality and financial responsibilities including the management of the CoE, marketing, branding, placement, costing of courses, management of hostels, course content, pedagogy, funding etc. will be the responsibility of the Technology Partner. The Technology Partner may engage with, invite and sign MoUs with industries (such as equipment manufacturers, software developers, tool and device manufacturers that service the sector) and continuously engage with the industries to ensure that the CoE remains relevant at all times.

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**4.2 Role of the Execution Partner**

The role of the Execution Partner shall include the following:

1. Setting up of the CoE including Installation of Software, Hardware etc.
2. Providing Operation team to manage the Centre for Three Years
3. To design the CoE and to develop a two-year strategic rolling plan for the CoE along with the client and be responsible for implementing the plan.
4. Identify and formulate training programs to develop skills in futuristic/ disruptive technologies and associated skill sets required for industry ready.
5. To develop courses, course content, course work, manuals, standard operating procedures, and standards, disseminate the same with the overall intent of improving the skill sets of individuals.
6. To impart high-end skills (and not generic skills) to Students, unemployed individuals and employed individuals (looking to up skill/ re-skill themselves).
7. To conduct train the trainer programs.
8. To conduct need based/ on-request training programs to cater to specialized requirements of corporate, and to generate revenue through these programs.
9. To carry out assessment, certification of trainees.

**4.3 Details of Laboratories to be set up**

S. No.	List of Labs
1	<p><b>Product Innovation Centre</b></p> <p>The Product Innovation Lab should consist of advanced Computer Aided Design Software, Computer Aided Manufacturing software, Composites Design &amp; Additive Manufacturing Software. These Solutions assist the students to understand engineering design and manufacturing. This Lab should support every aspect of product development, from concept design through engineering and manufacturing. Program CNC machine tools, control robotic cells, drive 3D printers and monitor quality using one software system. The computer aided manufacturing software should streamline and automate NC programming, while reducing cycle time, using powerful, application-specific tools. From 2.5-axis machining and mold manufacturing, to simultaneous 5-axis milling. Additive manufacturing Software should provide the ability to manufacture highly complex designs with features like</p>

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	<p>optimized surfaces and lattice structures. AM solutions should allow you to design and print complex geometries at scale. It should support widest range of 3D Printing Hardware on the market. It should print plastic or metal, fixed-plane, or multi-axis, on a desktop or industrial machine and should support 3MF and STL data standards for export to printers.</p> <p>The Lab would cater to the following areas:</p> <ul style="list-style-type: none"> <li>• Industrial Design &amp; Styling</li> <li>• Package Design</li> <li>• Mechanical Design</li> <li>• Composites Design</li> <li>• Electromechanical Design-</li> <li>• Mechatronics concept Designer</li> <li>• Mechanical Simulation</li> <li>• Electromechanical Simulation</li> <li>• Tooling &amp; Fixture Design</li> <li>• CNC Machining</li> <li>• Quality Inspection</li> <li>• Design for Additive Manufacturing</li> </ul>
2	<p><b>Manufacturing Process &amp; Production Centre &amp; Research Centre for Asset Lifecycle Management</b></p> <p>The Lab should consist of comprehensive portfolio of digital manufacturing solutions that support to digitalize manufacturing. With Digital Manufacturing software, it should provide synchronization between product engineering and manufacturing engineering. The Lab should also consist of Product Lifecycle Management Software which will allow students to learn how to take control of data and processes, including 3D Designs, documentation, and bill of materials. It should also consist of manufacturing operations management that supports advanced planning and scheduling software.</p>

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	<p>The Lab would cater to following areas:</p> <ul style="list-style-type: none"> <li>• Human-Centered Design and Planning</li> <li>• Offline Program Robotics &amp; Automation</li> <li>• Assembly Simulation for Virtual Process Verification</li> <li>• Optimize logistics &amp; material flow</li> <li>• Commission automation systems virtually</li> <li>• Manufacturing Data &amp; Process Management</li> <li>• Mechanical Design Management</li> <li>• Electrical Design Management</li> <li>• Bill of Materials Management</li> <li>• Change Management</li> <li>• Model Based Systems Engineering</li> <li>• Advanced Planning &amp; Scheduling</li> <li>• Electronic Chip Manufacturing Processes</li> <li>• PCB Design Manufacturing &amp; Analysis</li> <li>• IC Nanometer Design</li> <li>• HDL design, verification, synthesis and test of ASICs and FPGAs</li> </ul>
3	<p><b>Predictive Engineering Analytics Centre</b></p> <p>The advanced analysis lab Software should consist of a comprehensive, fully integrated CAE solution for complex, multidisciplinary product performance engineering. The 3D CAE Products that can import geometry from any CAD source and prepare analysis models in a unified environment for a wide range of CAE methods including finite element, boundary element, computational fluid dynamics, and multi-body dynamics. It should have advanced 3D modeling capabilities and simulation solvers that cover a comprehensive range of physics. It should offer interior and exterior acoustic simulation within an integrated solution. A unified and scalable modeling environment combined with efficient solvers and easy-to-interpret visualization capabilities enables to quickly gain insight into the acoustic performance. The CFD software should support minimum 50 HPC tokens.</p>

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The Lab would cater to following areas:

- Acoustic Simulation
- Aerostructures Simulation
- Composites Simulation
- Computational Fluid Dynamics Simulation
- Durability Simulation
- Dynamics Simulation
- Electromagnetic Simulations
- Motion Simulation
- Multiphysics Simulation
- Structural Analysis
- Thermal Simulation
- 1D Simulation
- Topology/geometry optimization

**Simulation & Test Lab (Hardware)**

The Advanced Analysis Lab Hardware should consist of a complete, integrated solution for test-based engineering, combining high-speed multi-physics data acquisition with a full suite of integrated testing, analytics, and modeling tools for a wide range of test needs. Designed to make individual users and complete teams more efficient, the software supports future-focused testing departments by offering the right balance between ease-of-use and engineering flexibility and by closing the loop with simulation.

The Lab would cater the following areas:

- Acoustic Testing
- Structural Dynamics Testing
- Rotating Machinery Testing
- Structural Testing

Minimum 40 channel Signal Control & Data Acquisition system along with 20 users “Testlab” Software to be provided in this lab.

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	<p>A dedicated Test Bed for Electronics System Design 600A (Temperature, Vibration &amp; Acoustics), (Hardware and software from TP.)</p> <ul style="list-style-type: none"> <li>• Comprehensive Diagnostics for Thermal Reliability</li> </ul>
4	<p><b>Research Centre Asset Performance Management (IIoT) Lab</b></p> <p>This lab should consist of cloud based, open IoT operating system that connects real things to the digital world and enables powerful industry applications and digital services. It should be a scalable cloud platform, in the form of a Platform as a Service for the development of applications.</p> <ul style="list-style-type: none"> <li>• Connect assets and upload data to the cloud</li> <li>• Collect, monitor, and analyze data in real-time</li> <li>• Gain insights that improve efficiency and profitability</li> <li>• Take advantage of apps and solutions that solve real problems</li> </ul> <p>A pre-configured device should be provided that allows connectivity to IoT platform. The device supports the transmission of data encrypted through a secured internet connection to IoT Platform. The device should allow for fast and easy IoT connectivity of machines and systems and Data collection via standard industrial protocols.</p> <p>TP shall have its own IIOT platform</p> <p>Low Code app Development Platform</p> <p>The IIOT lab shall also have a Low Code App Development Platform by the same TP. The TP's ( same ) App Platform enables business users and developers to build and deploy sophisticated multi-channel apps with a model-driven development platform that is much more efficient and easier to learn than traditional technologies</p>
5	<p><b>Smart Factory Lab</b></p> <p>This lab should consist of Smart manufacturing setup integrated with SCADA, Digital Twin. Entire system should be powered with open architecture such as PLC and SCADA. The Lab can be very easily integrated with other factory automation products such as CMM, RPT or even additional CNC Machining Centers. The TP</p>

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shall be OEM of all the Software and some Hardware technology being used in the Smart Manufacturing Lab except Robots, AGVs, Conveyer, CNC machine etc. The PLCs, CNC controller used inside CNC machine, Digital Twin Suit, SCADA shall be from the TP Only.

The system should be compatible with a TP's digital twin software which can be integrated with OPC UA. Complete system is equipped with TP's IIOT hardware with dedicated cloud space for remote monitoring as well as data storage. Entire system can be controlled remotely through IIOT app developed on TP's IIOT Platform.

The 'Smart Factory' consists of following hardware and software components.

1. CNC Turning Machine ( Non-TP , but controller need to be from the same TP )
2. CNC Milling Machine ( Non-TP , but controller need to be from the same TP )
3. 6 Axes Industrial Articulated Robot with minimum 10 KG Payload and minimum 1600mm reach ( Non-TP )
4. Robot Transfer Unit (With 7th Linear Axis of Robot) with minimum travel of 4 meter (Non – TP )
5. Automatic Storage and Retrieval System ( Non – TP )
6. Automated Guided Vehicle (Magnetic Strip Guided) ( Non- TP)
7. Bearing Sorting station with conveyors, pick and place assembly and pneumatic gauging system ( Non-TP)
8. Assembly station with pneumatic press and 2D Vision sensor for vision inspection ( Non-TP)
9. Inspection Station to measure the assembly runout at varied speeds. ( Non-TP)
10. Central Control Station with Workstation and dual monitors. ( Non-TP)
11. Handheld HMI unit for mobile operation. ( Non-TP)
12. Factory design and simulation (Digital Twin - TP)
13. AGV Sim – AGV Simulation Software ( TP or Non-TP)
14. IIoT Software setup (The same TP )

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**4.4 Scope of Services**

Sl. No.	Description
1	<p><b>Project Management</b></p> <p>After the MoA is signed and PO is released, the Partners should work closely with client in planning and execution of the COE.</p> <p>The partners (TP and/or its EP) should</p> <ul style="list-style-type: none"> <li>• Define the delivery timelines.</li> <li>• work closely with the client for the site readiness</li> <li>• Would be responsible for commissioning of all the items and ensure the entire lab is up and running.</li> <li>• Conduct Train the Trainer programs</li> <li>• Conduct One Industry Seminar every Semester</li> <li>• Support client in the conduction of regular workshops for its students as well as registrants for training/ skilling programs from academia and industry.</li> </ul>
2	<p><b>E-learning courseware</b></p> <p>A complete list of interactive E-Learning covering the below topics should be also provided along with the entire setup. The courses should be clearly broken down into Number of hours, designed in a structured manner which will allow the trainees to pick courses at different levels.</p> <p>All the Software courses under this category should possess online version.</p> <p>The Digital library should be a collection of Reference, Learning and Training material for the proposed Digital Twin Platforms. This library should be applicable to all engineering levels – Universities, Institutions, Polytechnics, Training Centers and Corporate learning Centers.</p> <p><b>Comprehensive Coverage</b></p> <p>The Digital Library should offer a wide range of content in the proposed Labs. The content should align with current industry demands and oriented to build skills while enhancing learning. Students can access the content across different branches of engineering and application.</p>

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**Access at Fingertips**

The E learning courseware should provide multiple contents accessible from any computer. Students should be able to learn at their pace. Multiple students should be able access the same content from a Digital Library unlike a book which will have limited number of copies.

**Interactive Content**

The content should be highly interactive and interesting. Using this Multimedia Digital Library students should be able to understand various concepts with the help of rich Graphics, Animations, Videos and Voice over.

The courses should be to be managed by a Learning Management System (LMS).

**Learning Management System – Features required are**

- Friendly and attractive user interface with a 3-tier architecture for managing clients
- Dashboard for viewing all relevant information on the platform in one glance (for each tier above)
- Comprehensive reports, based on users, courses, and enrolments
- Ability to add varied types of content, including PPT, PDF, videos, assignments, etc.
- Availability on mobile and tablet devices
- Batch user import (for adding a large number of users to the LMS in one go)
- Support for learning best practices such as spaced retrieval

**It should be possible to generate the following reports from the LMS:**

- MIS on number of courses conducted.
- Course wise enrolment.
- Preferred Courses
- Enrollment Vs Successful Completion
- Categorization of trainees – students/ faculty / industry / specialization

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	<p><b>eLearning Content to be offered for the following technologies:</b></p> <ul style="list-style-type: none"> <li>• Product Design / Engineering Design</li> <li>• Computer Aided Manufacturing</li> <li>• Engineering 3D Simulation</li> <li>• Digital Manufacturing</li> <li>• Product Lifecycle Management</li> </ul>
	<p><b>Lab Management</b></p> <ul style="list-style-type: none"> <li>• The CoE should work in the BOT Model (Build, Operate and Transfer Mode) for a period of 3 years.</li> <li>• At least 6 Engineers with mix of experience must be deputed for this period for individual labs who will be the technical resource for the respective labs.</li> <li>• The Engineer's activities are to conduct training activities, support faculty members technically in research and industrial consultancy.</li> <li>• The engineers should have good written &amp; oral communication, domain expertise, flair for teaching &amp; conversant with engineering software.</li> <li>• Senior Trainers should have minimum graduate or post graduate qualification in engineering and minimum 3-4 years of experience.</li> <li>• Trainers should have minimum Diploma or Graduate qualification in engineering and 2-3 years of experience.</li> <li>• There should also be a Centre manager and student coordinator deputed by the technology partner or executing partner who would be supervising the activities like enrollment of students, certification for students, Seminars and conferences being conducted, Maintenance of reports of the Centre Activity.</li> </ul> <p><b>TP and their Execution Partner (if any) should provide the following –</b></p> <ul style="list-style-type: none"> <li>• Managing the equipment in the lab and conducting the skill training programs</li> <li>• Ensuring trainer availability for the training programs</li> <li>• Provide update course material.</li> <li>• Maintain the equipment for the duration of the BOT period</li> </ul>

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**TP and their Execution Partner (if any) will manage the labs assigned by performing the following activities -**

**COURSES SCHEDULING AND IMPLEMENTATION OF TRAINING PLAN**

The TP and their Execution Partner (if any) shall be responsible for scheduling, conducting Training. TP and their Execution Partner (if any) will present the schedule to the Project Manager of the institute and get it approved and declare it.

The Technology Partner and the Execution Partner (if any), with the assistance of client will market the course and enroll the participants and schedule participants and other activities essential to training.

Training plan, including procedures for course enrolment, reporting of course progress, course completion and certification, monitoring of the training program, training records will be carried out jointly by the client, the Technology partner and the Execution partner.

**TRAINING METHODOLOGY**

TP and their Execution Partner (if any) should use digital material to teach theory, to make the understanding easy. TP and their Execution Partner (if any) will follow theory in learning and simulation for practical and usage of equipment to complete the effective learning and completion of the course. Knowledge checks will be used effectively to monitor the process during the training.

**EVALUATION PROCESS & CERTIFICATION**

There should be pre and post course test will be conducted for the participant to monitor the learning and understand the knowledge level prior to the course.

The eligible participant would be given certificates. The evaluation process can be determined by the client, the TP and their Execution Partner (if any). The certification should be a tripartite agreement between the client, the Technology Partner and the Execution partner (if any).

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**AUDITING**

The client may conduct periodical audit of the Centre. The audit includes both academic, and general, one senior executive (from the Institute) will be visiting the Centre and go through the activities carried out in terms of courses conducted, performance of the students and feedback given by the participants. The process also involves collecting the feedback on faculty, course, course ware and suggestions separately, so that clear complete relevant data is collected to work towards improvement. This information will be analyzed, and suggestions will be given to the Technology partner/ Execution partner to work towards improvement of the Centre. The suggestion should be documented and implemented within a mutually agreed timeframe.

The senior executive will also involve a team from the client to market the courses in the region to enable the successful functioning of the Centre.

**REPORTS**

- The EP will provide the following reports every quarter.
- MIS on number of courses conducted. Course wise students' enrolment.
- Course wise skills gained
- List of successful students. Footfall to the Centre.