



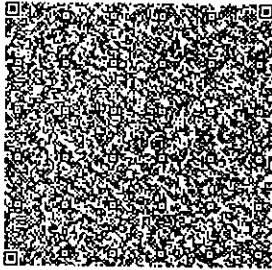
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MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING (MoU) BETWEEN THE DEPARTMENT OF HEAVY INDUSTRY (DHI), GOVERNMENT OF INDIA and **IITD-AIA FOUNDATION FOR SMART MANUFACTURING.**

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under the aegis of Indian Institute of Technology Delhi, for implementation of the project on Industry 4.0 namely “National Common Engineering Facility Center on Smart Technology Enabled Manufacturing” a SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hubs) Udyog under the component “Common Engineering Facility Centre” under the Scheme on Enhancement of Competitiveness in the Indian Capital Goods Sector” (hereinafter referred to as the CG scheme) of DHI, Government of India.

This MoU regarding implementation of “Common Engineering Facility Centre” under the CG Scheme, titled National Common Engineering Facility Center on Smart Technology Enabled Manufacturing a SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hubs) Udyog (hereinafter referred to as the “Project”) at the campus of Indian Institute of Technology – Delhi and Sonepat Campus is made for execution of the project on this 12th of February 2018 between parties, namely:


Department of Heavy Industry, under the Ministry of Heavy Industries & Public Enterprises, Government of India, having its office at Udyog Bhawan, New Delhi (hereinafter referred to as DHI which expression shall, where the context so requires or admits, be deemed to include its successors and permitted assignees)
And

IITD-AIA FOUNDATION FOR SMART MANUFACTURING having its office at IIT Delhi, Hauz Khas, New Delhi - 110016 (herein after referred to as in short as IAFSM, which expression shall where the context so requires or admits, be deemed to include its successor and permitted assignees).

It is agreed by and between the parties that the project would be executed jointly within the following Objectives, Scope, Deliverables and the Responsibilities of each of the implementing agencies.

1. DEFINITIONS

- a. “CG Scheme” means Scheme for “Enhancement of global Competitiveness of Indian Capital Goods Sector” of Department of Heavy Industry, Government of India as indicated in Notification No. 7/6/2011- HE&MT dated 5.11.2014 published in the Gazette of India (Extraordinary) Part I, Section 1, No.264.
- b. “Project” means projects proposed by Indian Institute of Technology - Delhi under the component ‘Common Engineering Facility Centre’ under the CG Scheme and approved by the Apex Committee formed under the CG Scheme in its meeting dated 9th August, 2017, namely, National Common Engineering Facility Center on Smart Technology Enabled Manufacturing a SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hubs) Udyog.
- c. “Project Implementing Organization” (PIO) shall mean (IITD-AIA FOUNDATION FOR SMART MANUFACTURING) responsible for implementing the Projects as indicated at (b) above.
- d. “Funding Organization” shall mean DHI supporting the project financially to the extent of 80% of the project cost.
- e. “Apex Committee” (AC) on CG Scheme will be hereinafter called AC-CG Scheme. Secretary, DHI is the Chairman of AC-CG Committee and Joint Secretary (HE & MT), DHI is the Member Secretary. AC-CG is constituted by the Government of India. AC-CG shall review the progress of the project.
- f. ‘Parties’ refer to the organizations participating in the project namely DHI and IITD-AIA FOUNDATION FOR SMART MANUFACTURING,



- g. **“Participating industry”** (PI) shall mean industrial unit or company participating in the project as indicated above and is liable to contribute at least 20% of the cost of the respective project.
- h. **“Approval Letter”** shall mean the letter No. 16/6/2017 - HE&MT dated 10 October, 2017 communicating detailed terms and conditions of the approval of the competent authority in Department of Heavy Industry for the Project.

2. OBJECTIVE

The key objective for setting up the Common Engineering Facility Centre of National Common Engineering Facility Center on Smart Technology Enabled Manufacturing a SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hubs) Udyog will be as follows:

- a) Cyber Physical Lab for Smart Manufacturing Research at IIT-Delhi, Hauz Khas campus
- b) Cyber Physical Factory at IIT-D Sonepat Campus
- c) Awareness campaigns on Industry 4.0,
- d) Training for Master Trainers,
- e) Active Participation Provisions for Start-up/ incubators,
- f) Hand-holding of SMEs to plan and implement relevant Industry 4.0 projects to be done through consultancy services on chargeable basis,
- g) Collaborating with neighbourhood Universities for student training/internship programmes,
- h) Involving industry in IAFSM membership model for sustainability,
- i) Participating in a Government formed platform for Industry 4.0 on common agenda,
- j) To make adequate provisions for e-waste management,
- k) Involving as many clusters
- l) Resource sharing amongst I4.0 centre

Detailed objectives of the Project have been indicated at **Appendix – A**.

3. PLAN, METHODOLOGY AND WORKING PROCEDURE:

3.1 In order to realise the objectives following measures will be adopted:

- a) Building the technological capability for analysing various units of Industry 4.0;
- b) Equipping the centre to analyse the capabilities of various units for Industry 4.0 technology to identify the critical areas of focus for creating solutions,
- c) Developing the facility for undertaking development of Industry 4.0 technology for production and manufacturing, automations, solutions.
- d) Establishment of facilities for Industry 4.0.

3.2 The physical infrastructure and R&D facilities will be created by IIT-Delhi in association with Participating Industries and the funding will be provided by DHI and Industry Partner(s).

3.3 Detailed technological targets of the Project have been indicated in **Appendix – A**.



4. MAJOR MILESTONE

4.1 The work on setting up of CEFC shall commence from the date of release of the first instalment of the Grant – in – Aid by the Government of India and shall be completed within the financial year 2019-20.

4.2 Major financial milestones in terms of resource allocations (expenditure) are listed as under:

(Rs. In Lakhs)

MAJOR ITEM OF EXPENDITURE	1 st YEAR		2 nd YEAR		3 rd YEAR		TOTAL
	DHI	IAFSM	DHI	IAFSM	DHI	IAFSM	
I4.0 enabled Micro Production Systems	0.0	0.0	352.8	121.2	96.0	24.0	594.0
I4.0 enabled Material Handling Systems	0.0	0.0	168.0	42.0	9.6	2.4	222.0
I4.0 enabled Inspection Systems	0.0	0.0	96.0	60.0	0.0	0.0	156.0
I4.0 enabled Training Facility	200.0	50.0	0.0	0.0	0.0	0.0	250.0
IIoT hardware & software licenses	180.0	45.0	60.0	15.0	0.0	0.0	300.0
CoE IT Systems and Networking	40.0	10.0	160.0	40.0	80.0	20.0	350.0
Miscellaneous & Consumables	0.0	2.0	20.0	6.0	0.0	0.0	28.0
Staff & Services Expenses	45.3	11.3	139.5	34.9	288.5	72.1	591.6
IIT Support Charges	4.6	1.1	0.0	17.4	0.0	36.1	59.2
TOTAL	469.8	119.5	996.3	336.5	474.1	154.6	2550.8

5. OUTPUT

5.1 The impact of output will be as follows:

Outcomes	Quantification
Production Qty. increase	20 to 40 %
Production Consistency	>95% (Currently it is around 60 to 80%)
Customer Complaints	Towards six-sigma
Rework	< 1% (currently 5 to 10%)
Manufacturing costs	20 to 25% reduction (for MSME)
Inventory reduction	20% (Considering today's inventory of 20-40 days can be cut by half)
Energy efficiency	Up to 30%
Breakdown %	< 0.1% from present 2%
Preventive maintenance	100% adherence (from current 60-80%)
Safety	Safe working for workmen as well as factory, environment, Safe products for the consumers.
Export competitiveness	Increase in Quality & Price Competitiveness
Regulatory compliance	Easier to assure

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5.2 **PHYSICAL & TECHNICAL TARGETS (MILESTONES):**

Quarter/Year	Physical & Technical Targets
Oct-Dec 2017	Setting up boot Camp @ Hauz Khas Campus, Awareness Programs
Jan-Mar 2018	Procurement of CP Lab, Integration & Testing of critical automation and IT components, Launch of Training Program
Apr-Jun 2018	Commissioning of CP Lab, Ordering of Discrete Manufacturing Equipment, Training Programs
Jul-Sep 2018	Installation of Machine Tools & related Fabrication
Oct-Dec 2018	Demonstration for Auto Components
Jan-Mar 2019	Demonstration for Machine Tool Components, Design of Hybrid Manufacturing
Apr-Jun 2019	Procurement of Hybrid Manufacturing Equipment, Master Trainer Programs, Collaborating with neighbourhood Universities
Jul-Sep 2019	Installation of Hybrid Manufacturing Equipment, MSME Cluster development
Oct- 2019	Demonstration of Hybrid Manufacturing

5.3 **OUTPUT MATRIX**

S.No.	OUTPUT MATRIX	OUTPUT MEASURED	
		SHORT TERM (2 years)	LONG TERM (5 years)
1	Samarth Udyog CEFC Commissioning	70%	100%
2	Cadre of trained people in the IAFSM	30	50
3	Branding in CEFC deliverables	100%	100%
4	Demonstration and Spread of awareness in companies	400	4,500
5	Number of training courses developed	12	25
6	Number of training contents developed	7	20
7	Number of trainers trained (Master Trainer)	100	300
8	Number of persons trained	800	9,000
9	Number of hours of training	8,000	90,000
11	Number of companies provided with try out services	80	900
13	Number of consultancy assignments with companies	40	250
14	Number of in-house/ research projects	20	70
15	Number of Smart products / processes / training kits developed	0	10
16	Investment targets achieved in time and quantity	100%	100%
17	Expenditure targets achieved in time and quantity	100%	100%
18	Revenue targets achieved in time and quantity	100%	100%
19	Number of seminars/ events organized / Supported	16	40
20	Online Awareness (Users)	10,000	1,00,000

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5.4 A Project Summary is attached at **Appendix 'A'**. Implementation Schedule of the Project is attached at **Appendix 'B'**.

6. MODE OF FINANCING

6.1 The project cost will be jointly funded by the Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Government of India (DHI) and the **IITD-AIA FOUNDATION FOR SMART MANUFACTURING** without violating any condition of the Scheme / GOI Rules. Total cost of **SAMARTH Udyog** is Rs 30.85 crore. DHI funding will be limited **Rs 19.40 crore** only at CEFC. Details of equipments are available at **Appendix 'C'**. The key activities of the CEFC at **Appendix 'D'**. Detail layout plan of the two facilities (Cyber Physical Lab for Smart Manufacturing Research at IIT Delhi, Hauz Khas campus and Cyber Physical Factory at IIT Delhi Sonapat campus is at **Appendix 'E'**.

(Rs. in Crore)		
S No.	Project Cost	Amount
1	Equipment	19.00
2	Knowledge Partnership & other expenses	11.85
3	Working capital expenses (By IAFSM promoters)	
Total Project Cost (1+2)		30.85

6.2 Funds will be released by DHI in the designated Project Account on pro rata basis after receiving confirmation of contributions by other funding partners. Release of fund will be subject to fulfilment of terms and conditions of this MoU, paragraphs 8 and 12 of the Gazette Notification dated 5.11.2014 and relevant Government order/ General Financial Rules, particularly Rules 228 to 245 of GFR 2017.

6.3 DHI Budgetary grant will be released in multiple instalments. Utilization of budgetary grant will be subject to and in compliance of terms and conditions of the Sanction Letter.

6.4 Release of 1st instalment of funds shall be arranged by DHI after signing of an MOU by the Grantee Organisation and after due confirmation of fulfilment of the commitment by the IAFSM to the Project, as per financial target indicated above. Pre-receipted bills will be submitted, prior to release of fund.

6.5 In addition to the terms & conditions mentioned in paragraph 6.2 above, release of subsequent instalments of funds by DHI will be subject to satisfactory progress of the project measured by Project Schedule and satisfactory utilization of the fund already released on the recommendations of PR&MC

7. FINANCIAL & FUNDING PARAMETERS OF THE PROJECT

7.1 The project is partly funded by DHI under the CG scheme through grant in aid as indicated in paragraph 6.1 above. The total approved financial outlay of the project as per approved proposal is **Rs.30.85 Crore (Rupees Thirty Crore Eighty Five Lakh only)**. This is the total cost of the CEFC. The grant- in- aid should be utilized for the purpose of CEFC only. Utilization of the grant-in-aid would result in achievement of the following quantitative and qualitative targets:

OUTPUT WISE BREAK-UP OF THE TOTAL PROJECT COST

(Rs. in Crore)

YEAR	TARGETS WITH EXPENDITURE HEADS		TOTAL
	(a) Equipment	(b) Knowledge Partnership & Other Expenses	(a) + (b)
1st Year	5.27	0.62	5.89
2nd Year	11.41	1.92	13.33
3rd Year	2.32	3.97	6.29
4 th Year	0	2.92	2.92
5 th Year	0	2.42	2.42

TOTAL	19.00	11.85	30.85
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7.2 Unless otherwise specified, funding by the Department of Heavy Industry will be limited to Project only and will be governed by the relevant provisions of General Financial Rules (GFR 2017) read with the DHI Notification dated 5th November, 2014 on Scheme on Enhancement of Competitiveness in the Indian Capital Goods Sector published in the Part I Section 1 of the Gazette of India Notification (Extraordinary) dated 05-11-2014 bearing no. 7/6/2014 - HE&MT (as amended from time to time) and other Government orders and will be subject to terms and conditions of this MoU.

8. ROLE AND RESPONSIBILITIES OF PROJECT IMPLEMENTING ORGANIZATION (PIO) also known as Grantee Organization which in the instant case is IAFSM.

8.1 The Project Implementing Organization (PIO) shall be responsible for timely delivery of the output subject to timely receipt of funds from both DHI and others.

8.2 The PIO shall maintain a separate account for the funds released by DHI for execution of this project.

8.3 The PIO shall make arrangements for proper operation and maintenance of equipment/ knowledge procured under the project. PIO shall acknowledge procurement of equipment under this project by a "TRUST RECEIPT" which is attached to this document as **Appendix 'F'**.

8.4 The PIO shall ensure that the funds released are utilized only for the purpose of the Project.

8.5 The PIO shall provide free access to DHI officers (or nominees / representatives) and the Apex Committee-Capital Goods Scheme (AC-CG) members and their representatives to all facilities/ assets and their records relating to the project located at their Worksite.

8.6 The PIO shall also be responsible for achieving and regular reporting the progress of the project to DHI. The PIO shall also submit its Standard Operating Procedure (SOP), Memorandum of Association (MoA) and Articles of Associations (AoA), proceedings of Governing Council / Board and such other documents, which contain information pertinent to the project.

8.7 The PIO shall maintain a register of permanent and semi-permanent assets including Equipments and Machinery acquired wholly or mainly out of the grant-in-aid as well as log for use of them. The PIO should maintain proof of having procured genuine new machinery / equipment from the vendor along with invoices, payment receipt and market value of the specifically procured machine. The Register/ log shall be open to inspection by the Department of Heavy Industry. The utilization of assets so created shall be in public interest and shall be the responsibility of the PIO.

8.8 The PIO will ensure that assets will not be disposed-of/ sold/ transferred/ leased/ rented/ transferred without prior approval of (AC-CG), Department of Heavy Industry.

8.9 The PIO will not load DHI grants into the revenue formula, while determining the user charges/ fees.

8.10 The PIO will ensure that the services are offered to the CG sector units particularly those belong to Micro, Small and Medium Enterprises sector at charges equal to or lower than the market rates, so that their cost of conversion is kept equal to or below global best practices.

8.11 The PIO shall also be responsible for adhering to law of the land including rules of central, state and local Governments in its operation.

8.12 The PIO shall indemnify and protect Government of India from all costs, damages and expenses arising out of any claim, action or suit brought against Government of India by third parties in respect of any infringement of any patent, registered designs or Intellectual Property Rights resulting from use of any technical information, data or process or design belonging to or used by the PIO and/ or furnished to Government of India.

8.13 The PIO will adhere and follow the Labour Acts and Rules while executing this Contract and shall keep the Government of India indemnified and protected from all claims, costs, damages and expenses arising out of any

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violation of Labour Acts and Rules.

8.14 In case the PIO proposes to import any equipment, software etc. for the purpose of performance of the job in India, all duties related to such imports shall be paid directly by the PIO to the concerned authorities. DHI will not bear any liability on this account. It will be the responsibility of the PIO to provide the required particulars and documents to the Customs authorities and other Government Authorities and get the materials cleared and transported in time. The PIO shall be fully responsible for the delays, demurrage, penalties, charges and losses, if any, in this regard.

8.15 The PIO, shall under the project cost, insure and keep insured all the machinery and equipment etc. acquired for implementation of the Project, for a minimum period of 5 years by utilizing the grant-in-aid. In case of loss or damage of such machinery and equipment, etc. the insurance benefit will be payable to the Government of India.

8.16 PIO shall ensure quality documentation and video recording in its all Centre.

9. MANDATORY OBLIGATIONS

9.1 It is obligatory on the part of PIO i.e. IAFSM, to ensure free access to AC-CG members, Review Committee Members/ DHI officials / its representatives to all facilities/ assets and records relating to the project located at their works.

9.2 The PIO shall duly acknowledge DHI for funding this project in all publications, reports, publicity, presentations materials, assets/ facilities created, events etc.

9.3 The PIO shall furnish all deliverables of the project such as full documentation pertaining to common facilities (including machinery and equipment), design etc. to DHI.

9.4 The assets/ machinery acquired/ facilities created by the PIO wholly or substantially out of Government grants, except those declared as obsolete and unserviceable or condemned in accordance with the procedure laid down in the GFR 2017 shall not be disposed-of, encumbered or utilized for the another purpose/ project, without obtaining the prior approval of the authority which sanctioned the grants. In case of winding up or dissolution of the organization all the assets acquired to that effect out of the grants-in-aid by the Ministry should be returned forthwith to the Government of India.

9.5 The PIO shall be required to maintain subsidiary accounts of the Government grant and furnish to the Accounts Officer a set of audited statement of accounts after utilization of the grants-in-aid or whenever called for.

9.6 The annual report and audited accounts of the PIO will have to be submitted to the Ministry in Hindi & English in required numbers by the grantee to be laid on the table of the both Houses of Parliament within stipulated period of the close of the succeeding financial year of the grantee if the non-recurring grant is Rs.50 lakhs and above as one-time assistance.

9.7 The accounts of the grants shall be open for inspection by the authority approving the grant-in-aid and audit, both by the Comptroller and Auditor General of India and Internal Audit party of the Principal Accounts office of the Department of Heavy Industry whenever the grantee institution] PIO is called upon to do so.

9.8 The PIO is required to submit performance-cum-achievement reports within a period of one month after the end of the financial year.

9.9 The expenditure on any scheme should not exceed the approved cost of the respective scheme and monthly targets of expenditure.

9.10 The grants-in-aid should not be a source of profit. If after examination of the Audited Accounts, Ministry comes to the conclusion that the grants-in-aid have been source of profit, then the PIO shall forthwith refund the amount of grants-in-aid to Government of India.

9.11 The grantee organization shall not utilize the interest earned on the recurring/ non-recurring grants in aid, released to it for any purpose. The interest earned shall be indicated in the Utilization Certificate (UC) which can be either adjusted in the next release or to be refunded to the Department of Heavy Industry after grants in aid sanctioned



is utilized.

9.12 The PIO may keep in view all the economy instructions while incurring the expenditure. The organization shall not incur any expenditure on those items, the purchase of which have been banned.

9.13 A Penal interest is chargeable if the PIO fails to furnish progress report Audited Statement of Accounts/ Audited Utilization Certificate etc. within the specified period after release of grant- in- aid in the event of short closure of the project due to non-technical reasons.

9.14 In the event of any liquidation or bankruptcy proceedings or any threatened distress action against the PIO or any of its assets; machineries and equipment procured for the purpose of the Project out of or with the support of grant- in- aid shall be outside such proceedings and the GOI may assume the control and management of the PIO and appoint any of its officer or authorized representative to run the Project.

9.15 It is mandate for PIO to register self and all Participating Organisation in the project on Public Financial Management System (PFMS i.e. www.pfms.nic.in) for receiving Government grant sanctioned to them and also tracking fund flow, unspent balances, etc. till last level of implementation of the project. The PIO is also required to submit data on Unspent balance in respect of the project on every last day of the month for which Government grant released.

10. ROLE AND RESPONSIBILITIES OF PROJECT COORDINATING ORGANIZATION — DHI

10.1 DHI will approve and provide grants and review the progress of the project.

10.2 A nominated Officer of DHI for the project will represent DHI in the Board/ Governing Council Project Co-ordination Mechanism of PIO.

10.3 No financial decisions will be taken in the Board / Governing Council / such mechanism without the presence of the DHI nominee or without the approval of DHI.

10.4 DHI would release the funds to the PIO i.e. IAFSM, in the designated Project Account for execution of the project depending upon the financial, technical and physical progress of the project and recommendations of the nodal officer.

10.5 DHI will monitor utilization of Grants by PIO so that the funds released are utilized by PIO only for the purpose of the project component for which it is released.

10.6 DHI would be free to use the equipment/ facilities; software procured/ developed for any scientific work or technology development/ demonstration purpose on their own or can request the PIO for use of this infrastructure by any other organization/ agency or manufacturer for scientific technology development/ demonstration for public purpose.

10.7 DHI will provide necessary certificates/ documents for facilitating approvals from Central Government under section 35 of IT act towards expenditure incurred on scientific research, wherever applicable.

10.8 Joint Secretary (HE & MT), DHI shall be the contact person for all matters concerning the project.

11. MONITORING PROGRESS

11.1 The PIO will furnish the progress (Physical/ Technical and Financial) of the project in reference to milestones for each quarter within a month after completion of the quarter in compliance with paragraph 16.2 of the Scheme Guidelines. For the purpose of furnishing quarterly reports, the 1st quarter starts in April of every financial year. The Quarterly Progress Reports (QPR) are to be furnished in the prescribed formats for reporting technical and financial progress.

11.2 Joint Secretary (HE&MT) of DHI (or his authorized representative(s)) will monitor the progress of the project with reference to the milestones specified in the project schedule. If necessary a team could undertake physical verification. DHI reserves the right to outsource full/ part work of physical verification.



11.3 Progress reporting may be done online, if such a system is made available by DHI.

11.4 Grants linked to milestones will be released after physical verification of the reported progress and request of grant release.

11.5 Annual Reports of the Project will also be submitted along with financial year end Utilization Certificates.

11.6 If deemed necessary, DHI and PIO will jointly constitute a Project Monitoring and Review Committee (PMRC) involving representatives from DHI, PIO, Industry Association, user industry and domain experts from outside.

11.7 Other steps for progress monitoring shall be as per the Notified CG Scheme Guidelines on November 5, 2014 and /or orders of Screening Committee.

12. PROJECT REVIEW BY DHI NODAL OFFICER

12.1 In case monitoring points to deviations, the progress of the projects will be reviewed by the DHI Nodal Officer(s) along with beneficiary units in reference to -set Project Schedule/ milestones and output.

12.2 Overall performance of the scheme will also be reviewed at least once in a year.

12.3 DHI Nodal officer will submit his report to the Screening Committee for its progress review from time to time.

12.4 Other mechanism for monitoring shall be as per the Notified CG Scheme Guidelines to be read with orders of Apex Committee issued in this regard from time to time.

13. PROJECT REVIEW BY APEX COMMITTEE OF THE CG SCHEME (AC- CG)

13.1 The Screening Committee will consider the report of the Nodal Officer and the QPR furnished by the PIO and send its comments/ recommendations along with the copy of the Quarterly Reports to the Apex Committee.

13.2 The Apex Committee will review the progress of the project which has been approved by it.

13.3 If necessary PIO and beneficiary units may be invited during progress review at AC~CG.

13.4 The AC~CG may send its own teams for physical verification, particularly in cases where the progress has not been as per milestones set.

13.5 The monitoring may bring out need for changes in approval of the project, which may be considered by the Apex Committee on their merits.

14. PROJECT REORIENTATION

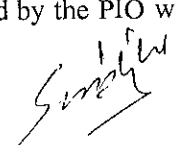
The scope and the work/ activities of the project can be re-orientated without deviating from broad objective and scope of the approved project, based on the recommendations of nodal officer, Screening Committee and approval of AC~CG

15. FUND UTILIZATION CERTIFICATE (UC) AND PROJECT ACCOUNTS

15.1 Before the release of subsequent grant, PIO shall submit the Fund Utilization Certificate (UC) in the specified format (Form GFR 12A) (Rule 238 (1) of General Financial Rules 2017) along with progress report and a certified copy of project account statement duly remarked / reconciled.

15.2 All Utilization Certificates indicating the financial statements shall be audited and certified by "Accounts Officer" of the PIO or by authorized "Auditors" or "Head of Accounts".

15.3 The UC in respect of utilization of grants for the purpose/ object for which it was sanctioned should be furnished by the PIO with an audited statement of accounts, within stipulated period of the closure of the financial



year in which Grant-in-Aid is released. The utilization certificate should also disclose whether the specified, quantified and qualitative targets that should have been reached against the amount utilized, were in fact reached, and if not the reasons thereof. They should contain an output based performance assessment. An UC of the released / utilized amount will be submitted without fail before the end of the next financial year or before release of the next instalment of grant, whichever is earlier. It will contain a certificate that previous UCs (wherever applicable) have been submitted to the satisfaction of the Department of Heavy Industry.

15.4 An interim UC shall be submitted, while making request for release of fund.

15.5 The project accounts will be maintained as per the GO/ GFR and best practices. Name/s of authorized signatories will be informed to DHI.

15.6 The Accounts duly audited by external auditors shall be forwarded to DHI at the end of each financial year.

15.7 Unspent balances/ bank interest / other earning will be taken into account in the Project. Any interest/ investment returns received on account of DHI funds will be counted as DHI grant within the overall sanction. UC will contain statement of such income. The interest earned shall either be adjusted in the next release or shall be refunded to the Department of Heavy Industry after grants in aid sanctioned is utilized.

15.8 Grants / bank interest spent on purposes other than sanction will attract heavy penalties and other punishments as per the provisions of law of the land.

15.9 Utilization of Fund and maintenance of Accounts should be done in accordance with relevant provisions of GFR 2017 and will be subject to Government audits/ CAG audits.

16 PROJECT COMPLETION & TECHNICAL REPORT

16.1 A project will be deemed to be completed when all outcomes have been achieved.

16.2 The project completion (commercialization of technologies developed/ acquired or facilities created) will have to be assessed in consultation with beneficiary units.

16.3 The PIO will report the project closure to the Joint Secretary (HE&MT), DHI. The Report will be submitted to the Screening Committee constituted under the Scheme.

16.3 The PIO along with participating organisation(s) and beneficiary units from CG sector shall make a presentation to the Screening Committee on project completion.

16.4 DHI nodal officer and/or an Expert Committee appointed by the Screening Committee will physically verify project completion and give their report to the AC-CG.

16.5 The AC-CG will finally approve the request of project completion on merits.

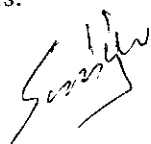
16.6 The PIO shall submit a Project Completion Report (Technical cum Financial) along with a soft copy in CD (preferably in MS word format) to the nodal officer in DHI within one month of the completion of the project irrespective of holding of AC-CG. The PIO shall also furnish the feedback, suggestions and project evaluation along with the project completion report. Such completion reports will be used for CG-Scheme evaluation and drafting Roll-out Phase of the CG-Scheme.

16.7 Based on approval by AC-CG, DHI will issue project closure certificate and also settle any remaining grants/ financial dues.

16.8 Project time overruns will have to be justified to AC-CG/ DHI.

16.9 Project cost overruns are not entertained by DHI. However, DHI-AC-CG will have to be in loop including early warnings. Further action will be taken as per Government Orders.

16.10 Project failures (part or full) will have to be justified to DHI AC-CG. Further action will be taken as per Government orders.



16.11 All decision of AC-CG will be binding on the PIO.

17. CONFIDENTIALITY

17.1 The PIO will maintain confidentiality and prevent disclosure thereof of all information and data exchanged/ generated pertaining to work assigned under this MoU till completion/ commissioning of the project except with prior consent of DHI.

17.2 The above condition is subject to RTI and other laws of the land.

18. STATUTORY REQUIREMENTS

18.1 Implementation of the Project will be carried out by the PIO in accordance with statutory provisions like Workmen's Compensation Act, Labour (Regulation and Abolition) Act, Contract Labour (Regulation and Abolition) Act, employees Provident Act or any other related enactment passed by the Parliament or State Legislature and any rules/ laws made thereunder by the either Central or respective State Governments.

18.2 Since the project is sanctioned to the PIO, it shall not be transferred to any other Institution. Transfer of project money within the Institution or with other Institutions under the same Management is not permitted under any circumstances.

18.3 If the force majeure conditions continue beyond six months, DHI and the PIO shall then mutually decide about the future course of action.

19. FORCE MAJEURE

None of the participating agencies/ bodies shall be held responsible for non- fulfilment of their respective obligations under this MoU due to the exigency of one or more of the force majeure events, such as but not limited to, acts of God, war, natural calamities such as flood, earthquakes etc. and strike, lockout, epidemics, riots, civil commotion etc. provided on the occurrence of cessation of any such events, the party affected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation.

20. VALIDITY OF APPROVAL

The MoU comes into force on the date of issue and is valid for five years from the date of issue or till the date of issue of Project Closure Certificate by DHI or till the end of scheme whichever is earlier.

21. AMENDMENTS TO THE TERMS & CONDITIONS OF APPROVAL

No amendment or modification of terms and conditions shall be valid unless the same is made in writing by DHI and the PIO or their authorized representatives and specifically stating the same to be an amendment of this MoU. On part of DHI approval of the Apex Committee will be a pre- requisite for making any amendment to this MoU. The modifications/ changes shall be effective from the date on which they are made/ executed, unless otherwise agreed to.

22. RESOLUTION OF DISPUTES

22.1 In the event of any dispute between DHI and the PIO, in the first instance, the same should be resolved mutually. For this, Secretary, Heavy Industry will be empowered to nominate a common panel of arbitrator.

22.2 In the event of non-resolution, the matter shall be referred to arbitration to be held in New Delhi as per the Indian Arbitration and Conciliation Act 1996. Costs shall be shared equally.

23. JURISDICTION



The instant MoU issued by DHI and acceptance of the same by the PIO will constitute an Agreement. The Courts at Delhi shall have jurisdiction in all matters concerning this Agreement including any matter arising out of the arbitration proceedings or any award made therein.

24. GOVERNING LAW

Notwithstanding anything contained in this MoU, in case of any conflict between any of the provisions of this MoU with provisions of DHI Notification on CG Scheme dated 5.11.2014/ General Financial Rules 2017/ and other relevant Government Instruction(s)/ Order(s), the latter will prevail. Right of interpretation of DHI Notification on CG Scheme dated 05-11-2014/ General Financial Rules 2017/ Government Instruction(s)/ Order(s) for this purpose shall rest with the Secretary, Department of Heavy Industry.

25. TERMINATION

25.1 **Termination by DHI:** DHI may terminate this arrangement upon 30 calendar days' notice in writing or after occurrence of any of the events specified in paragraphs below:

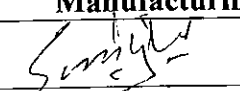
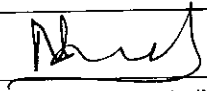
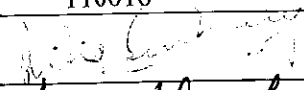
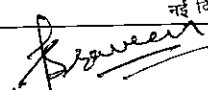
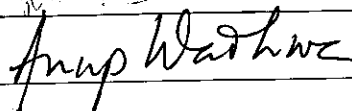
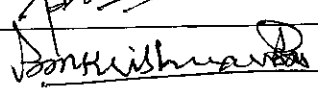
- (a) If the PIO does not remedy a failure in the performance of its obligations under the Agreement, within 30 days of being notified of such a failure, or within such further period as DHI may have subsequently approved in writing;
- (b) If the PIO becomes insolvent or bankrupt; or
- (c) If, as the result of Force Majeure event, the PIO is unable to perform a material portion of its obligations for a period of not less than 30 days.

25.2 **Termination by PIO:** PIO may terminate this arrangement upon 30 calendar days' notice in writing after occurrence of any of the events specified in paragraphs below:

- (a) If DHI fails to make any payment due to the PIO pursuant to this arrangement within 30 days after receiving written notice from the PIO that such payment is overdue; or
- (b) If, as the result of Force Majeure, DHI is unable to perform a material portion of its obligations for a period of not less than sixty days.

The termination of this arrangement shall not prejudice or affect in anyway, the rights and benefits accrued or liabilities and duties assigned to the Parties of this MoU.

WITNESS WHEREOF the parties hereto have signed this MOU on the day month and year mentioned hereinbefore.

	For and behalf of IITD-AIA Foundation For Smart Manufacturing	For and on behalf of Department of Heavy Industry (DHI)
Signature		
Name & Designation	Dr. Sunil Jha, Director	एन० शिवानंद/N. SIVANAND संयुक्त सचिव/Joint Secretary भारी उद्योग एवं लोक उद्यम मंत्रालय Ministry of Heavy Industries & Public Enterprises भारी उद्योग विभाग/Department of Heavy Industry भारत सरकार/Govt. of India नई दिल्ली/New Delhi
Address	IIT Delhi, Hauz Khas, New Delhi - 110016	
Witness1		
Witness2		

**EXECUTIVE SUMMARY OF THE "PROJECT"
COMMON ENGINEERING FACILITIES CENTRE (CEFC) AT IIT-DELHI BY IAFSM**

PROJECT TITLE	:	National Common Engineering Facility Center On Smart Technology Enabled Manufacturing a Common Engineering Facilities Centre (CEFC) as SAMARTH (Smart & Automated Manufacturing & Rapid Transformation Hubs) Udyog at IIT - Delhi
TARGET	:	1) Awareness Building, 2) Prototyping, Simulation and Testing Services, 3) Consulting Services, 4) Site Integration Services, 5) Education and Training, 6) Skills Certification, 7) Job work, 8) Research to promote innovation and adoption of Industry 4.0 solutions in order to make Indian industries more globally competitive in Capital Goods Sector
PROJECT DURATION	:	Within the financial year of 2019-20
PROJECT OUTLAY	:	Rs. 30.85 Crore
PROPOSED FACILITIES	:	a) Cyber Physical Lab for Smart Manufacturing Research at IIT-Delhi, Hauz Khas campus b) Cyber Physical Factory at IIT-D Sonapat Campus
MAIN SPONSOR	:	Department of Heavy Industry (DHI), Ministry of HI & PE, Govt. of India
PROJECT EXECUTION	:	IITD-AIA Foundation for Smart Manufacturing (IAFSM)
PROJECT STAKEHOLDERS	:	IIT Delhi & Automation Industries Association (AIA)

OBJECTIVES OF THE PROJECT:

The Project will revolutionize the production operations in SMEs by improving their quality, reducing throughput time and inventory cost. New analytics solutions help customers move ahead on Smart Manufacturing. The Project will lead to a simplified approach to analytics converting data into decisions. The Project will also enable flexibility to the manufacturers to customize their products to cater the high expectations of their consumers. This will also improve the quality of jobs and uplift the standard of living of people. The project shall introduce the demonstration, experimentation, and dissemination of multiple digital technologies in the Capital Goods sectors

OUTCOME OF THE PROJECT

Multiple technologies will be absorbed, integrated and deployed in showcasing flexible operating environments for different manufacturing challenges. Beneficiaries of the project will be able to de-risk their investments and take decisions for up gradation confidently. These technologies (a) to (l) below are currently envisaged from well-established and proven parties as end users will prefer robust systems for implementing in their plants. However, the CEFC will also generate tremendous interest from local suppliers to test out the reliability and compatibility with multiple other technologies.

Cyber Physical Systems (b) Sensors, Actuators & Controllers, (c) Collaborative Robotics, (d) Energy Efficient & Safety Devices, (e) Rapid Prototyping & Tooling Processes, (f) Wireless Instrumentation, (g) Digital Simulation of products processes, (h) Remote Maintenance, (i) Additive Manufacturing and 3D Printing, (j) CyberSecurity, (k) Augmented Reality, (l) Data Analytics of products, processes and services.



With the participation of multiple suppliers, we expect the following outcomes in terms of technology development, migration of Indian Industry to global standards in alignment with BIS:

1. Development of Communication Interfaces between Discrete Manufacturing Modules and MES - Client/Server or host-based systems, PC and PLC-based systems, integrate industrial communication systems like Profibus, Euromap, OPC, XML or web services, UMCM (Universal Machine Connectivity for MES)
2. Integration of sensors and development of customized CNC controller for various discrete manufacturing machine tools as per Industry 4.0 requirements. Implementing IEC 61131-3 PLC programming, PLC Open function blocks, and DIN 66025 compliant CNC controller.
3. Development of model and algorithms for converting data into information and then communicating to cyberspace (Machine cloud). Machine learning algorithm, OPC-UA and MQTT protocol implementation.
4. Development of digital product memory and define information exchange during production. The Digital Product Memory is based on semantic technologies, man-machine communication (M2M), intelligent sensor networks, instrumented environments, RFID technology and multimodal interaction. The Structure of the Object Memory Model will be as per W3C Standardization.
5. Online machine health evaluation and developing prediction algorithms for potential failure. Prediction of Machine Health Condition using Neuro-Fuzzy, Bayesian or similar machine learning Algorithms

BENEFITS

Major benefits of the Project are as follows:

- (i) Increase existing system productivity
- (ii) Optimize resource consumption and re-use
- (iii) Optimize systems for reduced energy consumption
- (iv) Shorten new product introduction, time-to market, and time-to-volume
- (v) Improve production layout and minimize investments
- (vi) Ensure that machines and equipment are in the right place
- (vii) Ensure that sufficient material handling equipment is available
- (viii) Optimize buffer sizes
- (ix) Ensure that product handling is kept to a minimum



PROPOSED IMPLEMENTATION SCHEDULE BY IAFSM AT IIT – DELHI

Project Milestones	2017-18	Y2 (2018-19)	Y3 (2019-20)	Y4 (2020-21)	Y5(2021-22)
LAUNCH	Formation of SPV and Governing Council	■			
	Announcement of Project for additional partnership	■			
	Finalization of Execution Team from Partner Companies	■			
	Recruitment of First batch of CEFC Staff	■			
	Satting up boot Camp @ Hauz Khas Campus	■			
ENGINEERING	Integration & Testing of critical automation and IT components	■			
	Delivery of training programs - Internal	■			
	Awareness Workshops	■	■		
	Need Survey	■	■		
	Inputs to Architect for Finishing Building Interiors	■			
	Specifications Finalization of CP Lab	■			
	Specification finalization of Discrete Manufacturing Cell	■			
	Layout Design & Simulation of Discrete Manufacturing Cell	■			
	Website of CEFC	■			
	Online Content development for Training		■	■	■
	Specification finalization of Hybrid Manufacturing Cell		■		
	Layout Design & Simulation of Hybrid Manufacturing Cell		■		
EXECUTION	Ordering of CP Lab Equipment	■			
	Setting up CP Lab	■			
	Ordering of Discrete Manufacturing Equipment		■		
	Digital Twin Development for Machina Tools		■		
	Installation of Machina Tools & related Fabrication		■		
	Fully Integrated Demonstration for Discrete Manufacturing			■	■
	a) Auto Components (Gaeir, Cylinder Head etc.)			■	■
	b) Machine Tool Components (Linear Slide)			■	■
	Design & Procurment of Hybrid Manufacturing Equipment			■	■
	Installation of Hybrid Manufacturing Equipment			■	■
Demonstration of Hybrid Manufacturing			■	■	
SERVICES	Imparting Skills and Technology Awareness	■			
	Hands on Training on Technology Equipment	■			
	Prototyping, Simulation and Tasting Services	■			
	Consulting Sarvicas	■			
	Job work		■		
	Site Consultancy / Supervision Services		■		
	Present draft curriculum to AICTE		■		
	Faculty Training Program		■		
	Engage Sector Skill Council		■		
	Customizad program for different roles		■		
	Skills Certification		■		
	Technology Licensing		■		
MEMBERSHIPS	Membership drive Industry	■			
	Membership drive Academia	■			
	Cloud Server hosting			■	■
EVENTS	Conferences		■	■	■
	Compalitions		■	■	■
	Exhibitions		■	■	■

LIST OF EQUIPMENT TO BE INSTALLED IN IAFSM AT IIT-DELHI**EQUIPMENT / MACHINERY ARE IDENTIFIED FOR SETTING UP THE CYBER PHYSICAL
FACTORY****(The proposed supplier / make may vary at the time of purchase and actual implementation)**

S.No.	Equipment / Machinery	Proposed Supplier / Make	Approx. Cost (in Rs. Lakhs)
1	CNC Lathe	EMCO, MTAB, Jyoti CNC, Ace Micromatic	55.0
2	CNC Milling	EMCO, MTAB, Jyoti CNC, Ace Micromatic	60.0
3	CNC Grinding	Grind Master, Micromatic, MTAB	45.0
4	3D Printing	Altem Technologies, Stratasys, EOS, 4DS India, Redington, 3D Systems	35.0
5	Laser Cutting	Spinks Impex, Sahajanand Lasers	32.6
6	Abrasive Water Jet	Stonetek India	45.0
7	Sheet Metal Press	ISGEC Heavy Engineering	25.0
8	Robotic Multipurpose Manufacturing Cell	Grindmaster	150.0
9	Die Casting	HMT, Toshiba	15.0
10	Thermoforming	RR Plast, ARBURG, Mac Machine, CLS	18.0
11	Hoppers	ACCUTEK	7.0
12	Mixing Equipment	ACCUTEK, Bosch	15.0
13	Oven	CVC Taiwan, Countech, Heat and Control	16.0
14	Dispensing	ACCUTEK, Bosch, Ishida, Sidel, Hilda, Hilden, Petals	20.0
15	Capping	ACCUTEK, Bosch, Ishida, Sidel, Hilda	14.0
16	Labelling	ACCUTEK, Bosch, Skanem Interlabels, Neutron	18.0
17	Wrapping	ACCUTEK, Bosch	15.0
18	Packaging	ACCUTEK, Bosch, Heat and Control, Uflex	15.0
19	Automated Material Handling Equipments	PARI, Gudel, Alstrut	60.0
20	ASRS	MTAB, PARI	20.0
21	Mobile Robots	KUKA, HiTech, Omron	45.0
22	AGV	HiTech Robots, Kuka,	35.0

23	COBOT	Universal Robots, ABB, Bosch, Kuka, Yaskawa, Hiwin, Omron, Yaskawa, Comau	50.0
24	Conveyor	PARI, Armstrong, Alstrut	12.0
25	Automated Inspection	Mahr, Mitutoyo, Taylor Hobson, Zeis, GMT,	150.0
26	Cyber Physical Lab & Associated Software	Festo, ETS, Rexroth, Bosch, SMC	250.0
TOTAL			1222.6

AUTOMATION HARDWARE FOR RESEARCH AND DEVELOPMENT WITH THE EQUIPMENTS

(The proposed supplier / make may vary at the time of purchase and actual implementation)

S.No.	Automation Hardware	Proposed Supplier/Make	Amount (in Rs. Lakhs)
1	Industrial Computers with CNC programming & interfacing Software	Siemens, B&R, Mitsubishi, Beckhoff, Parker	35
2	Sensors (Acoustic, vibration, temperature, encoders, accelerometer, gyroscope, etc.)	Pepperl+Fuchs, Kistler, Analog Devices, ifm electronics, Omron	30
3	Linear and Rotary positioners with Servo drives & motors	Hiwin, Parker, B&R	25
4	Cameras with image processing software	Zeiss, Leica, Pepperl+Fuchs, Yogasa	15
5	Force-Torque dynamometer	Kistler, Schunk, HBM	30
6	Dimension measurement probe	Micro-Epsilon, Renishaw	12
7	Modular manufacturing processing stations	Festo, Aircon, MTAB	35.0
8	Confocal sensor with controller	Micro-Epsilon	15
9	Embedded controller hardware and software	Siemens, Mitsubishi, Rockwell, Beckhoff	5
10	Wired & Wireless comm. modules, RFIDs	Pepperl+Fuchs, Turck, Siemens, Digi, Moxa, Weidmuller	5
11	Motion controller / PLCs/ Programmable Automation Controller (PAC)	Siemens, B&R, Rockwell, Beckhoff, Parker	20
12	Computers, network storage, server, Laptop	HP, Dell, IBM, Lenovo	25

Sumit

13	Automation Software	Festo, Siemens, Famic Technologies	50
14	Manual Workstation with AR	Festo, Aircon, SMC, Adroit	25
		TOTAL	327

IT SOFTWARE & SERVICES

(The proposed supplier / make may vary at the time of purchase and actual implementation)

S.No.	IT Software & Services	Proposed Supplier/Make	Amount (in Rs. Lakhs)
1	Enterprise Resource Planning (ERP)	SAP, Vlex Plus, iScala	350* (Software Licenses and services will be progressively added depending on the number of clients being serviced and their data need. Hence further break up is not possible at this stage.)
2	Manufacturing Execution System (MES)	Rockwell, Mitsubishi, Bosch	
3	Product Lifecycle Management (PLM)	Siemens, PTC	
4	Engineering	Dassault, PTC, Axcend	
5	Simulation	Witness, Dassault, PTC, FlexSim	
6	Cloud Server	Siemens, PTC, Microsoft, IBM, Google, IITD	
7	IT Security	FireEye, Belden	
8	Quality Management System (QMS)	ASI Datamyte, Hexagon	
9	Warehouse Management System (WMS)	PARI, Bosch, Grey Orange	

Sundar

KEY ACTIVITIES AT IAFSM AT IIT-DELHI

Awareness Building	:	The initial period will be utilised for demonstration, surveys and sensitisation of various stakeholders to the possibilities of adapting the proposed solutions to the immediate needs of users.
Prototyping, Simulation and Testing Services	:	The CPS facility and the associated technologies will provide a one stop shop for users whose needs cut across multiple disciplines and who want to witness a comprehensive digital transformation before taking up for actual implementation. This will enable clients to experiment and innovate with an appropriate mix of standard and customised solutions. Solution providers, System Integrators and Machine Builders will also benefit as they will not have to invest in 3rd party equipment. Instead they will have the opportunity to utilise specific portions of the CEFC, on a pay per use basis.
Consulting Services	:	The domain of Smart Manufacturing is expected to open up a new opportunity in industrial consulting, especially with regard to identification and removal of bottlenecks in current operations. The CEFC multi-disciplinary teams will undertake feasibility surveys, ROI analysis and process improvement studies for clients, prior to implementation and also post implementation.
Job work	:	The CEFC will carry out Job work for clients who are building their Smart Manufacturing concept with them. Such clients will be able to set up machine parameters for short production runs to test out product quality and market acceptability of multiple design options.
Research	:	Fundamental and applied research on various technologies associated with the implementation of smart technology enabled manufacturing will be carried out in the CEFC enabling easy penetrating of the state-of-art technologies to the industries. IIT Delhi will take up research projects in consultation with industry for development of cyber physical systems for machine tools, industrial IoT, machine data cloud, machine controllers etc. to bridge the technology adoption gap in manufacturing. These research projects will be executed with clear objectives to meet focussed technology requirement for smart manufacturing and easy adoption by the industries. The developed technologies will be licensed further for commercialization to interested industries.
Site Integration Services	:	Many times clients wish to test out the Proof-of-Concept on their actual production lines. The CEFC team assigned to the Client during concept formulation will undertake such site activities with a pool of industry solution providers and system integrators.
Education and Training	:	Short-term education and training courses will be offered along with on-line learning and assessment tools to educators and users on a chargeable basis. All the 12 technology streams will be covered.
Skills Certification	:	It is expected that Skill Councils such as Automotive Skill Council, Capital Goods Skill Council, Industrial Automation Skill Council and Tool Rooms will be creating their unique set of Role based competencies. The CEFC will offer them and their Training Partners, a gap filling option for theory and practical, and a brand-agnostic independent certification.

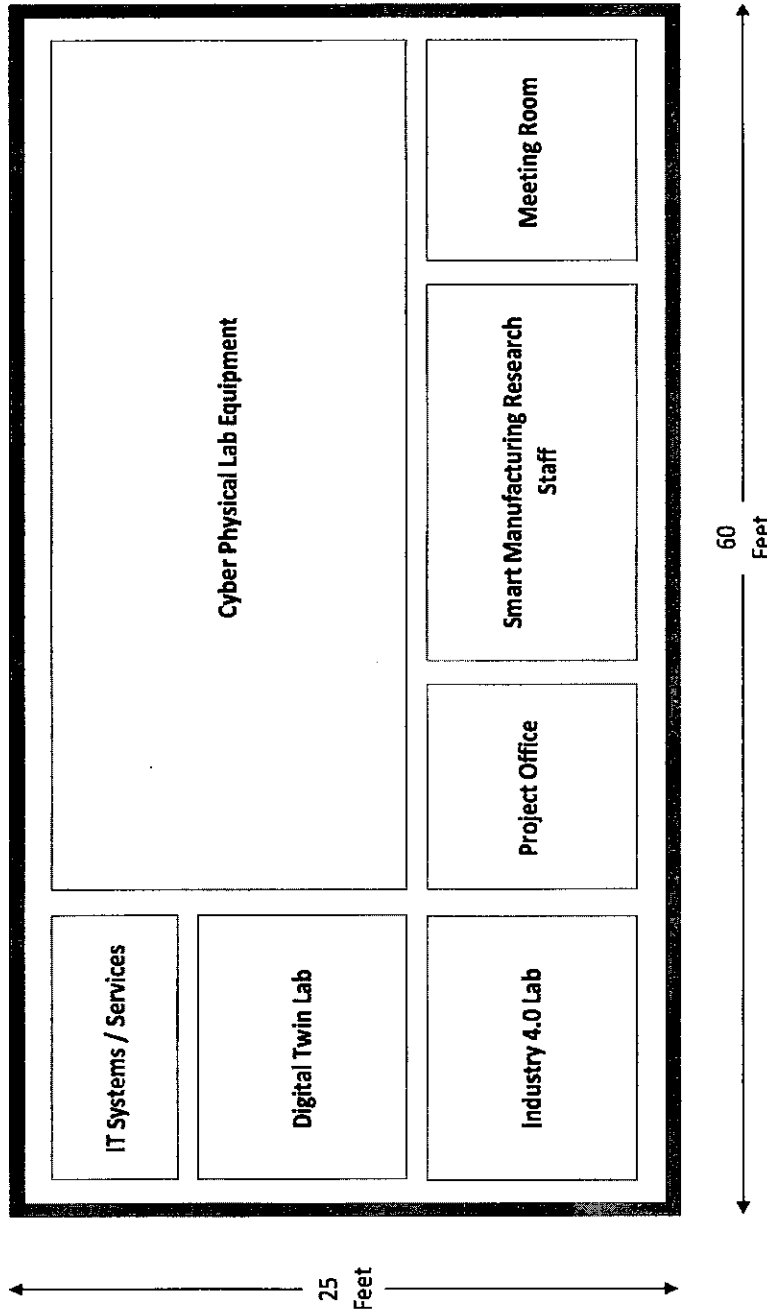
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LAB FACILITY MODEL

As a part of CEFC, it is proposed to set up a Cyber Physical Lab for Smart Manufacturing Research at IIT Delhi, Hauz Khas campus (proposed floor area 1500 sq. ft.) and a full fledged Cyber Physical Factory at IIT Delhi Sonapat campus (proposed floor area 30000 sq. ft.). The proposed layout of the two facilities is shown below.

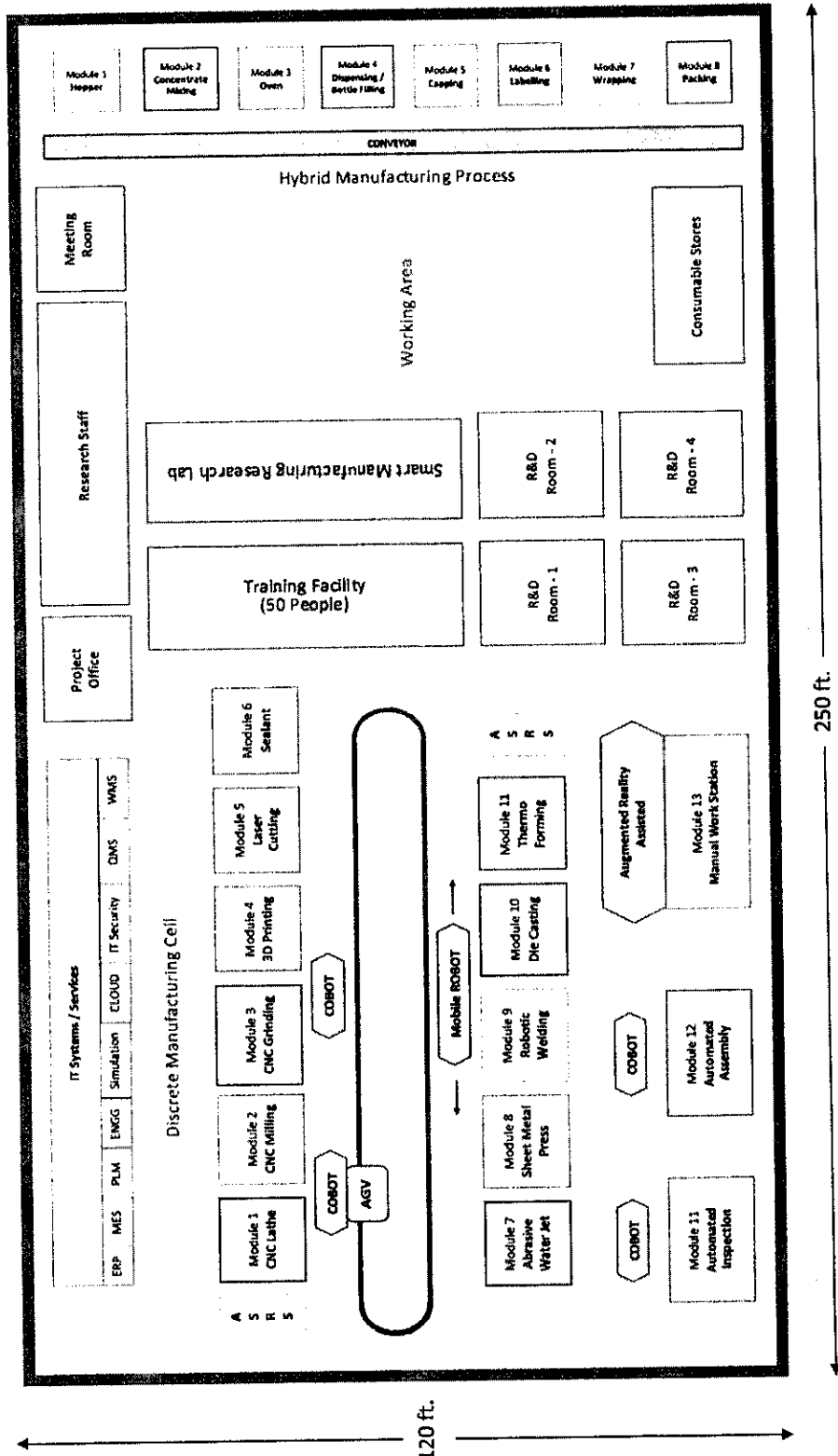
CoE on Smart Technology Enabled Manufacturing

Research Lab Space @ IIT Delhi, Hauz Khas [1500 sq. ft.]



CoE on Smart Technology Enabled Manufacturing

Cyber Physical Factory @ IIT Delhi, Sonapat [30000 sq. ft.]



120 ft.

250 ft.

Sonapat

The Cyber Physical Factory will house the Discrete Manufacturing Cell and Hybrid Manufacturing facility with following equipment:

Discrete Manufacturing:

- i. CNC Lathe
- ii. CNC Milling
- iii. CNC Grinding
- iv. 3D printing
- v. Laser Cutting
- vi. Sealant Unit
- vii. Abrasive Water Jet
- viii. Sheet Metal Press
- ix. Robotic Welding
- x. Die Casting
- xi. Thermoforming
- xii. Automated Inspection
- xiii. Automated Assembly
- xiv. Manual Work Station
- xv. Automated Storage & Retrieval System (ASRS)
- xvi. Collaborative Robots (COBOT)
- xvii. Mobile Robot
- xviii. Automated Guided Vehicle (AGV) / Conveyor

Hybrid Manufacturing:

- i. Hopper Unit
- ii. Concentrate Mixing
- iii. Oven
- iv. Dispensing/ Bottle Filling
- v. Capping
- vi. Labelling
- vii. Wrapping
- viii. Packaging
- ix. Conveyor

The modules in these manufacturing facilities are interfaced with following IT systems &

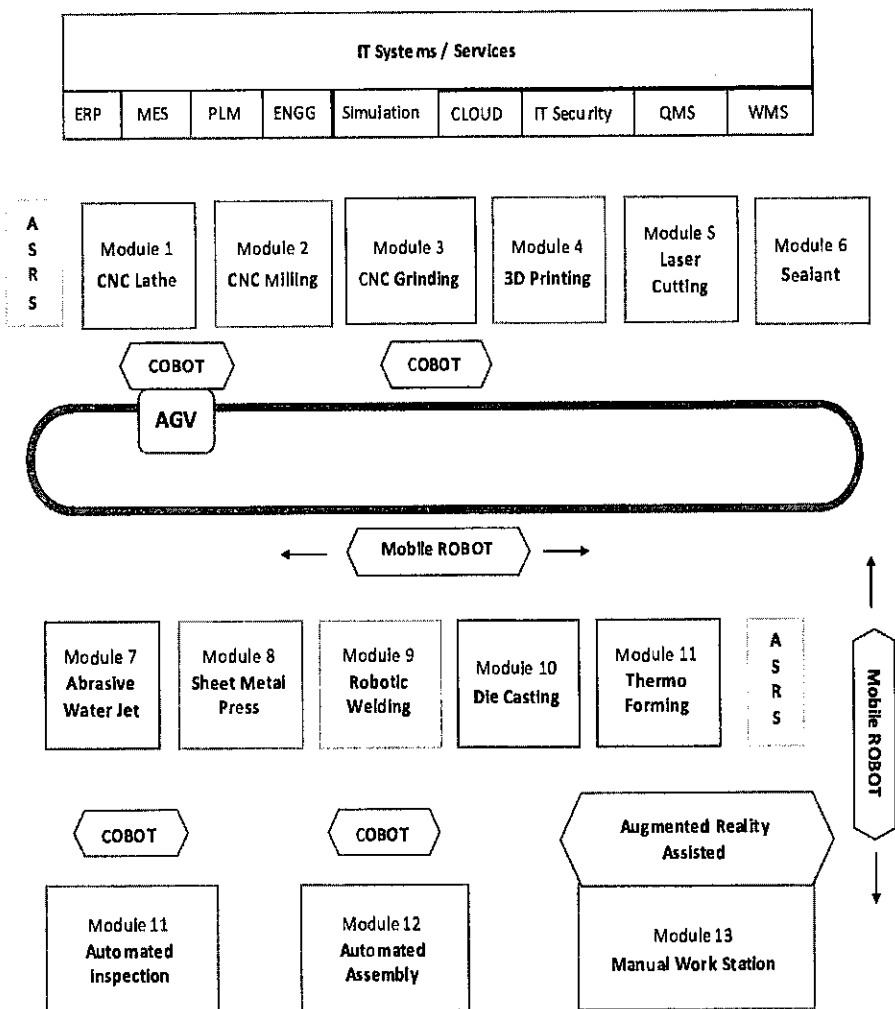
Services:

- i. Enterprise Resource Planning (ERP)
- ii. Manufacturing Execution System (MES)
- iii. Product Life Cycle Management (PLM)
- iv. Engineering



- v. Simulation
 - vi. Cloud Server
 - vii. IT Security
 - viii. Quality Management System (QMS)
 - ix. Warehouse Management System (WMS)
- Layout of Discrete Manufacturing Smart Factory is shown below which can be used for various client services and research in the CEFC. It houses all major equipment to cater the need of machine tool and discrete component manufacturing interfaced with major IT systems and services to implement and demonstrate industry 4.0 functionality. Various material handling equipment such as conveyor, gantry Robot, AGV, mobile Robot etc. will be used to move material between manufacturing modules as per the process plan.

Cyber Physical Smart Factory
Discrete Manufacturing Cell

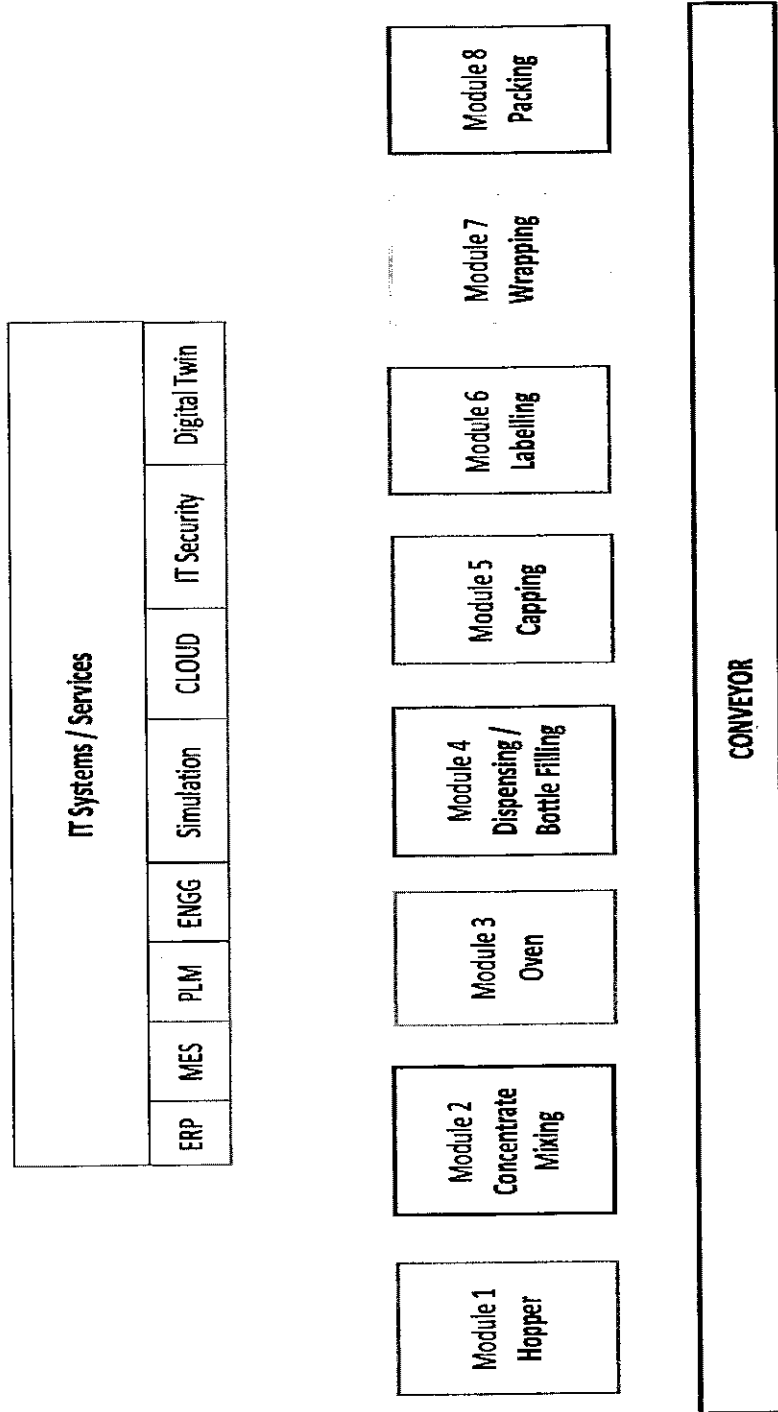


Signature

It is also planned to set up a Cyber Physical Smart Factory for Hybrid Manufacturing required for Food & Beverages and Bottling plants. All modules required for manufacturing a customized batch of food/beverage items are included in the facility. All modules are again interfaced with IT Systems & services to demonstrate functionality of industry 4.0 and smart manufacturing. It can also be used as a test and development platform for customized technologies to suit needs of manufacturing industries. Figure shows the layout plan of hybrid manufacturing facility.

Cyber Physical Smart Factory

Hybrid Manufacturing



Signature

TRUST RECEIPT

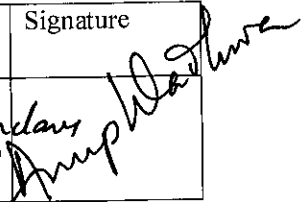
1. In the matter of MoU dated of2017 by Department of Heavy Industry (DHI), addressed to **IITD-AIA FOUNDATION FOR SMART MANUFACTURING at IIT- DELHI**, regarding the Project on Common Engineering Facilities Centre (CEFC) consisting of a) Cyber Physical Lab for Smart Manufacturing Research at IIT-Delhi, Hauz Khas campus and b) Cyber Physical Factory at IIT-D Sonapat Campus.

2. The Machinery and Equipment though purchased in the name of **IITD-AIA FOUNDATION FOR SMART MANUFACTURING at IIT - Delhi** with the funds provided by DHI, for the subject project, will be in Trust with **IITD-AIA FOUNDATION FOR SMART MANUFACTURING at IIT - Delhi** during the implementation of the project and thereafter till they are useful for the purpose stated in the MoU.

3. The Machinery and equipment will not be transferred or disposed of by us without the prior written approval of DHI, and would remain with **IITD-AIA FOUNDATION FOR SMART MANUFACTURING at IIT - Delhi**.

4. IN WITNESS THERE OF Automation Industry Association (AIA) has executed these presents on(day) of(month),(year).

Signed by

Sl.No.	Name	Occupation & Address	Signature
1	Automation Industry Association (AIA)	DIRECTOR - AIA B-1, Panchsheel Enclave New Delhi - 110017	

For and on behalf of the **IITD-AIA FOUNDATION FOR SMART MANUFACTURING AT IIT-Delhi** in the presence of Witnesses:

Sl.No.	Name	Occupation & Address	Signature
1.	SONIL JHA	IIT DELHI, HAUZ KHAS NEW DELHI - 110016	