



# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

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**Regd. Office:** IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

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## Minutes of the 2nd Hub Governing Body (HGB) meeting of the IIT Mandi iHub and HCI Foundation

### Logistics

The second meeting of the HGB of IIT Mandi iHub and HCI Foundation was held on 30<sup>th</sup> June 2021 at 10:30 AM in A7 Conference room, IIT Mandi, and online via Google Meet ([meet.google.com/fhn-ujmx-nbc](https://meet.google.com/fhn-ujmx-nbc))

### Attendance

1. Prof. Ajit Kumar Chaturvedi, Director, IIT Mandi – Chairman (*through Video Conferencing*)
2. Academic Representatives:
  - i. Dr. Venkata Krishnan, (SRIC & IR), IIT Mandi; Associate Professor, IIT Mandi
  - ii. Dr. Varun Dutt, Lead coordinator, IIT Mandi iHub and HCI Foundation, IIT Mandi; Associate Professor, IIT Mandi
  - iii. Dr. Arnav Bhavsar, Co-coordinator, IIT Mandi iHub and HCI Foundation, IIT Mandi; Associate Professor, IIT Mandi
3. Industry Representatives:
  - i. Dr. Balamuralidhar P., Principal Scientist & Head, TCS Innovation Labs (*through Video Conferencing*)
  - ii. Dr. Sushil Chandra, Scientist 'G' & Addl. Director, INMAS, DRDO (*through Video Conferencing*)
4. Dr. Murali Mohan, Mission Director, NM-ICPS; Scientist-G & Head, Frontier & Future Technologies Division, DST (*through Video Conferencing*)
5. Dr. Swati Dang (DST representative) (*through Video Conferencing*)
6. Prof. Prem Felix Siril, Associate Professor, IIT Mandi – Member Secretary

### Discussion and Decisions

Prof. Chaturvedi welcomed all the attendees for participating in the 2<sup>nd</sup> HGB meeting of IIT Mandi iHub and HCI Foundation. Dr. Dutt presented the activities of the IIT Mandi iHub and HCI Foundation. This introduction was followed by the following agenda items:

#### HGB/2/2021/1. REPORTING ITEMS

- Interviews for three (3) associate positions were held in late March and early April 2021. Based on the interviews three candidates were offered the associate position. Out of these three candidates, two have joined (one physically and one virtually). The third candidate has refused the offer.
- The advertisement for the CEO position was posted on 12th March 2021 and the committees for the interview were approved. The CEO's name has been finalized based on the recommendation of the shortlisting committee and the interview by the selection committee.

*V. Krishnan*

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**Workplace:** IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

**Email:** [tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in) | **Phone:** +91 1905 - 267987 | **Website:** <https://www.iitmandi.ac.in/TIH-HCI>



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Negotiations regarding salary and benefits are in an advanced stage, and an offer would be made shortly.

- There were 37 proposals received by the iHub against its first call for proposals. The processing of these proposals via approved committees is underway.
- The memorandum of understanding (MoU) with IIT Mandi Catalyst, IIT Mandi's technology incubator, for start-up and incubation activities, has been prepared and it will be signed shortly.
- An MoU with a European software company Unity 3D for virtual reality simulation environment tools is in an advanced stage of finalization.
- The budget for the purchase of a supercomputer was approved in the 1<sup>st</sup> HGB meeting. Currently, the approved purchase committee is in the process of procuring the supercomputer as per the norms.

## **HGB/2/2021/2. PROPOSAL FOR THE PURCHASE OF EEG + BIOFEEDBACK SYSTEM**

The iHub needs to buy a 256-channel EEG + Biofeedback system for conducting state-of-the-art research in areas concerning HCI, biomedical engineering, and healthcare. The iHub also envisages using this sophisticated system to develop and evaluate various applications/products, which could potentially be used in modules catering to enhancing cognitive performance and point-of-care diagnostic procedures. Also, the proposed system could be provided for use by other academic and/or commercial organizations for pre-defined charges. In this regard, a note sheet of this system's procurement was recommended by the Board of Directors (BoD) of iHub in the second BoD meeting held on 7<sup>th</sup> May 2021. The note sheet with specifications is provided in Annexure – 1.

**Discussion and Suggestions:** It was pointed out that the purchasing power of the Hub lies with the BoD. Also, as per the minutes of the 2<sup>nd</sup> Mission Coordination Committee (MCC) meeting - NM-ICPS held on 22<sup>nd</sup> June 2021, it is mentioned under point number 11 that mission released the initial grant Host Institutes (HIs) and HGB was empowered to establish TIH, register Section-8 company, recruit CEO, etc. Once a section-8 company is registered and BoD constituted, the companies are run as per the directions of respective BoDs. HGB will have a connection between the Mission, HI, and TIH and provide scientific, technical, and administrative support and act as an advisory body. All decisions regarding the running of a Company including decisions regarding procurement, recruitment, support of projects, fellowships, and other financial aspects are vested with BoD only as per the Companies Act. All hubs should follow accordingly. The HGB and BoD are two different and independent bodies with clearly defined roles and responsibilities. Chairman is common between HGB, and BoD and some Members could also be common but not necessary. Dr. Krishnan mentioned that, according to the recently approved norms of the HI, it was recommended to make AR (SRIC & IR) as a committee member instead of DR (S&P). Overall, this agenda item was recommended by the HGB for the approval of the BoD.

## **HGB/2/2021/3. PROPOSAL FOR THE PURCHASE OF WORKSTATIONS ALONG WITH 4 MANAGEMENT INFRASTRUCTURES**

The iHub has the requirement of purchasing 8 workstations along with 4 management infrastructures for research and development purposes. The proposed workstations will cater to upcoming projects. Also, these workstations could be provided for use by other academic and/or commercial organizations for pre-defined charges. The approximate cost of procuring all the items mentioned in

*Y. Krishnan*

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Annexure - 2 is expected to be INR 1.3 crores (including 18% GST). In this regard, a note sheet for the purchase of these workstations was recommended by the BoD of iHub in the second BoD meeting held on 7th May 2021. The note sheet is in Annexure - 2.

**Discussion and Suggestions:** All the purchases and the internal items are suggested to be discussed in the BoD meeting. The HGB recommended this item for the approval of the BoD.

**HGB/2/2021/4. DISCUSS CURRENT SPACE ALLOCATION FOR THE IHUB AND THE COST FOR VENUE PREPARATION AT THE IDENTIFIED SPACE**

As the TIH activities need to be expanded quickly by housing manpower and costly equipment, the iHub had made a proposal for about 700 sqm space on the 1st floor of the building next to the community centre and opposite the Mind Tree school. This space has been discussed in the Board of Governors meeting of IIT Mandi, where the IIT Mandi's construction wing has prepared an estimate for the venue preparation at this space for the iHub. It is proposed that the site can be made ready for use by covering this space from the outside, providing doors, and flooring. As per the estimate from IIT Mandi's construction wing for the above, the cost of the venue preparation would be close to INR 37.73 lakhs (see Annexure - 3). It is proposed to spend the amount of INR 37.73 lakhs from the iHub CAPEX funds for venue preparation at the identified space. The BoD of iHub had suggested the consideration of this item for the approval of the HGB in the second BoD meeting held on 7th May 2021. The HGB may deliberate and approve this agenda item.

**Discussion and Suggestions:** The HGB recommended this agenda item for the approval of the BoD.

**HGB/2/2021/5. Proposal for the reappropriation of the funds**

As per the Sanction order No. DST/NMICPS/TIH13/IITMandi/2020/2(G), dated 24/12/2020, the approved budget for non-recurring expenditure for the iHub was INR 7 crores. But the amount released under this head is only INR 2 crores. Also, the approved budget for recurring expenditure for the iHub was INR 11.25 crores. But the amount released under this head is INR 16.25 crores. As per DST, the iHub can reappropriate the budget with consent from the HGB. As per the approved budget, the reappropriation of the released funds in the first year under a non-recurring head from INR 2 crores to INR 7 crores is requested. Thus, after reappropriation, as per the approval from DST, the recurring budget would be INR 11.25 crores and the non-recurring budget would be INR 7 crores in the first year. As purchases and venue preparation activities need to be organized urgently, the reappropriation of funds was put forward in the second BoD meeting of iHub on 7<sup>th</sup> May 2021. The BoD of iHub recommended this item for the approval of the HGB. The HGB may approve this agenda item. The note sheet for the reappropriation of funds can be found in Annexure - 4.

**Discussion and Suggestions:** As per the minutes of the 2<sup>nd</sup> Mission Coordination Committee (MCC) meeting - NM-ICPS held on 22<sup>nd</sup> June 2021, it is mentioned in point no. 15 that HGB is empowered to re-appropriate the recurring and non-recurring budget within the allocations and place it before the BoD for possible ratification. Final approvals as recommended by Hubs will be placed before the Mission Governing Board (MGB). The decisions of MGB are final. HGB approved this agenda, and this may be ratified in the subsequent BoD meeting.

**HGB/2/2021/6. DISCUSSION ON IHUB'S STRATEGY ON ITS DIFFERENT ACTIVITIES**

The iHub has been created to execute different activities, which include research and technology development; skill development; innovation, incubation, and start-up; and collaborations. The HGB

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may discuss iHub's strategy on its above-listed activities and provide directions such that the iHub may become self-sustaining in the future.

**Discussion and Suggestions:** The HGB members suggested having meetings and brainstorming sessions with the industries and with the persons working in the HCI areas to decide the high risk and high impact problems. HGB members also said that they are open to the discussion, and they will help to the best extent in their capacity to guide this iHub. The HGB said that the areas outlined are fine. However, the road map and exact problems may come after brainstorming and subsequent discussion. It was also suggested that one way of moving on the high impact high risk problems could be from the human side, where we first identify the research gaps in integrating human senses and then look at possible applications in industry and society where addressing such gaps may be beneficial.

## HGB/2/2021/7. TAKING NOTE OF BOD POWERS AS PER COMPANIES ACT 2013

As per the minutes of the 2<sup>nd</sup> Mission Coordination Committee (MCC) meeting - NM-ICPS held on 22<sup>nd</sup> June 2021, it was mentioned on point no. 4 that the Hub in principle is not a part of the Host Institute (HI). It is an entity that can do things on its own and all HI's use Hubs as their technology platforms for translation research, market connect, industry collaborations, start-ups development, and commercialization of technologies developed by the HI. Each hub should read Tripartite Agreement (TA) thoroughly. Overlapping of hubs is possible and that is why hubs should network to solve specialized problems.

Also, according to point number 11, Mission released the initial grant to Host Institutes (HIs) and HGB was empowered to establish TIH, register Section-8 companies, recruit CEOs, etc. Once a section-8 company is registered and BoD constituted, the companies are run as per the directions of respective BoDs. HGB will have a connection between the Mission, HI, and TIH and provide scientific, technical, and administrative support and act as an advisory body. All decisions regarding the running of a Company including decisions regarding procurement, recruitment, support of projects, fellowships, and other financial aspects are vested with BoD only, as per the Companies Act. All hubs should follow accordingly. The HGB and BoD are two different and independent Bodies with clearly defined roles and responsibilities. Chairman is common between HGB, and BoD and some Members could also be common but not necessary. Invariably 1/3<sup>rd</sup> from Industry, 1/3<sup>rd</sup> from Academia (from other than HI), and 1/3<sup>rd</sup> from Govt. The project Director from HI will also be the member. Separate notifications are issued for HGB, and BoD and minutes are also prepared separately, and the Mission office will be informed accordingly.

As per the companies act 2013, only BoD is the supreme power. Hence, all the decision-making powers relating to the functioning of the iHub, are delegated to BoD. HGB has approved this agenda item.

(Approval via mail)

**Dr. Ajit K. Chaturvedi**  
Director, IIT Mandi  
Chairman, HGB, IIT Mandi  
iHub and HCI Foundation

**Dr. Prem Felix Siril**  
Professor, IIT Mandi, Member  
Secretary, HGB, IIT Mandi iHub  
and HCI Foundation

**Dr. Venkat Krishnan**  
Dean SRIC, IIT Mandi; Associate  
Professor, IIT Mandi- Academic  
Representative, HGB, IIT Mandi  
iHub and HCI Foundation

**Workplace:** IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

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*(Approval via mail)*

**Dr. Balamuralidhar P.**  
Principal Scientist & Head,  
TCS Innovation Labs,  
Industry Representative,  
HGB, IIT Mandi iHub and  
HCI Foundation

*(Approval via mail)*

**Dr. Sushil Chandra**  
Scientist 'G' & Addl. Director,  
INMAS-DRDO, Industry  
Representative, HGB, IIT Mandi  
iHub and HCI Foundation

*(Approval via mail)*

**Mr. Saurabh Mittal**  
Senior Advisor, IIT Mandi Catalyst,  
Industry Representative, HGB, IIT  
Mandi iHub and HCI Foundation

**Dr. Varun Dutt, Associate**  
Professor, IIT Mandi, Academic  
Representative, IIT Mandi- Project  
Director, IIT Mandi iHub and HCI  
Foundation

**Dr. Arnav Bhavsar,**  
Associate Professor, IIT Mandi,  
Academic Representative, IIT Mandi-  
Co-coordinator, IIT Mandi iHub and HCI  
Foundation

**Dr. K. R. Murli Mohan**  
Mission Director, NMICPS; Scientist 'G' & Head, Frontier and Future Technology Division,  
DST; DST Representative, HGB, IIT Mandi iHub and HCI Foundation

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## Minutes draft of the 2nd HGB Meeting of IIT Mandi iHub and HCI Foundation


messages

**Avinash Punekar** <ceo@ihubiitmandi.in> Thu, Sep 23, 2021 at 4:53 PM  
to: director@iitmandi.ac.in, akc@iitmandi.ac.in, Prem Felix Siril <prem@iitmandi.ac.in>, Venkata Krishnan <deansric@iitmandi.ac.in>  
Saurabh <saurabhmittal@gmail.com>, Balamuralidhar P <balamurali.p@tcs.com>, Sushil Chandra <sushil.inmas@gmail.com>,  
rmm@nic.in, Arnav Bhavsar <arnav@iitmandi.ac.in>, Varun Dutt <varun@iitmandi.ac.in>  
cc: tih@iitmandi.ac.in

Dear Sirs,

Please find the minutes draft of the 2nd HGB Meeting of IIT Mandi iHub and HCI Foundation held on 30th June 2021. Please suggest any changes or improvements to these minutes. We request your kind response by Monday 27th September 2021. Once all comments are incorporated, we will recirculate the finalized minutes for your kind approval over email.

Regards,  
**Avinash PUNEKAR**  
CEO  
IIT Mandi iHub and HCI Foundation

 **Minutes of 2nd HGB Meeting.pdf**  
4993K

**TIH IIT Mandi** <tih@iitmandi.ac.in> Thu, Oct 14, 2021 at 12:17 PM  
to: Avinash Punekar <ceo@ihubiitmandi.in>  
cc: "Timothy A. Gonsalves" <director@iitmandi.ac.in>, akc@iitmandi.ac.in, Prem Felix Siril <prem@iitmandi.ac.in>, Venkata Krishnan <deansric@iitmandi.ac.in>, Saurabh <saurabhmittal@gmail.com>, Balamuralidhar P <balamurali.p@tcs.com>, Sushil Chandra <sushil.inmas@gmail.com>, Murali <krmm@nic.in>, Arnav Bhavsar <arnav@iitmandi.ac.in>, Varun Dutt <varun@iitmandi.ac.in>

Dear Sirs,

Thank you again for your kind suggestions during the 2nd HGB meeting. There have not been any changes or modifications suggested to the attached minutes from the members till today. Sirs, we would request a line of confirmation from your side that these minutes are okay with you. We will look forward to hearing from you.

[Quoted text hidden]

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Best regards,  
Team,

[Quoted text hidden]

**Ajit K. Chaturvedi** <akc@iitmandi.ac.in> Thu, Oct 14, 2021 at 11:38 PM  
to: TIH IIT Mandi <tih@iitmandi.ac.in>

Fine with me.

Ajit  
[Quoted text hidden]

**Sushil Chandra** <sushil.inmas@gmail.com> Wed, Oct 20, 2021 at 1:12 PM  
to: TIH IIT Mandi <tih@iitmandi.ac.in>  
cc: Avinash Punekar <ceo@ihubiitmandi.in>, "Timothy A. Gonsalves" <director@iitmandi.ac.in>, akc@iitmandi.ac.in, Prem Felix Siril <prem@iitmandi.ac.in>, Venkata Krishnan <deansric@iitmandi.ac.in>, Saurabh <saurabhmittal@gmail.com>, Balamuralidhar P <balamurali.p@tcs.com>, Murali <krmm@nic.in>, Arnav Bhavsar <arnav@iitmandi.ac.in>, Varun Dutt <varun@iitmandi.ac.in>

Dear Avinash

I confirm that the minutes are okay.

On Thu, Oct 14, 2021 at 12:17 PM TIH IIT Mandi <tih@iitmandi.ac.in> wrote:

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Regards  
**Dr. Sushil Chandra**  
Associate Director  
Scientist ' G ' & Head  
Biomedical Engineering Dept.  
INMAS, DRDO, Delhi  
([LinkedIn](#)) ([Researchgate](#))

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**Saurabh** <[saurabhmittal@gmail.com](mailto:saurabhmittal@gmail.com)> Thu, Oct 21, 2021 at 4:29 AM  
o: TIH IIT Mandi <[tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in)>  
c: Avinash Punekar <[ceo@ihubiitmandi.in](mailto:ceo@ihubiitmandi.in)>, "Timothy A. Gonsalves" <[director@iitmandi.ac.in](mailto:director@iitmandi.ac.in)>, "Ajit K. Chaturvedi"  
<[akc@iitmandi.ac.in](mailto:akc@iitmandi.ac.in)>, Prem Felix Siril <[prem@iitmandi.ac.in](mailto:prem@iitmandi.ac.in)>, Venkata Krishnan <[deansric@iitmandi.ac.in](mailto:deansric@iitmandi.ac.in)>, Balamuralidhar P  
<[balamurali.p@tcs.com](mailto:balamurali.p@tcs.com)>, Sushil Chandra <[sushil.inmas@gmail.com](mailto:sushil.inmas@gmail.com)>, Murali <[krmm@nic.in](mailto:krmm@nic.in)>, Arnav Bhavsar <[arnav@iitmandi.ac.in](mailto:arnav@iitmandi.ac.in)>  
<[varun@iitmandi.ac.in](mailto:varun@iitmandi.ac.in)>

These are fine by me.

Thank you,  
Saurabh  
[Quoted text hidden]

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**Avinash Punekar** <[ceo@ihubiitmandi.in](mailto:ceo@ihubiitmandi.in)> Fri, Oct 22, 2021 at 2:47 PM  
o: [krmm@nic.in](mailto:krmm@nic.in)  
c: Varun Dutt <[varun@iitmandi.ac.in](mailto:varun@iitmandi.ac.in)>, [akc@iitmandi.ac.in](mailto:akc@iitmandi.ac.in), Venkata Krishnan <[deansric@iitmandi.ac.in](mailto:deansric@iitmandi.ac.in)>, Prem Felix Siril  
<[prem@iitmandi.ac.in](mailto:prem@iitmandi.ac.in)>, TIH IIT Mandi <[tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in)>

Dear Dr. Murali Mohan,

The 2nd HGB Meeting of IIT Mandi iHub and HCI Foundation was held on 30th June 2021. As there were no changes suggested by you within the 2 week period after the circulation of the minutes, we take it as your agreement with the same.

We will follow your suggestion on the 2 week period from here onwards and close the discussions on matters if there are no suggestions, feedback or objections from the committee members.

Thank you.

Regards,  
Avinash PUNEKAR

----- Forwarded message -----

From: **Avinash Punekar** <[ceo@ihubiitmandi.in](mailto:ceo@ihubiitmandi.in)>  
Date: Wed, 6 Oct 2021 at 11:23  
Subject: Re: Minutes draft of the 2nd HGB Meeting of IIT Mandi iHub and HCI Foundation  
To: <[director@iitmandi.ac.in](mailto:director@iitmandi.ac.in)>, <[akc@iitmandi.ac.in](mailto:akc@iitmandi.ac.in)>, Prem Felix Siril <[prem@iitmandi.ac.in](mailto:prem@iitmandi.ac.in)>, Venkata Krishnan  
<[deansric@iitmandi.ac.in](mailto:deansric@iitmandi.ac.in)>, Saurabh <[saurabhmittal@gmail.com](mailto:saurabhmittal@gmail.com)>, Balamuralidhar P <[balamurali.p@tcs.com](mailto:balamurali.p@tcs.com)>, Sushil Chandra  
<[sushil.inmas@gmail.com](mailto:sushil.inmas@gmail.com)>, <[krmm@nic.in](mailto:krmm@nic.in)>, Arnav Bhavsar <[arnav@iitmandi.ac.in](mailto:arnav@iitmandi.ac.in)>, Varun Dutt <[varun@iitmandi.ac.in](mailto:varun@iitmandi.ac.in)>

Dear All,

As there are no changes, suggestions from anyone so far, we will circulate these minutes as the finalized minutes for approval by email.

Regards,  
Avinash PUNEKAR

[Quoted text hidden]



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## **Annexure-1**

### **NOTE SHEET**

**Dated:** 27/04/2021

#### **Request to procure a 256-channel EEG + Biofeedback system for Research and Development Purpose at IIT Mandi iHub and HCI Foundation**

A Technology Innovation Hub (TIH) named "IIT Mandi iHub and HCI Foundation" (aka, the iHub) has been created under the Government of India's National Mission on Interdisciplinary Cyber-physical Systems (NM-ICPS) on the IIT Mandi campus. The iHub has the requirement of purchasing a 256-channel EEG + Biofeedback system for research and development purposes.

The iHub intends to use the 256-channel EEG + Biofeedback system for conducting state-of-the-art research across its different problems and domains concerning HCI. Also, the 256-channel EEG + Biofeedback system could be leased out for generating income to the iHub.

After a detailed study of the market and presentations from different vendors, broad specifications for a 256-channel EEG + Biofeedback system are proposed in Annexure - A. The approximate cost of procuring the proposed system is INR 2.6 crores.

In addition, we would like to propose the following purchase committee, which will help procure the 256-channel EEG + Biofeedback system for the IIT Mandi iHub and HCI Foundation:

1. Dr. Bharat Singh Rajpurohit, Chair
2. Dr. Arnav Bhavsar, Member
3. Dr. Varun Dutt, Member
4. Mr. Avinash Puneekar (CEO, iHub), Member
5. Dr. Sushil Chandra, External Member (Scientist 'G' & Addl. Director, INMAS, DRDO)

The payment of this purchase would be made from the first-year non-recurring funds in the iHub as detailed in the detailed project report.

As the purchase of the 256-channel EEG + Biofeedback system needs to be made urgently, the specification, cost, and committee may be approved by the HGB in its next meeting. Approval for executing the procurement of the proposed 256-channel EEG + Biofeedback system via the proposed purchase committee via GEM or via the conventional tendering process is requested.





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## Annexure – A

256-channel EEG + Biofeedback system – 1 quantity with the following specifications:

1. 256-channel EEG – a cascade of four 64-channel EEG modules (4x64) with cascading trigger adaptor.
2. Should be able to perform – Four 64-channel EEG experiments simultaneously/two 128-channel EEG experiments simultaneously/one 256-channel EEG experiment.
3. Each EEG module should have a tablet (at least 8-inch display size) with the EEG recording software (for moving application).
4. Each 64-channel module should have at least 6 bipolar channels (total 24 for 256-channels). It should have the provision to upgrade 6 bipolar channels to 24 bipolar channels per 64-channel amplifier. Each bipolar channel has the ability to acquire biofeedback data like ECG, EMG, GSR, Pulse etc.,
5. The amplifier should have the following technical specifications:
  - I. Weight - <500 gram / amplifier
  - II. Referential input noise - <1.0 $\mu$ VRMS (lowest sampling rate and signal range)
  - III. Referential input signal range – 150-1000 mVPP (programmable gain)
  - IV. Referential input impedance - > 1 GOhm
  - V. Referential common-mode rejection ratio (CMRR) - > 100 dB
  - VI. Maximum sampling rate – 16384 Hz
  - VII. Resolution – 24 bits
  - VIII. Trigger input – 8-bit TTL
  - IX. USB output interface – USB 2.0 compatible, electrically separated
  - X. Battery – Integrated
  - XI. Operation time – 5 hrs.
6. Should be supplied with a software development kit (SDE).
7. Adapters for 4 auxiliary and 2 passive sensors – four.
  - I. Bipolar Adaptor – Four.
  - II. Four Wireless Backpack for locomotive application.
  - III. Full HD Camera – Four.
  - IV. Auxiliary sensor kit – including sensors for respiration temperature, skin conductance and acceleration – Four.
  - V. 7 Gel-based caps must be included (one 256-channel, two 128-channel, four 64-channel)
  - VI. Should also include two dry electrode 64-channel caps.
8. All the caps should possess active shielding technology.
9. All the caps should be washable.
10. All the cap wires should be concealed within cap fabric to prevent damage/accidental removable electrodes
11. The system should be supplied with the licensed version of Analysis Software (Please note that open software is not acceptable) and should have the following specifications:
  - I. Complete analysis of EEG / ERP and MEG data including features like (pre) processing of data, co-registration of multimodal images (MRI, fMRI, CT), and visualization of results to head model creation and various source localization methods.
  - II. Allow users to process complete studies in batch mode and exchange data with MATLAB® for further analysis.
  - III. Highly advanced 3D display of single-channel coherence
  - IV. Being able to calculate coherence between a single channel and all other channels,

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- V. Display of results in a 3D map
- VI. When reading LORETA and sLORETA data, dipoles at local maxima should be activated
- VII. Enhanced Spike and Seizure detection
- VIII. Additional rendering properties for TMS response objects
- IX. Enhanced artifact detection feature
- X. MRI images with inverse solutions can be fused with fMRI, CT, and SPECT images.
- XI. Channel interpolation feature to select the nearest number of neighboring electrodes used for the spline interpolation calculation to generate illustrative data representation.
- XII. New display filters: FFT display
- XIII. Set up your experiment
- XIV. Experiment Manager for straightforward analysis for a complete group of measurements and possibility to import .eeg files
- XV. Personalized scripting
- XVI. Updated user manual and online help
- XVII. Coherence view properties: threshold freely adjustable up to 3 decimal digits
- 12. Workstation specifications accompanying the analysis software:
  - I. Processor –i5 with 3.0 GHz or better
  - II. RAM – 8 GB
  - III. HDD – 1 TB
  - IV. Monitor – 29-inch LED
  - V. Mouse & Keyboard – wireless
  - VI. Connections – USB 3.0, USB 2.0, HDMI, RJ 45
  - VII. OS – Windows 8/10
  - VIII. Software to Archive all experiment at one location
- 13. ERP Stimulus presenting setup
- 14. Technical Specifications for the wireless Transcranial Direct Current Stimulator (tDCS)
  - I. The system should have an 8-channels wireless battery operated
  - II. The system should have a variety of waveforms for stimulation current: tDCS, tACS, tRNS, and Sham mode
  - III. The system should be lightweight (>100 gm)
  - IV. The stimulation system should have the following minimum characteristics:
    - i. Number of channels: (up to) 8 channels
    - ii. Sampling rate: 1000 SPS
    - iii. Frequency range: 0 to 250 Hz (tACS) and 0 to 500 Hz (tRNS)
    - iv. Stimulation types: a linear combination of tDCS, tACS, and tRNS; and Sham
    - v. Maximum current per channel:  $\pm 2$  mA
    - vi. Current resolution: 1  $\mu$ A
    - vii. Current accuracy: 1%
    - viii. Maximum voltage:  $\pm 15$ V per electrode (allows 30 V of stimulation potential difference)
  - V. The following should be the stimulation safety parameters:
    - i. Maximum input current per channel: 2 mA
    - ii. Maximum total inject current: 4 mA (by all electrodes, at any time)
    - iii. Maximum duration per session: 1 hour
    - iv. The stimulation session must be pre-programmed
    - v. Electrode impedance check before and during stimulation
    - vi. Abort functionality possible at any instant
  - VI. Should be battery operating time: 8 hours

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- VII. The System should be supplied one Laptop
- 15. Warranty period of at least 3 years.



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## Annexure -2

### NOTE SHEET

**Dated:** 27/04/2021

#### **Request to Procure 8 workstations along with 4 management infrastructures for Research and Development Purpose at the IIT Mandi iHub and HCI Foundation**

A Technology Innovation Hub (TIH) named “IIT Mandi iHub and HCI Foundation” (aka, the iHub) has been created under the Government of India’s National Mission on Interdisciplinary Cyber-physical Systems (NM-ICPS) on the IIT Mandi campus. The iHub has the requirement of purchasing 8 workstations along with 4 management infrastructures for research and development purposes.

Currently, the iHub has no workstation. The proposed workstations will cater to upcoming projects undertaken by the iHub. Also, these workstations could be leased out for generating income to the iHub. After a detailed study of the market, broad specifications for one of the workstations are proposed in Annexure - B. The approximate cost of procuring all the items mentioned in Annexure - B is expected to be INR 1.3 crores (including 18% GST). 3 years physical on-site warranty services including visits by technical experts for maintenance and technical support on all the equipment is provided.

In addition, we would like to propose the following purchase committee, which will help procure the workstations for the iHub via GeM portal or via the conventional tendering (if procurement via GeM portal is not possible):

1. Dr. A. D. Dileep, Chair
2. Dr. Aditya Nigam, Member
3. Dr. Arnav Bhavsar, Member
4. Dr. Varun Dutt, Member
5. Mr. Avinash Punekar (CEO, iHub), Member

The payment for this purchase would be made from the first year’s non-recurring funds in the iHub as detailed in the iHub’s detailed project report.

As purchase of these workstations needs to be made urgently, the specification, cost, and committee may be approved by the HGB in its next meeting. Approval for executing the procurement of the proposed workstations via the proposed purchase committee is requested.





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## Annexure-B

### Technical Specifications for AI Computational Facility

#### Log in Node – , Qty – 1 Unit

<b>1. LogIn Node (Qty -1)</b>	Specification	Description
	Processor(s)	x86 Architecture based processor(s) Total 16 or more Cores . Supports DDR4 2933/3200 or better memory, with AVX2 instruction set supported natively.
	No of Processors	one or more to provide total CPU cores
	Performance Benchmark	Spec int rate 2017 benchmark report for desired Server Model and configuration must be submitted along with the bid. Report with Spec_fp_2017_rate_base- score must be >=95 for the configuration offered High Performance Linpack peak performance score per socket must be >=0.7TFlops
	Memory	128GB using 32GB memory modules. Memory modules/slots with advanced ECC or Chip-Kill or an equivalent technology. Scalability in current configuration must be up to 256GB with same capacity based
	RAID Controller	RAID controller that supports RAID 0, 1, 5, 10 levels
	Hard Disk Drives & SSDs	2 x 240GB SATA Enterprise GRADE SSD (>1 DWPD) , 2 x 4TB SATA 7.2K RPM HDDs
	HDD bays	HDD bays- supporting 4 or more SAS/SATA Hot Swap Hard drives/ Solid State Drives (Large Form Factor only). At least 1 NVMe/M.2/U.2 port available to populate respective drives. (required NVMe/M.2/U.2 controller must be supplied from day one).
	I/O slots (Peripheral Component Interconnect Express,PCIe) in current config	2 PCIe(x16 bandwidth) based slots and 1 x additional slot of x8/x16 bandwidth. I/O slot must be of the latest generation supported with processor
	Graphics controller	A dedicated video port available thru additional controller or on board

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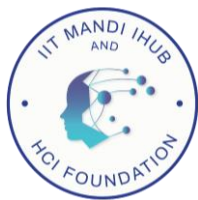
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	Scheduling Utility	Unified system management/monitoring tools for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customizing the node, And tool set with provisioning, monitoring, and reporting capabilities. With scheduling capabilities on a single node for CLI and GUI based selected applications. Utility must be a commercial licensed backed utility issued in the name of IIT Mandi. Product manual must be submitted with the bid.
	Ethernet ports	2 × 10 Gbps Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied) . Below features to be supported. SR-IOV Implementation Packet filtering with advanced support VXLAN supported wither thru S/W or H/W Counters available for Remote N/W Monitoring Remote boot supported with iSCSI Preboot Execution Environment from day one Allowed to have load balancing among multiple processing cores / physical CPUs
	Ports	Minimum 2 USB 3.0 or higher , and two 1 VGA/ graphics port
	Chipset	Compatible CHIPSET
	Server management	IPMI 2.0 Support with KVM and Media over LAN features. Must include all required licenses, if required for using these features. It should be able to automate mgmt. tasks and automated firmware updates. Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles USB 2.0 or 3.0 -based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events,
	Power supplies	80 Plus Platinum Certified efficient Redundant power supplies. Each power module must be of 500W or more
	Cooling	Required no. of Cooling fans.

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	Operating System	Should support the latest version of 64-bit CentOS., commercial Linux flavour (RHEL or SUSE), Ubuntu Linux, and Microsoft Windows.
	Regulatory compliance	OEM /bidder must not be banned or debarred or blacklisted by any govt organization during the last 5 years.
	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site warranty services including visits by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
	Form Factor	1U Rack Mountable or lesser

## **Computational Node Type 1 – , Qty – 2 Units**

<b><u>2.</u></b> <b><u>Computational</u></b> <b><u>Node Type -1</u></b> <b><u>(Qty -2)</u></b>	<b>Specification</b>	<b>Description</b>
	Processor(s)	x86 Architecture based processor(s) Total 64 or more Cores . Supports DDR4 2933/3200 or better memory, with AVX2 instruction set supported natively.
	No of Processors	one or more to provide total CPU cores
	Performance Benchmark	Spec int rate 2017 benchmark report for desired Server Model and configuration must be submitted along with the bid. Report with Spec_fp_2017_rate_base- score must be >=260 for the configuration offered High Performance Linpack peak performance score per socket must be >=2TFlops
	Memory	128GB using 32GB memory modules. Memory modules/slots with advanced ECC or Chip-Kill or an equivalent technology. Scalability in current configuration must be up to 256GB with same capacity based
	RAID Controller	RAID controller that supports RAID 0, 1, 10 levels

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	Accelerator	2 x Computational GPU with on board GPU Memory : 48GB GDDR6, 4500 or more CUDA Cores, 550+ Tensor Cores, memory interface bandwidth @384-bit. With memory bandwidth @ 670 GB/s or more
	Hard Disk Drives & SSDs	2 x 960GB SATA Enterprise GRADE SSD (>1 DWPD) , with sequential bandwidth (read) of 550MB/s , with sequential bandwidth (write) of 500MB/s , random theoretical peak read IOPs @ 95K. Details of SSD offered must be submitted with bid
	HDD bays	HDD bays- supporting 8 or more SAS/SATA Hard drives/ Solid State Drives (LFF/SFF). At least 1 NVMe/M.2/U.2 port available to populate respective drives. (required NVMe/M.2/U.2 controller must be supplied from day one).
	AI Frameworks preloaded from day one	1.CPU/Accelerator Optimised Tensor Flow 2..CPU/Accelerator Optimised Pytorch 3..CPU/Accelerator Optimised Theano 4..CPU/Accelerator Optimised Caffe 5.CPU/Accelerator Optimised Text2speech 6.CPU/Accelerator Optimised Mxnet 7.CPU/Accelerator Optimised CuDNN 8. Clara Deploy SDK 9.Deep vision AI 10. BIGDFT, 11. Parabricks, 12. R, 13. Microsoft CNTK Cloud access license for the above listed frameworks must be provided for unlimited users from day one. Datasheet/manual of the commercially licensed utility to be shared with bid
	I/O slots (Peripheral Component Interconnect Express,PCIe) in current config	Sufficient number of PCIe(x16 bandwidth) based slots to populate double width GPU controllers asked in the bid. I/O slot must be of the latest generation supported with processor
	Graphics controller	A dedicated video port available thru additional controller or on board
	Scheduling Utility	Unified system management/monitoring tools for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customizing the node, And tool set with provisioning, monitoring, and reporting capabilities. With scheduling capabilities on a single node for CLI and GUI based

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		selected applications. Utility must be a commercial licensed backed utility issued in the name of IIT Mandi. Product manual must be submitted with the bid.
	Ethernet ports	2 × 10 Gbps Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied) . Below features to be supported. SR-IOV Implementation Packet filtering with advanced support VXLAN supported wither thru S/W or H/W Counters available for Remote N/W Monitoring Remote boot supported with iSCSI Preboot Execution Environment from day one Allowed to have load balancing among multiple processing cores / physical CPUs
	Ports	Minimum 2 USB 3.0 or higher , and two 1 VGA/ graphics port
	Chipset	Compatible CHIPSET
	Server management	IPMI 2.0 Support with KVM and Media over LAN features. Must include all required licenses, if required for using these features. It should be able to automate mgmt. tasks and automated firmware updates. Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles USB 2.0 or 3.0 -based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events,
	Power supplies	80 Plus Platinum Certified efficient power supply. 1200W or more
	Cooling	Required no. of Cooling fans.
	Operating System	Should support the latest version of 64-bit CentOS., commercial Linux flavour (RHEL or SUSE), Ubuntu Linux, and Microsoft Windows.
	Regulatory compliance	OEM /bidder must not be banned or debarred or blacklisted by any govt organization during the last 5 years.
	Warranty	3 years onsite warranty by OEM / Bidder.

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		Physical on-site warranty services including visits by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
	Form Factor	Tower Form Factor

## **Computational Node Type 2 – , Qty – 6 Units**

<b><u>3.</u></b> <b><u>Computation</u></b> <b><u>al Node Type</u></b> <b><u>-2</u></b> <b><u>(Qty -6)</u></b>	Specification	Description
	Processor(s)	x86 Architecture based processor(s) Total 64 or more Cores . Supports DDR4 2933/3200 or better memory, with AVX2 instruction set supported natively.
	No of Processors	one or more to provide total CPU cores
	Performance Benchmark	Spec int rate 2017 benchmark report for desired Server Model and configuration must be submitted along with the bid. Report with Spec_fp_2017_rate_base- score must be >=260 for the configuration offered High Performance Linpack peak performance score per socket must be >=2TFlops
	Memory	128GB using 32GB memory modules. Memory modules/slots with advanced ECC or Chip-Kill or an equivalent technology. Scalability in current configuration must be up to 256GB with same capacity based
	RAID Controller	RAID controller that supports RAID 0, 1, 10 levels
	Accelerator	2 x Computational GPU with on board GPU Memory : 48GB GDDR6, 4500 or more CUDA Cores, 550+ Tensor Cores, memory interface bandwidth @384-bit. With memory bandwidth @ 670 GB/s or more
	Hard Disk Drives & SSDs	2 x 960GB SATA Enterprise GRADE SSD (>1 DWPD) , with sequential bandwidth (read) of 550MB/s , with sequential bandwidth (write) of 500MB/s , random theoretical peak read IOPs @ 95K. Details of SSD offered must be submitted with bid
	HDD bays	HDD bays- supporting 8 or more SAS/SATA Hot Swap Hard drives/ Solid State Drives (Large Form Factor only). At least 1 NVMe/M.2/U.2 port available to populate respective drives.

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		(required NVMe/M.2/U.2 controller must be supplied from day one).
	AI Frameworks preloaded from day one	1.CPU/Accelerator Optimised Tensor Flow 2..CPU/Accelerator Optimised Pytorch 3..CPU/Accelerator Optimised Theano 4..CPU/Accelerator Optimised Caffe 5.CPU/Accelerator Optimised Text2speech 6.CPU/Accelerator Optimised Mxnet 7.CPU/Accelerator Optimised CuDNN 8. Clara Deploy SDK 9.Deep vision AI 10. BIGDFT, 11. Parabricks, 12. R, 13. Microsoft CNTK Cloud access license for the above listed frameworks must be provided for unlimited users from day one. Datasheet/manual of the commercially licensed utility to be shared with bid
	I/O slots (Peripheral Component Interconnect Express,PCIe) in current config	Sufficient number of PCIe(x16 bandwidth) based slots to populate double width GPU controllers asked in the bid. I/O slot must be of the latest generation supported with processor
	Graphics controller	A dedicated video port available thru additional controller or on board
	Scheduling Utility	Unified system management/monitoring tools for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customizing the node, And tool set with provisioning, monitoring, and reporting capabilities. With scheduling capabilities on a single node for CLI and GUI based selected applications. Utility must be a commercial licensed backed utility issued in the name of IIT Mandi. Product manual must be submitted with the bid.
	Ethernet ports	2 × 10 Gbps Ethernet port with Preboot Execution Environment (PXE) boot capability required number of cables connecting node with switch must be supplied (2 x 2m CAT6 or higher/compatible cable must be supplied) . Below features to be supported. SR-IOV Implementation Packet filtering with advanced support VXLAN supported wither thru S/W or H/W Counters available for Remote N/W Monitoring

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		Remote boot supported with iSCSI Preboot Execution Environment from day one Allowed to have load balancing among multiple processing cores / physical CPUs
	Ports	Minimum 2 USB 3.0 or higher , and two 1 VGA/ graphics port
	Chipset	Compatible CHIPSET
	Server management	IPMI 2.0 Support with KVM and Media over LAN features. Must include all required licenses, if required for using these features. It should be able to automate mgmt. tasks and automated firmware updates. Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles USB 2.0 or 3.0 -based drive redirection with support for USB Key , VLAN functionality supports Reading Log Events,
	Power supplies	80 Plus Platinum Certified efficient Redundant power supplies. Each power module must be of 1200W or more
	Cooling	Required no. of Cooling fans.
	Operating System	Should support the latest version of 64-bit CentOS., commercial Linux flavour (RHEL or SUSE), Ubuntu Linux, and Microsoft Windows.
	Regulatory compliance	OEM /bidder must not be banned or debarred or blacklisted by any govt organization during the last 5 years.
	Warranty	3 years onsite warranty by OEM / Bidder. Physical on-site warranty services including visits by technical experts of Bidder or OEM for maintenance and technical support whenever needed.
	Form Factor	4U Rack Mountable and Tower Form Factor both must be supported

**Item 4-Interconnect Fabric Section-I for Primary Network– Qty : 1, with below features/components:**

Switch	10 Gbps (RJ-45) based Internally Managed Switch , with minimum 24 Ports (10GBASE-T) and additional ports available for uplink with speed higher than 10G
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Switching Capacity	With 500Gbps or more switching capacity
Cables	Required no. of cables to meet the solution's requirement of connecting 6 number of rack mounted systems.
Software	Host Software, performance monitoring tool and other required software
Mounting Kit	Rack mounting kit and other accessories must be supplied

**Item 5 - Interconnect Fabric Section -II – for Secondary & Management Network– Qty : 1, each with below features/components:**

Secondary Communication Network with required no of ports for whole solution	
Switch	Managed Gigabit Ethernet switch with 24 Ports of 1Gbps or more (RJ-45)
Cables	With required numbers of CAT6 cables along with appropriate cable length to meet the solution's requirement of building two separate networks interconnecting compute node type -2 with switches.
Software	Host Software, performance monitoring tool and other required software
Mounting Kit	Rack mounting kit and other accessories must be supplied

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**Item 6- AI Software Stack Section - with below features/components (for Compute Node Type-2 & Log In Node):**

Operating System	CentOS Linux
Distributed Computing Support by bidder	Yes, to be provided by bidder/OEM
Resource Management/Job Scheduling Support	Yes, to be provided by bidder/OEM
Kubernetes & Container Platform Services for Orchestration of AI Infrastructure	<ol style="list-style-type: none"><li>1. Bidders must provide compatibility of Compute Node Type 2 &amp; Log In Node with public container and docker offerings.</li><li>2. Utility and support must be provided with the systems for creating application containers for build &amp; release times. Also for decoupling applications from infrastructure.</li><li>3. Systems supplied must provide a local private repository of containers which also includes custom built containers built by users. Product datasheet for the S/W utility offered by bidder must be submitted with the bid.</li></ol>
Distributed Computing Management S/W	<p>Unified system management, monitoring tools for configuration, diagnosis and management of the system, Infrastructure manager with provisioning, monitoring and reporting capabilities Support Package and Image based provisioning Intuitive web interface to manage and customize the cluster Customizing networks and compute node profiles through GUI Customizing compute nodes (upto changing kernel parameter) Able to Push configuration changes and updates to the compute nodes without reinstalling and rebooting.</p> <p>Offered solution must be a commercial support based licensed s/w stack , issued in the name of IIT Mandi, with no limitation for no. of users and no. of nodes .Note : Product datasheet / manual must be submitted by bidders with the bid document</p>

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Workload Management S/W	Perpetual & floating license with commercial support for all nodes with warranty upgrade. Fully featured version with no limitation to no of jobs and scalability of nodes
	Integrated advanced scheduling features including cross-system scheduling, peer to peer scheduling with advanced fair share & hierarchical fair share reservations, preemption, access control lists (ACLs), Role based access control and backfilling scheduling, multi-cluster scheduling, Meta-scheduling for job scheduling and management across distinct clusters (earlier supplied clusters (if required to be covered as per user department) are also to be covered)
	Power aware job scheduling to support auto shutdown and auto boot of nodes as per the workload to be supported.
	Topology-aware scheduling (both inter- and intra-node) to ensure maximum application performance while minimizing cross-job network contention;
	Preemption and checkpointing (suspend/checkpoint/requeue) allow users to immediately run high-priority work
	Plugin framework for custom health checking, mitigation, and notification capabilities including off-lining flaky nodes, restarting scheduling cycles and requeuing jobs
	The Management Suite must offer Web/CLI based Job submission, monitoring, management and 3D remote visualization capability with secure access control which can be integrated with LDAP.
	The Cluster Management Suite must be a Web based tool for administration of HPC/Computing facility including real time monitoring, historical repository based on jobs, users, application etc.

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**Email:** [tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in) | **Phone:** +91 1905 - 267987 | **Website:** <https://www.iitmandi.ac.in/TIH-HCI>



# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

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**Regd. Office:** IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

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	S/W offered must be commercial support backed S/W. Bidder or the ISV must provide end to end support for the same.
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SL No:	Items
Pre qualification criteria	<ol style="list-style-type: none"><li>1. The bidder must not be banned or blacklisted by any govt organization in the past during the last 5 years.</li><li>2. OEM MAF for Nodes and Switches must be submitted with a bid.</li><li>3. All warranty and support must be provided by the bidder.</li><li>4. The bidder should have at least one service Center in India with service engineers in the relevant field of quoted item.</li><li>5. The bidder should have valid ISO certification. Please attach a copy of the certificate.</li><li>6. The bidder should clearly specify make and model in both Technical and Financial bid.</li><li>7. The bidder must be responsible for complete installation and support the infrastructure.</li></ol>

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## Annexure - 3

**Indian Institute of Technology Mandi**


Date 27-04-2021

**Sub: Construction of Technology Innovation Hub in LP-01 at North Campus of IIT Mandi.**

As per the request raised by the Dr. Varun Dutt (Project Director IIT Mandi iHub and HCI Foundation) and recommended by Dr. Prem Felix Siril (Director IIT Mandi iHub and HCI Foundation) to use the first floor of the existing constructed building next to Megastar and opposite Mind Tree School for the staff and activities of the IIT Mandi iHub and HCI Foundation (iHub).

Accordingly estimate for covering the first floor of the existing constructed building next to Megastar and opposite Mind Tree School an amounting to Rs.37,72,933/- has been prepared based on DSR-2018 & market rates including 1% contingency charges.

Submitted for kind consideration and approval please.

  
Assistant Engineer ©

Superintending Engineer

Conversion of parking in ST-1 into TIH & catalyst gr. floor & 1st floor has been approved by BOG in its meeting held on 31st March, 2021.

Now Director IIT Mandi iHub & HCI Foundation has desired to submit the estimate of 1st floor for covering from outside including doors & flooring work.

As per requirement estimate for 1st floor has been prepared amounting to Rs 37,72,933/- based on DSR-2018 & market rates including 1% contingency which includes outside partitioning to cover the 1st floor from all sides, providing doors & windows as per original plan, vitrified tile floor etc.

Submitted for further necessary action please.

-Jp 28/4/21

Deant IITM

Pl. see the estimate of covering the space with provision of doors/windows from all sides and flooring. This is as per the original proposal and



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estimate as presented to BoG.  
For your kind information.  
Sharma  
28/4/2021

Dr. Venu Dutt / Dr. Prem Felix

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# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

Regd. Office: IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

Detailed Estimate						
Name of work :- Construction of Technology Innovation Hub in LP-01 at North Campus of IIT Mandi.						
Sr. No.	Description of Items	Qty.	Unit	Rate (In Rs)	Amount (In Rs)	Item Rate as per DSR 2018
1	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.					
1.1	Size of Tile 600x600 mm					
2	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :	630.00	sqm	1500.55	945346.50	11.41.2
2.1	25 mm thick					
3	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & double action hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc. to be paid separately).	55.00	sqm	1531.85	84251.75	11.26.1
4	Providing and fixing S S 304 grade double shed glass door lock glass to glass 100mm padlock for Fully glazed door including necessary cutting, hole, fixing accessories and making good etc. all complete as per entire specifications, and as directed by engineer-in-charge.	6.00	Sqm	4447.90	26687.40	21.18
5	Providing and fixing S S 304 grade door handle set for fully glazed door including necessary cutting, hole, fixing accessories and making good etc. all complete as per entire specifications, and as directed by engineer-in-charge.	1.00	Each	2132.48	2132.48	M/R
6	Supplying and installation of moisture resistant/fire resistant 6 mm thick Heavy duty fiber cement board (High pressure steam cured) conforming to IS 14862:2000 of category III type B as per standard sizes fixed with self-drilling / tapping screws. Screws shall be of counter sunk rib head of 1.60mm to 4 mm thick of 8 to 10 gauge of length varying from 25 to 45 mm.	4.00	Each	2664.97	10659.88	M/R
7	Supplying and installation of moisture resistant/fire resistant 8 mm thick fiber cement board (High pressure steam cured) conforming to IS 14862:2000 of category III type B as per standard sizes fixed with self-drilling / tapping screws. Screws shall be of counter sunk rib head of 1.60mm to 4 mm thick of 8 to 10 gauge of length varying from 25 to 45 mm.	360.00	Sqm	1179.30	424548.00	26.45
8	Providing and fixing in all exterior face panels breathable vapour barrier underneath the cement fiber board as per National Building Code 2009 complete as per direction of Engineer-in-charge.	360.00	Sqm	655.25	235890.00	M/R
9	Designing, providing, installing and fixing factory finished custom designed cold form Light Gauge Steel Framed super structure comprising of steel wall panel, trusses, purlins etc manufactured out of minimum 0.75 mm thick steel sheet as per design requirements. The steel sheet shall be galvanized (AZ-150gms Aluminium Zinc Alloy coated steel having minimum yield strength 300-550 Mpa) conforming to AISI specifications and IBC 2009 for cold formed steel framing and construction and also as per IS: 875-1987, ISO 800- 1984 and IS:801- 1975. The wind load shall be as per provisions of IS 875 (part-III), LGSFS frame shall be designed as per IS: 801 using commercially available software such as Frame CAD Pro-11.7/ STAAD PRO-V8i/ArchitekV2.5.16/ Revit architecture-2011 or equivalent. Proper usage of Connection Accessories like Heavy Duty Tension Ties, Light Duty Hold-ons, Twist Straps (to connect truss with wall frames), Strong Tie, Tie Rod, H-Brackets, Boxing Sections, L-Shaped Angles for better structural stability. The framing section shall be cold form C-type having minimum web depth 89 mm x 39mm flange x 11mm lip in required length as per structural design requirement duly punched with dimple/slot at required locations as per approved drawings. The slots will be along centre line of webs and shall be spaced minimum 250mm away from both ends of the member. The	2700.00	kg	217.50	587250.00	26.41
10	Providing and fixing thermal insulation with Resin Bonded rock wool conforming to IS: 8183, having density 48 kg/m3,50 mm thick,wrapped in 200 G Virgin Polythene Bags fixed to wall with screw, rawel plug & washers and held Charge.	175.00	Sqm	282.55	49446.25	12.62
11	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	360.00	Sqm	115.15	41454.00	13.80
12	Distemping with oil bound washable distemper of approved brand and manufacture to give an even shade :					
12.1	New work (two or more coats) over and including water thinnable priming coat with cement primer					
13	Finishing walls with Acrylic Smooth exterior paint of required shade :	175.00	Sqm	153.45	26853.75	13.41.1
13.1	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)					
14	Design supply & installation of suspended Spider Glazing system designed to withstand the wind pressure as per IS 875 (Part-III). The Suspended System held with Spider Fittings of SS-316 Grade Steel of approved manufacturer with glass panel having 12 mm thick clear toughened glass held together with SS- 316 Grade Stainless steel Spider & bolt assembly with laminated glass fins 21 mm thick. The Glass fins and glass panel assembly shall be connected to Slab/ beams by means of SS- 316 Grade stainless steel brackets & Anchor bolts and at the bottom using SS channel of 50x25x2mm using fastener & anchor bolts, non staining weather sealants of approved make, Teflon/ nylon bushes and separators to prevent bi-metallic contacts, all complete to perform as per specification and approved drawings. The complete system to be designed to accommodate thermal expansion & seismic movements etc. The joints between glass panels (6 to 8 mm) and gaps at the perimeter & in U channel of the assembly to be filled with non staining weather sealant, so as to make the entire system fully water proof & dust proof. The rate shall include all design, Engineering and shop drawing including approval from structural designer, labour, T&P, scaffolding, other incidental charges including wastage, enabling temporary services all fitting fixers nut bolts, washer, Buffer plates,	185.00	sqm	164.70	30469.50	13.46.1
15	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, milled and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / p.C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :	15.30	Sqm	8130.45	124395.89	25.8
15.1	For fixed portion					
15.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	550.00	kg	456.30	250965.00	21.1.1.2

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# IIT Mandi iHub and HCI Foundation

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Sr. No.	Description of Items	Qty.	Unit	Rate (in Rs)	Amount (in Rs)	Item Rate as per DSR 2018
16	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, milled and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / panelling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, panelling and dash fasteners to be paid for separately) :					
16.1	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately)					
16.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	600.00	Kg	546.35	327810.00	21.1.2.2
17	Providing and fixing 12 mm thick prelaminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade I Type II, in panelling fixed in aluminium doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of Engineer-in-charge.					
17.1	Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side	1.00	sqm	997.70	997.70	21.2.1
18	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item)					
18.1	With float glass panes of 5 mm thickness (weight not less than 12.50 kg/ sqm)	95.00	sqm	1296.40	123158.00	21.3.2
19	Providing & fixing fly proof wire gauze to windows, clerestory windows & doors with M.S. Flat 15x3 mm and nuts & bolts complete.					
19.1	Stainless steel (grade 304) wire gauze of 0.5 mm dia wire and 1.4 mm aperture on both sides	45.00	Sqm	929.55	41829.75	10.29.2
20	Providing and fixing aluminium handles, ISI marked, powder coated (coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete. 200mm	2.00	Each	95.07	190.14	M/R
21	Providing and fixing aluminium handles, ISI marked, Powder coated aluminium (minimum thickness of powder coating 50 micron) transparent or dyed to required colour or shade, with necessary screws etc. complete.100 mm.	88.00	Each	55.08	4847.04	M/R
22	Providing and fixing aluminium tower bolts, ISI marked, powder coated (coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete.200 x 10 mm.	2.00	Each	90.62	181.24	M/R
23	Providing and fixing aluminium tower bolts, ISI marked, powder coated (coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete.150 x 10 mm.	176.00	Each	79.18	13935.68	M/R
24	Providing and fixing bright finished brass hard drawn hooks and eyes :					
24.1	300 mm	44.00	Each	86.45	3803.80	14.35.1
25	Providing and fixing 100mm brass locks (best make of approved quality) for aluminium doors including necessary cutting and making good etc. complete.	1.00	Each	458.55	458.55	21.13
26	Providing and fixing aluminium die cast body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 35 kg and door width upto 700 mm), with necessary accessories and screws etc. complete.	1.00	Each	1003.50	1003.50	9.83
27	Providing and fixing aluminium hanging floor door stopper, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade, with necessary screws etc. complete.	1.00	Each	33.95	33.95	9.101.1
28	P/F dash fastner /chemical fastner for frame work as per entire satisfaction and direction of Engineer-in-charge.	300.00	Each	20.33	6099.00	M/R
29	Providing and fixing stainless steel ( Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	550.00	kg	575.45	316497.50	10.28
Total					3735577.00	
Say					3735577.00	
Add Contingency @ 1%					37356.00	
Total					3772933.00	

J.E. (Civil)  
IIT Mandi

Assistant Engineer (Civil)  
IIT Mandi

Superintendent Engineer  
IIT Mandi

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# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

Regd. Office: IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

Detail of Measurement								
Name of Work:- Construction of Technology Innovation Hub in LP-01 at North Campus of IIT Mandi.								
Sr. No.	Description	Unit	N	L	W	H	Qty.	Remark
1	<b>Tile Flooring</b>							
	for flooring	sqm	1	36.80	16.00		588.80	
	skirting	sqm	2	36.80	0.10		7.36	
	-do-	sqm	2	16.00	0.10		3.20	
	near staircase portion	sqm	1	9.00	3.15		28.35	
	<b>Total</b>	sqm					627.71	
	<b>say</b>	sqm					630.00	11.41.2
2	<b>Kota stone</b>							
	Entrance approach portion	sqm	1	6.60	7.00		46.20	
	-do-	sqm	1	3.15	1.50		4.73	
	<b>Total</b>	sqm					50.93	
	<b>Say</b>	sqm					55.00	11.26.1
3	<b>Spider Glazing Door</b>							
	for door	sqm	1	2.00		2.55	5.10	
	<b>Total</b>	sqm					5.10	
	<b>Say</b>	sqm					6.00	21.18
4	<b>Door Handle</b>							
	for spider glazing door	each	4				4.00	
	<b>Total</b>	each					4.00	M/R
5	<b>Door Lock for spider Glazing door</b>							
	door lock	each	1				1.00	M/R
6	<b>6mm Board</b>							
	<b>Internal</b>							
	long wall	sqm	1	36.80		3.00	110.40	
	-do-	sqm	1	36.80		0.90	33.12	
	short wall	sqm	2	16.00		0.90	28.80	
	<b>Total</b>	sqm					172.32	
	<b>Say</b>	sqm					175.00	(A)
	<b>External Board</b>							
	long wall	sqm	1	36.80		0.90	33.12	
	-do-	sqm	1	39.80		3.00	119.40	
	short wall	sqm	2	16.00		0.90	28.80	
	<b>Total</b>	sqm					181.32	
	<b>say</b>	sqm					185.00	(B)
	<b>Total (A+B)</b>	sqm					360.00	26.45
7	<b>8mm Board</b>							
	same as 6mm board	sqm					360.00	M/R
8	<b>vapour barrier</b>							
	same as outer board	sqm					185.00	26.44
9	<b>LGSF 1.15mm Thick</b>							
	Detail for 1mtr length and 0.90mtr height							
	vertical member @ 400mm c/c	mtr	4	0.90			3.60	
	Horizontal member	mtr	3	1.00			3.00	
	Inclind member	mtr	1	0.95			0.95	
	<b>Total</b>	mtr					7.55	
	<b>Weight per mtr.</b>	kg					1.72	
	<b>Total weight.</b>	kg					12.99	
	<b>Say</b>	kg					13.00	
	<b>Total length</b>							
	long wall	mtr	1	36.80			36.80	
	-do- for R/wall side full height wall	mtr	3	36.80			110.40	
	short wall	mtr	2	16.00			32.00	
	<b>Total</b>	mtr					179.20	
	<b>Weight per mtr.</b>	kg					13.00	
	<b>Total weight.</b>	kg					2329.60	
	<b>Add 15% for bracing, strips &amp; clits etc.</b>	kg					349.44	
	<b>Total weight.</b>	kg					2679.04	
	<b>say</b>	kg					2700.00	26.41

Workplace: IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

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10	Rock wool							
	long wall	sqm	1	36.80		0.90	33.12	
	-do-	sqm	1	36.80		3.00	110.40	
	short wall	sqm	2	16.00		0.90	28.80	
	Total	sqm					172.32	
	say	sqm					175.00	12.62
11	wall putty	sqm					360.00	13.80
12	OBD	sqm					175.00	13.41.1
13	Exterior paint	sqm					185.00	13.46.1
14	Spider Glazing							
	Main Entry portion	sqm	1	6.00		2.55	15.30	
	Total	sqm					15.30	
	say	sqm					15.30	25.8
15	Aluminum Work							
	Fixed portion							
	Detail for 3.66 mtr x 1.65 mtr height wall							
	vertical member @ 1 mtr C/C	mtr.	5	1.65			8.25	
	Horizontal member	mtr.	2	3.66			7.32	
	Total	mtr.					15.57	
	weight per mtr	mtr.					1.67	
	Weight	mtr.					26.00	
	Add 15% for angle cleats and beading	mtr.					3.90	
	Total weight	mtr.					29.90	
	Weight per mtr. = (29.90/3.66)	kg					8.17	
	Say	kg					8.50	
	Total length of Aluminium partition long wall	mtr.	1	36.80			36.80	
	short wall	mtr.	1	16.00			16.00	
	-do-	mtr.	1	10.00			10.00	
	Total	mtr.					62.80	
	weight per mtr.	kg					8.50	
	Total weight	kg					533.80	
	Say						550.00	21.1.1.2
16	Openable Portion							
	Door style	mtr.	2	2.50			5.00	
	Rail	mtr.	3	0.90			2.70	
	Window shutter style	mtr.	88	1.65			145.20	11*8
	rail	mtr.	88	0.60			52.80	11*8
	Total	mtr.					205.70	
	weight per mtr.						2.50	
	Weight	mtr.					514.25	
	Add 10% for angle cleats and beading	mtr.					51.43	
	Total	mtr.					565.68	
	Say						600.00	21.1.2.2
17	Partical Board							
	for door shutter	sqm	1	0.90	0.90		0.81	
	Total	sqm					0.81	
	Say	sqm					1.00	21.2.1

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18	Glass pane	sqm	1	36.80	1.50	55.20	
	long wall	sqm	1	16.00	1.50	24.00	
	short wall	sqm	1	10.00	1.50	15.00	
	-do-	sqm				94.20	
	Total	sqm				95.00	21.3.2
	Say	sqm					
19	Wire Mesh	sqm	11	2.40	1.65	43.56	
	for window	sqm				43.56	
	Total	sqm				45.00	10.29.2
	Say	sqm					
20	Door Handle 200 mm	each	2				M/R
21	Window Handle	each	88				M/R
22	door tower bolt	each	2				M/R
23	window tower bolt	each	176				M/R
24	Window stay	each	44				14.35.1
25	Door Lock	each	1				21.13
26	Door Closer	each	1				9.83
27	Door stopper	each	1				9.101.1
28	Fastner	each	300				M/R
29	S.S.Railing						
	Detail for 1 mtr.	mtr.	2	1.00		2.00	
	50mm vertical post	mtr.	1	1.00		1.00	
	horizontal on top	mtr.				3.00	
	Total	mtr.				4.01	
	Weight per mtr	kg				12.03	(A)
	weight	kg				4.00	
	25mm mm pipe	mtr.	4	1.00		4.00	
	Total	mtr.				1.03	
	Weight per mtr	kg				4.12	(B)
	weight	kg				0.20	
	16mm mm pipe	mtr.	2	0.10		0.20	
	Total	mtr.				0.71	
	Weight per mtr	kg				0.14	(C)
	weight	kg				16.29	
	Total weight/mtr.	kg				16.50	
	Say	kg				27.00	
	Total Length in entrance porch portion	mtr.	1	27.00		5.00	
	-do-	mtr.	1	5.00		32.00	
	Total	mtr.				16.50	
	Weight per mtr.	kg				528.00	
	Total weight	kg				550.00	10.28
	Say	kg					
30	S.S. Handle for Door	each	4			4	M/R
	for spider glazing door (300mm long)	each					

*[Signature]*  
J.E. (C)

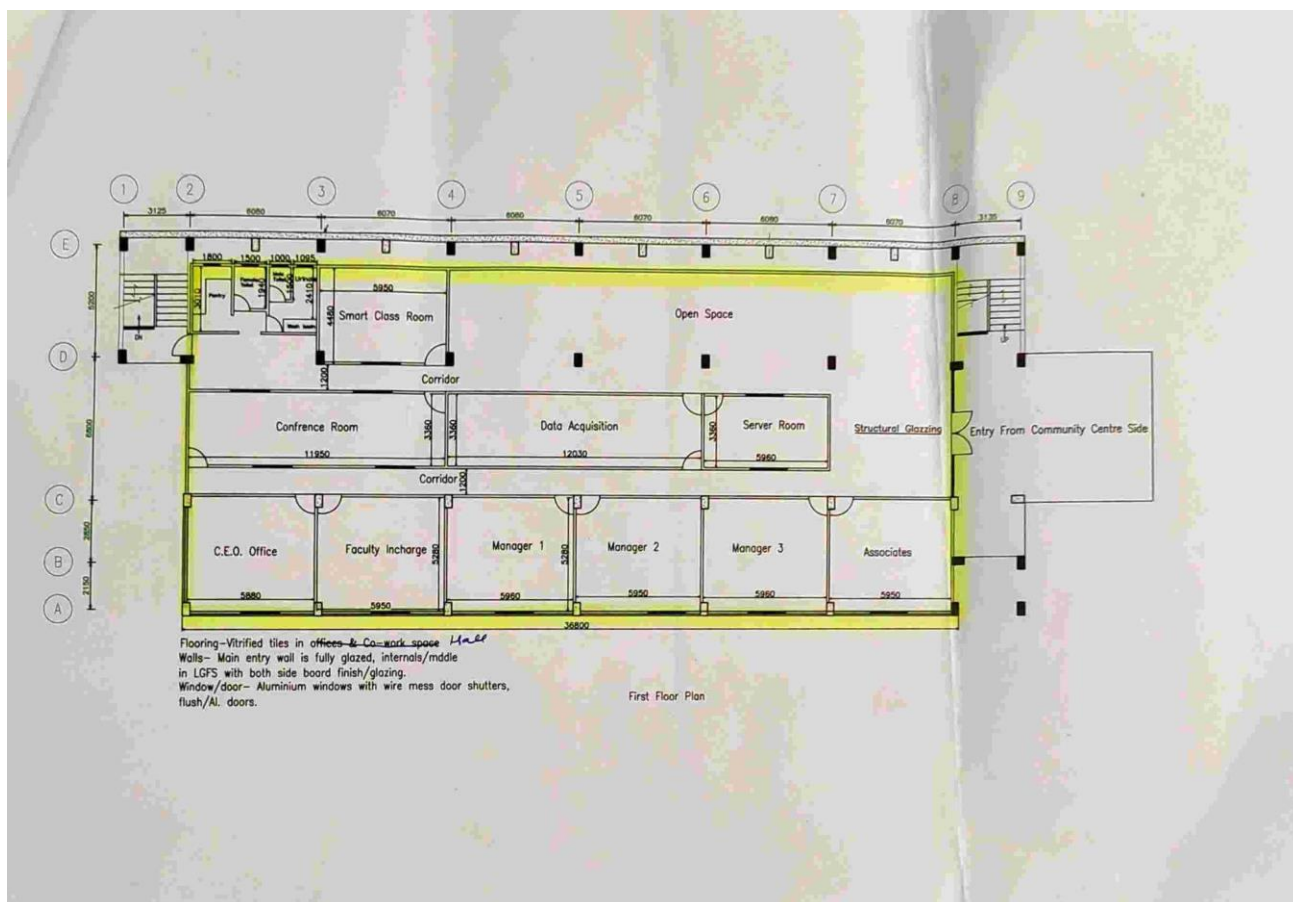




# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

**Regd. Office:** IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

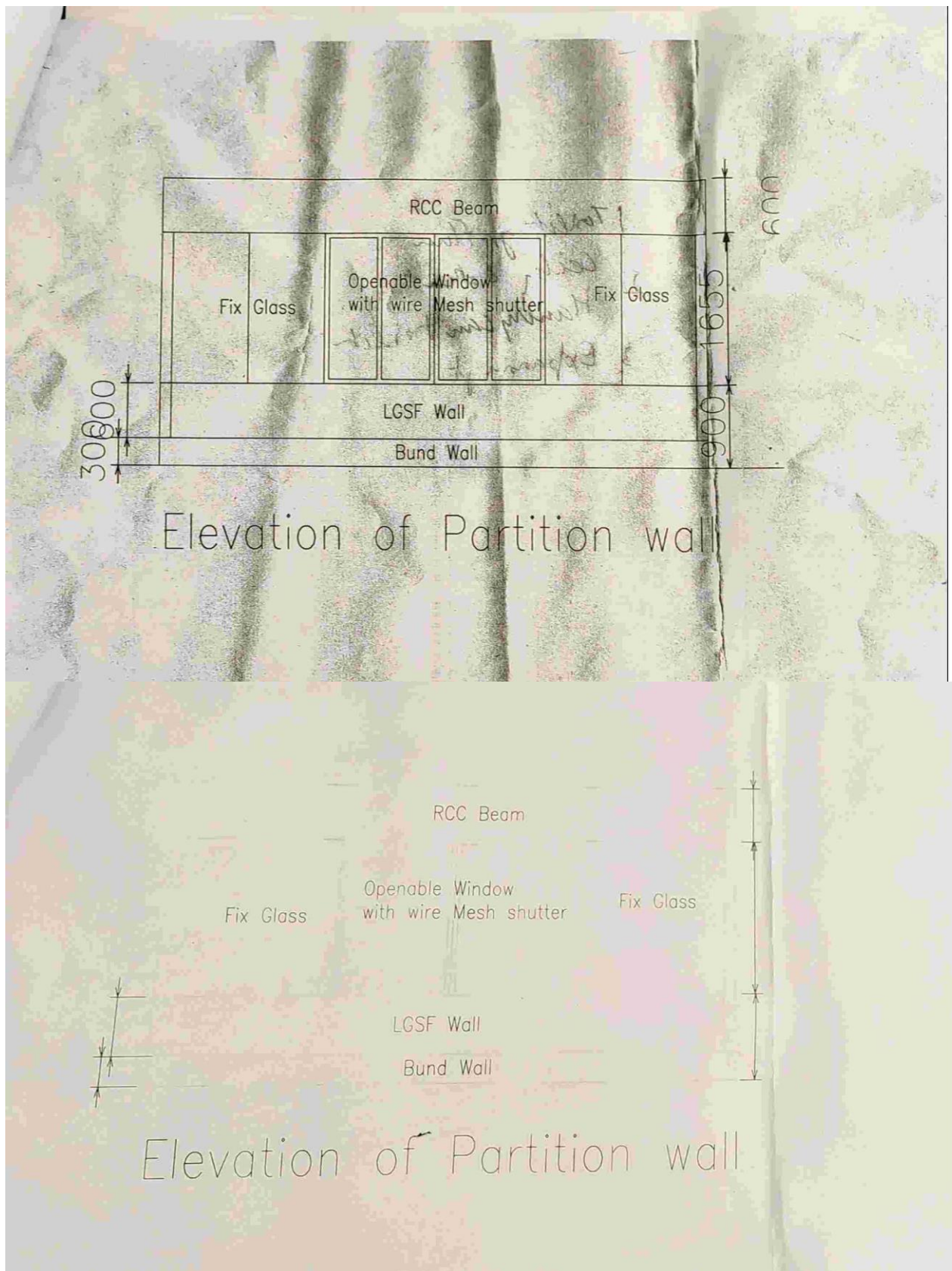


**Workplace:** IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

**Email:** [tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in) | **Phone:** +91 1905 - 267987 | **Website:** <https://www.iitmandi.ac.in/TIH-HCI>



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# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

**Regd. Office:** IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075



## IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

**Regd. Office:** IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

To:

Dean (I & S)  
Indian Institute of Technology Mandi  
VPO Kamand, Tehsil Padhar, District Mandi  
Himachal Pradesh, India - 175075

Through:

Dr. Prem Felix Siril  
Director, IIT Mandi iHub and HCI Foundation

Date: 27/04/2021

**Subject:** Requesting an estimate for covering the first floor of the building next to Megastar and opposite Mind Tree school as well as the space's flooring for IIT Mandi iHub and HCI Foundation's staff and its activities.

Dear Bharat,

We hope this mail finds you well.

As you may likely know, there was a discussion in IIT Mandi's Board of Governors meeting to use the 1st floor of the building next to Megastar and opposite Mind Tree school for the staff and activities of the IIT Mandi iHub and HCI Foundation (iHub). We would request an estimate for covering the first floor of this building from outside, providing a door on the 1st floor, and providing flooring at the space. This space will be used as the main office and sitting space for the iHub staff and its numerous activities. Please provide us an estimate for covering the first floor of this building from outside, providing a door on the 1st floor, and providing flooring at the space.

Best wishes,

**Project Director**  
IIT Mandi iHub and HCI Foundation

Recommended for providing an estimate for covering the first floor of this building from outside, providing a door on the 1st floor, and providing flooring at the space.

  
**Director**  
IIT Mandi iHub and HCI Foundation  
27/4/2021

Pl. provide the estimate as desired.

  
27/4/2021

Estimate is enclosed.

Dr. Varun Dutt / Dr. Prem Felix

27/4/2021

**Workplace:** IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

**Email:** [tih@iitmandi.ac.in](mailto:tih@iitmandi.ac.in) | **Phone:** +91 1905 - 267132 | **Website:** <https://www.iitmandi.ac.in/TIH-HCI>

**Workplace:** IIT Mandi iHub and HCI Foundation Office, SRIC Office, South Campus, IIT Mandi, VPO Kamand, District Mandi, Himachal Pradesh - 175075

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# IIT Mandi iHub and HCI Foundation

CIN: U73100HP2020NPL008102

Regd. Office: IIT Mandi, VPO Kamand, Mandi, Himachal Pradesh, India – 175075

Item no. 33.9: To consider the proposal to provide academic spaces for Catalyst (business incubator of IIT Mandi) and Technology Innovation Hub (TIH i.e. a project of Rs 110 Crore) by conversion of parking being constructed in LP-1 area into labs (Ground floor/first floor) and second floor into essential utilities/services.

Work of construction of multilevel car parking in front side of ST-01 & ST-02 building at North Campus was approved by BoG in its 26th BoG Meeting held on 30th August, 2019 amounting to Rs. 3,50,33,504/-. Work is under progress, 90% stands completed. This building is of three stories and covered area of each floor is as under:-

Ground floor	=	640 sqm. (6888.9 sqft)
1 <sup>st</sup> Floor	=	640 sqm. (6888.9 sqft)
2 <sup>nd</sup> floor	=	210 sqm. (2260.4 sqft)

Likely completion date shall be 31<sup>st</sup> March, 2021.

Two big initiatives of IIT Mandi for major outreach activities i.e. Catalyst (business incubator of IIT Mandi) and Technology Innovation Hub (TIH i.e. a project of Rs 110 Crore) are facing a severe space crunch. The limited space availability has severely affected the growth plans and activities of Catalyst and TIH.

IIT Mandi Catalyst, is the first technology business incubator in Himachal Pradesh for supporting entrepreneurs was set up in the year 2016. Catalyst has set ambitious goal of making Himachal Pradesh a world class innovation and entrepreneurship destination. Initiatives in this direction are as follows:-

- Center of Excellence:** Catalyst aims to attain a status of center of excellence in Agriculture, Biotech, Cleantech, and Heattech. It requires us to have a capacity to process 80-100 startups at a time. Catalyst is Liaoning with industry to bring in private funding, in addition to the government funding.
- Bionest Scheme:** Catalyst is applying for Bionest program of BIRAC which will help setup a laboratory for agri- bio startups.
- DST-EIR Scheme:** Catalyst is also applying for EIR program of DST under which aspiring entrepreneurs will be supported as they explore their startup ideas.

During the setup it was committed by IIT Mandi a space of 11,000 sqft. Also for setting up fabrication labs on 3000 sqft area, Rs. 1 Cr. was





# IIT Mandi iHub and HCI Foundation

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sanctioned for Catalyst. Catalyst is currently scattered in several different small spaces at IIT Mandi campus.

Similarly the technology Innovation Hub (TIH) in Human Computer Interaction (HCI) area was approved by DST in 2020. TIH shall be performing several activities like research project allotment, plan India large scale skill development and funding incubation for various startups.

Technical Innovation Hub (TIH) under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) is planned to make India a leader in Human Computer Interaction (HCI) research in the world. Based on faculty strengths, industry collaborations, and ongoing projects, TIH's focus will be on the following: technology (interface) development and evaluation, HRD & skill development, entrepreneurship, and collaborations. Due to the location of the hub at IIT Mandi, some of the technologies will be focused on the mountain region. A team of experienced faculty, as well as newly joined faculty, will participate in the success of the TIH. Also, a number of industries and academic institutions have committed to be a part of this TIH. The academic and industrial institutions include Aindra, Adobe, RxDataScience, DRDO, PGIMER, NDMA, NMHS, MeITY, NTRO, C-DAC Mohali, C-DAC Kolkata, C-DAC Bangalore, RFSL, AR-TRAC, R&DE, Bioedha, NMSWorks, CMU, NTNU, and London Met. The TIH has also made a list of companies in India that are focused on HCI-related research. TIH is committed to funding at least 30 companies during a period of five years. Along with that at least 90+ companies will be selected for in-house exploration for three months.

Total budget of TIH is about 110 Cr. for a duration of 5 year and there is requirement of about 30,000 sqft of covered space. TIH is currently has no space formally allocated to them. TIH is currently working from shared spaces available at IIT Mandi campus. During the project proposal agreement it was committed by IIT Mandi a space of 30,000 sqft.

Catalyst and TIH has committed to contribute Rs. 10 Lakhs and Rs. 15 Lakhs, respectively, for creating/renovating the infrastructure for setting-up the academic spaces as per their requirements. In addition, TIH shall also be giving IIT Mandi the rent for the space being used by them.

Proposal was discussed internally and it was proposed to convert the big halls of ground floor and 1<sup>st</sup> floor (equivalent area of 1280 sqm) of parking being developed in LP-1 area or for the time being for the academic space requirements and utilizations by TIH and Catalyst.

Open spaces in LP-1 area will be developed and utilized for the parking of vehicles by the residents and other users of LP-1. If above mentioned





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space is provided to TIH & Catalyst then Institute Commitment is getting fulfilled and request of space would be addressed conveniently for best possible use. Plan for the same has been prepared in consultation with in-charge of these centers.

There is also a demand for setting up essential utilities/services like Banks/Post-Office/ Utility shops for day-to-day requirement of Campus residents. Considering the same top floor is proposed to be converted for creating these facilities as it is at a sufficient distance from Academic/residential area and shall cater to the needs of students and resident without any major disturbances to academic activities.

Proposal was also discussed in Construction Review Meeting (CRM) held on 26-02-2021 (Minutes attached) and Committee has agreed for the same.

Estimate for conversion of parking halls into setting up of Catalyst labs/ TIH Center/essential utilities/services like Post Office/Banks/utility shops is prepared on the basis of providing light weight partition, tiles flooring, toilets facilities and electrical installation as per requirement based upon DSR 2018 and for some items on market rates as under and is annexed as **annexure 33.9 Page no. 71 to 103.**

Ground floor:	Rs. 1,04,04,204/-
1 <sup>st</sup> Floor:	Rs. 1,37,45,383/-
2 <sup>nd</sup> Floor:	Rs. 1,11,34,455/-
Total	Rs. 3,52,84,042/-

B&WC deliberated upon the proposal to convert the big halls of ground floor and 1st floor (equivalent area of 1280 sqm) of parking being developed in LP-1 area for the academic space requirements i.e. utilizations by TIH and Catalyst, on 2<sup>nd</sup> floor for setting up essential utilities/services like Banks/Post-Office/ Utility shops for day-to-day requirement of Campus residents and recommends the proposal/ estimate for approval to FC/BoG for an amount of Rs. 3,52,84,042/-.

Work shall be taken up in the next year budget or for arranging funds Higher Education Ministry shall be approached.



# IIT Mandi iHub and HCI Foundation

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## Annexure - 4 NOTE SHEET

**Dated:** 27/04/2021

### The reappropriation of funds from Recurring head to non-Recurring head of IIT Mandi iHub and HCI Foundation (iHub)

As per the attached Sanction order No. DST/NMICPS/TIH13/IITMandi/2020/2(G), dated 24/12/2020, the approved budget for non-recurring expenditure for the IIT Mandi iHub and HCI Foundation (iHub) was INR 7 crores, but the amount released under this head is only INR 2 crores. Also, the approved budget for recurring expenditure for the iHub was INR 11.25 crores. But the amount released under this head was INR 16.25 crores. Table-1 shows the approved budget and the released budget by DST in the first year.

**Table 1. Detailed Budget Amount in INR for Year-1**

Budget Head	Approved Budget (INR In crores)	1st release by SERB for Year-1 (INR In crores)	2nd Release by DST for Year-1 (INR In crores)	Total Funds Released in Year-1 (INR In crores)	Difference between approved and released budget (INR In crores)
Recurring	11.25	5.25	11	16.25	+5
Non-Recurring	7	2	0	2	-5
Total	18.25	7.25	11	18.25	

As per the DST, the iHub can reappropriate the budget with consent from the Hub Governing Body (HGB). So, reappropriation of the funds is requested as per the Table 2.

**Table 2. Year-wise recurring and non-recurring costs over five years after reappropriation**

Budget head / Year	Year 1 (in Crores)	Year 2 (in Crores)	Year 3 (in Crores)	Year 4 (in Crores)	Year 5 (in Crores)	Total (in Crores)
Recurring	9.10	14.89	18.24	17.16	14.30	73.69
Non-recurring	9.15	20.46	3.66	1.99	1.05	36.31
Total Rs in	18.25	35.35	21.90	19.15	15.35	110.00

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Crores						
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Furthermore, the iHub has to spend some amount on the venue preparation. The expenses under the miscellaneous expenditure were meant to cover such miscellaneous expenses of the iHub. Table 3 shows the amount under different heads over 5-years after approval of reappropriation is given.

**Table 3. Project budget over 5-years under different cost components after reappropriation**

Head	1st Year (in crores)	2nd Year (in crores)	3rd Year (in crores)	4th Year (in crores)	5th Year (in crores)	Total (in crores)
<b>Recurring</b>						
Manpower	0.88	1.50	1.55	1.74	1.94	7.61
Travel	0.23	0.44	0.59	0.56	0.51	2.32
Technology Development*	0.24	0.64	1.00	0.76	0.36	3.00
HRD and Skill development	2.70	5.48	6.88	5.51	2.82	23.40
Innovation, Entrepreneurs hip, and start- up ecosystem	4.60	6.14	7.64	8.16	8.43	34.96
International Collaboration	0.05	0.05	0.05	0.05	0.05	0.25
Expenses for honorarium	0.04	0.04	0.04	0.04	0.04	0.19
Miscellaneous	<b>0.37</b>	<b>0.60</b>	<b>0.50</b>	<b>0.35</b>	<b>0.15</b>	<b>1.97</b>
<b>Non-recurring</b>						
Equipment	8.85	20.06	3.26	1.75	0.81	34.73
Capex	0.30	0.40	0.40	0.24	0.24	1.58

As purchases and venue preparation activities need to be organized urgently, the reappropriation of funds may be approved.

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