I-HUB Quantum Technology Foundation

Minutes

of

THE SECOND (2nd) MEETING

of

HUB GOVERNING BODY (HGB)

held on

Tuesday, 15th November 2022

I-HUB Quantum Technology Foundation

Main Academic Building, IISER-Pune
Dr. Homi Bhabha Road, NCL Colony, Pashan
Pune 411008, Maharashtra, India

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The second meeting of the Hub Governing Body (HGB) of I-HUB Quantum Technology Foundation was held on **Tuesday, 15th November, 2022** at 11.00 a.m. in hybrid mode - through MS Teams Video Conference and a gathering at Director's Board Room, Main Academic Building, IISER, Pune.

The following personnel were present at the meeting:

HGB Members of I-HUB QTF:

Prof. Jayant B Udgaonkar, Director, IISER Pune	Chairperson
Prof. K Thyagarajan	Member
Professor & Head, Dept. of Physics, Bennett University	
Prof. Umakant D Rapol, Project Director, I-HUB QTF	Member Secretary
Dr. Gargi Dasgupta, Chief AI Officer, IBM Automation	Member
Dr. Sunita Verma, Scientist G, MeitY, Govt. Of India	Member
Dr. JBV Reddy, DST - nominated by	Member
Dr. Ekta Kapoor, Mission Director, NM-ICPS, DST to represent the mission office	

Key personnel related to I-HUB QTF:

Dr. Sangeeta Maini K M
Chief Executive Officer (CEO), I-HUB Quantum Technology Foundation

The following HGB members requested for a leave of absence:

Prof. D D Sarma, Professor, SSCU, IISc	Member
Dr. Ekta Kapoor, Mission Director, NM-ICPS, DST	Member
Mr. Ashish Bhandari, MD and CEO, Thermax Global	Member
Dr. Rohini Srivathsa, NTO, Microsoft India	Member

The following members were invited as special invitees:

Prof. Ramakrishnan S, Chanakya Chair Professor, I-HUB QTF	Present
Dr. Sunil Nair, Associate Professor, Physics, IISER Pune	Present
Col. Raja Sekhar G, Registrar, IISER-Pune & Promoter, I-HUB QTF	Not present

At the outset, the Chairperson welcomed Prof. Ramakrishnan, Dr. Sunil Nair and other members of the Hub Governing Body.

The Chairperson requested Dr. Sangeeta Maini K M, CEO, I-HUB QTF thereafter to lead the meeting and take up the formal items of the Agenda.

CONFIRMATION ITEMS

Item No. 2.1 **To consider minutes of the 1st HGB meeting held on 24th August 2021**

The minutes of the 1st HGB meeting (**Annexure-1**) were circulated via email to all members.

The following correction of a typographical error was suggested by Prof. Rapol:

> The HUB Governing Body is Research driven Advisory and strategic Body to render scientific directives. It is a synergy between Researchers and Industry to translate research into products. the HUB has no Administrative and Financial Powers.   **Correction: HGB**

Minutes of 1st HGB meeting were **CONFIRMED and APPROVED** with the correction of the typo HUB to HGB.

Item No. 2.2 **Follow up action on the minutes of the 1st HGB meeting held on 24th August 2021**

The Board **NOTED** the following follow-up of action

a) Clarification on roles of HGB and BoD from DST awaited

Regarding the clarification sought in the 1st HGB about the roles of Hub Governing Board (HGB) and Board of Directors (BoD), Dr. JBV Reddy, DST representative stated that the DST team will check with competent authorities and get back with clarification.

At the time of preparation of the minutes, the DST team communicated the following clarification on roles and responsibilities of Board of Directors vs Hub Governing Board:

HGB role is advisory and is to provide technical and scientific directions once the Section 8 company is set up. All management and governance decisions are to be taken by the BoD once the Section 8 company board is constituted. The Chairman of both BoD and HGB is the director of the Host Institute (HI). The interface of the Hub with Mission Office, DST is through Director/Head of HI and the Project Director. Representative of AS & FA, DST (not below the rank of Deputy Secretary), will be a special invitee to HGB of all TIHs.

b) MoU signed with the Synergy Quantum (Switzerland) and MoA under discussion
c) Company's financial disclosure by Quanfluence Pvt. Ltd. awaited
d) MoU signed with CDAC Pune for hardware and software stack for development of Quantum Computer at I-HUB QTF
e) 6 Spokes have been invited to work jointly with I-HUB QTF on development of Quantum Technologies
f) Technology Readiness Level (TRL) assessment of ongoing DST QuEST projects is underway

APPROVAL ITEMS

Item No. 2.3

Re-constitution of HGB members of I-HUB QTF

The Board **Noted** the updation of the HGB members.

The Hub Governing Body of I-HUB QTF updated its members as the current members (reference: Office Memorandum dated 27 May 2021 – **Annexure 2**) are no longer associated with their affiliates. Following is the list of HGB members that have been replaced by new members:

Existing HGB Members		Replaced by	
Name of the Member	Affiliation	Name	Affiliation
Dr. K. R. Murali Mohan	Scientist G (Mission Director, NM-ICPS, DST, GoI)	Dr. Ekta Kapoor	Scientist F (Head, FFT Division, DST, GoI)
Dr. B. K. Murthy	Scientist G, MeitY, GoI	Dr. Sunita Verma	Scientist G, MeitY, GoI

Relevant supporting documents from the NM-ICPS mission office and MeitY are enclosed as **Annexure 3** and **Annexure 4** respectively.

IISER-Pune, the promoter and the host institute of I-HUB QTF has issued an updated OM on HGB dated 19th October 2022 and is enclosed as **Annexure 5**.

The Board **RESOLVED** to approve the re-constitution of the HGB.

Item No. 2.4

To seek clarification from DST on conflicting roles of the HGB and BoD of I-HUB QTF

The Board **NOTED** the clarification sought.

As discussed under the follow-up action of 1st HGB, Dr. JBV Reddy, DST representative stated that the DST team will check with competent authorities and get back with clarification.

At the time of preparation of the minutes, the DST team communicated the following clarification on roles and responsibilities of Board of Directors vs Hub Governing Board:

HGB role is advisory and is to provide technical and scientific directions once the Section 8 company is set up. All management and governance decisions are to be taken by the BoD once the Section 8 company board is constituted. The Chairman of both BoD and HGB is the director of the Host Institute (HI). The interface of the Hub with Mission Office, DST is through Director/Head of HI and the Project Director. Representative of AS & FA, DST (not below the rank of Deputy Secretary), will be a special invitee to HGB of all TIHs.

Item No. 2.5   To consider Budget Estimates for the year 2022-2023

The HGB **NOTED** the Budget Estimates of the I-HUB QTF for 2022-23.

The CEO presented the following: The funds allocated to I-HUB QTF under Recurring and Non-recurring heads are as follows:

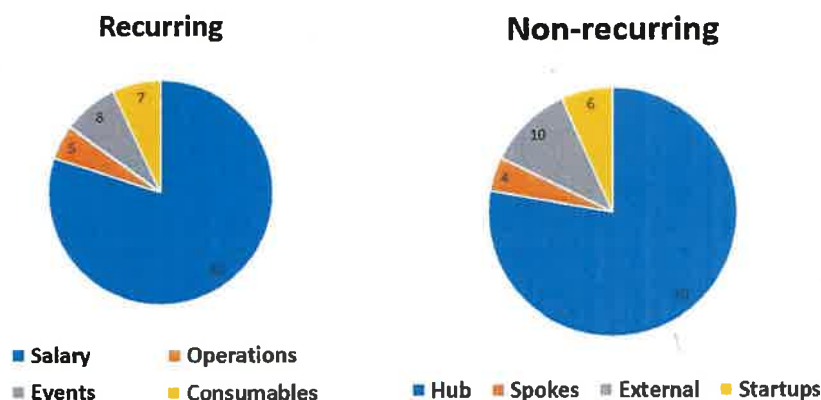| Budget Head	Budget in ₹ Crore					
	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Recurring	7.75	11.5	8.75	7.0	7.0	42.0
Non-Recurring	0.0	80.5	34.1	6.7	6.7	128.0
Total	7.75	92.0	42.85	13.7	13.7	170

The various heads under recurring and non-recurring are as follows:

Sr. No	Main objectives	Budget heads	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	Total
1	Technology development	Recurring	2	3.5	2.00	1.25	1.25	10
		Non-Recurring	0	72	28.10	3	3	106.1
		Sub total	2	75.5	30.1	4.25	4.25	116.1
2	HRD and skill development	Recurring	3	3	3.00	3	3	15
		Non-Recurring	0	1	0.50	0.5	0.5	2.5
		Sub total	3	4	3.5	3.5	3.5	17.5
3	Innovation, Entrepreneurship, and Start-up ecosystem	Recurring	1	3	1.75	1	1	7.75
		Non-Recurring	0	7	5.00	2.7	2.7	17.4
		Sub total	1	10	6.75	3.7	3.7	25.15
4	International Collaborations	Recurring	0.25	0.5	0.50	0.25	0.25	1.75
		Non-Recurring	0	0	0.00	0	0	0
		Sub total	0.25	0.5	0.5	0.25	0.25	1.75
5	Hub management unit	Recurring	1.5	1.5	1.50	1.5	1.5	7.5
		Non-Recurring	0	0.5	0.50	0.5	0.5	2
		Sub total	1.5	2	2	2	2	9.5
	Total	Recurring	7.75	11.5	8.75	7	7	42
		Non-Recurring	0	80.5	34.1	6.7	6.7	128
		Grand Total	7.75	92	42.85	13.7	13.7	170

The received funds as of date are : Rs. 7.75 Cr under Recurring head received in Year 1 and Rs. 5 Cr under Non-recurring head received in Year 2. After spending 75% of Year 1 recurring funds, the Year 2 allocated recurring funds will be requested.

Funds (₹ Crore)	Y1	Y2
Recurring	7.75	0.00
Non-recurring	0.00	5.00
Balance	5.20	5.00

The expenditure pattern under recurring and non-recurring is as follows, with salary component and HUB projects contributing to majority of the expenses.

Recurring   **Non-recurring**

■ Salary   ■ Operations
■ Events   ■ Consumables

■ Hub ■ Spokes ■ External ■ Startups

The Chairperson, HGB stressed on the fact that the expenditure to be incurred in the first quarter every year and the indenting and procurement process has to start at least in August of the previous year. For the current procurements at the hub for all the major equipment, the target for placing the Purchase Order should be January 2023.

Dr. JBV Reddy emphasised that there has to be an increase in the number of outreach events to which the Chairperson, HGB responded that Quantum Technologies is an emerging area and technology development needs to be the primary focus of the HUB and at the same time, events will be pursued as long as they do not affect the technology/product development.

Prof. Ramakrishnan suggested the involvement of HUB PIs in online mode if they have time-constraints. Dr. Verma offered to team up with CDAC and use CDAC resources for research and training. Dr. Reddy added that we should involve relevant line ministries for training and outreach activities.

Item No. 2.6	To discuss and allocate funds for the India-Finland joint development project in Quantum Technologies (I-HUB QTF as nodal agency)

The Board **NOTED** the following on India-Finland Joint development:

Prof. Umakant Rapol summarised the proposed India-Finland Joint development program on Superconducting qubits-based quantum computer (document enclosed).

The project may involve financial commitment from the HUB under the 'International Collaborations' activities. If there is any additional fund requirement other than the projected budget in the Detailed Project Report (DPR), the DST representative stated that additional fund allocation request would be taken up by DST.

The item is **resolved.**

Item No. 2.7	**To seek clarification on official approval of the DPR from the Scientific Advisory Council of NM-ICPS**

The Board **NOTED** the following on approval of Detailed Project Report.

DST appraised the HGB that there will be a Scientific Advisory Committee meeting of NM-ICPS to discuss the review of DPR; the meeting will be followed by the DPR approval process.

The board **resolved** the matter.

ADOPTION ITEMS

Item No. 2.8	**To consider sharing of good practices/processes with respect to procurement or finance followed by leading hubs (that started earlier than the I-HUB QTF) under the NM-ICPS**

The HGB members unanimously decided that this item is out of the purview of the HGB discussions and these matters be resolved between the hub and the DST office.

RATIFICATION ITEMS

Item No. 2.9	**Appointment of Staff – scientific staff and admin staff**

The Board **NOTED** the appointment of staff.

1) Scientific Staff:
a. Professor S. Ramakrishnan has accepted the offer of Chanakya Chair Professorship at I-HUB QTF. Appointment of additional Chanakya Chair Professors is underway.
b. Four scientific staff have been recruited on ad hoc basis to work on various projects under the supervision of scientists working with the I-HUB QTF.
c. The process of recruitment of Faculty Fellows is underway.

2) Administration Staff:
a. Two Administrative Assistants and one Business Development Manager have joined the I-HUB QTF
b. One Admin Staff (Operations Manager) to join in December 2022
c. Two Admin staff (Sr. Finance Officer and Analyst - Content Development) have been sent offers.
d. Recruitment of two QT Market Research Analyst and two temporary Procurement Staff is in process.

Item No. **Constitution of Committees and presentation of members**
2.10 **list**

The Board **NOTED** the constitution of committees.

- **Scientific Advisory Committee (SAC)**
- **Technology Innovation Committee (TIC)**
- **Startup Evaluation Committee (SEC)**
- **Procurement Committee (PC)**
- **Selection and Recruitment Committee (SRC)**
- **Mentor Pool – HUB PIs and external experts**

The I-HUB QTF has constituted the following committees for evaluation of projects and procurement related to development of Quantum Technologies.

Scientific Advisory Committee (SAC):
(1) Prof. Umakant D Rapol, Project Director, I-HUB QTF
(2) Prof. M S Santhanam, IISER, Pune
(3) Dr. Atikur Rahman, IISER, Pune
(4) Dr. Sunil Nair, IISER, Pune
(5) Dr. Mukul Kabir, IISER, Pune
(6) Prof. R Vijayraghavan, TIFR
(7) Prof. S Ramakrishnan, Chanakya Chair Professor, I-HUB QTF
(8) Prof. Kailash Rustagi, Chair, PAMC, QuEST
(9) Dr. Sangeeta Maini K M, CEO, I-HUB QTF

Technology Innovation Committee (TIC):
(1) Prof. Jayant Udgaonkar, IISER, Pune (Chair, BoD)
(2) Dr. Sudhir Ranjan Jain, BARC
(3) Prof. Umakant D. Rapol, Project Director, I-HUB QTF
(4) Dr. Gargi Dasgupta, IBM
(5) Dr. Nitin Samarth, Pennsylvania State University
(6) Prof. Apoorva Patel, IISc
(7) Dr. Sangeeta Maini K M, CEO, I-HUB QTF

Startup Evaluation Committee (SEC):
(1) Prof. S Ramakrishnan, Chanakya Chair Professor, I-HUB QTF
(2) Mr. Anil Sharma, Head, Corporate Incubation, TCS
(3) Dr. Sangeeta Maini K M, CEO, I-HUB QTF
(4) Dr. Rohini Srivathsa, NTO, Microsoft India
(5) Prof. Umakant D. Rapol, Project Director, I-HUB QTF
(6) Dr. Sudhir Kamat, Director, DIA-RCOE, IISc
(7) Dr. Shankar Venugopal, VP, Mahindra & Mahindra
(8) Dr. Sudhir Varadarajan, Head (Design, Innovation & Incubation), IIITDM
(9) Prof. S Sivaram, Honorary Emeritus Professor, IISER, Pune

Procurement Committee (PC):
(1) Prof. M S Santhanam, IISER Pune (Chairperson)
(2) Mr. Salim Sheikh, Purchase Officer, IISER Pune
(3) Dr. Atikur Rahman, IISER Pune
(4) Dr. Surjeet Singh, IISER Pune

(5) Prof. Umakant D Rapol, IISER Pune
(6) CA Vasundhara Laad, Jt. Registrar (Fin. & Ac.), IISER, Pune
(7) Dr. Sangeeta Maini K M, CEO, I-HUB QTF

Selection and Recruitment Committee (SRC):
(1) Dr. Naresh Sharma, IISER, Pune
(2) CA Vasundhara Laad, Jt. Registrar (Fin. & Ac.), IISER, Pune
(3) Dr. Goldi Misra, Chief Technology Officer and Chief Information
    Security Officer, IISER, Pune
(4) Prof. Umakant D Rapol, Project Director, I-HUB QTF
(5) Dr. Sangeeta Maini K M, CEO, I-HUB QTF

In addition to these committees, the I-HUB QTF is creating a mentor pool consisting of eminent people from academia and industry that have vast experience in building innovation and entrepreneurship ecosystems.

REPORTING ITEMS

Item No. 2.11

Updates on I-HUB QTF activities (by CEO)

Members **NOTED** and discussed the content of the presentation.

Dr. Sangeeta Maini K M, CEO, I-HUB QTF presented (the presentation is enclosed) various technical projects initiated by the HUB. There was a discussion about bringing together people working on different aspects of Quantum Technologies and duplicating the efforts. People with different skillset and experience in each aspect of vertical need to be brought together so that they work on complementary aspects of the project to optimise national resources. Prof. Umakant Rapol presented the timelines of various project. It was explicitly mentioned that those timelines be aggressively pursued and those timelines for many of the projects would be reduced to half due to various technological advancements across the globe in terms of availability of various components and subsystems. The members were of the opinion that a detailed project and roadmap to be presented to the HGB in the upcoming/future meetings. A new roadmap identified for the top projects of the hub will be circulated to the HGB.

The members asked the Project Director and the CEO for an updated roadmap and the timelines with expected deliverables and to be circulated to the board members. The Project Director assured the HGB that within two weeks, this document will be done for the top three projects that align with the grand goals and also the remaining projects of the hub and what can be achieved until December 2023.

It was suggested by the members that each vertical have a monitoring advisory group, chaired by a member from HGB with additional members from HGB or co-opted external members to monitor progress of each vertical.

The sub-committees will meet more frequently to assess the progress of the projects under various verticals and there can be yearly review on the deliverables.

The members discussed the need for adhering to the established standards as and when applicable whenever any product is developed.

Item No. 2.12	**Financial Status of I-HUB QTF**

The Board noted the setting-up and streamlining of the CNA account and an update on the recurring and non-recurring funds available with the I-HUB QTF.

The financial status of I-HUB QTF was **NOTED** by the HGB.

Item No. 2.13	**Main Technology deliverables of I-HUB QTF (Flagship QT Projects)**

The Board **NOTED** the main technology deliverables of I-HUB QTF as discussed as part of the HUB updates presentation by CEO. The I-HUB QTF has identified three Flagship Projects, as recommended by the I-HUB QTF Board of Directors (13th June 2022 BoD meeting), that are to be monitored closely and are to be delivered on priority.

Item No. 2.14	**Evaluation of external proposals (from academic institutes and startups) in progress**

The HGB **NOTED** that the external proposals (from academic institutes and startups) are under evaluation with the reviewers and shall be sent to committees for final evaluation.

Item No. 2.15	**Inclusion of Spokes**

The HGB **NOTED** the inclusion of six Spokes Projects.

Item No. 2.16	**Roadmap for Human Resource Development of I-HUB QTF**

The HGB **NOTED** the roadmap for Human Resources Development with many outreach programs and technical workshops in the pipeline.

The I-HUB QTF is organizing technical workshops, sensitization and outreach programs with regard to Quantum Technologies at academic institutes, colleges and universities:
(1) Line-up of technical workshops in four QT verticals
(2) Line-up of sensitization activities in local colleges
(3) Line-up of sensitization activities across India (including northeast India)

Item No. 2.17	**Tendering Process for high-value procurements**

The HGB **NOTED** that the Tendering process for procurements with the creation of secondary account of IISER-Pune on Central Public Procurement Portal (CPPP) in the name of I-HUB QTF shall be streamlined.

Item No. 2.18	**Update on MoUs signed by I-HUB QTF**

The MoU updates of I-HUB QTF were **NOTED** by the HGB.

The I-HUB QTF has an MoU with CDAC Pune (22 February 2022) for the development of hardware and software stack for the quantum computer. The CDAC Pune is seeking funding for their part of the project.

Item No. 2.19	**Update on Indo-Russia collaboration**

The HGB **NOTED** the Indo-Russia collaboration.

- Indo-Russia Joint Seminar on Quantum Technologies was organized in the period 20-22 August 2022 wherein the Russian team of experts in Quantum Technologies from Russian Quantum Centre and Russian universities visited I-HUB QTF and IISER, Pune and knowledge exchange took place between the Russian and Indian quantum experts.
- The Russian Quantum Centre has shown keen interest in working together in research and programs. MoU is being drafted for joint work.

Item No. 2.20	**Participation by I-HUB QTF in Centre-Science Conclave, Ahmedabad**

The HGB **NOTED** the participation of I-HUB QTF in Centre-Science Conclave, Ahmedabad

The I-HUB QTF team and its startup GDQLabs Private Limited successfully transported the Cold Atoms set up to Science City, Ahmedabad and demonstrated at the DST-organized Centre-State Conclave the trapping of cold atoms to the members of government and public.

Item No. 2.21	**Any other item with the permission of the Chairperson**

The Chairperson, HGB brought to the notice of the HGB the nomination of Dr. Sunil Nair as Associate Project Director, I-HUB QTF to assist the Project Director, I-HUB QTF in the project and administrative activities related to I-HUB QTF.

Dr. Maini requested the Chairperson, HGB that the CEO be included in all meetings related to I-HUB QTF for better clarity, documentation and decision making of any matter. The Chairperson said that this request will be considered.

Action Items

1. The I-HUB QTF should involve relevant line ministries for training and outreach activities.

2. The Project Director and the CEO to update on the roadmap and the timelines with expected deliverables. The document to be circulated to the board members.

3. A monitoring and advisory committee to be constituted from members of the HGB. Additional external members can be co-opted by HGB members, if needed.
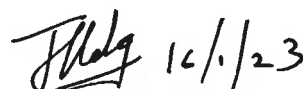
The meeting ended with the Chairperson, HGB thanking the members and invitees for their participation at the meeting.

Dr. Sangeeta Maini K M
Chief Executive Officer, I-HUB QTF

Prof. Umakant D Rapol
Project Director, I-HUB QTF
&
Member Secretary, HGB, I-HUB QTF

Prof. Jayant B Udgaonkar
Director, IISER-Pune
&
Chairperson, HGB, I-HUB QTF