

COMPLETION REPORT

PART - 1

1. Title of the project : ENSURING QoS IN INTERNET OF MEDICAL THINGS USING SOFTWARE-DEFINED NETWORKING
2. Implementing Organisation : Tezpur University
3. MeitY Sanction No. and Date : 13(15)/2020-CC&BT dated 21.07.2020 and 24.01.2023
4. (a) Total Budget Outlay : Original : **Rs. 36,39,433/-**
Revised, if any: **NA**
- (b) Duration of project : 21.07.2020 – 20.07.2023
- (c) Date of completion and reasons for delay, if any : 20.07.2023
5. Total funds spent under various approved budgetary Heads/actual expenditure. Reasons for deviation, if any (as per enclosed Table 1) : **Rs. 35,89,558/-**
6. Details of equipment/assets acquired out of MeitY funds with the name of equipment, sources of supply, total cost/whether Indian or imported (as per enclosed Table 2 and 2A) : Enclosed
7. Details of manpower associated with the project (as per enclosed Table 3) : Enclosed
8. Details of year-wise audited statement of accounts and utilization certificates submitted to MeitY (as per G.F.R.19 & 12A) : Enclosed

PART – II

I. Project work and achievements :

a. Executive Summary : **Annexure A**

b. Details covering targets, achievements in quantitative term and reasons for variations, if any on the following:

i. Scope of the project: *Healthcare, Internet of Medical Things, Software-Defined Networking;*

ii. Systems/ Sub-systems with specifications or feasibility report on futuristic studies: NA

iii. Research papers/Technical Reports brought out:

9 conference papers:

One in IEEE ICC 2021,

one in IEEE Globecom 2023,

one in IEEE Indicon 2022,

two in IEEE I3CS 2023 including a second best paper award,

one in IEEE Globecom 2021 workshop,

one in IEEE Infocom 2022 workshop,

one in IEEE ICC 2023 workshop

one in Springer's InCITE 2023 conference

2 journal papers:

One in Springer Cluster Computing (indexed by SCIE+SCOPUS),

One in

Elsevier SmartHealth Journal (indexed by SCOPUS)

Two more journal papers are to be submitted.

1 Indian patent application registered: IPR patent application no.

202331068011 titled **"IOMT BASED HOSPITAL NETWORK WITH OPENFLOW QOS SUPPORT AND FOG/CLOUD OFFLOADING"**

iv. Manpower trained: *4 PhD Scholars, 2 M.Tech, 10 B.Tech, and around 60 participants of the workshop held.*

v. Anticipated know-how transfer to industry: *Yet to do*

vi. Technology/Know-how developed (Hardware, software & other details, if any); know-how document available or not:

Our patent application document includes the necessary details

vii. No. of industries shown interest for know-how utilization/ commercialization :

In talks with multiple medical institutes in Assam

viii.No. of users/interested for taking prototype/finished product.

Two private hospitals have shown interest.

ix.No. of industries/users interested in applying the know-how developed for enhanced productivity

Two private hospitals have shown interest.

2. Additional information

i) Details of patents registered, if any : *One Indian Patent application registered*

ii) Technological spin offs, seeding of a :
major activity and how the project has
helped in enhancing the technological
base/capabilities in the country

iii) Future areas for work :

**TABLE : 1 HEAD-WISE BREAK-UP OF EXPENDITURE
(Rs. In Lakhs)**

S.No.	Head	Approved Budget Outlay	Expenditure Incurred Upto 20.07.23 RE FE Total	Expenditure From 21.07.20 To 20.07.23 RE FE Total	Anticipated Expenditure From -----To----- -----FE BE Total	BE	Remarks
1.	Capital Eqpt. (FE Comp)*	21,41,065	20,98,801	20,98,801			All necessary equipments are acquired but Rs. 42,264 stayed unspent Rs. 7,611/- stayed unspent from overhead
2.	Consumable items/components (FE comp)	60,000	60,000	60,000			
3.	Duty on Imports	NIL	NIL	NIL			
4.	Staff Salaries	7,88,640	7,88,640	7,88,640			
5.	Travel	2,00,000	2,00,000	2,00,000			
6.	Contingencies	2,00,000	2,00,000	2,00,000			
7.	Overheads/, if any	2,49,728	2,42,117	2,42,117			
8.	Other expenditure debitable to this project (please specify)	NIL	NIL	NIL			

- FE utilised, over and above sanction made by DOE, through OGL facilities may be indicated separately. Please indicate if there is any
- Deviation from originally approved budget and whether necessary approval has been taken.

TABLE 2.1 EQUIPMENT (IMPORTED) PROCURED FOR THE PROJECT

(Rs. In Lakhs)

S.No.	Description	Manufacturer/ Supplier	Brief Specifications	Purchase Order No. & date	Date of Receipt	Total Cost	Duty * Paid	Conditions G- Good B – Bad
NA	NA	NA	NA	NA	NA	NA	NA	NA

Please indicate duty amount paid for each equipment

Mention conditions of equipment purchased. If bad, describe the fault/defect and what action has been taken to repair it?

TABLE 2.2 CAPITAL EQUIPMENT (INDIGENOUS) PROCURED FOR THE PROJECT

(Rs. In Lakhs)

SN	Description	Manufacturer/ Supplier	Brief Specifications	Purchase Order No. & date	Date of Receipt	Total Cost (Rs.)	Duty Paid	Conditions G – Good B - Bad
1.	SDN OpenFlow Switch (Qty.4)	Allied Telesis/ WIMAX	16-ports managed PoE+ OpenFlow switch	GEMC-51168773241-7934 dt: 22.12.2020	18-Jan-2021	4,89,480.00/-	Incl.	G
2.	Wi-Fi. Access Point (Qty: 10)	NETGEAR/Comp utech India	Controller based Indoor Access Point	GEMC-51168778771-4914 dt: 22.12.2020	13-Jan-2021	1,53,490.00/-	Incl.	G
3.	Printer (Qty: 1)	Brother/ Computech India	Brother Laser Monochrome Printer	GEMC-51168777845-2416 dt: 22.12.2020	13-Jan-2021	17,950.00/-	Incl.	G
4.	Desktop Comp-uter (Qty. 2)	Dell/ WIMAX	Dell Intel Core i7 9700 8GB RAM, 1000 GB HDD, Win 10 Pro	GEMC-51168772661-9862 dt 06.01.2021	21-Jan-21	1,70,000.02/-	Incl.	G
5.	Server (Qty:1)	Dell/ WIMAX	DELL EMC 1 X DDR4 SDRAM with ECC 128 GB	GEMC-51168774254-7301 dt 06.01.2021	30-Mar-2021	4,44,871.00/-	Incl.	G
6.	IoT Lab Kit (Raspberry PI) (Qty: 20)	mLabs/ Computech India	IoT Lab kit (Raspberry PI)	GEMC-51168771777-8477 dt 11.03-2021	17.08.2021	1,16,380.00/-	Incl.	G
7.	Arduino board (Qty: 20)	TechnoKratzz/ Computech India	IoT Lab kit (Arduino)	GEMC-51168775588-3137 dt 11.03.2021	17.08.2021	15,000.00/-	Incl.	G
8.	Gas Sensor (Qty: 20)	Supplier: Computech India	Gas Sensor	GEMC-51168772834-7229 dt 11.03.2021	17.08.2021	15,000.00/-	Incl.	G
9	ESP32 DEVELOPMENT BOARD (Qty:20)	Computech india	ABS Plastic Housing Photoelectric Sensor Range Excess Gain)	GEMC-511687767121999 dt 10.02.2022	10.03.2022	44,000.00/-	Incl.	G
10	SENSOR PROBE FOR PULSE OXIMETRY (Qty:20)	Computech india	Switches Microcontroller Educational Kit	GEMC-511687758767251 dt 10.02.2022	10.03.2022	42,000.00/-	Incl.	G
11	ACCELEROMETER AND GYROSCOPE (Qty:20)	Computech india	Printed Circuit Board	GEMC-511687711791912 dt 10.02.2022	10.03.2022	24,000.00/-	Incl.	G
12	HEART RATE MONITOR (Qty: 20)	Computech india	Heart Rate Monitor	GEMC-511687757474069 dt 04.02.2022	10.03.2022	60,000.00/-	Incl.	G

13	MUSCLE SENSOR(Qty:20)	Computech India	PCB T&H Sensor	GEMC-511687702976738 dt 04.02.2022	10.03.2022	130,000.00/-	Incl.	G
9	16Port PoE + L2 Switch with Open Flow (Qty:1)	WIMAX	16Port PoE + L2 Switch with Open Flow	GEMC-511687735548803 dt 13.01.2022	14.03.2022	210,000.00/-	Incl.	G
10	24-U server Rack (Qty:1)	WIMAX	24-U server Rack	GEMC-511687735548803 dt 13.01.2022	14.03.2022	56,000.00/-	Incl.	G
11	Networking Accessories I (RJ 45 PATCH CABLE) (Qty:50)	WIMAX	Networking Accessories	GEMC-511687735548803 dt 13.01.2022	14.03.2022	16,280.00/-	Incl.	G
12	Acer Laptop	Computech India	Acer, Core i7, Windows 11 laptop	GEMC-511687749566351 dt 14.03.2023	15.03.2023	94,350.00/-	Incl.	G

Mention condition of equipment purchased. If bad, describe the fault/defect and what action has been taken to repair it?

TABLE 2.3 SALE/TRANSFER OF CAPITAL GOODS (WITH PRIOR PERMISSION OF MeitY)

S.No.	Description	Sale/Transfer S/T	Orgn. To which sold/ Transferred	Sale Value Rs. In lakhs	Funds Refunded to MeitY

TABLE 3: MANPOWER ASSOCIATED WITH THE PROJECT:

S.No.	Name*	Designation	Qualification	% of time devoted to this project	Salary drawn From the Project funds (Y/N)	Date of Joining	Date of Leaving	Total average Emoluments (monthly)
1.	Dr. Nabajyoti Medhi	Assistant Professor, PI	PhD	45% (SDN and IoT)	NA	NA	NA	University Faculty
2.	Prof. D. K. Saikia	Professor, Co-PI	PhD	25% (SDN and IoT)	NA	NA	NA	University Faculty
3.	Dr. Sanjib Kumar Deka	Assoc. Prof. Co-PI	PhD	25% (Wireless Networks)	NA	NA	NA	University Faculty
4.	Angkurita Roy	JRF	MCA, NET, Pursuing PhD	100% (IoT and ML)	Rs. 7,88,640/- till 15.01.2023	01.12.2020	15.01.2023	Recruited Staff
5.	Birglang Bargary	PhD Scholar	M. Tech, Pursuing PhD	50% (SDN and its security)	NA	NA	NA	PhD Scholar with fellowship
6.	Priyanka Bardalai	PhD Scholar	M. Tech, Pursuing PhD	25% (SDN based QoS)	NA	NA	NA	PhD Scholar, currently employed

7.	Himadri Neog	PhD Scholar	MCA, Pursuing PhD	50% (IoT, HealthCare 4.0)	NA	NA	NA	PhD Scholar with institute fellowship
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* Please indicate as applicable
(a) Institute Faculty and Staff
(b) Staff recruited for the project
(c) Students

No.13(15)/2020-CC&BT
Government of India
Ministry of Electronics & Information Technology
CC&BT Division

Dated: 05.01.2023

To,

The Pay & Accounts Officer,
Ministry of Electronics & Information Technology (MeitY),
New Delhi – 110003.

Subject: Extension of the duration of the project entitled “Ensuring QoS in Internet of Medical Things (IoMT) using Software-Defined Networking (SDN)” implemented by Tezpur University.

Sir,

I am directed to refer to this Ministry's communication of even number dated 21.07.2020 conveying approval of the Competent Authority for the project entitled “Ensuring QoS in Internet of Medical Things (IoMT) using Software-Defined Networking (SDN)” implemented by Tezpur University at a total estimated cost of Rs.36,39,433/- (Rupees Thirty Six Lakh Thirty Nine Thousand Four Hundred Thirty Three Only) over duration of 24 months to be implemented by Tezpur University. The completion date of the project was 20.07.2022.

2. I am now directed to convey the approval of the Competent Authority for the extension of the project duration by 12 months i.e. from 21st July, 2022 to 20th July, 2023 without any enhancement in the approved project outlay.
3. There is no other change in the Administrative Approval of even no. dated 21.07.2020 as well as the terms and conditions governing grants-in-aid for the implementation of the project.
4. This issues with the approval of GC(CC&BT), MeitY vide e-file No.3073454 dated 02.01.2023.

Yours faithfully,

A. Padmavathi
(A. Padmavathi)
Deputy Director

Copy to:-

- 1) The Director, Office of the Director General of Audit, Post & Telecommunication, Shamnath Marg, Civil Lines, Delhi – 110054.
- 2) Integrated Finance Division, MeitY.
- 3) DDO, MeitY.
- 4) The Registrar, Tezpur University, Napaam, Tezpur.
- 5) Dr. Nabajyoti Medhi, Chief Investigator & Assistant Professor, Computer Science & Engineering, Deptt. Of Computer Science & Engineering, Tezpur University, Napaam, Distt. Sonitpur, Assam.
- 6) GC(CC&BT) / Scientist'D'(PK) / DD(AP) MeitY.
- 7) Sanction Folder/Sanction File.

A. Padmavathi
(A. Padmavathi)
Deputy Director

GFR 19-A


FORM OF UTILIZATION CERTIFICATE (Period: From 21.07.2020-to-20.07.2023)

S. No.	Letter No. & Date	Amount
1.	MeitY Administrative Approval No.: 13(15)/2020-CC&BT dated 21.07.20 & 13(15)/2020-CC&BT dated 24.01.23	Rs. 36,39,433/-

1. Certified that out of **Rs. 36,39,433/- (Thirty six lacs thirty nine thousands four hundreds and thirty three)** of grant-in-aid sanctioned during the year **2020-2023** in favour of **Tezpur University, Assam** under this Ministry/Department letter No. given in the margin and **Rs. 36,39,433/- (Thirty six lacs thirty nine thousands four hundreds and thirty three)** on account of total unspent balance, a sum of **Rs. 35,89,558/-** has been utilized for the purpose of project under MeitY CC&BT group entitled "*Ensuring QoS in Internet of Medical Things (IoMT) using Software-Defined Networking (SDN)*" for which it was sanctioned, that the balance of **Rs. 49,875/-** remaining un-utilized at the end of the project.
2. Certified that I have satisfied myself that conditions on which the grant-in-aid was sanctioned have been dully fulfilled/ are being fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned. ,

Kinds of checks exercised.

1. Stock checking for procured items and other expenditure
2. Physically verifying the equipments installed
3. Payments are made under direct supervision of Finance Officer


(N. Medhi)
Principal Investigator


29.9.23
Finance Officer,
Tezpur University
Finance Officer
Tezpur University


Registrar,
Tezpur University
Registrar
Tezpur University

Ensuring QoS in Internet of Medical Things (IoMT) using Software-Defined Networking (SDN)
Statement of Expenditure
21.07.2020 - 20.07.2023

MeitY: 13(15)/2020-CC&BT dated 21.07.20 & 13(15)/2020-CC&BT dated 24.01.2023

	Sanctioned Cost	Grand Received (First installment)	Grand Received (Second installment)	Expenditure Incurred			Total Expenditure	Balance till 20.07.2023	Requirement of fund after 20.07.2023	Remarks (if any)
				(A) 1 st yr(2020-2021)	(B) 2 nd yr(2021-2022)	(C) 3rd yr(2022-2023) & till 20.07.2023	(A + B + C)			
Non - Recurring	21,41,065	21,41,065	0	8,30,920	11,73,531	94,350	20,98,801	42,264	NA	
Equipments										
Recurring	7,88,640	3,94,320	3,94,320	0	4,03,000	3,85,640	7,88,640	0	NA	
Human-Resource										
Consumables	60,000	30,000	30,000	0	24,920	35,080	60,000	0	NA	
Travel	2,00,000	1,00,000	1,00,000	0	12,801	1,87,199	2,00,000	0	NA	
Contingency	2,00,000	1,00,000	1,00,000	0	1,01,149	98,851	2,00,000	0	Required as admissible	Required for TA/DA of on-campus PRSG meeting
Overheads	2,49,728	1,24,864	1,24,864	1,03,582	24,127	1,14,408	2,42,117	7,611	NA	
Total	36,39,433	28,90,249	7,49,184	9,34,502	17,39,528	9,15,528	35,89,558	49,875	Required as admissible	

* Interest Earned (2020-2021) = 32,596 (Remitted)

* Interest Earned (2021-2022) = 4,782 (Remitted)

Signature of the PI
Name: Dr. Nabajyoti Medhi
Date: 08/09/2023
Date of Start of Project: 21.07.2020

(Handwritten Signature)
Signature of Competent Financial Authority
(With Seal and Date)
Finance Officer
Tezpur University