

# **RFD**

**Results-Framework Document** 

For

**Centre for Development of Telematics** 

(2012-2013)

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# Results-Framework Document (RFD) for Centre for Development of Telematics (20 Section 1:

### Vision, Mission, Objectives and Functions

#### Vision

C-DOT to become World Class Indian Telecom Technology Development Centre.

#### Mission

i. To indigenously design develop state of art telecom technologies, products and solution.ii. To meet the telecom needs of India, particularly of national importance in strategic sector and rural areas.

#### **Objectives**

- 1. Work on telecom technology products and services to provide solutions for current, future requirements and converged networks including those of national importance especially related to rural applications, strategic sector and security
- 2. Support Telcos and service providers in the introduction of new technologies, features and services by optimal utilization
- 3. Develop and progressively transfer technology from design to manufacture utilizing resources from within the country and
- 4. Provide market orientation to R&D activities and sustain C-DOT as a centre of excellence.

#### **Function**

- 1.Work in the frontiers of technology of Telematics & Information Technology taking into account futuristic trend and to conduct such basic research to meet the objectives.
- 2.Indigenous Telecom R&D to meet the telecom needs of the country.
- 3.Making country self reliant with appropriate telecom technologies by import substitution.
- 4.Build partnerships and joint alliances with Academia, Industry, Solution providers, Telcos and other R&D organizations to
- 5.To promote & assist ancillary industry in the production of high quality components, subassemblies and equipment to meet performance standards required by the telematic industry.

# 12-2013)

#### Results-Framework Document (RFD) for Centre for Development of Telematics

(2012-2013)

#### Section 2:

## Inter se Priorities among Key Objectives, Success indicators and Targets

							Ta	rget / Criteria Va	alue				
Objective	Weight	Action	Success Indicator	Unit	Weight	Excellent(100 %)	Very Good(90%)	Good (80%)	fair (70%)	Poor (60%)			
[1]Work on telecom technology products and services to provide solutions for current, future requirements and converged networks including those of national importance especially related to rural applications, strategic sector and security agencies,		[1.1] Completion of R&D deliverables	[1.1.1] LTE-A (Long Term Evolution- Advance): Design, Development & Prototype of Femto eNodeB system for LTE			20/02/2013		15/03/2013	25/03/2013	31/03/2013			
etc.	55	planned for the year	LIE	Date	8.0	20/02/2013	01/03/2013	15/03/2013	25/03/2013	31/03/2013			
			[1.2.1] Design & Development of IEEE 1588 (backhaul for both 2.56 & 10G) compliant CPE for OAAS (Optical Aggregation & Access System): 2.5G, OLT solution with optical interfaces adaptable to 10G GPON & demonstration of services over 10G GPON	Date	9.0	31/01/2013	15/02/2013	28/02/2013	15/03/2013	31/03/2013			
			[1.3.1] CMS (Centralize Monitoring System) R&D: Software enhancement for RMC with Disaster Recovery (DR) , ISF Software Customization for LIS Interface, ISP Integration Basic Design, Software Release for Field Problems.	Date		15/01/2013	15/02/2013	15/03/2013	25/03/2013	31/03/2013			
			[1.4.1] Commercial Grade Terabit Router: Design completion for fault tolerant multi Terabit Router	Date	9.0	15/01/2013	15/02/2013	15/03/2013	25/03/2013	31/03/2013			

												<u> </u>	
	[1.5.1] UNMS												
	(Unified Network												
	Management												
	System): Design &												
	Development of												
	Unified NMS - V1.0.0	_											
	for testing / validation	Date	5.0	20/02/2013	01/03/2013	15/03/2013	25/03/2013	31/03/2013					
	[1.6.1] Broadband												
	CPE (Customer												
	Premises) with 3G												
	wireless fallback –												
	Field Trial												
	commencement	Date	3.0	30/11/2012	31/12/2012	31/01/2013	28/02/2013	31/03/2013					
	[1.7.1] CPRS												
	(Customized Platform												
	for Rural Services) :												
					1								
	A genericapplication												
	platform for DRAX												
	(Data Rural				1								
	Application												
	Exchange) for Client												
	sytem												
							1						1
	implementation with												
	demonstration for												
	advanced features												
	e.g. Near Field												
	Communication												
	(NFC) & services like												
	adhar authentication	_											
		Date	3.0	15/01/2013	15/02/2013	15/03/2013	25/03/2013	31/03/2013					
	[1.8.1] High												
	efficiency RF												
	Amplifier (HERA):												
	Design												
	implementation for												
	card realization &												
		Date	5.0	30/11/2012	31/12/2012	31/01/2013	28/02/2013	31/03/2013					
	[1.9.1] EAIS												
	(Enhanced Active												
	Infrastructure				1								
	Sharing) : GPRS				1								
	(General Packet						1						1
	Radio Service) &						1						1
	EGPRS (Enhanced												
	GPRS) functionality				1								
	implementation over						1						1
	SGRAN (Shared												
	GSM Radio Access												
	Network) - R&D field												
	trial.	Date	4.01	31/12/2012	31/01/2013	28/02/2013	25/03/2013	31/03/2013					
												1 7	
	[2.1.1] CMS roll-out				1								
[2]Support Telcos	in the field –												
in the introduction of new features/	build upto 40%												
new technologies, upgradations/	capacity and IT												
features and services adaptations/	infrastructure up to												
by optimal utilization technical support for	20% capacity.						1						1
of installed networks, developed	•Upgradation of												
pilots and studies. 25 technologies		Number	4.0	12	8	4	3	2					
			17.0	14	ı •	1-4	10	1-	1		1 1	1 1	1 1

	1	1			1			,	,		,		
			[2.2.1] WIPS -		1								
			Design &										
			development of										
			secure mobile										
			wireless network -										
			Demonstration	Date	3.0	31/01/2013	20/02/2013	01/03/2013	15/03/2013	31/03/2013			
			[2.3.1] SDCN										
			network Expansion &										
			setting-up of Network										
			Operation Centre										
			(NOC) for SDCN	Date	3.0	31/01/2013	20/02/2013	01/03/2013	15/03/2013	31/03/2013			
			[2.4.1] MOES /	Date	0.0	0.70.720.0	20/02/2010	01/00/2010	10/00/2010	01/00/2010			1
			GPON Technology										
			piloting to address										
			broadband										
			requirements of										
			telecom / non-										
			telecom segments of										1
			urban / rural and		1								1
			North-East.	Date	3.0	30/10/2012	30/11/2012	31/12/2012	31/01/2013	31/03/2013			
			[2.5.1] Multi-	Date	3.0	30/10/2012	30/11/2012	31/12/2012	51/01/2013	51/03/2013	<del>                                     </del>		+
			sectored BBWT		1								
			system with active										
			sharing : Pilot trial	Date	3.0	31/01/2013	10/02/2013	20/02/2013	05/03/2013	15/03/2013			
			Sharing . I not that	Date	5.0	31/01/2013	10/02/2013	20/02/2013	03/03/2013	13/03/2013			+
			[2.6.1] Migration of										
			Fixed Line (equipped										
			capacity) to IP based										
			technology -										
			completion of										
			acceptance testing &										
			submission and										
			approval of proposal										
				Data	3.0	30/06/2012	15/07/2012	31/07/2012	10/08/2012	20/08/2012			
			for mass deployment.	Date	3.0	30/06/2012	15/07/2012	31/07/2012	10/08/2012	20/08/2012			-
			[2.7.1] Technology support in the field										
			for fixed-line, ATM										
			etc : Field issues'		1								
			redressal by Bug		1								
			fixes/New Release	0/	3.0	100	95	90	85	80			
			Enhancements etc.	%	3.0	100	90	90	00	ου			<del> </del>
			[0 0 4]										
			[2.8.1]										
			Implementation of										
			ISP Monitoring										
			solution at all										
			locations (ready with		1								
			requisite Hardware)										
			comprising Gateways		1								
			/ POPs (Point-of-	0/	2.0	100	00	60	40	20			
[OID accordance and			Presence)	%	3.0	100	80	60	40	30	<del>                                     </del>		<del> </del>
[3]Develop and													
progressively					1								
transfer technology			[2 4 4] Cianina -f										
from design to			[3.1.1] Signing of										
manufacture utilizing			Transfer of										
resources from within		[2 4] Teorities of	Technology										
the country and	4	[3.1] Transfer of	agreements : No. of	Niconala	4.0	-	4	2	2	4			
abroad.	4	Technology	Technologies	Number	J4.U	5	4	ျ	4	11			'

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			[4.1.1] Exhibitions /											
			Technical											
			Presentations to											
[4]Provide market			prospective											
orientation to R&D			customers /											
activities and sustain			Demonstrations /											
C-DOT as a centre of		[4.1] Technology	Feasibility Studies											
excellence.	4	Promotion	and Pilots	Number	4.0	25	20	15	10	5				
* Efficient														
Functioning of the		Timely submission of												
RFD System	3	RFD for 2012-13	On-time submission	Date	2.00	05/03/2012	08/03/2012	09/03/2012	10/03/2012	11/03/2012				
ra D Ojotom		141 2 101 2012 10	On time dubinicolon	Date	2.00	00,00,2012	00/00/2012	00/00/2012	10/00/2012	11/00/2012				
		Timely submission of												
		Results for 2012-13	On-time submission	Date	1.00	01/05/2013	02/05/2013	03/05/2013	04/05/2013	05/05/2013				
* Administrative			Prepare ISO 9001											
Reforms	5	Implement ISO 9001	action plan	Date	1.00	01/05/2013	02/05/2013	03/05/2013	04/05/2013	05/05/2013				
			Implementation of											
			ISO 9001 action											
		Implement ISO 9001	plan.	Date	2.00	25/03/2013	26/03/2013	27/03/2013	28/03/2013	29/03/2013				
		l												
		Implement mitigating												
		strategies for												
		reducing potential	0/ /: 1 /:	0.4		400	0.5		0.5					
		risk of corruption	% of implementation	%	2.00	100	95	90	85	80				
* Improving Internal														
Efficiency /														
responsiveness /			Independent Audit of											
service delivery of		Implementation of	Implementation of											
Ministry / Department	4	Sevottam	Citizen's Charter	%	2.00	100	95	90	85	80				
, , Dopartinont			Independent Audit of											
			implementation of											
		Implementation of	public grievance						1	1				
		Sevottam	redressal system	%	2.00	100	95	90	85	80				
		+									 		 	 

## Results-Framework Document (RFD) for Centre for Development of Telematics (2012-2013)

#### Section 3:

#### Trend Values of the Success Indicators

				Actual Value for EV	Actual Value for FY	Target Value for EV	Projected Value for	Projected Value for			
Objective	Action	Success Indicator	Unit	09/10	10/11	11/12	FY 12/13	FY 13/14			
[1] Work on telecom											
technology products											
and services to											
provide solutions for											
current, future											
requirements and											
converged networks											
including those of		[1.1.1] LTE-A (Long									
national importance		Term Evolution-									
especially related to		Advance): Design,									
rural applications,		Development &									
	[1.1] Completion of	Prototype of Femto									
	R&D deliverables	eNodeB system for									
	planned for the year		Date								
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		_ ,,,,								
		[1.1.2] Design &									
		Development of IEEE									
		1588 (backhaul for									
		both 2.5G & 10G)									
		compliant CPE for									
		OAAS (Optical									
		Aggregation &									
		Access System):									
		2.5G, OLT solution									
		with optical									
		interfaces adaptable									
		to 10G GPON &									
		demonstration of									
		services over 10G									
			Date								
		[1.1.3] CMS									
		(Centralize									
		Monitoring System)									
		R&D : Software									
		enhancement for									
		RMC with Disaster									
		Recovery (DR) , ISF									
		Software									
		Customization for LIS									
		Interface, ISP									
		Integration Basic Design, Software									
		Release for Field									
			Date								
		[1.1.4] Commercial	Date								
		Grade Terabit									
		Router: Design									
		completion for fault									
		tolerant multi Terabit									
			Date								
1	1	1	****	1	1	1	ı.	1		 	

this justice is the second of		<u>,                                      </u>					
Unified Nativork Management System; Design and Unified NMS - V1.0.0 Integrating validation of laste  11.1.6   Promotion of laste  11.1.7   CPRS   Coustomer   Premises) with Sg   Prefet Integration of laste  11.1.7   CPRS   Countomized Platform   Tork Platform of Laste  11.1.7   CPRS   Countomized Platform   Tork Platform of Laste   Design of laste							
Management System; Design & Development of Developm							
System; Design & Development of Unified NMS - V1.0.0   Date		(Unified Network					
System; Design & Development of Unified NMS - V1.0.0   Date		Management					
Development of Unified MMS - V1.0.0 Date (If 1.6) Exception / validation Date (If 1.6) Exception / validation Date (If 1.6) Exception date (If 1.6) Ex							
Unified MMS - V1.0.0 for testing Validation Date  [1.1.6] Broadband CPE (Customer Permisse) with 3C Field Trial commencement  [1.1.7] CPRS (Customized Pisition for Rural Services): A pattern for DRAX (Data Rural Application Exchange) for Client system implementation with misplementation with misplementation (NFC) & services is dear a unberfacture e, e, Near Field Communication (NFC) & services like adher a unberfacture in (J. 1.1) Communication (NFC) & services like dear a unberfacture for any of the services is dear a unberfacture for							
To retesting / validation Date							
[1.1.6] Proadband CPE (Customer Premises) with 3G wireless fallback - Facilitation General Commission (Int.17) CPRS (Customized Platform for Rural Services): A genericapilisation platform for DRAX Application Exchange) for Client system implementation with demonstration for each Nater Field Communication (NFC) & services like arben exhemication etc.  [1.1.8] High Amplifier (HERA): Design implementation for card realization & Apolication (NFC) & services like arben authentication etc.  [1.1.13] EAS (Enhanced CREA): Design implementation for card realization & PoC  [1.1.13] EAS (Enhanced CREA): Design implementation for card realization & PoC Services like Sharing : GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) (Enhanced							
CPE (Customer Premises) with 3G wireless fallback - Field Trial - Field Trial - Field Trial - Commencement Date  11.17 (PRS) (Customized Platform for Run Services): A genericapplication platform for DRAX (Data Runal Application platform for DRAX (Data Runal Application Exclusings) for Client surplementation with demonstration for advanced features e.g. Near Field Communication (NFC) & services like experiments on (NFC) & services like experiments on the finance of the comment of th							
Premises with 3G wireless fallback—Field Trial commencement  I1.1.7] CPRS (Customized Platform (Customized Platfor							
wireless fallback— Field Trial commencement  (1.1.7) CPRS (Customized Platform for Rural Services): A genericapiteation platform or DRAX Application Exchange) for Client sylven implementation with demonstration for advanced features a.g. Near Field Communication (NIC) & services like adher authentication in like adher authentication (NIC) & services like adher authentication (INC) & services like adher authentication for card realization & PoC Amplifier (HERA): Design implementation for card realization & PoC (I.1.9) EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Sarvice) end GPRS) functionally implementation over SGRAN (Shared GSM Radio Access							
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[1.1.8] High efficiency RF Amplifier (HERA): Design implementation for card realization & PoC  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGRS (Inhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
efficiency RF Amplifier (HERA): Design implementation for card realization & PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access GSM Radio Access							
Amplifier (HERA): Design implementation for card realization & PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access		[1.1.6] Fight					
Design implementation for card realization & PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
implementation for card realization & PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
card realization & PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
PoC Date  [1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & ECPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
[1.1.9] EAIS (Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
(Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access		PoC Date					
(Enhanced Active Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access		[1.1.9] EAIS					
Infrastructure Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access		(Enhanced Active					
Sharing): GPRS (General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
(General Packet Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
Radio Service) & EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
EGPRS (Enhanced GPRS) functionality implementation over SGRAN (Shared GSM Radio Access							
GPRS) functionality implementation over SGRAN (Shared GSM Radio Access		FGPRS (Enhanced					
implementation over SGRAN (Shared GSM Radio Access							
SGRAN (Shared GSM Radio Access							
GSM Radio Access							
Network) - R&D field							
trial. Date		trial. Date					
[2.1.1] CMS roll-out							
[2] Support Telcos in the field – □	[2] Support Telcos						
and service providers   2.11 Enhancements/ •Main Data Centre	and service providers [2.1] Enhancements/						
in the introduction of Inew features/ build upto 40%	in the introduction of new features/						
new technologies, upgradations/ capacity and IT	new technologies upgradations/						
fleatures and services adaptations/ infrastructure up to	features and services adaptations/						
reatures and services ladequaturity immassibilities by the potential utilization   technical support for   20% capacity.							
by opiniar utilization learninear support to 20% capacity.							
pilots and studies.   technologies   existing pilot CMC.   Number	pilots and studies.   technologies	existing phot CIVIC. INUITIDE				1	

		[2.1.2] WIPS -					
		Design &					
		development of					
		secure mobile					
		wireless network -					
		Demonstration	Date				
		[2.1.3] SDCN					
		network Expansion &					
		setting-up of Network					
		Operation Centre					
		(NOC) for SDCN	Date				
		[2.1.4] MOES /	Date				
		GPON Technology					
		piloting to address					
		broadband					
		requirements of					
		telecom / non-					
		telecom segments of					
		urban / rural and					
		North-East.	Date				
		[2.1.5] Multi-sectored					
		BBWT system with					
		active sharing : Pilot					
		active snaring : Pilot	D-4-				
		trial	Date				
		[2.1.6] Migration of					
		Fixed Line (equipped					
		capacity) to IP based					
		technology -					
		completion of					
		acceptance testing &					
		submission and					
		approval of proposal					
		for mass deployment.	Date				
		[2.1.7] Technology	Date				
		support in the field					
		for fixed-line, ATM					
		etc : Field issues'					
		redressal by Bug					
		fixes/New Release					
		Enhancements etc.	%				
		[2.1.8]					
		Implementation of					
		ISP Monitoring					
		solution at all					
		locations (ready with					
		requisite Hardware)					
		comprising Gateways					
		/ POPs (Point-of-					
		Presence)	%				
[3] Develop and		1 10301100)	70				
progressively							
transfer technology		10 4 43 0: : :					
from design to		[3.1.1] Signing of					
manufacture utilizing		Transfer of					
resources from within		Technology					
the country and	[3.1] Transfer of	agreements : No. of					
abroad.	Technology	Technologies	Number				

[4] Provide market orientation to R&D activities and sustain C-DOT as a centre of excellence.	[4.1] Technology Promotion	[4.1.1] Exhibitions / Technical Presentations to prospective customers / Demonstrations / Feasibility Studies and Pilots	Number				
*Efficient Functioning of the RFD System		On-time submission	Date		08/03/2012		
	Timely submission of Results for 2012-13	On-time submission	Date		02/05/2013		
*Administrative Reforms	Implement ISO 9001	Prepare ISO 9001 action plan	Date		02/05/2013		
Reforms	Implement 100 3001	Implementation of ISO 9001 action plan.	Date		26/03/2013		
	Implement mitigating strategies for reducing potential risk of corruption				95		
*Improving Internal Efficiency / responsiveness /		Independent Audit of					
service delivery of Ministry / Department	Implementation of	Implementation of Citizen's Charter	%		95		
winisary / Department	Sevotiani	Independent Audit of implementation of public grievance redressal system	%		95		

# Results-Framework Document (RFD) for Centre for Development of Telematics (20 Section 4:

### **Description and Definition of Success Indicators**

#### and Proposed Measurement Methodology

S. No.Actions Success IndicatorDescription and Definition of Success IndicatorsProposed Measurement Methodology 1. Objective: Work on telecom technology products and services to provide solutions for current, future requirements and converged networks including those of national importance especially related to rural applications, strategic sector and security agencies, etc.Completion of RD deliverables planned for the yearLTE-A[1]: Design, Development prototype of Femto eNodeB system for LTE.LTE-A (LTE Advanced) is a promising 4G-and-beyond next generation mobile technology. It enables migration of current GSM/UMTS-based networks to content-rich multimedia service networks for mobile subscribers . LTE-A infrastructure consists of several network nodes like eNodeB, RRH (Remote Radio Head), PDN (Packet Data Network) gateway, serving gateway, mobility management entity, etc. All these network nodes are required for providing 4G broadband services and for seamless integration to existing 3G technologies Design , development and prototype Femto

# lesults-Framework Document (RFD) for Centre for Development of Telematics Section 5:

### **Specific Performance Requirements from other Departments**

Department/PSU/AuthorityRelevant Success IndicatorWhat do you need?Why do you need it?How much you need?What happens if you do not get it?Department of Telecommunication (DOT)Allocation of RD funding funds for CMS- national roll-programTimely release of allocated funding for RD programs /schemes roll-outTo meet the cost of technology development roll-outsAs approved in the budget for the financial year subject to utilization. National roll-out of projected RD outcome will be affectedSDCN network expansion setting up of Network Operation Centre (NOC) for SDCN DOT to provide details of subscriber locations. MTNL to ensure availability of physical pair for network expansion within NCR.To implement decision of the Union Cabinet.100% of specified support.SDCN network expansion will not be completed.For SDCN Pan India roll-out DOT to authorize assist in allocatingsites availability of infrastructure at state capitalpremises. BSNL to make available site connectivity from NCR to all state capitals.Pan Indian SDCN will not exist.CMS Roll-out in the field.DOT to authorize assist in allocating TSP sites availability of infrastructure at TSPs premises.It is basic requirement to start field implementation.All TSPs allocation as per the targetImplementation will be adversely effected.TSPs telecom exchanges should be ETSI[1]

(2012-2013

	Resu	ults-Framework	Document (	RFD) for C	entre for De	evelopment	of Telemat	ics	(:	2012-2013	)		
					Sect	ion 6:							
				OutCom	e/Impact of	Departmen	t/Ministry						
OutCome/Impact of Department/Ministry	Jointly responsible for influencing this outcome /impact with the following		unit	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14					
Law Enforcement Agencies, Defense and the technologies for bridging the digital divide between the urban and rural, remote, NE Region of the country for the socio- economic development of the	MTNL  - Law Enforcement Agencies, Defense  - Indian telecom manufacturers  - Department of IT  - NIC  - Scientific Analysis Group (SAG), DRDO	the network	Number	6	5	7	7	7					
		[21. 01]Technology commercialization – Readiness of technologies for Transfer to manufacturers	Number	4	6	8	4	3					