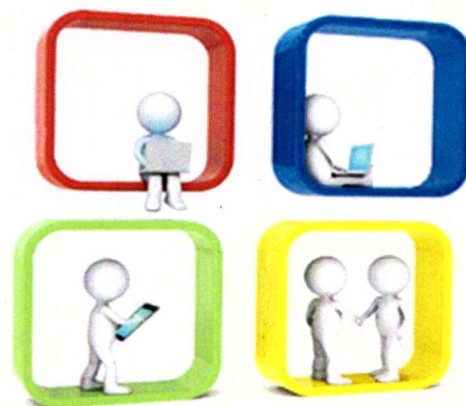
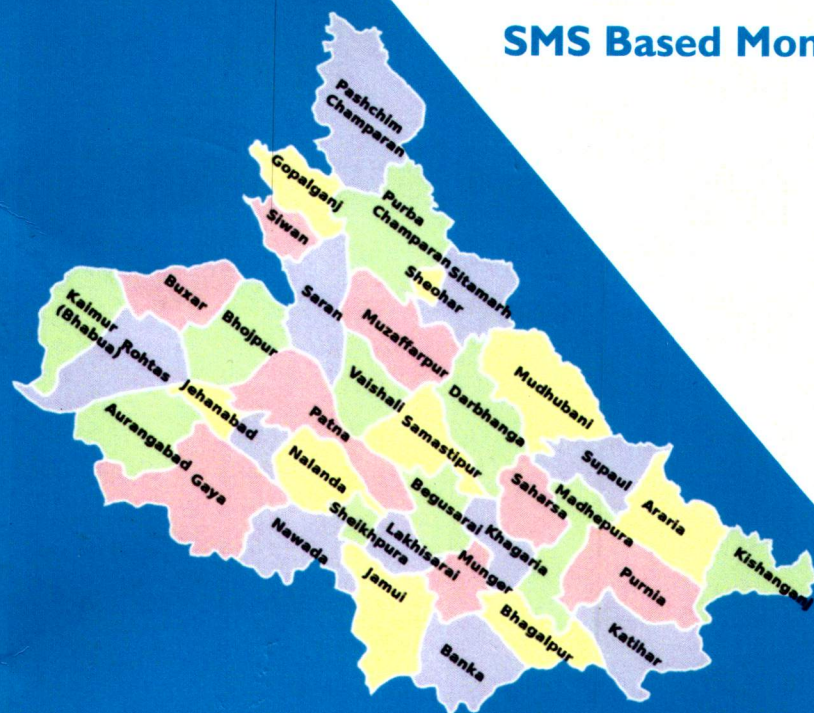




M Technology for Good Governance

SMS Based Monitoring System



Documentation Supported By
Department of Administrative Reforms & Public
Grievances
Ministry of Personnel, Public Grievances and Pension
Government of India

PREFACE

Use of Mobile phones has become widespread in all walks of life. We are discovering newer and innovative applications of mobile Technology in our daily life. One such promising usage of mobile technology, especially SMS tool, is in the area of governance. Bihar has witnessed an innovative application of SMS technology under the aegis of its administrative reforms programme.

Using SMS technology, the intervention has enabled regular monitoring of 10 key government services. The concerned officers have to send only a simple SMS in the pre-coded text to a specific mobile number at the end of each working day and the details on the financial/ physical progress are captured by the central server. The progress details could be accessed through the online dashboard by the concerned head of departments and other officers.

This documentation has been done to highlight the key features of the system and with the objective of sharing this best practice with all the stakeholders interested in the innovative usage of technology in the governance process.

In this document, many screenshots and boxes have been provided to facilitate easy understanding of how the system functions. It is hoped that the readers would find the documentation interesting as well as useful.

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1. Introduction

1.1 Background

The Government of Bihar has over time faced hindrances in the implementation of various schemes and programs, including, an inadequate monitoring system, plagued by absence of adequate resources and technology at the grass root level. The traditional monitoring system used by the Government of Bihar, relied on manual tabulation at the district / block / panchayat level, which was generally conducted at the end of every month. The key issues plaguing the traditional system include:

- Lack of weekly or fortnightly reporting, leading to delay in information flow and thus a delay in undertaking corrective action
- Non-availability of data in the public domain, leading to lack of transparency in the provision of services
- Lack of adequate personnel at the grass root level to collate and tabulate the data in the required format
- Lack of technology usage to enable faster collection, tabulation and transfer of data from grass root level to the state level
- Inconsistency in the reporting format across departments, leading to difficulty in channeling information from the block to the district to the state

With the advent of the Right to Information (RTI) Act, provision of information became mandatory and reporting suffered due to delays caused by inadequate resource and high demand. Eventually, data collection and collation and production of reports assumed greater

importance than monitoring and monitoring officers were employed solely for developing monthly reports. Yet, the reporting was not done in a timely manner and there were no mechanisms to verify the data. Additionally, the presence of 534 blocks proved monitoring to be an overwhelming task and there was large non-compliance to the monitoring requirements of the state.

In order to address the issues plaguing monitoring of schemes/programmes, the Government of Bihar undertook M-technology (Mobile Technology) to ensure on-going monitoring of select schemes / programmes being implemented in the state.

1.2 About Bihar

Bihar, the 12th largest state in terms of geographical size at 38,202 sq miles (98,940 km²) and 3rd largest by population - Bihar has a population of 10.38 Crore. The state comprises 9 divisions, 38 districts and 534 blocks

Division	Districts
Patna	Patna, Bhojpur, Kaimur, Rohtas, Buxar, Nalanda
Magadh	Gaya, Jehanabad, Arwal, Aurangabad, Nawads
Tirhut	Muzaffarpur, East Champaran, West Champaran, Sitamarhi, Vaishali, Sheohar
Saran	Saran, Siwan, Gopalganj
Bhagalpur	Bhagalpur, Banka
Munger	Munger, Khagaria, Lakhisarai, Sheikhpura, Jamui
Purnea	Purnea, Katihar, Araria, Kihanganj
Darbhanga	Darbhanga, Madhubani, Samastipur, Begusari
Koshi	Saharsa, Madhepura, Supaul

The Government of Bihar envisions Bihar as an e-Governed, IT-enabled, e-Literate state in the country. For the purpose GoB has built core IT infrastructure in the State, ushering in e-Governance, providing extensive citizen-centric services, promoting IT education, incentivising IT businesses to set up units in the state, regulating IT services and putting in place institutionalized arrangements for implementation and monitoring of IT activities in the state. Some of the key IT initiatives in Bihar include:

- National e-Governance Programme (NeGP) Initiatives
 - ★ BSWAN (Bihar State Wide Area Network)
 - ★ CSC (Common Service Centre) / Vasudha Kendra
 - ★ E - District
 - ★ E - Procurement
 - ★ State Portal (Bihar Online)
 - ★ SSDG (State Service Delivery Gateway)
 - ★ SDC (State Data Centre)
 - ★ CCTNS (Crime and Criminal Tracking Network System)
- State IT Initiatives
 - ★ Brain DC (Bihar Revenue Administration Intranet Data Centre)
 - ★ SecLAN (Secretariat Local Area Network)
 - ★ CTMIS (Comprehensive Treasury Management Information System)
 - ★ VATMIS (Value Added Tax Management Information System)
 - ★ iWDMS (Integrated Work Flow & Document Management System)
 - ★ ICT @ School
 - ★ e-Shakti
 - ★ BKC (Bihar Knowledge Centre)
 - ★ MoP (Modernization of Prison)
 - ★ Sec ID (Secretariat Identification)
 - ★ Jaankari I (RTI Call Centre) &
 - ★ Jaankari II (RTI online)

In addition to above, Government of Bihar has explored innovative usage of M Technology in governance and other developmental areas such as health, education, agriculture, employment etc. For facilitating the daily monitoring of the same. Box 1 discusses some of the benefits of M-Technology.

Box 1: M-Technology

Mobile technology or M-technology is proving to be a fast-paced and complex arena that is rapidly evolving in most countries under a wide variety of circumstances and conditions. It has opened new channels of communication between people and governments, potentially offering greater access to public information and basic services to all. No other technology has been in the hands of so many people in so many countries in such a short period of time (World Bank 2008). In fact, globally, more people now have access to a mobile device than to justice or legal services (UNDP 2008).

Key benefits of mobile technology include:

- It offers portable, real-time communication and information access for people who previously had little or no access to affordable communication channels.
- ◆ It offers portable, real-time communication and information access for people who previously had little or no access to affordable communication channels.
- ◆ Mobile platforms are simple, requiring only a basic mobile

Box 1: M-Technology, *contd.*

phone with SMS capacity and this has allowed its adoption all over the world from South Africa, to India, to Mexico to monitor elections, track violence and crime, provide logistical support in natural disasters, oversee inventories etc.

- ◆ Mobile phones require basic literacy, making the barriers to entry much lower than with other modern ICTs.
- Fosters transparency, social accountability and strengthens the demand side of governance by providing people with critical tools to engage with public institutions and demand more and better services.
- ◆ It enhances service delivery and reform from and within important governing institutions of public administrations to parliaments to systems of justice and generates new possibilities for open government.
- ◆ Mobile technologies can reduce bureaucratic holdups for average citizens and streamline work for civil servants. They enable citizens to bypass intermediaries who may take money for facilitating transactions, making service delivery more efficient and transparent.
- Helps reduce information gaps and restrictions inherent in marketplaces where consumers and producers have little means of comparing commodity prices between distant markets.

Box 1: M-Technology, *contd.*

- ◆ Micro-entrepreneurs can access market information from remote locations, increasing the speed of trade and reducing travel expenditures.
- Combat poverty by expanding service delivery possibilities in health care, agriculture, employment and education.
- ◆ In the health sector, there have been many pioneering mobile initiatives improving connectivity and information transmission in areas that are hard to access.
- ◆ As an emergency response tool, mobile technologies have helped establish networks of communication between citizens, organizations and government agencies in times of crises.
- ◆ They are also being used to educate and keep citizens and vulnerable stakeholders abreast of environmental and energy-related issues, including weather patterns, climate change and responsible environmental stewardship.
- They also facilitate for transmitting the data gathered on the server and thereafter analyzing the same for trend analysis and for forecasting the future requirements that can be aligned to the needs of the government and also to the requirements of the state and the system.

2. M-Technology in Government of Bihar

2.1 Objective

The Government of Bihar has leveraged Mobile Technology (M Technology), using the SMS feature of mobile phones to strengthen administrative monitoring in the state. Presently the system tracks the progress of 10 most public oriented development efforts in all 534 blocks of the state. The initiatives include:

- National Rural Employment Guarantee Scheme (NREGS)
- Indira Awas Yojana (IAY)
- Pension Distribution
- Bicycle/Dress Distribution
- Student Scholarship Distribution
- Food Services
- Health Services
- Mutation
- Rainfall
- Integrated Child Development Scheme (ICDS) basic needs like food, health and education

The SMS Monitoring System aims to empower policymakers and the public with tools to effectively monitor the progress of key development schemes. The assumption is that daily monitoring will empower policymakers with the necessary information to strengthen mechanisms for public service delivery and will also ensure access to information for all citizens.

2.2 Methodology

The overall methodology used for implementing the SMS Monitoring System includes the following activities:

- Mandating the setting up of the SMS Monitoring System under

the supervision of the Principal Secretary, General Administration Department, Government of Bihar

- Identifying schemes / programmes that can be monitored and identification of key parameters for monitoring, that would be informative yet simple enough to convey through SMS,
 - ◆ For example, health services are measured by number of medicines available and the number of outpatients
- Procuring the identified technology (at the backend is a SQL server and the front end is on .NET) and the required expertise to set up the server, website etc.
- Identifying block level implementing officers for the identified schemes / programmes for sending the SMS
 - ◆ The system requires 10 implementing officers to be appointed from every block to send an SMS from a registered number, between 5 p.m. and 8 p.m., indicating the day's progress on a scheme / initiative
 - ◆ All messages are directed to a central server, where they are processed and uploaded to an online database: <http://210.212.23.52/smsbihar/>.
 - ◆ Officials from the various departments access data through an online dashboard through which scheme progress is tracked and analyses conducted to inform further policy
- Providing a mobile under the Closed User Group (CUG) System,

2. M-Technology in Government of Bihar

to each implementing officer, where phone charges are paid for by the government.

- Training the relevant officers at the block level on the use of mobile phones for composing and sending short standardized messages
- Posting IT managers at several district offices to guide and monitor reporting processes and intervene for resolution of technical hindrances
- Conducting a pilot at Saran for the duration of one month. SMS monitoring for all the 10 schemes / programmes were first conducted at Saran, post which the system was rolled out for the entire state

2.3 Process Description

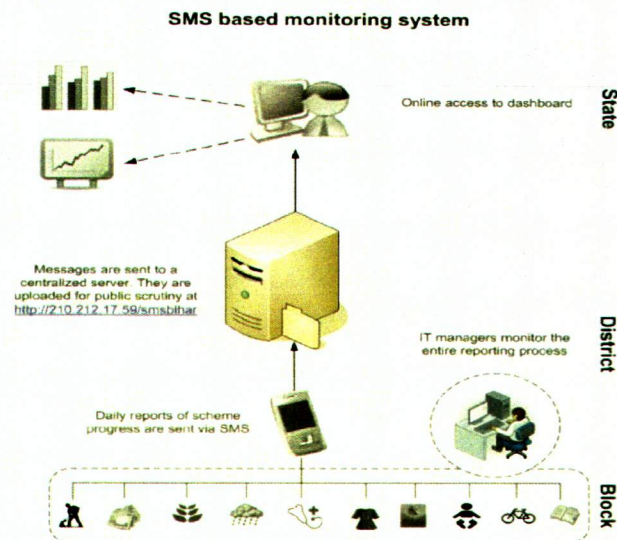
The process for using mobile technology for monitoring the initiatives is given below.

- All appointed implementation officers at the Block level, like the Block Development Officer, Block Education Officer, Child Development Project Officer, Programme Officer NREGA, Circle Officer etc., send from a registered phone number through an SMS, information on the progress of the 10 initiatives identified, to a dedicated phone number
- The information received at the dedicated phone number is updated on a central server
- The IT manager posted at the district level monitors this process

of sending SMS from the blocks and assists in resolving any problem that may arise

- The information collected on the server is thereafter made visible to the public at <http://210.212.23.52/smsbihar/>.
- The information available on the central server is analyzed and various reports generated, which are used by decision makers for further planning and corrective action
- Cumulative data can also be displayed in an easy-to-interpret, graphical form on an online dashboard and is accessible to both state officials and the public at large.

The process has been illustrated in the diagram below.



2.4 Key Benefits of the SMS Monitoring System

The key benefits arising from implementing the SMS based Monitoring System in Bihar include:

- **Introducing a system of daily reporting and monitoring:** Development programmes often fail postimplementation because of a lack of sustained efforts. Monitoring is a crucial component in sustaining a programme. Although the need for monitoring is acknowledged, efforts are usually insufficient in this regard. The SMS Monitoring System has instituted a simple yet effective system of monitoring the progress on a regular basis and has enabled daily monitoring. This development initiative has enhanced accountability as it leaves little opportunity for slack or corruption
- **Using simplified processes through appropriate technology choice:** Sending an SMS is one of the fastest form of communication. Minimal training is required for sending text messages and basic education level is required for using this process. The digital platform also eliminates the need for paperwork and hence speeds up data analysis for improved efficiency and effectiveness. Additionally a message sent by the implementing officer to the appropriate number is stored in a central server and decoded, resulting in daily reports that display district wise progress of schemes.
- **Enabling easy availability of data, through online access:** The information sent from the blocks through SMS and stored on the central server is thereafter analyzed and various reports generated. The data captured through SMS and the various reports generated thereafter are made easily available to all

through the SMS Monitoring Website accessible through a link on the General Administrative Department, Government of Bihar website.



The confirmation of data sent each day from the districts is captured on the website and various reports are generated and made available on the website. Key aspects and sample reports of the schemes / programmes being monitored through the SMS based Monitoring System have been illustrated in the box below.

Box 2: Key aspects of the process for reporting the schemes / programmes and sample reports generated

Example 1: Rainfall

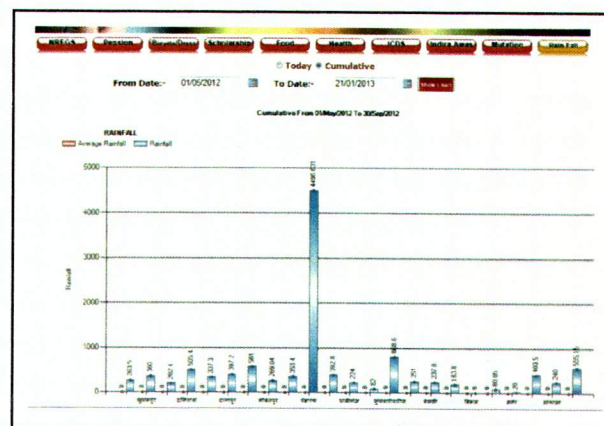
All Agricultural Officers are requested to send a SMS to the BDO, regarding the quantity of rainfall in their block before 11 AM every day. The BDO thereafter collates and sends the information to the central server.

- If the rainfall recorded is 25 mm, the text should be sent as 'BL11, RF25'. BL11 is the project code for rainfall. The AO's name and designation are stored in the database and hence allows for easy identification of submissions
- If there has been no rain, then the message should be sent as 'BL11, RF0'
- If the AO forgets to send the rainfall report one day, he can send it with the next day, he can send it with the next day's report as a separate text. Messages are not case sensitive

Key aspects to be kept in mind for successful message delivery include:

- SMSs can only be sent by registered mobiles. The delivery report option must be switched on the mobile phones so that BDOs are informed when the messages are delivered

An illustrative report on the rainfall received, on a cumulative basis between May 2012 and January 2013 in Patna district is given



Example 2: NREGS

All SMSs are sent by the Programme Officers, regarding the expenditure and number of laborers covered under NREGS, to the central server. An illustrative report on the expenditure and number of laborers covered under NREGS, on a cumulative basis between April 2012 and September 2013 in Patna district is given below.



Example 3: Bicycle / Dress

All SMSs are sent by the Block Education Officer regarding the status of distribution of bicycles/ dresses, to the central server. An illustrative report on the distribution of cycles/ dress, on a cumulative basis between December 2012 and January 2013 in Patna district is given below..



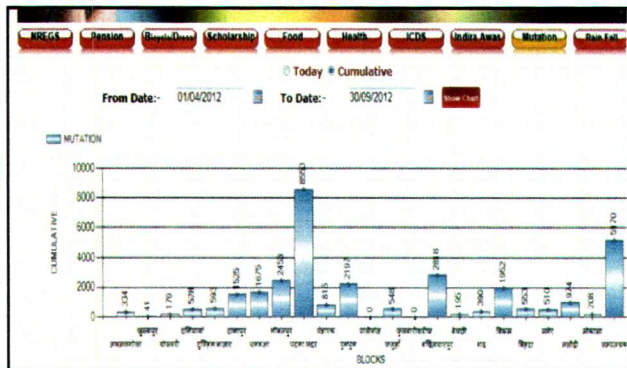
Example 4: ICDS

All SMSs are sent by the Child Development Project Officer regarding the status of ICDS in the block, to the central server. An illustrative report on the number of centers visited, on a cumulative basis between December 2012 and January 2013 in Patna district is given below.



Example 5: Mutation

All SMSs are sent by the Circle Officer regarding the status of mutation at the districts, to the central server. An illustrative report on the number of mutation in Patna, on a cumulative basis between December 2012 and January 2013 is given below.



2.5 Key Impact

Monitoring and evaluation is an integral part of any development project. It helps to quantify targets achieved and validate whether actions are carried out as planned. It also helps in identifying problems and making decisions accordingly. The SMS based monitoring system has a significant impact on developmental progress. The key impact of the system includes:

- **Availability of Data:** The presence of implementing officers who are empowered to send data on each of the 10 initiatives through SMS has made the availability or transfer of data from the field level to the center faster and more efficient. Previously, the data had to be collected and transferred through pen and paper reporting. Presently approximately 4000 SMSs are sent to the central server and published on the public domain on a daily basis. The presence of a digital platform eliminates the need for paperwork and hence speeds up data analysis for improved efficiency and effectiveness

- **Replicable:** The system uses a very basic technology solution - SMS technology that is prevalent amongst a large population in the country and is simple to use. The infrastructure requirement for establishing the system is also simple, requiring mobile network towers, mobile phones and a centralized server for updating the data. Additionally, the use of mobile phones is simple and requires little formal education or knowledge of technology. This low cost, low tech platform usage for monitoring is easily replicable across the country. Some of the States in India have already shown interest in replicating the Bihar model.
- **Sustainable:** Mobile phones are low-cost and nearly every household in India has access to a mobile phone. This ensures that people in the most remote of locations are familiar with and have access to mobile technology. By leveraging a tool using the mobile phone technology, a monitoring programme can be both financially and socially sustainable. Additionally, mobile phones are minimally dependent on difficult to maintain factors such as infrastructure, electricity and internet connectivity, which make it an ideal choice for catering to the less developed areas in the country
- **Transparency and Accountability:** The SMSs received on the central server are published in the public domain for public scrutiny and feedback. This ensures that transparency is maintained in the monitoring of the progress of the initiatives. The system gives each and every citizen of Bihar an opportunity to learn about developmental progress in their own community while strengthening government accountability to the citizens by increasing transparency in public service delivery.

2.6 Key Challenges

Despite the fact that mobile technology has revolutionized the monitoring of schemes / programmes / initiatives at the ground level, there are challenges involved in using mobile technology. Some of the key challenges include:

- **Limitations of the mobile network:** Mobile network in the rural areas may not always work as expected. For example, the text messages may be delayed enroute or jammed. Additionally, electronic forms and Short Messaging Services (SMS) on mobile phone may be problematic for large-scale deployment.
- **Limitations of the mobile network:** Mobile network in the rural areas may not always work as expected. For example, the text messages may be delayed enroute or jammed. Additionally, electronic forms and Short Messaging Services (SMS) on mobile phone may be problematic for large-scale deployment.
- **Basic literacy for mobile phone usage:** Though the literacy level required for using mobile phones is minimal, yet many find the operation difficult and complex. Often the phone operator is not able to save the data or perform simple operations on the device. Additionally, older age people are slower in operating mobile phones and the keypad operation maybe difficult for them.
- **Managing change:** Changing the behavior of people and their mode of operation is a great challenge. People have traditionally been used to physical monitoring and paper and pen reporting. The usage of technology for monitoring required training and change management interventions.
- **Sustained effort:** Most new initiatives face the challenge of failing after some time due to lack of sustained effort. The use of mobile technology was new and faced the additional challenge of phasing out before the system became completely operational due to lack of effort from the field level operators.

3. Way Forward

The use of low cost and low technology platform for monitoring schemes / initiatives has revolutionized the monitoring scenario in Bihar. The SMS based Monitoring System can be further leveraged for better governance. Some of the key initiatives that may be undertaken include:

- Introduce a larger number of schemes / initiatives under the SMS based Monitoring System, so that a larger number of Departments can avail of the facility
- Analyse the data captured through SMSs for better forecasting. The system can be used as a tool for analysing trends and forecasting future requirements and thereafter planning for the same
- Integrate local language capabilities into the tool to make the tool user friendly
- Develop the dashboard into a two-way communication platform, wherein the public will be able to provide feedback on the data gathered and the system in general
- Incentivize monitoring and provide extra recognition to officers for ensuring full compliance to the requirements of the system
- Extend the use of mobile technology for monitoring by using other features like GPS and camera, to take pictures of beneficiaries being administered the benefits along with the time and date marked on the photograph.

Appendix 1 SMS Format

Scheme	SMS Text Format
National Rural Employment Guarantee Scheme (BL 1)	BL1, EX (expenditure incurred in lakh), SC (number of ongoing schemes), NL (number of labour) Fore.g.: BL1,EX40,SC12,NL100
Pension (BL 2)	BL2, SW (state widow pension numbers), NP (national physically challenged number), SP (state physically challenged), OA (old age pension) Fore.g.:BL2, NW10,SW8,NP12,SP123,OA222
Bicycle/Dress distribution (BL 3)	BL3, DS (number of dress distributed), BC (number of persons to whom bicycle has been distributed) Fore.g.: BL3,DS7,BC50
Scholarship (BL 4)	BL4, AS(no of students from class 1 to 6), BS (no of students from class 7 to 10), CS (no of students given scholarship for college) For eg:BL4,AS44,BS99,CS545
Food (BL5) Applied for rice and wheat only in unit	BL5, BP (below poverty line), AP (annapurna), AN(antodaya) For e.g: BL5,BP5000,AP388,AN4520
Road and Bridges (BL 6)	BL6, RO (number of roads prepared in kms), BD (number of bridges being prepared), RW (number of rural roads prepared in kms) For e.g.: BL6,RO35,BD66,RW10
Health (BL 7)	BL7, JB (number of deliveries), MD (medicines availability),PT(out-patient numbers) For e.g.: BL7,JB66,MD100,PT346
Integrated Child Development Scheme (ICDS), (BL 8)	BL8, CV (the code of centres visited and NOT number of centres visited) For e.g.: BL8,CV202,146,199
Indira Awas Yojana (IAY) (BL 9)	BL9, TR (target which consists of last year's record and the current year's target), DA (first installment stage 1), DB (second installment stage 2) For e.g.: BL9,TR23100,DA560,DB2840
Mutation (BL 10)	BL10, CU (cumulative numbers of mutations done) For e.g.: BL10,CU127 (only cumulative figures must be reported and mutation on hearing shall not



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