DEPARTMENT OF WOMEN & CHILD DEVELOPMENT
GOVERNMENT OF ODISHA

DASHBOARD MONITORING SYSTEM ON KEY INTEGRATED CHILD DEVELOPMENT SERVICES INDICATORS
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ABBREVIATIONS

DPEP   District Primary Education Programme
DoH&FW  Department of Health & Family Welfare
DWCD   Department of Women & Child Development
ICDS   Integrated Child Development Services
GIS    Geographical Information System
GoI    Government of India
GoO    Government of Odisha
HMIS   Health Management Information System
MPR    Monthly Progress Report
NOP    Nutrition Operation Plan
PSE    Pre School Education
SNP    Supplementary Nutrition Program
SPMU   State Program Management Unit
SSA    Sarva Sikhya Abhiyan
SQL    Structured Query Language
THR    Take Home Ration
TMST   Technical & Management Support Team
ToR    Terms of Reference
EXECUTIVE SUMMARY

The Integrated Child Development Services (ICDS) is one of the oldest government scheme for improvement of mother and child health. The major component of ICDS is monitoring and reduction of malnutrition among the 0-6 year’s children of the state. A large volume of information on beneficiaries and services provided are collected and compiled at different levels to measure the result and impact of the program. The department invests significant human and financial resources to facilitate the data collection and reporting process. The utilization of data creates many challenges for the department especially the M&E cell which has limited human resources. To overcome this challenge, TMST was requested to assist the Department of Women & Child Development (DWCD) in developing a system of ‘dashboard’ based review of ICDS monitoring data to help improve operational decision making across the board.

In 2006, the DWCD in convergence with SSA/DPEP has piloted to monitor the nutritional status of children (0-6yrs) in one district of Odisha. The Child Tracking System (CTS) tool used for e-Shishu project of SSA/DPEP has been used to monitor programmes like MDM and PSE. Based on the experience the department developed its own web based application “e-Pragati” and rolled out across the state in the same year. The massive amount of data are collected, stored, analyzed and used for program monitoring but present limited scope to perform analysis on multiple indicators. The MIS reports had limited use in program planning and monitoring aspects.

There is a growing recognition that users need highly visual tools that provide a top level view of operational performance, with drill down facility to provide detailed insight into specific areas. The adoption of IT assisted visual tools such as ‘dashboard’ will enable the department to make the shift from report-centric to metric-centric information management. It will help to understand the correlation between the services provided and beneficiaries benefited on composite indicators. A tailored dashboard reflecting real time key performance indicators, from services to beneficiaries, using colour coded alert system can help DWCD to achieve a fundamental shift in approach and fuel information based decision making across the department. This dashboard monitoring tool is designed and developed to improve evidence based reporting system and assist the managers at different levels to optimize the use of reported MPR data in program planning, monitoring, supervision and implementation.

A core team consisting of subject matter specialists from the Department, members from SPMU and TMST was formed to identify the key areas to include in the dashboard. 12 key indicators are selected and clubbed into four groups and each group was assigned with a score of 1000 points. Similarly each indicator was further given weights as per programmatic importance. Six months (April 2011 – September 2011) MPR data were collected, validated and data relations established. This final data set was used to generate the indicators and build-up the central dashboard database. The application is designed on open source platform and frontend tools are provided to the users to select and use multiple indicators. Multiform MIS reports like tables, charts, graphs and maps with colour ranges are incorporated to measure the intra and inter district performances. The state users have been trained and access rights have
been assigned to the state, district & project level users to use the application and review their own performance.

The most important benefits to the department are to review the performance at a glance and support the decisions making process. Other key benefits are:

- **Visual presentation of performance on key indicators**

  The embedded graphical interface generates various visual outputs of the same indicator to compare among districts/projects. The mapping facility on composite variables will generate multilayer maps with other social determinants of the program and other data sources like Census, HMIS etc.

- **Evidence based monitoring and supervision tool**

  The flexibility of query based analysis provides ample scope to establish correlation between indicators and outputs. It will support the performance based resource allocation and activity planning.

- **Measure efficiency & inefficiency**

  The performance ranking of districts will measure the efficiency of the district compared to other districts. Good performing districts and clusters can be easily highlighted.

- **Identification of data outliers and correlations**

  The data outliers and correlations will be quickly identified and will help the managers to pin down the data errors at micro level. This process will subsequently improve the data quality and reporting.

The application is developed in open ended platform to ensure easy scalability with the scope of integration with other applications in future.
1. INTRODUCTION

The Integrated Child Development Services (ICDS) Scheme was launched in 1975 seeking to provide an integrated package of services in a convergent manner for the holistic development of the child. One of the key objectives of ICDS is to improve the nutritional and health status of children below the age of six years, pregnant and lactating mothers and to reduce the incidence of mortality, morbidity, mal-nutrition and school drop-outs. Now, the State has achieved universalization of the ICDS Programme by way of coverage of all the 200 Rural Projects, 118 Tribal Projects and 20 Urban Projects in different urban areas through 60,918 Anganwadi Centres and 10,216 Mini Anganwadi Centres. All 326 projects are operational in the State. The Department of Women & Child Development has a routine monitoring system in place to monitor the monthly progress of ICDS activities. The monthly data sheets at sector level are prepared and integrated at project level. The sector level data further compiled at project level and sent to district to prepare district progress report. The whole process of data collection, validation and compilation at project level is in manual form where as at district level project wise electronic data sheets are prepared and district MPR is generated. The MPR (Monthly Progress Report) format contains project wise data on beneficiaries and services provided like SNP, THR, PSE etc. during a month. A large volume of information on beneficiaries and services provided are collected and compiled to measure the result and impact of the programme. The banking and use of data poses several challenges to the department because of limited human resource to analyse and utilise the data for real-time decision making. The critical gap in the existing monitoring system is that it has limited scope of data integration and does not provide comparative analysis on different indicators to help the district and state level managers use the data for valued-added planning and monitoring.

2. MONITORING PROCESS IN DEPARTMENT OF WOMEN & CHILD DEVELOPMENT

In 2006, the Department of Women & Child Development (DWCD) in convergence with SSA/DPEP has initiated a process to monitor the nutritional status of children (0-6yrs), on pilot basis in one the district of Odisha. The Child Tracking System (CTS) tool used for e-Shishu project of SSA/DPEP has been used (baseline data of children) to monitor the programmes like MDM and PSE. During the piloting phase it was observed that correct information on 6-11 year children covered under MDM from each school and PSE information was not available from the field. To overcome these limitations the department had decided to further develop the child database and set up its own monitoring system.

The web based application “e-Pragati” was developed in two stages: In stage 1 the focus was on collecting infrastructure information, personal profile of Anganwadi workers and helpers, details of AWC like location, category etc. In stage 2 the main objective was to build a robust beneficiaries database integrated with AWCs along with programmatic indicators like immunization and nutritional status of child, pregnant women and nursing mother. The application was rolled out in 2006 across the state. The application provides a central depository of ICDS data and generates district wise reports. A massive amount of data is collected, stored, analyzed and used for program monitoring. The GIS mapping features were incorporated to enhance the reporting system. However, the application had limited scope to
perform evidence based analysis on multiple indicators. The designed MIS reporting structure was focused on activities rather than being result driven. The MIS generated by this application had limited use for evidenced based program planning, monitoring and supervision.

2.1 Dashboard

A dashboard is an application that captures and processes bulk data so that data values are represented in a standard concise manner. The data values in a dashboard can be manipulated in a way that affects the final output and performance of particular indicators. Certain key indicators are included in a dashboard application and analyzed based on programmatic weightages and ranking.

2.2 Dashboard Tool for Department of Women & Child Development

The department is collecting large volume of data with a purpose to retrieve the data and use to measure the achievements of ICDS objectives. Although department uses the data but it is impossible to manually validate, compile and consolidate the data into meaningful information. The traditional tabular and two dimensional graphical data representation has many limitations such as inability to correlate with other variables in a single table or graph. A dashboard has several advantages over conventional data collection and presentation methods. It is designed to handle multiple variables and allows multiple view options for analyzing indicators. The “what if” capability along with multiform graphical representations of outputs and performances are helpful to the program managers on evidence based planning and monitoring of programs.

The web based dashboard application is designed and developed to improve evidence based reporting system and assist the managers at different levels to optimize the use of reported MPR data in program planning, monitoring, supervision and on implementation. Last six months (April 2011 – September 2011) MPR data are being used to generate nearly 12 composite indicators as suggested by the department. Those selected key indicators are assigned with different weightages based on program priority and multiform outputs like tables, charts, scatter diagrams and maps are generated. The districts are ranked based on performance indicators and colour shades are used to depict the performance of districts. The application provides scope to select multiple indicators and measure the performance of a district and also among the districts. The districts & projects can review their own performance and two ways feedback process can be established.
3. THE DASHBOARD MONITORING SYSTEM

3.1 Objective

Design & develop a dashboard monitoring system based on key ICDS indicators to improve the monitoring process and helps in evidence based decision support system.

3.2 Benefits

3.2.1 Visual presentation of performance on key indicators

The embedded graphical interface provides the user to generate various visual outputs of the same indicator to compare among the districts/projects. The multi-layer mapping facility on composite variables along with other program determents like socio-economic status will help the user to understand role of co-factors in a program.

3.2.2 Evidence based monitoring and supervision tool

The flexibility of query based analysis provides ample scope to the user to establish correlation between indicators and outputs. The other data sources like census 2011, HMIS are compatible with the application and used to make the MIS more robust. Users can integrate and use other reliable data.

3.2.3 Measure efficiency & inefficiency

The ranking of districts on an indicator will show the performance of the district compared to other districts. Indicators are grouped for ease of review and districts are ranked on the basis of composite scoring. User can easily distinguish districts based on performance and activities can be planned accordingly.

3.2.4 Identification of data outliers and correlations

The application will quickly identify the data outliers and correlations. The managers can pin down the data errors at micro level. This process will subsequently improve the data quality and reporting.

3.2.5 Saves Time

The user will get a quick snap shot of the program performance of the state/district at any point of time. The user management tool provides access right to the users to operate at different levels and view different MIS reports.

In future, this application can include additional indicators as well as other programmes / schemes such as:
- MAMATA to monitor the service coverage and fund utilization
- Malnutrition and Anemia data
- Immunization status data

3.3 Dashboard Monitoring Software Application

3.3.1 Interface background

Admin & District application modules are fully designed in Open Source software in Linux Platform with PHP & MYSQL Database. All Reporting data is saved under secure MY-SQL Database. Data generation and validation made through JavaScript and Jquery. Flash Map is already generated and stored in the server. Data fetching technique used based on user request and XML data generation.

Color generation & score calculation will show depending on the district wise data entered by various district or state. Map color & data is fully dynamic & generated through user queries in various combinations of Indicators in months and years.

The online application is available on [http://dashboardmonitoring.com/orissa](http://dashboardmonitoring.com/orissa)
3.3.2 Control flow diagram

Dashboard Map Generation - Odisha

Odisha State & all district can configure any category of dashboard depending on indicator Inputs:

1. Auto Map Generation
2. Dashboard Type Creation
3. District Indicator Data updation
4. Auto % Ratio Calculation
5. User Input - Search Functionality
6. Monthly Trend in Maps
7. District Progress Index

Legend
- RED = Start and Finish of Process
- BLUE = Different Login Credential to configure Dashboard
- GREEN = Reporting Entry Module to generate Map
- Month / Year
- ORANGE = User Request Completion

Graphical representation of the control flow diagram with steps such as database server configuration, login processes (admin, district), data collection, compilation of entered data, and generation of district maps.
3.4 Processes Undertaken for Dashboard Development

3.4.1 Presentation of dashboard application

The web based application was demonstrated to the core team to understand the use of indicators and its graphical representation of output and impact. The indicator’s weightages, scoring methods and colour shading are thoroughly discussed and visual interpretations are reviewed. The data inconsistency, missing value variables and reporting above 100% achievement like issues are highlighted during the discussion.

The final dashboard application was demonstrated online to the department based on six months MPR data. The performance monitoring indicators and differences between standard reporting versus dashboard reporting are explained. The operational procedures like data input, assignment of indicator weightages, data layering concept etc. are discussed and demonstrated. Super user management components are explained and various reports, graphs and maps are shown. Participant feedbacks are recorded and incorporated in the application (Annexure – 1)

3.4.2 Users profile management

There are two types of user profiles are designed to operate the application.

Super Users: These users have the access right to interact with both backend and frontend modules of the application. They can create new users and manage the existing users with different access rights. They are entitled to add or delete indicators and alter the scoring value of an indicator. The Asst. Director, M&E cell and M&E consultant, SPMU are trained and provided the access right to play the role of super user.

General Users: The general users can see all MIS reports and select indicators to build customized reports. The Program Managers, District Social Welfare officers and Child Development Project Officers are the general users to view their respective districts in detail and can upload their feedbacks.
3.4.3 Building of dashboard database

The frontend database application tool is designed and developed in MS-Excel format to capture the input data and generate calculated variables used for building of indicators. The tool is shared with the department to understand and to check the validity of each variable used in the dashboard application. The monthly progress report data (Annexure – 2) of six months were collected and reviewed for logical errors. The district wise selected data sets were prepared and outliers are identified. Once data was validated the scoring indicators were formed and migrated to MY-SQL database for further analysis.

3.4.4 Indicator selection and weight scoring

A core team consisting of subject matter specialists from the Department, members from SPMU and TMST is formed to identify the key areas to include in the dashboard. Different levels of indicators are identified and for each indicator the numerator, denominator, data grouping and weight parameters are assigned. The final 12 district level indicators (Figure – 1) are clubbed into four groups and each group is valued as 1000 points. These 1000 points are further divided between the indicators under each group based on program importance. For example the two indicators under Targeting Beneficiaries are equally valued as 500 points. Similarly the input group of indicators is valued as AWC conducting 21 feeding days as 350 points; AWC conducting 21 PSE days as 350 points and staff positioned against sanctioned as 300 points (Figure – 2). The colour range is defined for each group of indicators based on values scored. Depending on the indicator categories like less is better (% of Children weighed Grade III & IV) and more is better (% of Normal Children weighed, % of AWC conducting 21 feeding days) the colour shading are dynamically assigned (Figure – 3).
Figure - 1

Targeting Beneficiaries

Women surveyed against expected total pregnancies
Children surveyed against expected 0-6 population

Input

AWC conducting 21 feeding days
AWC conducting 21 PSE days
Staff positioned against sanctioned

Output

SNP Children (6-60 months)
SNP (Pregnant & L. Women)
PSE coverage children (3-6 years)
Weighing efficiency against total survey population

Impact

Children Weighed Normal
Children Weighed Grade I & II
Children Weighed Grade III & IV
Figure – 2

![Dashboard Reporting](image)

Figure – 3

**Calculation**

- Relative performance - Illustration

<table>
<thead>
<tr>
<th>Rank</th>
<th>Districts</th>
<th>Targeting: Women Surveyed</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jharsuguda</td>
<td>82%</td>
<td>1000</td>
</tr>
<tr>
<td>2</td>
<td>Balangir</td>
<td>59%</td>
<td>647</td>
</tr>
<tr>
<td>10</td>
<td>Ganjam</td>
<td>49%</td>
<td>489</td>
</tr>
<tr>
<td>18</td>
<td>Puri</td>
<td>41%</td>
<td>371</td>
</tr>
<tr>
<td>28</td>
<td>Boudh</td>
<td>30%</td>
<td>194</td>
</tr>
<tr>
<td>30</td>
<td>Jagatsinghpur</td>
<td>18%</td>
<td>0</td>
</tr>
</tbody>
</table>

The Dashboard presents performance using a scheme of colour codes: green is good, red is bad, and yellow is average. The best performer in a group gets dark green, 1000 points; the worst gets dark red, 0 points.
4. TRAINING

The state level personals of the M&E cell have been trained to use the dashboard. The state and district level user log is created and access rights are provided. The access rights are provided to some key users to alter the data set and create new indicators as required. The user operational manual and training manual is available on the home page of the dashboard application.

5. COST AND SCOPE

- The entire dashboard application is designed and developed using open source platform. Currently district level monitoring indicators are incorporated and MIS reports are developed. However, the department can add or delete other indicators without any major functional changes in the application.

- The application can be further scaled-up up to project and sector level. The structure and designing of the application needs to be modified based on new indicators and customized analysis reports are to be developed.

6. ISSUES AND LESSONS LEARNED

- The success of this application is solely depending on availability of high quality data. The use of inconsistent data and data over reporting will generate erroneous outputs and will often mislead the decision making process.

- This application is applicable to few indicators only hence users must be vigilant on performance monitoring and ranking.

- The variable grouping and indicator weightages are subject to user’s choice.

- Assigned dedicated staff to maintain the dashboard database and enter the data into electronic formats through software must be identified.

7. CONCLUSION

The experience has been positive in terms of the interest and participation of the department. The easy tool will be immediately helping to monitors the progress status of key ICDS indicators at state/district level. The flexibility and compatibility with other data source enhances the scope of the application to use as evidence based monitoring tool in program planning, monitoring and supervision.
ANNEXURE – 1

MINUTES OF THE DASHBOARD MONITORING SYSTEM DEMO

Dated: 7th January, 2012
Venue: NSAP Conference Hall

Dashboard monitoring system demo and progress review was held at NSAP conference hall, Dept. of Women & Child Development on 07.01.2012 under the chairmanship of Ms. Sujata R. Karthikeyan, IAS, Director Social Welfare Department of Women and Child Development.

Members present:

1. Ms. Sujata Karthikeyan, IAS, Director, Social Welfare, DWCD
2. Ms. Durgesh Nandini Sahu, Under Secretary, DWCD
3. Ms. Jyoti Kanungo, DSWO, Hqr., DWCD
4. Ms. Chandarani Mohanty, DSWO, Hqr., DWCD
5. Mr. Sridhar Sahoo, AD, DWCD
6. Mr.Ashok Dash,SI,DWCD
7. Mr. B. K. Behera, SI, DWCD
8. Ms. Biraj Laxmi Sarangi, TMST
9. Mr. Jeetendra Pattanaik, TMST
10. Mr. Praveen Sharma, TMST
11. Mr. Abdul Rahim, TMST
12. Ms. Mona Jethwa, Nutrition Consultant, SPMU
13. Mr. Santosh Panda, BCC Consultant, SPMU
14. Ms. Subhasree Panda, M &E Consultant, SPMU
15. Mr.Sanjib K Guha,Consultant Knowledge Management

Meeting started with the welcome address by Ms. Sujata Karthikeyan, I.A.S, Director, Social Welfare. Then Mr. Abdul Rahim team member TMST presented the concept of dashboard monitoring system and its advantage over traditional monitoring system. The draft version online dashboard monitoring application system was demonstrated based on few key ICDS indicators. Five months (April 2011 – August 2011) MPR data was incorporated, analyzed and integrated with dashboard monitoring system.
ACTION POINTS

1. Director suggested including at least one year MPR data (especially 2011 data) into the final analysis.

2. THR and MAMATA indicators should be included. Maximum three indicators on the progress of MAMATA scheme are to be identified and integrated in the dashboard.

The next meeting is to be schedule on 1st week of February, 2012.
### Annexure – 2

#### Integrated Child Development Services (ICDS) (Format-I)

**District Project Wise Report on ICDS for the Month of July, 2011**

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>District / Project Wise</th>
<th>Total Population Within project</th>
<th>No. of SNP Beneficiaries</th>
<th>Girls</th>
<th>Girls</th>
<th>Reported No. of Deaths</th>
<th>Normal</th>
<th>Girl</th>
<th>Girl</th>
<th>Girl</th>
<th>Total No. of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Angul</strong></td>
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<td><strong>Balasore</strong></td>
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#### Integrated Child Development Services (ICDS) (Format-II)

**District wise / Project wise Report for the month of July, 2011**

<table>
<thead>
<tr>
<th>B.P.</th>
<th>District / Project Name</th>
<th>No. of Panchayats Providing Services</th>
<th>Total Population</th>
<th>No. of SNP Beneficiaries</th>
<th>Girls</th>
<th>Girls</th>
<th>Reported No. of Deaths</th>
<th>Normal</th>
<th>Girl</th>
<th>Girl</th>
<th>Girl</th>
<th>Total No. of Children</th>
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**ODISHA TECHNICAL AND MANAGEMENT SUPPORT TEAM**

**Odisha TMST**