Digital India To Empow

DATA DRIVEN **DECISION MAKING**

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Department of Electronics & Information Technology Ministry of Communications and IT Government of India





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ata has long been recognized as a government asset but with the inception of the Open Government Data Platform, it can now easily be shared and utilized both inside government and among citizens, entrepreneurs, and researchers to find solutions to persistent civic problems. Governments can be most effective when information and data are readily available to help them understand the issues at hand and weigh the available/ viable options. The Open Government Data (OGD) Platform setup by the Government (NIC, DeitY) for providing proactive and open access to the data available with various ministries/ departments/ organizations of Government of India now has over 26,000 datasets published by different departments. These datasets are being used by Academia, Researchers, Civil Society as well as Industry. Efforts are being made to increase awareness and consumption of published datasets.

A workshop on 'Data Driven Decision Making' was conducted for Chief Data Officers, on 7th January, 2016, at Gulmohar Hall, Habitat Centre, New Delhi. It was attended by representatives from various Ministries/ Department and Community. There were three Panel Discussions on 'Data Driven Decision Making: Sectoral Perspective', Government Data Use License' and 'Data Contribution by Community'. The panellists were representatives from the Government, Industry and the Community.

The discussions shed light on the need to use data in order to take informed decisions. The

About

success of the data-driven approach depends upon the quality of the data gathered and the effectiveness of its analysis and interpretation. Hence the decisions made with data are more likely to be implemented and effective. Collection and dissemination of information supported by relevant data is the key aspect of good governance. Government departments can use the available datasets for data assisted decision making, enable effective risk analysis, enhancing organizational resilience and risk management towards planning, monitoring and timely actions.

A data-driven approach can help government officials make better and smarter policy decisions and approach policy matters with more useful information in hand. Data driven approach will encourage citizen engagement as the decision makers can feel the pulse of the nation before the decisions are taken, instead of getting the reactions after policies have been implemented. Data should thus be used with utmost care while taking policy decisions.

Being the important aspect of governance, it was decided to come out with a compendium of the case studies presented during the session 'Data Driven Decision Making: Sectoral Perspective'. The case studies presented during 'Open the workshop explaining the way data helped officials in taking informed decisions, has been compiled in this publication so that it would be helpful and provide new insights to the decision makers.



Dr. Aruna Sharma, Secretary Department of Electronics and Information Technology Ministry of Communications and Information Technology

Data is one of the most important elements any economy for planning and decision maki American statistician W. Edwards Dem rightly said, "Until you are supported by data, are just another person with an opinion". today's scenario, where Digital India initiative being implemented, the focus is now evaluating the importance of Open Governme Data in Decision Making.

We are at the beginning of a very long important journey. Being Open Data Policy NDSAP in place, Government departments ha to proactively release Datasets in an op formats on Open Government Data Platfor Chief Data Officers of the OGD Platform hav crucial role in stimulating release of open da

Open Government Data can impact and creat development regime where it can stimula economic activities.

Foreword



Government of India



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	management towards planning, monitoring and
	implementation of programs, formulation of
and	budget and policy etc.
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ave	I congratulate the OGD team for the effort they
pen	have put in compiling this compendium.
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/e a	The case studies included, would go a long way
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Preface



Ms. Neeta Verma

Director General National Informatics Centre Department of Electronics and Information Technology Ministry of Communications and Information Technology

ur lives are increasingly shaped by the ubiquity of data around us. As consumers we rely on the wealth of information to influence our decision making. Businesses benefit and rely on data when it comes to taking decisions regarding Monitoring and Management of Operations, Human Resource Management, Customer Relation Management, Supply Chain and formulation of Business Plans.

As a result of this new domains have emerged such as Big Data and Data Analytics. Data continues to par innovation and efficiency among businesses and we as consumers stand to benefit from it in terms of competitive prices and better quality products.

Open government data is a tremendous resource that is as yet largely unused. Government collects and generates a huge quantity of high-quality data in various sectors. This data when made open has huge potential benefits. However data is siloed and is inaccessible to even those who own and manage it, since it is locked up in proprietary databases or published in a cumbersome format, thus making analysis and collaborative problem solving difficult. This prevents public entities from effectively using the asset that is available in abundance.

The Open Data initiative of the Government has helped in addressing some of these problems. Through this Platform it is our endeavor to release non- personal and non- sensitive public data like crime rates, agricultural data, performance of schools, hospital directory etc in a format that can easily be used, analyzed across departments.

The data has given the Government an opportunity to positively impact the lives of the citizens. It will enable agencies to measure their own performance against stated goals and identify the areas where improvement is needed. Today we have already released more than 26,000 datasets and many more are waiting to be released.

Inspite of data being available, the public A new era of data-driven governance and civic entities still base their decisions on instincts. innovation is taking shape and the results are Time and again it has been proved that decision amazing. This is an indication of the possibilities taken is more fruitful when they are backed that lie a<mark>hea</mark>d for exploring and take its with data. Decision making is more effective advantage. Large datasets have their own when information and data are available to help rewards but the Government has to find a fine understand the issues at hand and weigh the balance between innovation, intelligence and available options. the security.

A data-driven approach can help government Thus Government wide access to information must be encouraged to facilitate increased use officials make better and smarter policy of evidence and evaluation in decision making. decisions, and approach policy matters with Being Data Driven means that planning, more useful information in hand. Data driven decision making and operations are guided by approach can encourage citizen engagement as measures and evidence contained within the the decision makers can feel the pulse of the Datasets across the Departments and nation before the decisions are taken, instead of Organizations, which is to this date is a getting the reactions after policies have been challenge. implemented. Thus the theme of the workshop was "Data Driven Decision Making".

There is a need to setup a nationwide data infrastructure which will help departments publish, extract and integrate Datasets and analyze data using the analytic tools. The other requirement is to have a pool of Data analysts, Data scientists and other Data savvy talent in abundance across all Departments.

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How Information (Data Generated from Various Surveys and HMIS) Helps in Data Driven Decision Making



Dr. Vishnu Kant Srivastava Chief Director (Statistics) Department Of Health & Family Welfare



Use of Road Accidents Data by Government Stakeholders to Reduce Road Accidents and Ensure Road Safety – A Study on Black Spot Management



Sh. Ranjan Mukherjee Director TRW, Ministry of Road Transport & Highway



Depot Online – Data Driven Decision Making



Sh. Abhishek Singh **Executive Director** Food Corporation of India



Data Driven Decision Making Workshop at a Glance

How "Legal Information Management and Briefing System" Can Assist Judicial and Legal System to Take Effective and Fast Decisions



Sh. Suresh Chandra Law Secretary **Department of Legal Affairs**

To deal with increased expectations, the Government has to increase efforts to manage conflicts by providing adequate mechanism to deal with grievances and resolution of disputes.



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n today's world those decisions are considered correct and effective which are backed by facts. This happens when we have all the data at our disposal. Decisions have to be taken in a legal framework, thus all the facts need to be considered while taking decisions. Each individual has certain responsibilities with accountability and which along transparency come when the individual understands his or her position in the Government environment.

The present legal information system in Indian courts works in a traditional environment as compared to its western counterparts. The need of the hour is to equip the courts/authorities with technology based legal information system. Legal Information system is defined as a system in which legal information is transferred, consolidated, received and feedback is given in such a manner that these processes act together to support knowledge utilization by legal producers and consumers. The goal of any legal information system is to achieve transparency and accountability on a long term basis.

In order to streamline the procedures and make data available at a single point, the department of Legal Affairs has developed a web based application that is capable of handling a wide range of requirements for various Departments and the administrative authorities for effectively handling/monitoring of the court cases.

Legal Information Management Briefing System is an application developed by the Ministry of Law in association with the Railway department and NIC. This application is very useful for all Government employees as all the data relating to all court cases will be available here for all registered users. There are approximately



This is a Government to Government service, where the Government departments become users after they have registered with the application.



15,000 courts in India; where about 3.2 crore cases are pending. The State is a party in a large numbers of the cases; however we are not sure about the total number. This figure speaks about the enormity of litigations in India and the slow rate of disposal of cases in all the courts. This application will address this problem and empower the authorities with data so as to facilitate them to take data driven decisions.

LIMBS is a web based application, designed and developed with features like

- Address Government litigation
- Easy to access
- It is a web based tool for comprehensive and proactive monitoring of Court cases
- ▶ The data is available at one place 24x7 and
- Can be accessed from anywhere at any time.
- It is available on I phones as well.
- It is environment friendly since the work is not done on paper
- Detailed information about cases is not required as is the case in other software's and
- Reduces dependency on the subordinate staff as the user is just a click away from getting the required information.

A ministry wise progress report is made available for all to see. Simple steps can be followed to

- 'Register' in LIMBS application
- Enter required fields into 'My Court Cases'
- Add progress of the case
- Update the status of the case Upload a document and
- ▶ Generate a report.

This is a Government to Government service, where the Government departments become users after they have registered with the application. It is the central repository for all cases relating to the government departments,

since cases can be uploaded here. Once this is done user can upload details relating to the proceedings of the court, Documents etc.

The Legal department can monitor the cases and also act as consultants for the other departments. Some new features have been added like:

- Case Transfer details
- My Preferred Cases
- ► Help File
- Department
- Sub- department

The ministry nominates a nodal officer as the user who uploads the cases. The nodal officer can do the following:

- Activate User
- Add Designation
- Add Advocate Post
- Add Case Category
- Add Advocate

Besides this the department is also planning some value additions to the application like:

- Advocate Payment Module
- Arbitration
- Mobile Apps

Irrespective of all the efforts the Department of Legal Affairs, there are some problems that are being faced. These are:

- Nodal Officers are not yet decided
- Users are not responding
- Entry of cases is slow as they are entered manually

Ministry wise cases entered are less.

The modern Welfare State is not merely concerned with the narrow, orthodox duties of maintaining law and order and collecting tax. It is clothed with five-fold functions of firstly as protector, secondly as a dispenser of social services, thirdly as industrial manager, fourthly as economic controller and fifthly as arbitrator between groups and individuals. That is why we have to find new moorings and fresh legal foundations agreeable to a dynamic, democratic society. Ideological shift in the concept of social justice and the rule of law call for greater efforts on the part of the legal and political thinkers and give them a new mission.

Primary expectation of the people from the judicial system is the availability of speedy, affordable and effective justice to all. Our judicial system is comprised of 4 components certain basic principles and values largely outlined by the Constitution; a set of operational norms including rights and duties of citizens spelt out in the laws; institutional structures for enforcement of the laws and a cadre of legal personnel including advocates



and judges for administering the system. Government has to take into account these components while dealing with the litigation policy or access to justice.

The confidence of the people in the justice delivery system is essential pre-requisite for the very survival of democracy. The loss of that confidence can lead to instability and threaten the very essence of democracy. We are all aware how difficult it is for a common man, a dismissed worker or a peasant uprooted from his land or a school teacher or an oppressed woman to approach the court of law for justice. The cost of litigation, the fees of successful lawyers and even the expenses of initiating the dispute redressal system are beyond the reach of most of the common people who seek justice. The mounting pendency of cases at every level of our judicial system is a matter of grave concern of the people of our country. As per statistics collected by my Ministry, the total number of pending cases in various courts is approx. 3.18 crore*. Judicial reforms have been the focus of many legislative changes and administrative initiatives that have been attempted by my Government.



The litigation by or on behalf of the Central Government and the State Governments is conducted in accordance with the provisions of Criminal Procedure Code, 1973 and the Civil Procedure Code, 1908. Whenever any authority under the Central Government is made party, Union of India through the concerned Secretary is made the first respondent. Before the Union of India is made party, it is incumbent upon the petitioner to serve notice u/s 80 of CPC before filing a plaint before any court of competent jurisdiction. The courts are not supposed to admit or entertain any plaint or suit unless requisite notice is served upon the concerned authorities under the Union Government.

Similarly, when a suit is filed against a private party on behalf of the Government, the private party is put to show cause and if necessary alternative dispute resolution mechanism is also explored. As regards criminal cases, prosecution cases are decided based on available evidence and prima facie case against the accused. As per extant procedure, the administrative decisions to prosecute on behalf of the State, to file suit

on behalf of or to defend Union of India, decisions are taken in accordance with the Government of India (Allocation of Business) Rules, 1961 and the Government of India (Transaction of Business) Rules, 1961. Most of the administrative decisions are taken under the overall supervision of the Minister in-charge of the concerned Ministry for the business allocated to that Ministry. As advice on legal matters and conduct of litigation on behalf of Union of India before various courts is the subject matter of the Department of Legal Affairs, normally, on the desirability of filing a prosecution case or suit or of defending Union of India or filing appeals etc., legal advice is tendered by the Department of Legal Affairs. All pleadings filed before various courts and tribunals are also vetted by the Department of Legal Affairs. Thus, if procedure is followed litigation involving Union of India may be curtailed.

The information seeking behaviour of law professionals directly relates to their legal

information needs. The information seeking process of legal professionals in relation to information needs can be explained as a series of six stages:

Initiation - Becoming aware of the need information when facing a problem.

Selection - Identifying and choosing a gen topic for seeking information.

Exploration - Seeking and investiga information on the general topic.

Focus formulation - Fixing and structuring Legal data is therefore paramount to the problem to be solved. success for data driven decision making in the Collection - Gathering pertinent information Legal system.

for the focused topic

CONCLUSION

With the revolution in the means of transport expectations from the people and at the same time meeting the requirement of sustainable growth. Certain amendments have been made in the laws and outdated and obsolete laws are being repealed. The huge litigation which is clogging the courts and judicial system has to be managed in such a way so that the litigation is brought down and consequent burden on the public exchequer is also brought down. Besides legislature measures, we are going to implement Legal Information and Management System (LIMBS) by which we may be digitally monitoring all the cases wherein Union of India is party. By such a monitoring, we may synchronize our efforts more effectively and efficiently and thus bring down litigation. We are also pursuing National Litigation Policy which aims to augment strength of legally trained persons and availability of competent legal advice which will also lessen the burden on the public exchequer. I hope with these efforts better administrative decisions will be made and good governance will be achieved.

and information technology, the world has become a global village. Trade and commerce including international cooperation have increased. The size of the Government which is comprised of Central Government and 36 States and Union Territories is huge and there may be over 50 lac government employees. There has been information; explosion and awakening amongst the people and consequent thereupon increased expectations from State agencies. Freedom of information provided by the Right to Information Act has added more cleavage of opinions and increasing conflicts. To deal with increased expectations, the Government has to increase efforts to manage conflicts by providing adequate mechanism to deal with grievances and resolution of disputes. The traditional institutions comprising legislature, executive and judiciary are under tremendous pressure to keep pace with development of science and technology,

Presentation - Completing information seeking, reporting and using the result of the task.

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A look at the six stages, points to the fact that the route to accurate legal information depends on careful identification of the needed legal information based on the problems to be addressed and adoption of strategic approaches to getting the information.



How Information (Data Generated from Various **Surveys and HMIS) Helps in Data Driven Decision Making**



By Dr. Vishnu Kant Srivastava **Chief Director (Statistics) Department Of Health & Family Welfare**

Health Information can be used for planning, monitoring & evaluation, Publications and Parliament questions & RTI queries.



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uality data is fundamental for health systems and programs to reach (or maintain) their intended targets. The implementation of electronic health records (EHR), advent of mobile health, and increasingly sophisticated data analytics are rapidly changing the health care industry. Benefits include evidence-based cost-effective treatments: monitoring remote telemedicine; increased awareness of patient risks and preventative care implementation and improved fraud and abuse detection.

Post independence, India has invested huge sums of money in the development of extensive health care system. Ministry of Health Family welfare acts as a Coordinator between the state Health departments, Planning commission, central council of Health etc. besides implementing various national programs and items under unions list and concurrent list. It is aided by the Directorate General of Health Services.

The Ministry of Health and Family welfare contributes datasets, which include:

- Department Publications such as Health and Family Welfare Statistics in India and Rural Health Statistics in India.
- Survey Data includes National Family Health Survey, District level Household survey and Annual Health survey.
- Health Management Information System
- Key Indicators from Census and Sample Registration System will have Population by Sex, Religion, Crude by Birth, Infant Mortality Rate, Neonatal Mortality Rate, Under 5 Mortality Rate, and Maternal Mortality Ratio (MMR) as part of it.

and

Whereas the survey based and publication based quality becomes good as it come to light only after its finalisations, the portal based data as that of HMIS do not become as good for last months as it becomes rather better for the last year's months because of their getting finalized gradually over the period of time. Though said that portal based data like that of HMIS are real time data but they are not so. Such data can be real time data only if such data are work driven data. It means as the functions are done or performed data gets generated automatically in the system. Such portals actually give real time

HMIS data is available on Data Portal of India under Open **Government Data** Platform India. It includes data indicators related to Maternal Health, Child Health, Family Health, **Health Facility** services, Laboratory Testing and Mortality.



based data and their coverage remains complete also.

Data disseminated by the ORGI, surveys, HMIS are used by the Ministry of Health and Family Welfare to know the following:

- Estimated number of pregnant women, live births, number of infant for immunisation activities in different States and UTs.
- To assess district-wise need to know the pregnant women, live births and infant for immunisation activities, service delivery.
- ▶ To estimate number of infant deaths, under 5 deaths and maternal deaths to assess the goals to be achieved under Millennium Development Goals (MDG) and Sustainable Development Goals (SDG) which would be monitored from 2017 to 2030.
- Data provides valuable input to know the status of different indicators of Maternal Health e.g. Institutional Delivery, Safe

Delivery, ANC, nutritional status, anaemia, Child Health Indicators viz. status of full immunization, nutritional status, anaemia and current use of family planning methods, unmet needs for family planning Uses of data.

Large Scale Surveys:

The Ministry has been conducting large scale surveys periodically to assess the level and impact of health interventions. These surveys include National family Health Survey (NFHS), District level Household Survey (DLHS), Annual Health Survey (AHS) etc. The main aim of these surveys is to assess the impact of the health programmes and to generate various health related indicators at the District, State and National level.

District level Household Survey:

The District Level Household and Facility Surveys (DLHS) were initiated with a view to assess the utilization of services provided by health facilities and people's perception about the quality of services. DLHS is designed to





provide district level estimates on important States and facility survey in AHS States) with the indicators on maternal and child health, family objective of estimating reliable indicators of planning and other reproductive health services population, maternal & child health and family and important interventions of National Rural planning at District and State Level. As part of Health Mission (NRHM). DLHS-4 (2012-13), the the Survey, a number of Clinical Anthropometric fourth in the series of the district surveys was and Biochemical (CAB) tests are carried out to preceded by DLHS-1 in 1998-99, DLHS- 2 in produce district level estimates for nutritional 2002-04 and DLHS -3 in 2007-08. status and prevalence of certain life style disorders. The major constituents of the CAB The fourth round of DLHS was planned component are height, weight, and blood (household and facility survey in non- AHS pressure, estimation of haemoglobin (Hb),



blood sugar and test for iodine content in the salt used by households. The District/State Fact sheet are now available for 21 States/ UTs and State Reports are available for 18 States.

Annual Health Survey (AHS):

Three rounds of Annual Health Survey (AHS) were conducted for providing district level estimates on major programme indicators, besides estimates of impact indicators like Total Fertility Rate (TFR), Infant Mortality Rate (IMR), Under Five Mortality Rate (U5MR), Maternal Mortality Ratio (MMR- at commissionerate level), etc. Office of RGI is the nodal organisation for conducting AHS. Under the AHS, 284 districts in the 8 EAG States (Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Rajasthan, Odisha, Uttar Pradesh and Uttarakhand) and Assam were covered. The AHS was conducted during 2010-11, 2011-12 and 2012-13 and the results are now available. Further, under the AHS, a separate component on Clinical, Anthropometric and Bio-chemical (CAB) tests was conducted in 2014 to collect data on height & weight measurement, blood test for anaemia and sugar, blood pressure measurement and testing of iodine in the salt used by households. The results of CAB survey are also available in the form of factsheets.

National Family Health Survey (NFHS):

Three rounds of National Family Health Surveys were carried out in 1992-93 (NFHS-1), 1998-99 (NFHS-2) and 2005-06 (NFHS-3) under the stewardship of the Ministry of Health and Family Welfare, Government of India, with the International Institute for Population Sciences (IIPS), Mumbai, serving as the nodal agency for conducting the survey to provide estimates of various health and family welfare indicators at the State and National level. The Ministry has decided to integrate all surveys and to conduct one survey (i.e. National Family Health Survey) to provide district and above level data with a periodicity of three years. Accordingly the Ministry has initiated the activities related to the fourth round of the Survey (NFHS-4) which is presently under progress. The survey is being carried out in two phases covering all States and UTs in the country as under: First Phase: Andhra Pradesh, Assam, Bihar, Goa, Haryana, Karnataka, Madhya Pradesh (East), Madhya Pradesh (West), Maharashtra, Manipur, Meghalaya, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh (East), Uttarakhand, West Bengal, Andaman & Nico Islands and Puducherry.

Second Phase:

Arunachal Pradesh, Chhattisgarh, Guja Himachal Pradesh, Jharkhand, Jammu Kashmir, Kerala, Mizoram, Nagaland, Odis Punjab, Rajasthan, Uttar Pradesh (Bundelkha + Central), Uttar Pradesh (West), Chandiga Dadra & Nagar Haveli, Daman& E Lakshadweep and NCT of Delhi

The main survey field work of NFHS-4 has be completed in all the States/ Regions covered the first phase except in Assam where the m survey field work is progressing. The Factshe in respect of 15 first phase States/ UTs are a released in January, 2016. Further out of States/Regions covered in the second phase NFHS-4, the field work of Mapping and listing households has been completed in all the Sta / Regions except in Nagaland and Punjak Chandigarh.

Health Management Information Syst (HMIS)

According to World Health Organization, HMIS is RCH reports- State wise, Min- Max report and an information system specially designed to Range wise] and Analytical reports [Scorecard assist in the management and planning of and Dashboard and Factsheet: State & District]

CONCLUSION

Health Information can be used for planning, monitoring & evaluation, Publications and Parliament questions & RTI queries. To conclude it can be said Today's complex healthcare systems allow little to no margin for error. Data provides information that guides majority decisions. Data-driven decision making is a

bar	health programmes, as opposed to delivery of care. It is an important managerial tool to monitor how far we have travelled and where
	the gaps are. The features of HMIS are-
rat,	Web based MIS, where facilities/
&	districts/ states are reporting data on a
sha,	defined periodicity in a pre- defined
and	format.
arh,	 Captures data related to service delivery
Diu,	(performance related) and facility
	infrastructure.
	1.94 lakh facilities across 672 districts of
een	India uploading data on performance
d in	indicators.
nain	 Reports available in public domain.
ets	
also	HMIS data is available on Data Portal of India
15	under Open Government Data Platform India. It
e of	includes data indicators related to Maternal
g of	Health, Child Health, Family Health, Health
ates	Facility services, Laboratory Testing and
o &	Mortality. There are two types of reports
	available on HMIS Public domain- Standard
	reports [like Data Reporting status, Data item
tem	wise, Data Item wise comparisons, Performance
	of key HMIS indicators, RCH reports- item wise,
IS is	RCH reports- State wise, Min- Max report and
to	Range wise] and Analytical reports [Scorecard
6	

systematic process of collecting, analyzing, and synthesizing data. The evidence-based practice applies to research findings that may have been completed in the last month, year, or longer, data-driven decision making is action oriented and may involve making a decision for tomorrow based on today's outcomes.

Role of Data of Rajya Sabha Questions and Answers in Decision Making



By Sh. Pradeep Chaturvedi Director (IT) **Rajya Sabha Secretariat**

An analysis of data of PQs also permits the potential to discover new insights into the operating mechanisms and ultimate performances of parliament as a central institution in the political process.

he Parliament of India is the supreme their answers data are very crucial and have legislative body of the Republic of India. been listed and explained below: Parliament is comprises of the President of India, the Rajya Sabha (Council of States) and Accountability and Transparency: the Lok Sabha (House of the People). Rajya Sabha is the upper house of the Parliament of government without transparency India and is a permanent body, which is not subject to dissolution.

Rajya Sabha has co- equal and co- extensive powers with Lok Sabha, except in the financial matters. Any bill except money bill can be initiated in the Rajya Sabha and can only become a bill when passed by both houses. The Rajya Sabha has played a crucial role in strengthening the Indian federation. The Constitution has assigned special roles to this elders' chamber of the Indian Parliament. When the Parliament wants to make a law on an item in the State list, it can do so only if the Rajya Sabha passes a resolution by a two-thirds majority. It has the power to initiate, investigate and decide the impeachment charges against the President and Vice- President. Rajya Sabha can just by an address, move for the removal of a judge of the Supreme Court or High Court. It has the power to amend the constitution, elect President, elect and dismiss the Vice- President. Rajya Sabha alone has the power to legislate in national interest on matters listed in the state list and lastly, it has the power to approve or disapprove the Presidents proclamation.

The Question Hour is one of the most significant items of business in parliamentary proceedings and it gives the whole institution of Parliament the great significance it possesses. The data that is derived from these questions speaks volumes about its usefulness in the functioning of the Government. The benefits of the questions asked in the Parliament along with

There can be no democratic system of and accountability. Asking questions is a refined parliamentary device. The ability of parliamentarians to ask questions to members of the executive either in written form or on the floor of the chamber is a feature of many legislatures. Parliamentary questions answers often generate significant media attention and public interest. This Hour has assumed high importance in legislatures because of Government's heavy involvement in matters

The Ouestion Hour is one of the most significant items of business in parliamentary proceedings and it gives the whole institution of Parliament the great significance it possesses.





affecting the day-to-day life of the citizens for which Ministers are collectively answerable to the people. Questions are asked primarily to elicit information, to ensure accountability, and for exercising a kind of legislative control over executive actions. Questions provide recorded data on individual members and the parliament as a collective institution. Questioning is a mechanism used to impose parliamentary accountability on the Government. Parliamentary Questions (PQs) provide unique and exact insight into parliamentarians' concerns and can provide data for empirical analysis permitting reasonable inferences. The aim is to obtain a clearer understanding of the behavior of legislators and the function of legislatures. Each Question provides at least two pieces of informational interest- First; PQs allow identification of a question's topic and thus formation of an opinion regarding the policy interests and agenda of the questioner. Second, the representative orientation of individual parliamentarians may become apparent from examining the question. An analysis of data of PQs also permits the potential to discover new insights into the mechanisms ultimate operating and performances of parliament as a central institution in the political process. Such an analysis provides an opportunity to reconsider whether or not theories which point to the weaknesses of parliament, especially in terms of executive accountability, provide an accurate picture of legislative function and performance.

Monitoring Government Expenditure:

The questions raised in the Parliament is an effective way to monitor how well the Government is spending the Public money. Effective monitoring of the analysis of data of PQs can be a great tool of effective monitoring of Government Expenditure as the following: Has public money been spent on the purposes for which it was assigned?

Has it been spent efficiently, and without will save the time and resources of the State waste? Legislatures. Has spending been kept within the budget allocation? Public intervention in Policy Making: Is there evidence of fraud or misappropriation,

or other irregularities?

Policy Making:

The Parliament gets the answers from the concerned ministries. Members of the house are free to comment on the issue. The responses, opinions and data provided by various Ministries through various Ministries through various members of the House, becomes the basis of policy formulation which is favorable to most people of the country.

Role Model for the States:

The procedure followed by the Parliament and the decision taken can become a role model for the states. They can thus adopt the policy as it is or customize it according to their needs. This



The data received by Rajya Sabha in the form of Questions Answers from various Ministries/ Departments is already lying on the website of Rajya Sabha. However, it cannot be utilize in any Software application for analysis without modification or conversion as these information are either in Office Word or PDF format. To facilitate end user that is researchers, students, scholars and public at large, Rajya Sabha Secretariat is in the process of making all these data available on the open Government Data (OGD) Platform India. Over the years, Rajya Sabha has become a great reservoir of information which has been provided by various Government and even organisations. Once these data is made available on OGD Platform, it can be utilized for generating new conclusions through interlinking of various data by use of

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latest computing software tools. These data would generate public opinion in the end, that will finally impact the decision making process. This effort of Rajya Sabha Secretariat would actually invite public at large to participate in the Government and its decision making process without any extra effort by the Government.

Questions and answers have a significant role in the Parliament. They allow Members of Parliament to hold the Government to account, using either oral questions to Ministers in the House of or written questions. They oblige Ministers to explain and defend the work, policy decisions and actions of their Departments. Now making these data available on OGD Platform would permit the potential users to discover new insights into the operating mechanisms and ultimate performances of Government.



Use of Road Accidents Data by Government Stakeholders to Reduce Road Accidents and Ensure Road Safety – A Study on Black Spot Management



By Sh. Ranjan Mukherjee **Director** TRW, Ministry of Road Transport & Highway

Both Central and State governments and other stakeholders are making best efforts towards reduction of road accidents and its effects and implementing various road safety improvements programmes along with strong monitoring mechanism.



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ransport Research Wing (TRW) of the departments, Police (Traffic) departments, Ministry of Road Transport and Highways Health departments, Education departments, is the nodal agency which collects, Research and academic Institutions and road compiles, analyses and disseminates data construction authorities/departments etc. relating to roads and road transport, road Central and States Governments are incurring huge costs for collection of data and creating a

accidents and road safety. As road transport mainly comes under the real time data base. Thus, the need is to make domain of the State administration, the best utilisation of data/information and availability of relevant data depends on the accordingly to adopt suitable policies for efforts mobilised by States/U.Ts. improvement.

TRW receives road accident data on calendar year basis from Police Departments (Traffic) of the States U.Ts on the basis of certain prescribed formats and publishes the relevant data in a report form namely, 'Road Accidents in India '. The latest available report covers information for the Calendar year 2014. During the year 2014, there were 4.89 lakh road accidents which killed about 1.40 lakh people and injured more than 4.93 lakh persons in India. The analysis of road accident data 2014 reveals that about 56 accidents take place and 16 lives are lost every hour on an average in our country. This publication contains State/U.T wise and selected city-wise data on various facets of road accidents in India including number of fatal accidents, number of persons killed and injured, major causes of road accidents in India, international comparison of road traffic injuries and deaths, road safety initiatives of the Government of India. This can also be accessed form the Ministry's Website WWW.morth.nic.in.

The main purpose behind mobilisation of road accident data/ information is to reduce road accidents, make roads safer for the users and hence to ensure road safety. We all know that road safety is a multi-dimensional issue and it involves numerous stakeholders at Central as well as State level such as Transport

Use of Road Accident Data:

Make use of data/inputs for road safety research and evolving of better standards and guidelines for road safety;

Use of data/ inputs for adopting road related measures like design, setting standards and audit of the roads from the point of view of preventing road accidents and ensuring road safety;

Use of data/ inputs for adopting measures for vehicle related measures like prescribing safety measures, enforcing regulations etc.;

To identify road accident black spots and high road accident prone road stretches where maximum road accidents and resultant injuries and fatalities are occurring that can help in planning and establishing various facilities specially for road accident victims like hospitals, placement of ambulances near the identified black spots, deployment of traffic personnel and to take remedial rectification measures on priority basis.

Use of data/inputs for assessing the need for better, relevant and contemporary laws, management and enforcement and to

appropriately adopting them and deterring the irresponsible road user behaviour.

Data obtained/collected using intelligent transport system such as radar speed cheek devices, surveillance camera, GPS/GIS enabled accident management system will help in strict enforcement against all traffic violations and in turn would induce better road user behaviour leading to reduction in road accidents and ensuring road safety;

> Data can be used for creating public awareness, inculcating education about road safety and adherence to the traffic rules.

The challenge now is to make better use of the road accidents data/information and making best possible efforts by all concerned in achieving our goal of reducing road accidents by 50 per cent by 2020.

Civil society stakeholders can contribute, particularly in the present age of social media, by providing information on roads, road users, behaviour patterns of road users, accident prone road stretches/areas etc.

We need improved data methods, reporting and proper of analysis of data to get the real picture. Timely, updated and comprehensive data managed through a modern and seamless database system should be shared by the various Government stakeholders will help in taking prompt and appropriate measures/action. More reliable data only help us in adopting suitable corrective measures and solve our problems quickly.

Civil society stakeholders can contribute, particularly in the present age of social media, by providing information on roads, road users, behaviour patterns of road users, accident prone road stretches/areas etc. We need to capture this data/information in an institutionalised approach/mechanism. This will help the Government stakeholders in getting the data and facilitate the Government stakeholders in taking quick action for reducing accidents and ensure safety.

Black Spot Management:

TRW has also started its efforts in collection of road accidents data on black spots especially on national Highways. In these black spots, the level of risk of road accidents is higher than the general level of risk in surrounding areas. The data/information on black spots are to be reported by the Police (traffic) departments of States/U. Ts to TRW of the Ministry of Road Transport and Highways as per the prescribed format.

Why Black Spots? Data pertaining to the locations of identified black spots provided information on the causes for appearing such black spots. Some major causes are curved and narrow road and no bypasses, blind turns and damaged surface of roads, Narrow bridge, steep slope and curve, Narrow T and Y junction, rural roads directly connecting to Highways, wrong road designing, bad road conditions etc. The data/information has been collected on the location of accidents, nature of roads, and number of fatalities for that particular year and reasons for frequent accidents.

▶ 13 Major States which accounted for more than 85% of road accidents have provided

	Road Accident Fatalities: 2011, 2012 and 2013				
S. No	States	No. of Fatalities at Top 25 Black Spots			
		2011	2012	2013	
1	Andhra Pradesh	99	62	71	
2	Bihar	91	98	63	
3	Chhattisgarh	61	44	74	
4	Gujarat	250	114	114	
5	Haryana	90	70	97	
6	Karnataka	121	90	151	
7	Kerala	263	244	232	
8	Madhya Pradesh	297	147	132	
9	Maharashtra	102	53	42	
10	Rajasthan	250	126	193	
11	Tamil Nadu	1,053	749	668	
12	Uttar Pradesh	255	352	244	
13	West Bengal	58	65	59	
	Total	2990	2214	2140	

Source: fatalities data reported by Police Departments of respective States.

details of the top 25 black spots for 2011, 2012, 2013 in their respective States.

Black spots identified on the basis of 10 or more fatalities by Police Departments of the respective States/UTs have provided data for 2011, 2012 and 2013. The data/information has been collected on the location of accidents, nature of the roads (National Highways, State Highways and Other Roads), number of fatalities for that particular year, and reasons for frequent accidents.

Remedial Action:

After systematic compilation of data, all details examination and taking appropriate measures to rectify those identified black spots on priority basis.

- Suggestive Short-term measures O Rumble strips
 - O Reflective stickers at junctions
 - O Fixing signboard/ Cautionary board
 - O Providing signage
 - O Speed Restrictions
- Suggestive Long-term measures
 - O Construction of Vehicular Under-pass
 - O Construction of By-pass
 - O Construction of flyover
 - O 4-laning



We know that road traffic accidents are amenable to remedial action. Latest data/information on road accidents make all the stakeholders much worried because of its alarming situation. Thus significant reduction in Coordination with all stakeholders is very much important. Both Central and State governments and other stakeholders are making best efforts towards reduction of road accidents and its effects and implementing various road safety improvements programmes along with strong monitoring mechanism. In this context a number of road safety initiatives have been taken by the Publication ' Road Accidents in India'- 2014

Details of remedial measures taken by NHAI at Top Black Spots of 13 States

S.	States/	Total	No. of	No. o	f Black	Short	-term	Long	-term
No	UTs	No. of	Black	Spots		Remedial		Remedial	
		Black	Spots	requiring		Measures		Measures	
		Spots*	pertaini	rem	edial				
			ng to	mea	sures				
			NHAI	Short	Long-	Comp	In-	Comp	In-
				-term	term	leted	progr	leted	progr
							ess		ess
1	Andhra	25	19	17	15	17	0	5	1
	Pradesh &								
	Telangana								
2	Bihar	21	20	17	20	17	0	9	8
3	Chhattisgarh	22	12	3	10	3	0	0	8
4	Gujarat	25	23	20	23	20	0	7	15
5	Haryana	25	25	9	25	9	0	4	15
6	Karnataka	25	10	8	6	8	0	5	1
7	Kerala	27	4	4	3	4	0	2	0
8	Madhya	24	12	4	8	4	0	0	8
	Pradesh								
9	Maharashtra	25	21	16	21	16	0	3	14
10	Rajasthan	25	20	16	20	16	0	16	4
11	Tamil Nadu	25	24	23	24	23	0	9	6
12	Uttar Pradesh	25	14	12	12	12	0	1	5
13	West Bengal	26	19	17	19	17	0	2	13
	Total	320	223	166	206	166	0	63	98
* - A	s reported by the	Police D	eptt. (traffi	c) of res	spective	States.			

Source: National Highways Authority of India as on 16.12.2015

Data Driven Decision Making in India Budget



By Sh. N M Jha Director (Budget) Ministry of Finance

The Budget preparation is primarily based on accounting data. The format in which the data is required is mentioned in the Budget circular which is issued every year.



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ata-driven decision making is the process of making choices based on appropriate analysis of relevant information. Budgeting is the process of creating a plan to spend your money. Government Budget planning, execution and management is an intricate and complex process starting from formulation of budgets such as Union and State level budgets, to tracking approvals and funds to ensure effective utilization of the budgeted resources. Jacob Lew has very rightly said," The budget is not just a collection of numbers but an expression of our values and aspirations". Budget as we all know is basically about numbers and thus entirely data driven.

The importance of data cannot be underestimated. Without reliable information, the macroeconomic framework is literally not worth the paper it is written on. This includes the collection of economic data and the monitoring of developments in economic conditions as well as the monitoring and consideration of changes in laws and regulations that affect revenue, expenditure, financing and other financial operations of the government. Government Budget is an itemized accounting of the payments received by government as taxes and other fees and the payments made by government as purchases and transfer payments.

Earlier, the budgets in India were prepared through basic Excel programs. It is only after 2011-12, that there was a shift towards database system. A lot of data is generated by the Finance Department and the same is also required from the Ministries. The budget document provides data from the past present and estimates for the budget year (future). In

India, Controller General of Accounts (CGA) is the lead partner in providing data based on accounting information mainly for Actuals. CGA compiles information from other accounting entities as well.

The Budget preparation is primarily based on accounting data. The format in which the data is required is mentioned in the Budget circular which is issued every year. It is needed for estimation of Revenues like tax, non- tax, nondebt capital receipts and borrowings. It is also required for a scheme wise estimation of expenditure, Non- Plan provisions including Salaries and Pensions etc. and most importantly to work out performance on major fiscal parameters.

To review the expenditure decisions on additionalities/ supplimentaries sought and **Contingency fund** advances require access to data relating to Monthly Accounts, PFMS and E-Lekha.





Database is used to prepare several budget documents viz. Expenditure Budget Volume 1 and 2, Demands for Grants, Receipts Budget, AFS, Budget at a Glance etc. Manual statements are also added in some documents viz. Expenditure Budget Volume 1 and Receipts Budget. It is required for Appropriation Bills including Vote Account, putting forth Supplementary Demands for Grants and Excess Appropriation/ Demands for Expenditure, Trends of receipts and expenditures. Working out the State's share of taxes, Investments to NSSF receipts and Preparation of Borrowing Calendar are all prepared making use of the database that is available.

To review the expenditure decisions on additionalities/ supplimentaries sought and Contingency fund advances require access to

data relating to Monthly Accounts, PFMS and E-Lekha. It is also needed in the preparation of Appropriation Accounts and Finance Accounts.

Monthly Accounts: The accounts compiled by the Pay and Accounts Offices are consolidated on a monthly basis in the Principal Accounts Offices at the Ministry's headquarters. These accounts of the Ministry are sent to the Controller General of Accounts. The accounts received from various Ministries are consolidated in the office of the Controller General of Accounts to generate the accounts of the Government of India as a whole. These monthly accounts are reviewed and a critical analysis of expenditure, revenue collection, borrowings and deficit is prepared for Finance Minister.

Public Financial Management System

(PFMS): This was a Scheme of the Planning Commission originally which has now been passed on to Ministry of Finance. Office of Controller General of Accounts is the implementing agency. Project is being monitored at the highest level in the Ministry of Finance. The aim is:

• To capture releases: All releases made by the central civil ministries to states/ special purposes vehicles (society's routes)/Autonomous bodies and NGOs on real time basis to generate reports on daily /weekly/monthly basis. The system has capabilities of tracking fund flows to the last beneficiaries. To develop interface between RBI and States to interlink the releases received from the centre to states, states to districts treasury/division/blocks. To develop

interface between PFMS portal and core banking Systems for e-payment directly into accounts. To keep entire project in Public domain. To capture real time basis from different expenditure implementation levels up to blocks /subdivisions and there after Panchayats and real user/ beneficiary. Change from release system /fund flow system to flow of authorization and reimbursement to banks on actual payment basis. It has provisions for capturing utilization of funds from different implementation levels by establishing interlink between CPSMS and core banking system.

• To enhance utilization of funds and reduce idle funds.

O Presenting releases details and actual



expenditure to the legislatures by the respective states.

• E-Lekha: is a prudent financial management application. It provides an electronic payment and accounting information system for the Civil Accounts Organisation with the objective of improving efficiency and accuracy of the accounting process. The objectives of the project were to integration applications by preparation of accounts from one central database, provide a comprehensive IT-enabled core accounting solution, improve accounting process efficiency and to create a secure system with enhanced transparency.

A budget needs to have boundaries and a bottom line. An effective budget is backed by data. Data is required at every stage of budget preparation. All activities relating to budget are used to prepare documents which have been listed above. Data-driven decision making strategy begins with a phased approach that may encompass data access and integration, reporting and data analysis. More the data increases the chances of proactive and informed decisions. Decision about increasing or decreasing the allocation of resources can be taken easily and quickly. However there is a need for better coordination at all levels- States and Local Bodies. Data can be put on the Open Government Data site and people can play with it.

Depot Online – Data Driven Decision Making



By Sh. Abhishek Singh **Executive Director** Food Corporation of India

Technology and e Governance have a transformational potential of making public services accessible and efficient and helps make Government responsive and accountable.



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echnology and eGovernance have a transformational potential of making public services accessible and efficient and helps make Government responsive and accountable. As part of Digital India initiative, e Governance has changed the way citizens interact with the Government - it enables Government reach out to the citizens rather than citizens struggling from pillar to post in the maze that we used to know as Sarkaar. Across sectors - whether it is Passports or Driving Licenses, Banking services of paying taxes citizens have benefited immensely from e services and it has helped cut down transaction times and transaction costs - as also reduced corruption in public services as was evidenced in Impact Assessment studies conducted by IIM Ahmadabad. Use of technology allows faster processing of information and data that is critical for decision making and faster delivery of services.

One of the key services which citizens access every month and is critical for a welfare State is Public Distribution System (PDS). The PDS System covers not only the beneficiaries who get the monthly allocation of food grains through the Fair Price Shop but it also directly affects the farmers who benefit through the procurement of food grains. It is vital for the economy and finances as the Food Subsidy is one of the biggest items on the Government Subsidy Bill and any improvement in the efficiency in the procurement, storage and distribution operations can have huge returns.

Depot Online System if FCI

Procurement of Food grains and its distribution is complex as we have only 3 States that are surplus in Wheat – Punjab, Haryana & Madhya Pradesh and only 4 States that are surplus in Rice – Punjab, Chhattisgarh, Haryana & Andhra

Pradesh. Almost 300 LMT of Wheat and Rice is procured and sent for consumption in States across India. This requires planning for optimal storage capacity in procuring areas as also the consuming areas along with ensuring the most efficient and cost effective means of transportation. Food grains being perishable commodities also require timely preservation and quality control operations so the citizens are given good quality food grains. Technology can play a big role in these operations.

Food Corporation of India is responsible for most of the back end operations of procurement, storage and movement across various States from where food grains are

The scope of the Project is to not only design the new IT system to automate the end-to-end depot operations, but it also intends to improve the current processes in order to bring in more transparency, increase efficiency and capture real time data to support decision making process.



issued to State Governments for distribution under the Public Distribution System under the National Food Security Act to citizens. The complexity of FCI operations can be depicted pictorially below:

Owing to its large network of operations and, complexity of interactions with internal and external stakeholders, FCI has been facing multiple challenges in effective management of depot level operations and stock. The primary challenges are - district to depot level and vice-versa Lack of single source of validated information for depot level data

In order to address these challenges, FCI is implementing a Depot Online Project with the objective to automate all Depot Operations to bring in efficiency and accountability. The Vision Statement for the Project is to: "Transform the food distribution supply chain through IT intervention by bringing in transparency, reliability and effectiveness of



- Information support for spot decisions owing to dynamic nature of operations
- Shortage of storage during peak season
- Uncertainties in railway movement
- Calculation of Release Order (RO) balance and reconciliation
- Assignment of work to different gangs simultaneously
- Timely and accurate data flow from

procurement, storage and distribution" To be in alignment with the above Vision Statement and overcome current operational challenges, FCI has taken the initiative to implement Depot Online System with the following objectives –

- Standardization and automation of depot level processes
- Efficiency improvement in management

of food grains storage and distribution

- Enablement of real time monitoring operations
- Timely data reporting
- Improvement in end-to-end operation visibility for informed decision making
- Effective interfacing with key extension stakeholders

The scope of the Project is to not only desite new IT system to automate the end-to-ordepot operations, but it also intends to imprit the current processes in order to bring in mitransparency, increase efficiency and capter real time data to support decision make process. The major gaps highlighted by stakeholders reveal that the depot officials not have stock positions on a real time bar and the officials at senior management level can't derive meaningful conclusions to midecisions from the data available to the Therefore it was decided to incorporate the process change – "all manual registers to the stock process change – "all manual registers to the stock process change – "all manual registers to the stock process change – "all manual registers to the stock process change – "all manual registers to the stock process change – "all manual registers to proce



n	made online by capturing data at source and on	
g of	real time basis" which will allow cutting down	
	lots of manual effort to record data in registers	
	and, correct and reconcile them at the day end	
onal	to generate MIS reports.	
g	A <mark>nother ke</mark> y business process improvement	
rnal	identified is that the "truck data entry should	
	happen online at the place of origination" to	
sign	ease the gate entry process and help reduce	
end	the long queue outside the gate during peak	
ove	season.	
ore		
ure.	The gaps identified are categorized into four	
king	major heads -	
the	Lack of availability of real time data to	
s do	support decision making	
asis	Freeing up of resources	
vels	Data inconsistency and duplication	
ake	Process bottlenecks	
em.		
key	The key features of the solution adopted	
be	include the following:	
matic e mainte	opturing and submission of data onsolidation & rolling up of data for register/report mance of data integrity and data quality	

Convenience for data entry, submission, view and status check
 Function specific android apps for both tablets and smartphones
 Support for push notification and updates from central server

Offline transaction using mobile applications
 Local instance equipped with temporary data storage
 Synchronization with central server when online

Real-time data entry through a single application
 Minimization of redundancy and improvement in data accuracy
 Phasing out of some current standalone MIS applications

Complete visibility for end-te-end streamlined flow of operations
 Web services for real-time point-to-point synchronous integration
 Messaging for real-time asynchronous integration

Enabling informed decision making or decision support
 Extraction of data from various external and internal systems
 Monitoring of key performance indicators

The project is already under implementation and Pilot Depots are operational under the system. By June 2016, all FCI Depots would be covered by the project followed by the Depots hired from CWC, SWC and Private Parties.

One of the key objectives of the project is to ensure that data which is generated at the depot level is analysed and processed at various levels in order to serve as a decision support system. Given the complexity of the operations of FCI, it is essential that the senior management looks into data pertaining to Key



Performance Indicators and build in analytics on the same so that there is overall improvement in the operational efficiency of the Corporation.

Thus, data generated from the depot level is aggregated at the District level, Regional level, Zonal level and Headquarters level and various visualisation techniques are used to present relevant data in real time. The system identifies exceptions as also situations and locations which may require intervention. Depending on the type of data, the same is presented either graphically and pictorially to make it easier to analyse and comprehend.



For critical operations like Quality Control and Movement of food grains alerts have been designed which will be sent to the relevant personnel through e-mail and SMS. Suitable escalation matrix has also been planned which would ensure that supervisory officers are alerted well in time in case there is any lapse by a subordinate. It enables end-to-end visibility of supply chain operations up to the last mile of operations that is up to the stack level in a depot.

Thus, this project relies heavily on data analysis and data management of improving the operations of the Corporation.





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CONNECTION

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Data Based Intelligence



^{Ву} Sh. Vipul Kaushik Director - Advisory Services Ernst & Young LLP

A structured approach to performance and perception management can really help in continuous monitoring and improvement of Key areas of performance.



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Executive Summary

Ernst & Young is one of the world's leading professional services firm with operations in 150 countries. Ernst & Young employs more than 167,000 personnel providing an unmatched depth and variety of specialized services. Our worldwide organization enables our clients to take full advantage of the resources that are available and helps us to serve our clients with a level of quality and consistency that is superior to that of our competitors.

Ernst & Young has a significant Fortune 500 client base across the world. Ernst & Young's strong market share, both domestic and international means that we can provide you with the benefits of our vast and highly effective service and information infrastructure.

Businesses today face faster change and more complexity than ever before. That's true whether they are global companies or local enterprises. Growing our own business depends on helping our clients navigate through that change and complexity, wherever they are in the world.

At Ernst & Young, delivering in the market means being the best in three areas: building sustainable relationships, driving execution excellence and delivering exceptional service.

We are thankful to NIC for providing the opportunity to present our thoughts on Open Govt. data workshop on data driven decision making. It also provided us a great learning by listening to the thoughts of other visionaries who shared their experiences, usage and expectations from open data platform.

We strongly believe that, open Govt. data workshop certainly provides a great platform for anyone to leverage data based insights. This proves the fact that sharing of data provides lot more advantages than restricting it for individual usage.

This document is intended to share our thoughts as were presented in the workshop.

Data Based Intelligence Why Data Based Intelligence

The predictive models, advance analytics are used for risk scoring for existing taxpayers as well as for a new taxpayer/ dealers in future.

also sharing of data for specific or common objectives. We have all realized that sharing of data can not only help in operational efficiency but could also be used to generate insightful and intelligence decisions. The benefits of data based intelligence are actually the inherent need for a 21st Century officer like:

- Improved Performance
- Moving from "How Much" to "How Well"
- Impact of Investments
- Compliance monitoring and management
- Strategic and tactical planning
- Budgeting
- Transparency and accountability
- Faster Decision making

Measuring Performance and Perceptions

enabler that not only helps in measuring the performance of various departments, initiatives and schemes but it also help is assessing the perceptions of citizens and helps in gauging the real benefits that the citizens are leveraging from various initiatives and projects.

The structured approach for performance measurement is as illustrated below. It's a top down approach where the vision of the department broken up into focus areas and each focus area has multiple KPI's that helps in doing a quantitative analysis of performance. Each KPI is defined in terms of its definition, calculations and dimensions across which it is viewed. The KPI is broken up into base measures and each base measure is mapped to the source of its data.



A structured approach to performance and perception management can really help in continuous monitoring and improvement of Key areas of performance. Technology is a great Once the data source is identified, the feasibility of accessing the required data is analysed through following steps:



- Data source technology assessment
- Data quality analysis
- Identification of Security needs
- Identification of presentation needs
- Identification of analytical needs



This helps in creation of a detailed KPI repository which is illustrated in the diagram below:

The above framework could be further extended for generation of balance scorecards where performance of and entity / department is measured through a single number which is obtained by applying weightages to different KPI's as per the focus of the department. The illustrative diagram of this concept is as stated below:

governments to plug the gaps in their tax administration and contribute toward sustainable development.

Proliferation of 'data generators' such as social media, digital transactions, and utility and bank payments have resulted in a wealth of data, both structured as well as unstructured



demonstrated significant improvement in performance on the service and compliance front, using the immense power of analytics. However, there is still a lot of ground which needs to be covered for deployment of analytics as a standard practice across tax related activities. Governments need to have a focused analytics strategy in place, with clearly defined plans around data aggregation, quality control, devising the analytical methodology and tackling legacy technology challenges.

Governments worldwide lose more than \$3.1 trillion in annual revenue because of tax evasion, according to a report by World Bank. The equivalent of more than 5.1 percent of



Analytics for Commercial Taxes

Tax administrations around the world are losing billions of dollars each year, due to due to non-compliance, evasions, frauds or non-collection. In an era where governments are struggling with tight fiscal constraints, changing demographics and pressure to deliver more efficient services, it is imperative for (including text, video, pdfs etc.). Tax authorities can increasingly leverage this data and use advanced analytics to conduct audits and uncover trends and discrepancies, using new techniques such as rule-based monitoring, modelling and outlier detection.

Several tax administrations (across emerging as well as developed countries) have already global gross domestic product never reaches the coffers of 145 national governments in the form of taxes, according to the report by The Tax Justice Network, an independent group that promotes financial transparency.

The report is based on figures from the World Bank. The lost taxes are mainly from the shadow economy, or cash transactions that were hidden deliberately from the tax authorities. "If more had been done to tackle the rampant tax evasion, Europe would not be facing a crisis today," Richard Murphy, the author of the report, said in a statement. Italy loses €183 billion, or \$242 billion, to tax evasion a year, and its debt of €1.9 trillion represents just over 10 years of tax evasion, he said.

Countries such as Italy and Greece have vowed to crack down on tax evasion and cash transactions for goods and services that fall below the authorities' radar. Germany and Britain signed an agreement with Switzerland about recovering some tax revenue from accounts held by their citizens in Swiss banks. South America has the world's largest shadow economy compared with its G.D.P., followed by Africa and Europe, where income hidden from the tax authorities amounts to about 20.5 percent of G.D.P. That compares with 10.8 percent in North America, according to the report. The figures do not include income from criminal behaviour like smuggling or the illegal drug trade.

The United States lost the most tax revenue in absolute terms — \$337 billion — followed by Brazil and Italy. But at 8.6 percent, the U.S. shadow economy is also the smallest as a percentage of G.D.P. That compares with 15 percent of G.D.P. in France6 percent in Germany and 27.5 percent in Greece.

All the above facts and figures showcase the quantum of tax evasion due to non-compliances and frauds which is enormous and very critical for not only the growth of individual countries

but also holistically of the world economy as a whole.

The key models and techniques which can be applied by tax administrations including: Business Rules / Anomaly Detection Techniques / Predictive Models/ Advance Analytics/ Data Mining Techniques / Social Network Analysis /Text Mining & Sentiment Analysis

Business Rules: A list of business logic and rules tested appreciated and very effective across the different commercial tax departments can be incorporated with required customization. The rules then can be validated both statistically as well by the business users as business rules.

Anomaly Detection Techniques: The anomaly detection techniques includes both statistical outlier detection as well as business rules to holistically view any anomaly/ potential non-compliances and frauds across a list of key performance indicators.

Predictive Models/Advance Analytics/Data Mining Techniques: The predictive models, advance analytics are used for risk scoring for existing taxpayers as well as for a new taxpayer/ dealers in future. It incorporates the equation based models including regression, logistic regression, rule based algorithms including decision trees (Both CHAID- Chi Square Association Interaction Detection & CART- Classification & Regression Trees) as well as artificial intelligence or Neural Networks. The data mining and pattern recognition techniques includes cluster analysis, principal component analysis for dividing the tax payers/dealers/ evaders into groups or clusters. Every cluster should have a different technique of revenue maximization. The predictive modelling techniques and the data mining will be integrated together & thus will have more impact rather than using the two techniques in isolation. The clustering technique helps the client to know about the strategy. But every cluster can have huge number of dealers/ taxpayers. The predictive modelling techniques help in prioritizing some of the dealers/ taxpayers from each cluster in terms of risk score and go after them.

Social Network Analysis: The Social Network Analysis or Link Analysis would help to link different key performance indicators, information in terms of bank accounts, utility bills, newspaper information, web information etc. and create association rules for probable evaders. This technique is very effective for carousal trading or potential circular trading and has been able to focus on some big networks involving in huge transactions/ evasions in commercial tax departments of some developing and emerging countries.

Text Mining & Sentiment Analysis: The text mining and sentiment analysis helps in categorizing the different texts, unstructured data, newspaper information, videos, pdfs, web information available in the network and thus can be used in sync with the predictive models to update the risk scores/ probability of evasion in future with more dynamic information and thus the effectiveness/ classification of the model increases.

Dashboards Using Data.Gov.in

Data.Gov.in provides an excellent platform where data from multiple platforms can be accessed for analysis. Using the structured approach as defined above, one gets an





opportunity to integrate data from multiple departments and do a more meaningful analysis. This is illustrated through the following dashboards:

ard		Departments		State at a Glance
	181	Agriculture		
	*	Education	10	PMO Schemes
	1	Energy		Anna Santi
	Ø	Health	X	Important Projects
	2	Horticulture	10	District Dashboards
	0	Industries	-10-	
	A	Public Works	212	Comparisons
	0	State Tax & Revenue	(A)	
		Ortime DarkBoard	C.	Analysis





Data Driven Decision Making Workshop at a Glance



