



Design and Development of Web based Information System for Results Framework Document in ICAR

N. Srinivasa Rao, Mukesh Kumar, A.K. Choubey and Sunil Kumar Jha
ICAR-Indian Agricultural Statistics Research Institute, New Delhi

Received 10 December 2015; Revised 15 June 2016; Accepted 30 June 2016

SUMMARY

Indian Council of Agricultural Research (ICAR) is one of the largest national agricultural system in the world with 101 institutes and 71 agricultural universities spread across the country. Following the guidelines of Government of India, ICAR was given responsibility to all the ICAR institutes to develop Results Framework Documents (RFDs) in their institutes. But, there is no web based information system available in ICAR for preparing and reporting the RFDs to the respective subject matter divisions (SMD) and for preparing consolidated reports and evaluating overall performance of the institutes by the ICAR headquarters. Thus, ICAR-IASRI developed a web based Results Framework Document Management System (RFDMS) in ICAR to manage RFD activities in ICAR which replaces the existing manual handling of RFD documents. The system consists of 6 input options viz., Section 1 to Section 6 of RFD and each of these sections further constitutes different options that help the user to enter various components of RFD. The RFDMS facilitates institutes to prepare, submit targets and achievements and consolidated reports online and also provides access to officials for effective monitoring and decision making. It is a centralized, automated and uniform reporting tool across ICAR institutes resulting into improved targets monitoring and decision making. This system leads to IT empowerment and improved information management of RFD in ICAR.

Keywords: Results framework document, Document management system, Web based system.

INTRODUCTION

Document management became an important entity in any organization. Document management is a process that supports operational activities, strategic planning and decision-making. So any organization looks for a solution that allows to capture the documents in digital form, archiving for fast retrieval, movement of the documents, monitoring, evaluation and decision making (Emelia 2011, Nathaniel 2012 and Tom 2012).

Recently, several document management systems were developed across the global. In 2012, a Result Framework Management System was developed by National Informatics Centre (NIC) to manage the RFD documents of all the central ministries. In this system the RFDs are being submitted online by all the ministries and monitored by the Government of India (<https://www.rfms.nic.in/>). The Results-Based Management System

(RBMS) was developed by The United Nations Office for Disaster Risk Reduction (UNISDR's) which is aimed to strengthen capacities, efficiencies and accountabilities in its management and programmatic functions and work processes to effectively deliver its mandate as well as its strategic framework (<http://www.unisdr.org/who-we-are/rbms>). An operational framework was prepared by World Health Organization (WHO) for monitoring and evaluation of health system strengthening (HSS) and discussed how it can be operationalized at the country level (http://www.who.int/healthinfo/HSS_MandE_framework_Nov_2009.pdf).

2. NEED OF RFDMS

The ICAR is an autonomous organisation under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture

and Farmers Welfare, Government of India. The Council is an apex body for co-ordinating, guiding, managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country (<http://icar.gov.in> and <http://dare.nic.in>). It has 101 institutes and their regional stations and 8 Zonal Project Directorates spread across geographical location of India. Government of India issued guidelines to all the Ministries to prepare RFDs in their departments/institutes (www.performance.gov.in). Following these guidelines, ICAR had given responsibility to all the ICAR institutes to develop RFDs in their institutes (<http://icar.org.in>).

RFD is a record that helps prioritizing and measuring the performance of any department/organization. This document contains department/organizations agreed objectives, policies, programs, projects, success indicators and targets to measure progress in implementing them. It also ensures that things are done in the right direction with effectiveness and efficiency, doing the desirable things in the right direction from the national point of view. Based on the guidelines of ICAR, RFDs are being prepared by all the ICAR institutes and submitted manually to the authorities for effective monitoring and evaluation of performance of the individual institutes. At present there is no web based information system available for submitting the results framework document in ICAR institutes to the respective subject matter divisions (SMDs) and to prepare consolidated reports and to evaluate overall performance of the institutes by the ICAR headquarters as it is a time taking process and lot of time and manpower is required. Therefore, the designing and development of results framework document management system in ICAR is essentially required to manage RFD activities in ICAR.

Thus, ICAR-IASRI developed a web based Results Framework Document Management System (RFDMS) in ICAR to manage RFD activities in ICAR which replaces the existing manual handling of RFD documents. The RFDMS facilitates institutes to prepare, submit targets and achievements online and provide access to officials authorized by the Institutes, respective SMDs and RFD coordination unit in ICAR. It facilitates generation of consolidated reports. It simplifies the process of RFD preparation, information flow and generation of reports for

effective management and monitoring. This system helps as a dash board for management authorities in decision making, as all the institute RFD documents is available at a single point. It is a role based system and the roles can be assigned by ICAR-IASRI and RFD coordination unit of ICAR. It also provides availability of previous years documents / Achievements / Composite Scores/Trend Values to the institutes, SMDs and RFD coordination unit, ICAR (<http://iasri.res.in>).

3. MATERIALS AND METHODS

Government of India prepared the format of RFD and issued guidelines to prepare RFDs in their departments/institutes (www.performance.gov.in). Based on this format, the database was designed and application program with various modules were developed.

3.1 Database Development

The RFDMS has six sections. The section 1 constitutes the vision, mission, objectives and functions of the institute. This section provides the context and the background for the RFD. Vision and mission concepts plays a major role in the strategic planning exercise of any organization. Vision is an idealized state for the department. Vision is a long term statement and typically generic and grand. It does not change from year to year unless the department is dramatically restructured and is expected to undertake very difficult tasks in the future. The department's Mission is the nuts and bolts of the vision and mission should follow the vision. The vision represents the big picture and the mission represents the necessary work. The objectives and functions represent the developmental requirements to be achieved by the department in a particular sector by a selected set of policies and programs over a specific period of time. These are linked and derived from the department vision and mission statement.

Section 2 consists of key objectives, which will be selected from the list of all the objectives of the department. The key objectives to be incorporated by the department should add up to 85% weights. The remaining 15% are mandatory objectives, which are approved by the Council. These objectives will be ranked in a descending order of priority according to the degree of significance and specific weights will be

attached to the objectives. For each objective, the department must specify the actions to be taken to achieve the objectives in terms of policies, programs, schemes and projects. Often, an objective has one or more actions associated with it. For each action, the department must specify one or more success indicators, which are important management tools for driving improvements in departments' performance. A success indicator provides a means to evaluate progress in implementing the policy, program, scheme or project which are qualitative and quantitative aspects of departmental performance. The specific units and relative weights will be attached to each success indicator. The next step is to choose a target for each success indicator. Targets are tools for driving performance improvements. The targets will be presented as per the five point scale *viz.*, Excellent (100%), Very Good (90%), Good (80%), Fair (70%) and Poor (60%) (www.performance.gov.in).

Section 3 deals with the trend values of the success indicators. RFD must provide actual values for the past two years and also projected values for two years in the future against every success indicator and the corresponding target.

Section 4 contains detailed definitions of various success indicators and proposed measurement methodology. It also contains the abbreviation/acronyms and other details of the relevant scheme.

Section 5 contains the expectations from other departments that impact the department's performance and are critical for achievements of the selected success indicator.

Section 6 contains the broad outcomes and the expected impact the department has on national welfare (www.nic.in).

3.2 Software Development

RFDMS was designed and developed in 3-tier architecture on the .NET platform. The user interface was developed using HTML (Jon 2011), CSS (Christopher 2008), JSP (Marty *et al.* 2007 and Phil 2003), the application layer was developed using ASP.net (Stephen 2002 and Stephen 2004) and the database layer was designed using MySQL (Russell 2008 and Seyed *et al.* 2008). The system has a user interface for

online data entry, updation and modification of all sections of RFD document. The system was divided into two components such as user and administrator. The user component has the access to the system for online data entry, updation and modifications of all the sections of RFD document time to time. The administrator component has the control to create a new member of this RFDMS, manage the database, delete unwanted information and modify the existing database etc. The software development process was carried out by following the sequence of software engineering life cycle components *viz.*, system requirements, system analysis, software designing, software coding and software testing (Frank 2014).

4. RESULTS AND DISCUSSION

The home page of web interface consists of member login and password fields which allows the organization to access RFD management system (Fig. 1). After entering the login details, the user can access the system. The system was divided into three main modules *viz.*, 'Prepare RFD', 'Input Achievements' and 'Print RFD'. The 'Prepare RFD' module allows the organization to prepare their result framework document, the 'Input Achievements' module allows the organization to enter the achievements and the 'Print RFD' module allows to prepare various reports and provide print option.

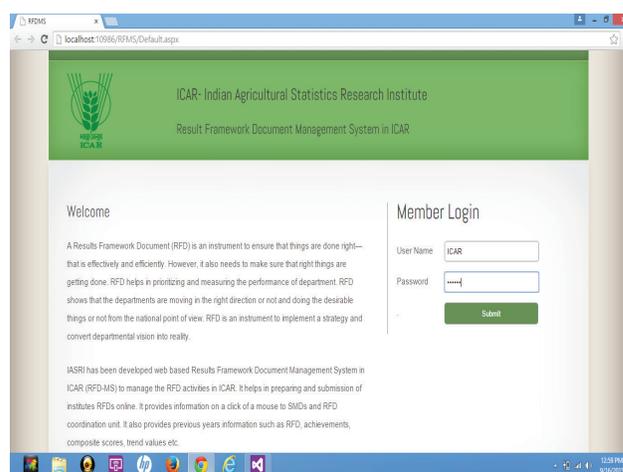


Fig. 1. Home Page of RFDMS

The 'Prepare RFD' module consists of five options mapping to the five sections of RFD such as section 1, section 2, section 3, section 4

option displays a page, where the organization has to enter the expected outcomes/impacts, details of all the departments jointly responsible for achieving goals, success indicators with expected trend values to measure the department impact.

The ‘Input Achievements’ module gives the input screen for entering achievements once the organization has the targets mentioned in the RFD. The ‘Print RFD’ modules helps the organization to take a print out of the RFD document, once all the RFD entries are ready. Choosing the ‘Print RFD’ option displays a page, which consists of a combo box for selecting the year. User can select the year from the select year combo box for which the RFD needs to be printed. Now the user can click the view report button, report for the concerned institute for the selected year gets displayed and then click print button to print the report.

This software serves as a web based management system in managing the process of RFD document in the ICAR. It helps in preparing and submission of institutes RFDs online. It provides archives of RFDs, achievements, composite scores, trend values and other information.

5. CONCLUSION

RFD provides a summary of the most important results that a department expects to achieve during the financial year. Based on the manual document of results framework, a result framework document management system was developed in ICAR to prepare and submit RFD documents and input achievements online. The reporting through this system will help in measuring the overall impact of the institutes targets and achievements. The web-based tool provides information on a click of a mouse to SMDs and RFD coordination unit in ICAR. It facilitates generation of consolidated

reports for individual institutes, SMDs and RFD coordination unit. It will also provide previous years information such as RFD, achievements, composite scores, trend values etc.

REFERENCES

- Christopher, S., Todd, D., Cindy, Li, Ethan, M., Dunstan, O. and Mark, T. (2008). *Professional CSS for Web Design*. Wiley Publishing Inc., IN
- Emelia, P.A., Syamsul, R., Kamaruzaman, J. and Christon, E. (2011). *Electronic Document Management System*. *World Appl. Scis. J.*, **12**: 55-58.
- Frank, T., Orlando, K. and Barbara, B. (2014). *Essentials of Software Engineering*. Jones & Bartlett Learning, MA.
- Jon, D. (2011). *HTML & CSS, Design and Build Websites*. John Wiley & Sons, Inc., IN
- Marty, H., Larry, B. and Yaakov, C. (2007). *Core Servlets and Java Server Pages*. Pearson Education, Inc., Boston.
- Nathaniel, R. (2012). *Handling Paper in a Digital Age: The Impact of Document Management*. Aberdeen Group. Incl., Boston
- Phil, H. (2003). *JSP 2.0 The Complete Reference*. Tata McGraw-Hill, New Delhi.
- Russell, J.T.D. (2008). *MySQL in a Nutshell*. O’Reilly Media, CA.
- Seyed, MM, Tahaghoghi and Hugh E.W. (2007). *Learning MySQL*. O’Reilly Media, CA.
- Stephen, A.S. (2002). *ASP.NET by Example*. Que publications, USA.
- Stephen, W. (2004). *ASP.NET Unleashed*. Sams Publishing, USA.
- Toms, L. (2012). A Study on electronic document management system integration needs in the public sector. *Intern. J. Adv. Eng. Tech.*, **5(1)**,194-205.
- <http://dare.nic.in/>
- <http://iasri.res.in/>
- <http://icar.org.in/>
- <http://www.performance.gov.in/>
- <https://www.rfms.nic.in/>
- <http://www.nic.in/>
- <http://www.unisdr.org/who-we-are/rbms>
- http://www.who.int/healthinfo/HSS_MandE_framework_Nov_2009.pdf