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Measuring Effectiveness Of E-Office System: A Case Of E-Governance Implementation In Odisha

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Abstract: The increasing importance of information management in the government sector has become instrumental in the evolution of e-governance systems. The improved communication process in the offices based on increasing competitiveness and reengineering the entire governance activities significantly reduced operational costs and time aiming at achieving higher level of effectiveness. This paper applies an analytic hierarchy process for measuring the effectiveness of e-office implementation in Odisha based on citizens' satisfaction with four criteria: clarity, usefulness, accuracy, and reliability of the information. We considered ten different offices under the Government of Odisha that implemented this e-governance application to measure the relative effectiveness of e-Office system in these criteria.

Keywords: **E-governance, Effectiveness Measurement, Analytic Hierarchy Process, Government of Odisha**

I. INTRODUCTION

Reform becomes imperative as time advances, and citizens expect the Government to be an effective service provider and key facilitator in vital sectors, viz., maintenance of law and order, infrastructure development, and providing basic services in health, education, social security, food security & poverty reduction, etc. The current fast-changing socio-economic, political and technological panorama has put greater demands on the government machinery to adapt to the new situation for effective public service delivery. The ability of the Government to deliver goods and provide services, in turn, depends on the availability of robust citizen-centric policies and actionable means to implement such policies that require organizational structure and processes to undertakethese activities, quality of its man-power, size and composition of government expenditure on priority areas, application of modern technology and the swiftness with which the system responds to the needs of the citizens. Torealize the stated goals for good governance, corresponding changes and innovations in the system, processes, and attitude become essential from time to time. Managing such changes is vital to make reforms successful. Change management demands relentless effort from the change managers to neutralize resistance to change and make it acceptable to the stakeholders. Reform and modernization are not one-time events. As they happen to be a continuous process of changing for the better, what Caiden (2007) terms the **"**institutionalization of reform**"** becomes essential to make reform a continuous process and regular activity. In this context, an institutional framework for spearheading reforms in Odisha was envisaged as the Odisha Modernizing Government Initiative (OMGI). It draws upon the recommendations of the Task Force on administrative reforms and subsequent resolution by the Government of Odisha (No.89/ARC Dated 04 October 2005). The OMGI was launched in Sept'2006 as part of Odisha Public Sector Reforms Programme-ORSRP-II with support from the Department for International Development (DFID) India.

A government resolution was passed to set up the Centre for Modernizing Government Initiatives (CMGI) as a society with bylaws and a memorandum of association. The OMGI was envisaged to be carried forward by the CMGI on termination of DFID assistance in December'2008. Thus, the CMGI was designed as an institutional mechanism for governance reform in Odisha. It has been functioning with strategic support from the General Administration & Public Grievance (Administrative Reforms) Department, Government of Odisha. The objective of this programme has been to provide a strategic platform for undertaking reform initiatives that would ultimately help the Government become citizen-centric. Accordingly, the goal of CMGI has been to provide support service to the Government for efficient and effective public service delivery by adopting a four-pronged approach: building an enabling policy framework for service delivery, reengineering service delivery processes, use of ICT for smart service delivery & enhancing the capacity of the public personnel to manage a modern citizen-centric government. The CMGI also coordinates and supports the designing and implementing good governance reform programmes. It undertakes action research, provides professional advice, and conducts change management programmes for government departments and agencies to successfully help them implement their reform agenda. It also works closely with policymakers like ministers, officials, and other stakeholders, especially citizens, to promote a Simple, Moral, Accountable, Responsive and Transparent (SMART) Government. The CMGI also acts as a think tank and helps translate government goals, objectives, and policy priorities into tangible reform actions in governance. It helps the State Government identify those areas for change that will make the most impact in improving performance and policy-making in Government. It enables it better to respond to the needs of the people. It also creates a bank of best practices and tools in governance reforms, including e-governance. In this context, e-Office is an application of e-governance implementation. However, these initiatives need to be evaluated in terms of efficiency and effectiveness for better service delivery to the citizens (Osman et al., 2014).

E-government allows access to government information and services, and decision-making processes related to government (Fan & Yang, 2015). Its higher quality and efficient service will generate a high level of users' acceptance and satisfaction with the associated web portal (Yoo & Donthu, 2001; Loiacono et al., 2002). Singh et al. (2022) studied the efficiency of e-government websites for the success of e-government initiatives in India. As per their argument, there is a need to understand the perception of e-government users. In this context, this paper measures this perception in four different criteria, viz., clarity, usefulness, accuracy and reliability of information in a 9-point preference scale based on the analytic hierarchy process (Saaty & Sodenkamp, 2010) for measuring the relative effectiveness of e-office implementation in these dimensions as a part of e-governance initiative in Odisha. Ten different Government offices have been considered for such an evaluation by the e-Office users.

II. E-OFFICE IN ODISHA

Government officials in Odisha face the stupendous task of catering to extremely disjoint actions, activities, decisions and processes related to governance at any point in time. Appointments, tasks, schedules, documents, and files of the Minister and Officials are discrete elements and need to be handled efficiently and, in a time-bound manner. Many unrelated but relevant information collection and follow-up actions are exhibited as standalone structures. Many unspoken, strong interconnectivity between these actions affect the day-to-day operations of the organizations. In this context, executing things on demand and on-time delivery of results without compromising quality and cost is challenging.

The e-Office is one of the key IT projects of the National Informatics Centre (NIC), aimed at improving internal efficiencies in an organization through electronic administration, leading to informed and quicker decision-making and better public service delivery. It is a complete digital workplace solution for Government offices. It is based on the Central Secretariat Manual of Office Procedure (CSMOP), formulated by the Department of Administrative Reforms & Public Grievances (DAR&PG). The open architecture and framework on which e-Office has been built make it a standard reusable product amenable to replication across the Governments at the Central, State and District levels, as shown in Figure 1.

Figure 1: e-Office framework

The e-Office was implemented as a Mission Mode Project (MMP) under the integrated category of the National e-Governance Programme of the Government. The NIC developed the product and aimed to usher in more efficient, effective and transparent inter-government and intra-government transactions and processes. The product was built as a single reusable system by bringing together independent functions and systems under a single framework to enhance transparency, increase accountability, and transform the Government's work culture and ethics. The e-Office software was designed to reduce the movement of hard copies within an organization and integrate various unrelated activities within an organization. The software is based on open technologies and web-based, user-friendly, and easy-to-use web-based platforms. This facilitates easier deployment over the Local Area Network, Wider Area Network, as well as over the internet whenever required. After the necessary authentication, the user can access the system using a standard internet browser. The complete system works with a centralized back-end database to store the necessary structured information keyed in by the user. The key features of the system are:

1. User interface, which is easy to use, has been straightforward and web-based;
2. Capture the maintenance flow of documents.
3. Keeping control information about documents, with/ without storing the documents electronically
4. Two-track search: One with keywords and the other a full-text search of all the documents.
5. Tracking physical file movement in the organization.
6. Facility of recording notes electronically.
7. Linking files and documents with tasks, appointments and schedules.
8. Allows tracking and cross-referencing schedules, tasks, and appointments with documents, letters, and reference material.
9. Searching files and documents based on tasks, appointments, events, subjects and related keywords.
10. Open Architecture technology neutral
11. Common datasets and standards.
12. Role-based access for authorization.
13. Directory-based authentication.
14. Workflow Manager
15. Open standards and Technologies based
16. Unicode Compliant-Support for local languages
17. Organization level common repository of user information for various services & applications.

However, many invisible bottlenecks exist at the operational level that control information flows. So, it is important to interconnect, integrate, convert and control the bottlenecks to create a competitive advantage. Given the enormity of the amount of information that crosses the various policies, theadministrative,legislative, promotional &governance functions that the organization has to discharge; it becomes humanly impossible to keep track of each of them, and maintain the control information manually. Hence, it was of a tremendous help to use an integrated system to capture, dissemination and use all of these actions and information elements, along with the control information. The efficiency, productivity and

control that can be exercised on the implementation of every decision can be increased by use of such system.

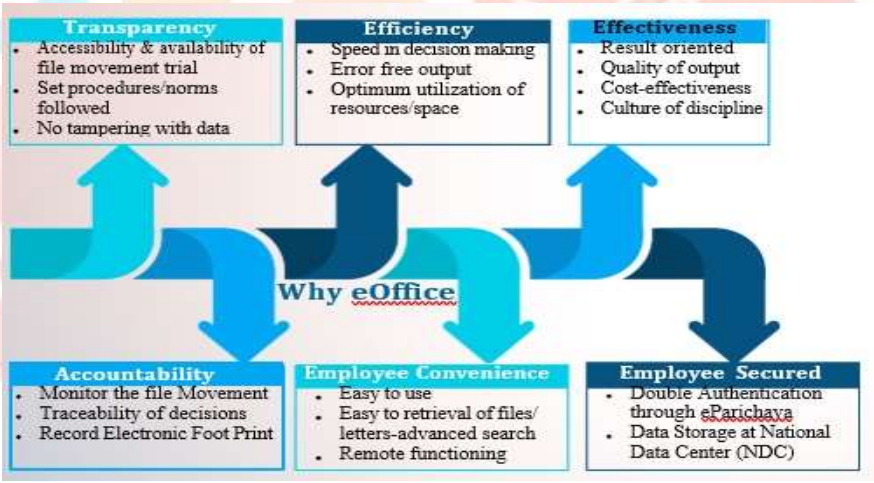
III. IMPLEMENTATION OF E-OFFICE

Project Monitoring Unit (PMU) was formed at NIC, Odisha to oversee timely rolling out of e-Office and monitoring of the same. The roles and responsibilities are as follows.

1. Assess IT intervention needed to implement e-Office at various state departments, offices.
2. Ensure system in place, training & handholding support provided to PMU staffs.
3. Provide five years post implementation support in offline mode.
4. Provide operational guidance to the users to resolve the intermediary issues.
5. Pursue/coordinate with the District Collectors/ Directorates.
6. Ensure data are captured and updated from time to time in the designed template.
7. Keep the IT infrastructures readily available e.g. scanner, internet support, facility provisions, client systems for all users.
8. Ensure all e Office users have NIC email id and allied DSC for all e-Office users.
9. Establish multiple network links.
10. Prepare Training Calendar to arrange venue and logistics for the user's training & handholding.
11. Identify one e-Office administrator for product administration.
12. Provide project commencement and project completion certificates to NICSI.
13. Monitor the progress, verify the work, assess the deliverables and final certification.

Figure 2 shows the performance metric of e-Office in service delivery to citizens

Figure 2: E-office performance



The operational system of e-Office has nine components (Manual of HRMS, 2022), which are as follows:

1) File Management System (e-File) automates the processing of files and receipts. This includes creation of files (both electronic and physical), movement of files in the workflow, tracking of files and their management.
2) Knowledge Management System (KMS) acts as a centralized repository of various documents such as acts, policies and guidelines.
3) Collaboration and Messaging Services (CAMS) for internal collaboration and messaging.
4) Leave Management System (e-Leave) automates the leave application and approval process.
5) Tour Management System (e-Tour) automates employee tour programmes.
6) Personnel Information Management System (PIMS) manages employee records, and the output of PIMS is an e-Service Book.
7) Property Return Information System Management (PRISM) for electronic filing of Asset and Liability Declaration, in accordance with the Lokayukt Act-2013 of Government of India.

8) Smart Performance Appraisal Report Recording Online Window (SPARROW) application for electronic filing of Performance Appraisal Report (PAR) as per the defined channel of submission.

9) Work from Anywhere (WAW) through data-sharing APIs.

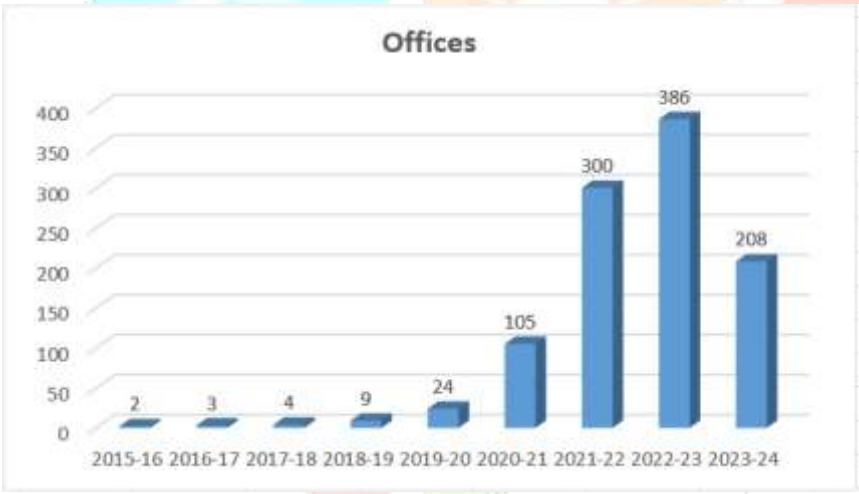
IV. EFFECTIVENESS OF E-OFFICE

The e-Office minimizes costs and timeliness, maintaining service quality and compliance with service requirements as per government rules, which is considered a competitive advantage to the government, individuals, and businesses. The e-Office tool has proved to have provided benefits to all of its stakeholders in the following manner:

1. enhancing transparency
2. enhancing accountability
3. assuring data security and data integrity
4. promoting innovation by releasing staff energy and time from unproductive procedures.
5. transforming the Government work culture & ethics.
6. promoting greater collaboration in the workplace and effective knowledge management.
7. enhancing the productivity of the employee/organization.
8. saving paper, time, & money- Both for Government &citizens/ business as well.

The Governance Division of the CMGI associated with the e-Office implementation across the State has achieved success, and the year-wise details (Annual Report of CMGI, 2024) are shown in figure 3 below.

Figure 3: Status of e-office implementation



During current financial year, e-Office got implemented in 75 offices so far.In total, more than 1200 offices are covered under e-Office implementation, and the plan will cover 150 more offices during 2024-25.

V. MEASURING EFFECTIVENESS OF E-OFFICE

We applied analytic hierarchy process (AHP) methodology to measure the relative effectiveness of the e-Office initiative along four dimensions, viz., clarity, usefulness, accuracy and reliability (Singh et al.,2022), based on users' perception and their pair-wise comparative judgements on these dimensions in a 9-point scale as presented in Table 1. The AHP provides the relative ease but theoretically strong multi-criteria methodology for evaluating alternatives.The evaluation is conducted by using the developed pair-wise comparison judgments that result in the numeric representation of each comparison by a point estimate. The calculation of priorities (or prioritization) is carried out using the Eigenvector method, and the synthesis is done using the linear additive value function. In this study, ten Government offices were considered for the evaluation of the above criteria based on ten different

Table 1: Saaty's 9-point preference scale

Intensity of importance	Definition	Explanation
1	Equally important	Criteria are preferred equally for the overall objective
3	Moderately important	Judgment slightly prefers one criterion over another
5	Strongly important	Judgment strongly prefers one criterion over another
7	Very strongly important	Judgment prefers one criterion very strongly over another
9	Extremely important	Judgment prefers one criterion extremely over another

Figure 4: Citizen-centric e-office evaluation by AHP

Citizen X:

AHP Matrix	Clarity	Usefulness	Accuracy	Reliability	Normalized Principal Eigenvector
Clarity	1	1	5	3	39.3%
Usefulness	1	1	5	2	37.1%
Accuracy	1/5	1/5	1	1	8.7%
Reliability	1/3	1/2	1	1	14.9%

Eigenvalue Consistency Ratio		
	λ	4.085
	CR	3.1%

Table 2: Effectiveness of e-office implementation in different offices

Relative effectiveness values across offices in %					
	Clarity	Usefulness	Accuracy	Reliability	Total
State Transport Authority	39.53	21.33	20.50	18.64	100.00
Directorate of Horticulture	32.68	26.49	21.22	19.61	100.00
Odisha Electricity Regulatory Commission	41.05	20.35	20.05	18.55	100.00
Crime Branch of Police	35.61	24.41	20.39	19.59	100.00
Odisha State Food Commission	33.41	25.54	22.44	18.61	100.00
Odisha Livelihood	41.05	20.57	20.19	18.19	100.00

Mission					
Directorate of Elementary Education	39.79	21.27	20.05	18.89	100.00
Odisha Rural Development and Marketing Society	35.97	23.02	22.34	18.67	100.00
State Crime Records Bureau	41.07	19.95	19.79	19.19	100.00
Odisha Sub-ordinate Staff Selection Commission	29.69	28.87	20.87	20.57	100.00
Odisha Industrial Security Forces	32.00	26.94	22.48	18.58	100.00

samples of citizens from each of these offices. Figure 4 shows the evaluation of these dimensions for a citizen-X based on the methodology where the consistency ratio (CR) has been calculated as follows:

$$CR = \frac{\lambda - n}{n - 1}$$

where λ and n are the eigenvalue and number of alternatives. The judgement is consistent as the consistency ratio for this evaluation is lesser than 0.1 for citizen X. We averaged all consistent judgments and removed all inconsistent judgments ofthe citizens. Table 4 summarizes the values of the dimensions of effectiveness for the offices under consideration. To test whether perception levels are distinctly different from each other across the offices, we formulated the null hypotheses as follows:

H1a: There is no significant difference in the perception level of clarity in the e-office use across the offices.
H1b: There is no significant difference in the perception level of usefulness in the e-office use across the offices
H1c: There is no significant difference in the perception level of accuracy in the e-office use across the offices.
H1d: There is no significant difference in the perception level of reliability in the e-office use across the offices

We conducted ANOVA to test the hypotheses, the results of which are presented in Table 3, where it is evident that support exists for the same levels of perception of the users in different offices for the considered dimensions.

Table 3: Results of ANOVA

	Clarity	**Usefulness**	**Accuracy**	**Reliability**
F statistic	1.187	1.34	1.33	1.21
p-value	1.37E-07	8.13E-18	2.34E-07	7.64E-12
Support	Yes	Yes	Yes	Yes

VI. **CONCLUDING REMARKS**.

The e-Office system has been implemented in various Government offices under e-governance initiative of the State government of Odisha for effective service delivery to the citizens. This paper used AHP to measure the relative effectiveness of the e-Office system in terms of four dimensions. Out of several offices that used this system, we selected ten organizations for the study and considered respective samples of citizens to express their views using Saaty's 9-point preference scale. After getting weights of these dimensions citizen-wise for their consistent judgements, we obtained average scores of these weights for each of the offices. These scores represented the relative effectiveness of the e-Office system based on the dimensions. We also conducted ANOVA and found the system effective with respect to the dimensions considered in this work. However, data envelopment analysis can be applied to the data in Table 2 to determine the relatively efficient offices.Moreover, an efficient-cum-effectiveness strategy over time is recommended as a future study to identify e-government characteristics in the e-Office system with users' intention and citizen satisfaction.

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