

**HOUSING AND URBAN DEVELOPMENT DEPARTMENT
CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY**

2.4 Implementation of e-Governance Initiatives in Chennai Metropolitan Development Authority

Executive Summary

Government of Tamil Nadu introduced (2006) e-Governance system for the regulatory functions of Chennai Metropolitan Development Authority (CMDA). The objectives of this e-Governance application were to reduce time taken for according approval to Planning Permission Application (PPA), improve transparency in their day-to-day functions, better monitoring of the system and web-enabled interaction. The Government also carried out Business Process Re-engineering to facilitate the computerisation, by introducing an improved electronic work flow including automating the key component of checking Building Plans electronically. Performance Audit of implementation of e-Governance initiatives in CMDA revealed following audit findings:

There was no improvement in time taken for processing the PPA after introduction of e-Governance system and the time frame set in Citizen Charter was not adhered to. Breaks in the work flow led to adoption of batch process, which deprived public of the facility to verify status of their applications online. This defeated the objective of improving transparency in CMDA's day-to-day functions.

Due to incomplete/partial implementation of e-Governance system, Automated Planning Permission Application Software (APPAS), the core software for online building plan scrutiny which was originally planned to be integrated with e-Governance system, was not integrated. The APPAS database also had deficiencies in its design.

Even after spending ₹ 1.01 crore and six years after introduction of e-Governance system, CMDA could not achieve any of the planned objectives.

2.4.1. Introduction

Chennai Metropolitan Development Authority (CMDA), a statutory body constituted under the Tamil Nadu Town and Country Planning Act, 1971 is responsible for issuing building plan, layout and sub-division approvals for the public and builders to take up construction works within the jurisdiction of Chennai Metropolitan Area (CMA). CMDA is headed by a Member Secretary (MS) who is the administrative head and assisted by a Special Planner, a Chief Planner, Deputy Planners, and Assistant Planners etc. CMDA issues planning permission (PP) to ordinary, special buildings, group developments and multi-storeyed buildings.

2.4.2 Computerisation and its objectives

GoTN introduced (2006) e-Governance system in the regulatory functions of CMDA mainly to streamline management of applications and its flow across sections with the objectives of reducing time taken for according approval to Planning Permission Application (PPA), improving transparency in their day-

to-day functions, better monitoring of the system and web-enabled interaction. A Core Group⁴⁸ (CG) was formed to suggest Business Process Re-engineering activity to simplify application process, reduce time taken for approval and to avoid multiple visits to CMDA by public. CG submitted its report in July 2006. National Informatics Centre (NIC), the software developer, after considering the report of CG submitted (September 2006) a Detailed Project Report (DPR) to CMDA for ₹ 240 lakh⁴⁹ indicating hardware requirements, time schedule and cost involved for implementation of e-Governance initiatives and the DPR was approved (September 2006) by CMDA. Citizen Charter of CMDA which came into force in the year 2005 prescribed time-limit of 45 days and 75 days for disposal of PPAs in respect of ordinary/special buildings and multi-storeyed buildings⁵⁰ respectively. However, the CG in their report did not consider this specific time frame and generally defined one of the objectives as "reducing the time taken for according approval to PPA".

The entire e-Governance activities were proposed to be implemented in three phases in a 'work flow based system' and using intranet technology with a time frame of January 2007 for Phase I and June 2007 for Phase II. No time frame was fixed for Phase III. Functions of CMDA in according building plan approval i.e. from receipt of applications to issue of permission were covered under Phase I. Other related functions such as verification of building constructions with reference to planning permission accorded, legal disputes, appeals, regularisation etc., were planned in Phase II. Phase III contemplates computerisation of administrative functions of CMDA. NIC handed over full-fledged e-Governance work flow automation software to CMDA containing 18 modules⁵¹ for Phase I with relevant documentations like data dictionary, user manual and project proposal (User Requirement Specification (URS) & System Requirement Specification (SRS)). Back end of database was developed in PostgreSQL⁵². The e-Governance initiative was launched in CMDA on 1 October 2007. During 2006-13, an expenditure of ₹ 101.33 lakh was incurred on procurement of hardware and software and payment to data entry operators.

⁴⁸ Consisting of CMDA, National Informatics Centre and other Stake holders such as builders associations, architects association and licenced surveyors

⁴⁹ Phase I – ₹ 115 lakh (Ordinary building, Special building, Multi storeyed Building, Institutions/ Industries, Layouts and Reclassification); Phase II – ₹ 75 lakh (Enforcement, Legal disputes, Appeal and Regularisation); Phase III – ₹ 36 lakh (Administration, Accounts, Projects and Other sections) and ₹ 14 lakh (Site preparation & Furniture)

⁵⁰ (i) Ordinary buildings - floor area not exceeding 300 square metres and Ground +1 floor in height; (ii) Special buildings - residential or commercial buildings with more than two floors or residential buildings with more than six dwelling units or a commercial buildings exceeding a floor area of 300 square metres; (iii) Multi-Storeyed buildings - buildings exceeding four floors and 15.25 metres in height

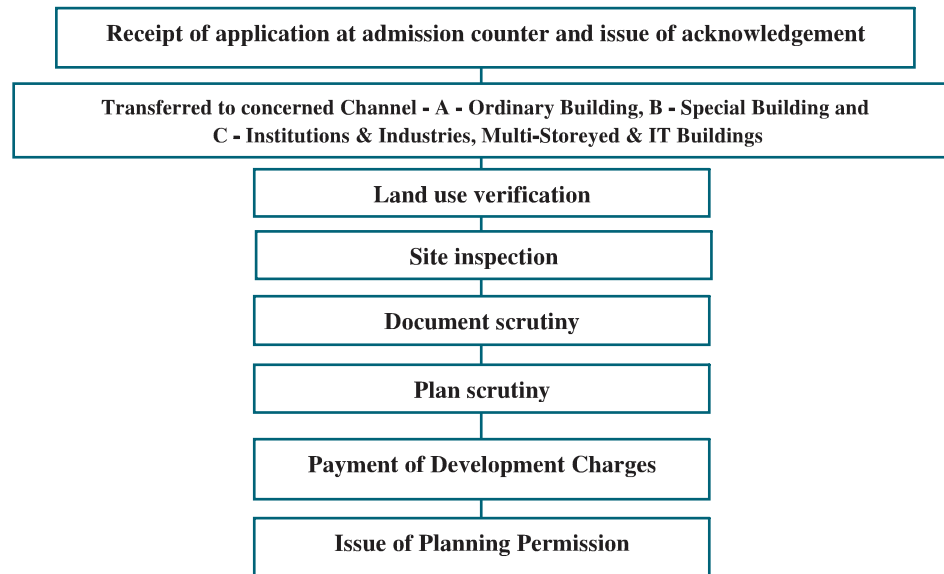
⁵¹ Login & Menus, Counter, Land Use Entry, Initial Scrutiny, Concerned Channel (SB), Inspection, Form –B entry, Document scrutiny, Document scrutiny review, Plan scrutiny, plan scrutiny review, MS approval, Open Space Reservation, Coastal Regulation Zone, Development Charges, Approval, Return and Refusal.

⁵² PostgreSQL is an open source object-relational database management system (ORDBMS) with free/open source software license

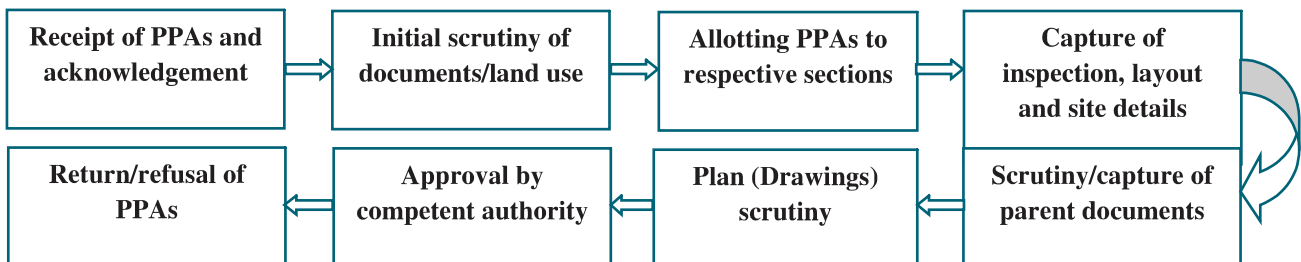
Manual system and e-Governance work flow

The procedure followed in the manual system earlier and work flow automation process which was envisaged after re-engineering are depicted in **Flow Diagrams 2.1 and 2.2.**

Flow Diagram 2.1: Manual system



Flow Diagram 2.2: Computerised workflow envisaged originally



2.4.3 Scope and Audit Objectives

Scope of audit was limited to Phase I only since the remaining two Phases were not taken up by CMDA. Audit was undertaken to assess the extent to which CMDA could achieve the objectives of computerisation under Phase I and reasons for shortfalls, if any.

Audit objectives were

- (i) to assess whether e-Governance system as implemented met its programme objectives of
 - reducing the time taken for giving Planning Permission to the applicants and adhering to the period stipulated in the Citizen Charter;
 - improving transparency of operations of CMDA; and
 - introducing work flow based system.
- (ii) to assess whether all the requirements/rules were mapped into the Information Technology system with requisite controls; and

(iii) to analyse reasons for lacunae, if any, in meeting the objectives.

2.4.4 Audit Criteria

Criteria relied upon in audit were –

- Development Control Rules of CMDA under Second Master Plan, 2008.
- Best Practices of Systems Development.

2.4.5 Audit Methodology

Audit at CMDA, Chennai was conducted in February and March 2013. Files relating to implementation of e-Governance initiatives and Automated Planning Permission Application software (APPAS) were scrutinised. Database maintained in PostgreSQL for e-Governance and MS-Access for APPAS were downloaded and examined using CAATs⁵³. Though computerisation under e-Governance was introduced in October 2007, the back data relating to earlier period were captured in the system. Hence, the period of audit covered under e-Governance system was from April 2005 to March 2013. Provisions and controls available in the application software were ascertained through examination of the database and through exception reporting. Audit commenced with an Entry Conference with the Member Secretary, CMDA in February 2013 wherein objectives and scope of audit were discussed. Exit Conference was held with representatives of Government in Housing and Urban Development Department in January 2014 wherein audit findings were discussed. Replies furnished by CMDA to audit observations were duly incorporated in the report.

2.4.6 Audit Findings

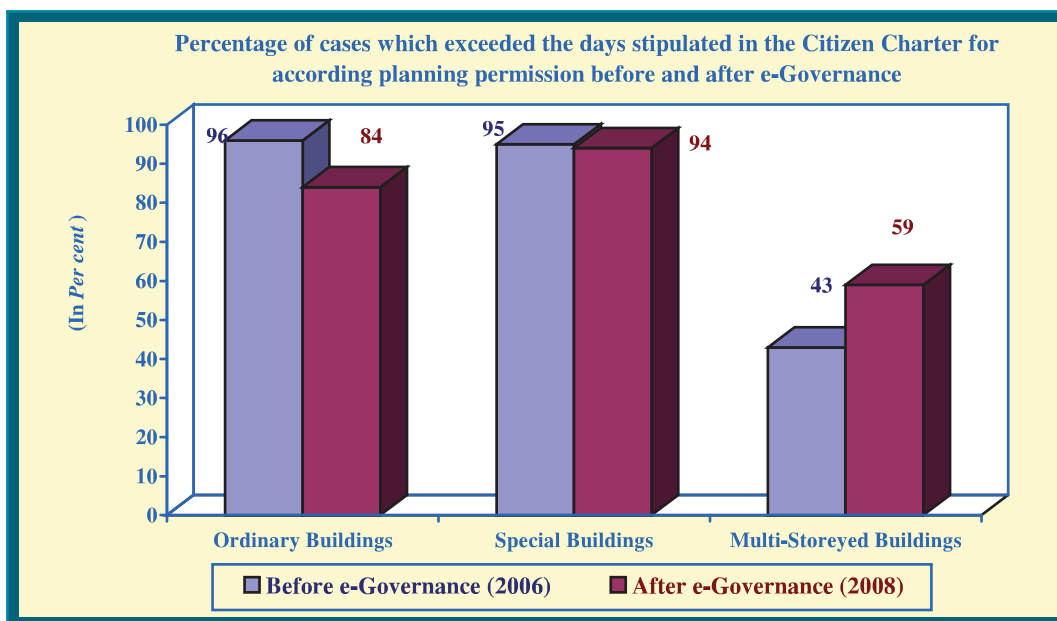
2.4.6.1 *Non reduction in time taken in processing Planning Permission Applications*

One of the foremost objectives of introduction of e-Governance system in 2007 by CMDA in their regulatory functions was to reduce the time taken in according planning permission. Also, a PPA was to be processed within 45 working days in the cases of ordinary building and special building and 75 working days in the case of a multi-storeyed building according to CMDA's "Citizen Charter".

To examine the performance of CMDA with reference to Citizen Charter in issuing planning permission to different types of buildings before and after implementation of e-Governance, one year prior to e-Governance and one year after e-Governance were selected by audit. For this purpose, the planning permissions accorded during the year 2006 through manual process and the year 2008 i.e. after the introduction of e-Governance system were examined in audit by comparing data available in the system with related manual records. Performance in time taken before and after introduction of e-Governance in respect of PPAs is depicted in the **Chart 2.3** and **Appendix 2.8**.

⁵³ Computer Assisted Audit Techniques

Chart 2.3: Performance in time taken before and after e-Governance



It was observed that though marginal improvement in time taken after e-Governance was noticed in case of ordinary buildings, 84 per cent of cases took more than 45 days. In case of special buildings there was no improvement in time taken since 94 per cent of the cases took more than 45 days. Similarly, in the case of multi-storeyed buildings 59 per cent of the cases took more than 75 days.

Further, to analyse present trend in time taken for according PPAs in the year 2013, 20 cases (10 special buildings and 10 multi-storeyed buildings) were randomly selected from 335 special buildings and 49 multi-storeyed buildings and examined. The results are furnished in **Appendix 2.9**. It was observed in audit that in multi-storeyed buildings, the delay was also attributable to applicant or to external departments. However, in the case of special buildings, the delay was attributable to CMDA in various stages of processing and in none of the test-checked cases was the planning permission accorded within the stipulated time. Therefore, the time frame set in the “Citizen Charter” for disposal of cases i.e. 45 days for special buildings and 75 days for multi-storeyed buildings were not met by CMDA and one of the objectives of introduction of e-Governance viz., “speedy clearance of PPAs” was not achieved.

2.4.6.2 Failure to achieve transparency and web-enabled interaction

In the Project Proposal prepared and agreed to between CMDA and NIC, it was committed that the Work Flow Based System would enable effective monitoring of the status of the file as it passed through each level of scrutiny. Further it was envisaged in the Project Proposal that the status of the file at any stage could be viewed through queries within CMDA and also by the applicants through website to ensure “Transparency in operation”.

Out of 18 modules developed by NIC in consultation with CMDA for e-Governance Work Flow Automation System, one of the modules viz., “Document Scrutiny” was developed for capturing details of ownership.

However, during execution stage, CMDA failed to capture such details in the Document Scrutiny module and the subsequent stages in the workflow system. Instead, CMDA resorted to capturing these vital details after according Planning Permission to eligible PPAs by adopting batch process method.

Break in the work flow, contrary to its own objectives and adoption of batch process method to capture vital details after according Planning Permission deprived the public of the facility to view the status of their application online defeating the objective of improving transparency in CMDA's day-to-day functions.

On the overall implementation of e-Governance, CMDA replied (April 2013) that since the process was not a straight forward one, the problems faced were being rectified and the system would be made operational in future. Business Process Re-engineering Activity should have addressed this issue.

2.4.6.3 Failure of e-Governance Work Flow Automation Process

Provision was made in the software developed by NIC to capture all data pertaining to a PPA through the system i.e. from "Acknowledgement" to granting "Planning Permission" as depicted in **Flow Diagram 2.2**. However, CMDA processed all PPAs through system up to 'Site Inspection' stage only. To audit queries raised on this issue, it was replied (April 2013 and October 2013) by CMDA that initially issue of capturing "voluminous data" was discussed by CMDA with NIC and it was planned by CMDA to execute the same to ensure paperless office, even though it was a time consuming process. After introduction of Second Master Plan, certain modifications were required to be carried out in software and there was slackness in the process. Moreover, Planning Assistants found it difficult to make voluminous data entries at this screen and hence the process was stopped at this level.

Due to above reason reported by CMDA, software was not used from the stage of 'Document Scrutiny' and the e-Governance implementation came to a halt. As CMDA was aware of the fact that "voluminous" data entry was required to be made at this stage it could have sorted it out with NIC during system design. It could have been flagged at least at the time of testing of the software and consequent simplification done in the data entry process. Instead, CMDA developed another module through NIC to capture backlog entries in respect of "Approved Planning Permission Applications" in the e-Governance system to record transactions in database through a batch process. CMDA employed two data entry operators to key in the backlog data, while no reason was offered for not utilising them to key in data at the bottleneck stage. Registration and Land Revenue departments of the State had data in digitised form on ownership of land, survey number, scanned copy of sale deed and document number. CMDA failed to approach these departments to explore the feasibility of obtaining the data from their online database. CMDA stated that other departments did not have the data required. However, the fact remains that these departments completed digitisation of data in 2001 and 2003.

The following observations are made in this regard –

- When information relating to ownership of land in the Planning Permission file of an applicant is recorded in the manual system and the transaction is completed, the need to enter data electronically

cannot be perceived. Therefore, decision to discontinue the work flow on that basis lacked justification.

- Further, instead of taking any step to resolve the issue and move ahead with the work flow automation process, CMDA decided to continue with a manual approval process, where the critical check of compliance of the building plan with the developmental regulations was done through a standalone computer system (APPAS). This resulted in delays and lack of transparency defeating the stated purposes of computerisation.

CMDA failed to take any action to resolve the issue with NIC and implement the e-Governance work flow automation process in full. Due to failure of CMDA to initiate concrete action, the e-Governance system remained largely incomplete.

During the Exit Conference (January 2014), the Chief Planner, CMDA stated that steps were being taken to put the work flow based system back on track in consultation with NIC.

2.4.6.4 Mapping of rules and input controls

(i) Non-integration of Automated Planning Permission Application Software with e-Governance system

In the e-Governance Project Proposal submitted (September 2006) by NIC to CMDA, development of an application software for plan scrutiny was already envisaged. Though scrutiny of plan forms an integral part of the e-Governance work flow automation process, CMDA decided (January 2009) to automate the same only after three years. Development of application software was entrusted (February 2010) at a cost of ₹ six lakh to a private firm selected through tendering process. The firm developed tailor-made software called APPAS, after duly incorporating all parameters as contemplated in the Second Master Plan 2008. Applicants were required to submit the drawings in Compact Discs (AutoCAD format) from 1 June 2012, which would undergo pre-check and detailed scrutiny of plan. The software after several test runs was put to use from November 2012.

Examination of the working of the APPAS software revealed that rules were mapped and outputs generated through the software complying with Development Control Regulations. However, the APPAS software was functioning independently (September 2013) and was not integrated with e-Governance system as originally envisaged in the e-Governance initiatives due to partial implementation of e-Governance system.

CMDA replied (September 2013) that since certain modifications to the existing e-Governance software were to be carried out, integration of APPAS with e-Governance could not be done at this stage.

(ii) Deficiencies in e-Governance database due to lack of validation controls

As mentioned in paragraph 2.4.6.3, all PPAs were processed by CMDA in the work flow automation process up to 'Site Inspection' stage only rendering the e-Governance database incomplete. To alleviate the situation to certain extent, CMDA appointed (October 2009) two data entry operators to update the e-Governance database by capturing certain critical data in the system in respect of "Approved Planning Permission applications" so as to generate reports from it.

Assistance of NIC was sought for developing a separate module to capture backlog entries in the front-end screen with the same e-Governance database. The ‘Public_Approved_Applications’ and ‘Public_Approved_Payments’ are two important tables in which the backlog data captured gets stored and form the basis for generating various Management Information System reports by CMDA. Examination of these two tables disclosed the following deficiencies -

- In 66 out of 1,729 approved applications, the approval date was before the date of submission,
- In 112 approved applications, the details about payment of “Development Charges” were not captured in the system and
- Space for vital information was left blank as given in **Table 2.30**.

Table 2.30: Details of vital information left blank in two important database tables

Approved Applications (Total No. of records 27,437)		Approved Payments (Total No. of records 70,771)	
Information	No. of records left blank	Information	No. of records left Blank
Approval data	579	SBC Number	33,036
SBC Number	13,072	Type_Charge code	3
Submission date	10,758	Amount paid	15
PP Register Number	2,406	Mode of payment	57,239
Channel	247	Remittance date	11,224
Applicant name	569	-	-
Applicant address	20,845	-	-
Site address	316	-	-
Proposal brief	31	-	-
Floor Space Index(FSI)/ Non-FSI /Open Space Reservation Area	27,148	-	-

Application software should have proper input controls to ensure that information captured is valid, accurate and complete. These deficiencies in the database showed that software lacked adequate input controls. In all these cases, reports generated from the system would be incomplete.

(iii) Deficiencies in APPAS database

The System Requirement Specifications (SRS) prepared by the software developer and approved by CMDA provide for the following –

- Provision of a client-server technology along with work flow model
- Creation of a proven Relational Database Management System (RDBMS) for APPAS
- Creation of master tables simultaneously while developing the software

- Provision of secured encrypted passwords to the users
- Creation of log files
- Trusted backup policy

However, APPAS database suffered from following deficiencies due to failure of CMDA to ensure the implementation of commitments made by the developer in the SRS:

- The database is created in MS-Access (a semi RDBMS) which do not provide sufficient controls and ensure security of data. Folders containing the MS-Access database can be deleted by the user easily.
- APPAS software is run on three individual machines (instead of adopting a client-server technology) and the data is stored separately in the above three systems, which are vulnerable to unauthorised access.
- Instead of creating Master tables, the developer incorporated all parameters in coding of the application software itself. Any change in the parameter can be made only by the developer and CMDA is dependent on the software developer for changing the parameters.
- No “unique field” representing file name has been created for each applicant. More than one file number was assigned for an applicant. The file numbers do not have any naming convention. Due to the absence of a unique field, integration of e-Governance database with APPAS database is difficult.
- No “date” was captured in any of the important tables to know the date of processing of the AutoCAD CD.
- No encrypted passwords were assigned by the Administrator to the users. Audit found that “passwords” in readable format were stored in one of the table itself. No logs were created in the tables. Due to the above security lapses, the database is vulnerable to unauthorised access at any stage of operation.
- No systematic and proper backup procedure is followed for APPAS database.

During the Exit Conference (January 2014), the Chief Planner, CMDA stated that efforts were being made to rectify the deficiencies in the APPAS software and to effectively integrate the same with e-Governance software in the near future.

2.4.7 Conclusion

There was no improvement in time taken for processing the PPA after introduction of e-Governance system and the time frame set in Citizen Charter was not adhered to. Breaks in the work flow led to adoption of batch process, which deprived the public of the facility to verify status of their applications online. This defeated the objective of improving transparency in CMDA’s day-to-day functions. Due to incomplete/partial implementation of e-Governance system, APPAS, the core software for online building plan scrutiny which was originally planned to be integrated with e-Governance system was not integrated. The APPAS database also had deficiencies in its

design. Even after spending ₹ 1.01 crore and six years after the introduction of e-Governance system, CMDA could not achieve planned objectives.

2.4.8 Recommendations

CMDA may initiate the following actions to make the e-Governance system fully operational:

- Reintroduction of the work flow process by integrating manual check of history of ownership and APPAS.
- Addressing the control weaknesses identified and incorporating the required validations in e-Governance software.
- Conversion of APPAS software from the existing MS-Access database into a complete RDBMS to improve security and provide assurance on integrated working.
- Creation of Master tables for all the parameters set forth in Second Master Plan, 2008.