



COMPENDIUM of Selected Papers



20th National Conference
on
e-Governance

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20th National Conference on e-Governance



Department of Administrative Reforms & Public Grievances
Ministry of Personnel, Public Grievances & Pensions
Government of India

Table of Contents

Chapter 1	
Cyber Security Policy for Digital India- Roadmap for Secure Cyber Space	1
<i>Jagdish Chander Sharma (IAS), Shailender Kaushal, Ajay Singh Chahal</i>	
Chapter 2	
Augmented Transformational Methods for Effective e-Governance	6
<i>SMMM Kalyan Kumar NIC, S C Pradhan NIC</i>	
Chapter 3	
Digital Transformation in Himachal Pradesh Transport Department: Reaching out to Last Mile Rural Population	11
<i>Dr. Sunil Kr. Chaudhary, IAS, Bhupinder Pathak, Ajay Singh Chahal</i>	
Chapter 4	
Digital Transformation – Processes, Challenges and Managing Changes	18
<i>N. Natarajan, Scientist ‘C’</i>	
Chapter 5	
Digital Transformation- India Perspectives	24
<i>Keyur C. Sampat</i>	
Chapter 6	
Mee-Seva – Easier. Faster	30
<i>Sanjay Jaju</i>	
Chapter 7	
Mobile Oriented Development Initiatives for GIS to Citizens – ‘MODI – GIS 2C’	36
<i>Dr. R Balamurali Krishna</i>	
Chapter 8	
“SAKSHAM”: Technology led Monetary Transactions System leading to Financial Inclusion	41
<i>Dr. Saurabh Gupta, Sameer Rajan</i>	
Chapter 9	
The Role of Intermediaries in e-Government adoption in India: Bridging the Digital Divide	48
<i>Rajiv Kumar, Dr. Amit Sachan</i>	
Chapter 10	
Unique Property Identification Number	53
<i>Dr Vasantha Kumar N, IAS; Santulan Chaubey, Director</i>	

Unique Property Identification Number

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1. Abstract

Rapid growth of cities has resulted in large number of constructions (residential and commercial) in both planned and unplanned manner. Space constraint in cities resulted in multistorey buildings (Apartment) culture peculiar to urban areas. Rapid, unplanned expansion of cities (horizontal and vertical) by conversion of rural areas, made it difficult for authorities to evolve a numbering system suitable in urban areas to identify a property (both land and building). In rural areas, the task of assigning number to a property is done generally by the revenue department. But in cities, revenue records have not been updated regularly and the task of assigning unique identification number to a property has been mandated to the concerned local bodies, primarily with an intention to collect property tax.

This paper analyses the existing frameworks to provide unique property identification numbers to all properties in Delhi. It also intends to provide a new framework based on emerging technologies like Geographical Information System (GIS) enabling an eco-system to assign unique property identification number in urban areas like Delhi.

Index Terms: Aadhaar number; GIS, Urban Planning, Local Bodies, Unique Property Identification.

2. Introduction

Aadhaar Number has been able to provide Unique Identification for each individual resident of India. Likewise, there is a compulsive requirement to provide Unique Identification Number (UIN) to each property in the country particularly in metropolitan cities like Delhi, Hyderabad, Mumbai, etc. For the purpose of this paper 'property' means both building and land. Many states have attempted to assign unique number to urban properties but with mixed results. This may be due to the general thought process that there should be continuity with the past, which in this case means the revenue records. The present paper tries to look at the issue de novo but at the same time ensuring all the purposes for which the numbering was assigned in the past is catered to along with certain new purposes.

It can be argued that a postman reaches a property based on the address written on a letter, which is unique to each property. What is the need for unique number

if postal address itself is unique? There is no standard way to write a postal address. For example 'Rama Krishna Puram' 'RK Puram' 'R.K Puram' etc. means the same. The converse 'Gandhi Street' may be present in more than one place within a specified area. The postal addresses are unstructured and non-standardized. The delivery of letter also depends on the local knowledge of postman, where as a unique number should enable many other stake holders to identify the property in an easy way. Hence even though postal addresses are unique it is longer, non-standardized and cannot be located without human help on ground.

In Delhi, as per the revenue records at certain places where consolidation has taken place unique numbered uniform sized rectangular polygons called 'khasras' have been assigned and at other places the field maps are irregular in shape. The village tri-junction pillars and other fixed points have not been preserved making it difficult to identify the property. The revenue system does not take assign number to urban buildings. Even within the khasra numbers the actual piece of land belonging to individual property owners has not been delineated. Hence this system also cannot be used as a framework to assign number to property.

3. Need for Unique Number of properties

Apart from the requirement to assign unique number for collection of property taxes, there is a need to have a Unique Identification Number for properties for other purposes also:-

1. Planning for cities including infrastructure
2. Ownership details in Urban areas
3. Titling of Urban Property
4. Emergency response, Disaster management
5. Land usage data
6. Census
7. Digital Address, etc.

4. Existing Frameworks for giving property number in Delhi

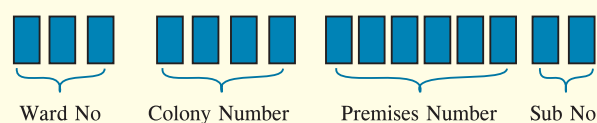
MCD framework: The Municipal Corporation of Delhi (MCD) Act deals with the assignment of Identification code numbers and manner of its notification (Property

Identification Code Number) under sub-section (1) and (2) of section 125.

As per the sub-section 1 of Section 125, “the property identification code number by which any processes in any area within the jurisdiction of the Corporation may be known shall be fixed in the following manner

- The first three digits shall indicate the ward number in numeric form,
- The next four digits shall indicate the colony number in numeric form
- The next six digits shall indicate the premises number alphanumerical form, and
- The next two digits shall indicate the sub-number of premises numerical form.

All colonies in Delhi shall be serially numbered”.



However, the three MCDs have not yet provided unique property identification numbers as per the above parameters. North MCD has started the process but is in its initial stages.

The following are the major constraints in using MCD framework of assigning unique numbers to properties -

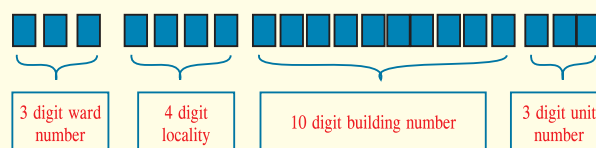
- The ward boundaries of MCD change at least once in 5 to 10 years, based on census data, to equalize population. This means the first 03 digits change once in 10 years at least.
- While 6 digits have been allotted to premises number, there is no separate mechanism to capture the number of floors in a premise, which is an important parameter in multi-story buildings.
- Even if 2 out of the 6 digits can be used for numbering the floors, it will leave only 4 digits for the number of premises, which means that a maximum of 9999 premises only can be captured in a ward/ colony.
- The last two digits are being used to capture “unit” details by MCD even though it is mentioned as sub number premises. ‘Unit’ here means the ownership within a premise.

Since ward boundary can change and the details of the floors are not captured specifically in this method, the “Uniqueness” cannot be ensured by this framework. Therefore this approach may not be the best approach.

DSSDI framework: Government of NCT of Delhi (GNCTD) had initiated a flagship project “Delhi State Spatial Data Infrastructure (DSSDI) to map entire Delhi covering 1,464 Sq. Km on a 2000:1 scale. Under this project, around 350+ GIS layers including properties and

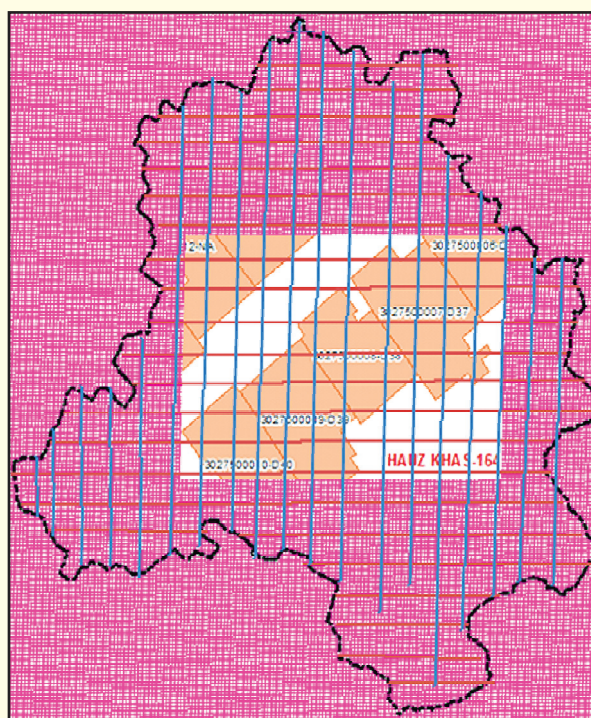
vacant land has been created. These layers form a strong base for designing GIS based applications and Decision Support Systems and the building vector can be updated with the latest satellite imagery.

- Government of Delhi through its DSSDI project (2007 data) has also provided Unique Number to all properties. DSSDI framework was also influenced by the MCD Act with minor deviation.
- The logic for providing property number by DSSDI (GSDL) is given below -



The following are the major constraints in using DSSDI framework of assigning unique numbers to properties.

- Apart from the issue of first 3 digits indicating ward number which can change once in 5 to 10 years, there are other shortcomings as well.
- The locality boundary (next 4 digits) is not an administrative (or) legal boundary and hence this polygon is variable and cannot be validated by any government agency.



- The subsequent 10 digits are derived as follows. Entire Delhi has been overlaid by a uniform sized grid (250 X 250 meters). The first 5 digits stand for the grid number. The next 5 digits capture the buildings within a grid. But the grid can itself be shifted up or down or sideways being an imaginary object.

- d) The locality boundary is ill defined, the grid is imaginary polygons that can be shifted and imaginary polygons cannot be visualized on ground making it difficult for any person to identify the property based on the DSSDI framework.

5. Proposed framework to uniquely identify a building/property?

Any framework to assign unique number should be able to do the following-

- i) Uniquely identify the building.
- ii) Uniquely identify the vacant land
- iii) Enable property tax collection to be more efficient
- iv) Simplify capture of Ownership details and its changes
- v) Prevent fraudulent practices in transaction of property
- vi) Bring transparency in urban property settlements
- vii) Accommodate future changes in property landscape

Apart from the above, the framework should make the process of assigning numbers as easy as possible to a large extent by a desk exercise, once assigned not required to change except for specific purposes, capture floor details, unit (ownership). The framework should also cater to the frequent changes that occur in the footprint of buildings in cities and also enable identification of vacant land from a building and the conversion of vacant land (full/partial) into buildings later.

Using Global Positioning System (GPS), we can uniquely identify any point on earth providing its Latitude and Longitude (x and y coordinates) in two dimension plane. As in a Cartesian plane each point in GIS on Delhi is 'unique'.

Delhi in DSSDI project and using subsequent satellite imageries has the footprint of each building in the form a polygon. The projection system of those polygons is on an international standard known as World Geodetic System 1984 (WGS-84). For each polygon a 'centroid' can be derived automatically. The centroid will be expressed as 12 - 15 digit latitude and longitude. It is also clarified that when a standard projection system like WGS - 84 is used to derive centroid, the values will remain the same.

The 12 - 15 digits centroid unique latitude and longitude value can be converted in to a unique 6 digit (alpha numeric) value by a simple application software in an automated way (Illustrated below). Different logic can be used in the application software to derive 6 digit code for building and vacant land, thereby enabling

easy identification by looking at the code as building or vacant land.

9	B	4	C	3	A
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After the 6 digits, 2 digit code can be used for capturing the floor details. 100 floors can be captured using numeric form 01 to 99&00. If a building has more than 100 floors in future, alpha numeric like OA -----OZ, AA-----AZ,-----ZA up to ZZ can be used.

Another 2 digit can be used capture the 'unit' detail - the ownership details within a floor which can also be numeric, alphanumeric as in para above.

There may be properties particularly in un-planned colonies which may be difficult to be delineated automatically by the system in to separate entities and instead a larger polygon (combined footprint) may be assigned a centroid based 6 digit value. A 2 digit (alphabetical) code can be added in front of the 6 digit unique number. Alphabets from A up to ZZ can be added in case during field visit if the 6 digit number has been generated considering a larger building unit but on the ground there are more than one building units.

The above framework will assign 12 digits unique property identification number. (Illustrated below).

A	A	9	B	4	C	3	A	0	3	2	3
Status		Geo Code				Floor		Unit No			

This Unique 12 digit number will enable –

- a) A computer enabled system to easily (re)translate the code into a complete address system and pin point the said property on a map.
- b) An individual would be able to decipher using the 6 digit geo code whether it denotes a building or a vacant land.
- c) Whenever a person applies for building permission, he/she should denote the 12 digit unique number of the vacant land or the previous building on which the proposed building will come up. A new number can be assigned by the same logic for the new building subsequently. The remaining parcel of vacant land if any, can retain the unique number of the vacant land.

6. Constraints in implementation of the proposed framework:

While the '6' digit unique code can be generated through software, it require of field survey to capture the floor details, unit number and for unplanned area properties. Apart from this for agencies specific requirements like floor area, owner details, land usage etc. also needs to be collected during field survey.

7. Steps required

Initiating process for providing unique id to a property will require various systems in place. An indicative listing of those systems is given below –

1. Enabling Act / Rules
2. Generation of Geo Codes, area wise
3. Development of application
4. Door to door survey to identify the Unit No
5. Issuance of number and linking with property

The issuance of a unique number to the property requires a nodal department like Revenue or Urban Development who can involve all concerned agencies, get the survey and frame up enabling Acts and Rules.

References:

1. <http://www.movable-type.co.uk/scripts/latlong-gridref.html>
2. Centroid of irregular shapes - <http://mathworld.wolfram.com/GeometricCentroid.html>
3. World Geodetic System 1984 (WGS84) - <http://earth-info.nga.mil/GandG/wgs84/index.html>