

Original Article

Centralized Computer System for Property Management

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Abstract - In the United States of America, property management is handled in multiple departments and offices. The county office handles deed records, property tax assessments, and payments. The city office handles building permits and inspection records. These county offices and city offices each maintain their own software to perform the said functions. There are approximately around 3244 counties in the USA, and each county has multiple city jurisdictions under them served by their own city offices. This creates a lot of redundancy regarding software, hardware servers and manpower required to operate them. To address the resource wastage and improve the work flow a centralized computer system is proposed and discussed in this article. The system will use a unique Home Identification Number to manage the workflow. The system is useful as it provides a lot of benefits in terms of resource savings, manpower savings and consistent user experience across all counties.

Keywords - Building permit, Developmental planning, Home valuation, Property management, Property record, Property valuation.

1. Introduction

In the United States of America, information related to a property is tracked and maintained in different sources [1]. The property zoning permit, building permit, and inspection record are maintained and transacted at the local city office [2]. The property deed record, lien detail, tax assessment and tax payment are maintained and transacted at the county office [3]. These county offices and city offices each maintain their own software to perform the said functions. There are approximately around 3244 counties [7] in the USA, and each county has multiple city jurisdictions under them served by their own city offices.

This creates a lot of redundancy regarding software, hardware servers and manpower required to operate them. When the property is put for sale, the realtors and/or realtor websites are used to list the property for sale along with the proposed sale price, buildup area details and other related property features like rooms, appliances, land size information, school information, construction year, construction material, property sale history, tax history, flood, wildfire risk etc.[8]. The person involved with the new development, sale or purchase of a property has to transact with these multiple sources at the city level, county level and realtor level to get the required authorization and find the history and other information related to the property. Sometimes, this information is not readily available in online electronic form. The property's sale price also does not give enough consideration to the property's history, events, health, and risk information.

Similar challenges exist in India as the information related to a property is tracked and maintained in different sources. The town planning department maintains the zoning permit, building permit and inspection record [4]. The registration department maintains the deed and lien record [5]. The revenue department maintains the tax assessment and tax payment [6]. The person involved with the development, sale or purchase of a property has to transact with these multiple sources to get the relevant information and authorization.

From the above discussion, it is clear multiple systems exist at multiple places catering to the same need. This model, by its design, is redundant and has a lot of inefficiencies in terms of hardware resources, software resources and manpower resources. The cumulative cost of maintaining these multiple systems is high as each county office and city office budget and maintains these systems separately. The user experience is also poor, as the user has to interact with multiple departments separately.

A new theoretical centralized computer system is proposed in this article. This new system eliminates multiple systems and significantly reduces inefficiencies in hardware, software, and manpower resources. By design, the cost of maintaining this new system is less compared to maintaining multiple systems at multiple places. This new system streamlines and makes it convenient for the system users to get the relevant information and authorization from a single consolidated source, leading to a positive user experience compared to existing systems.



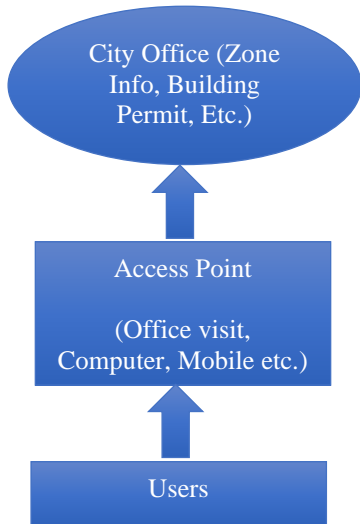


Fig. 1 Existing workflow for city office interactions

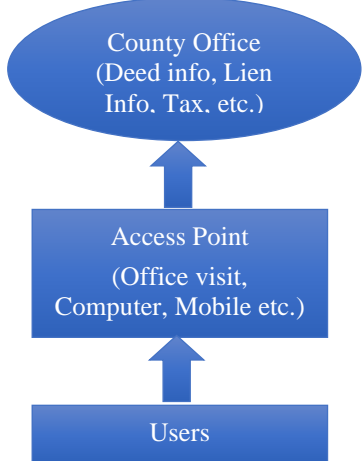


Fig. 2 Existing workflow for county office interactions

2. Literature Review

USA census estimates for 2012 show there are just over 19500 municipal governments and nearly 16500 township governments [9]. These governments are responsible for zoning and building regulations within their jurisdictions [9].

The same USA census estimates show just over 3000 counties [9]. These counties are responsible for property tax assessment and record keeping within their jurisdictions [9-10].

Because of the above model, multiple redundant systems exist at multiple places catering to the same need.

To address the above inefficiencies, a new theoretical centralized computer system is proposed as follows.

3. Method

When a block /plot of land is marked for housing, commercial or industrial development, the centralized computer system accessible over the internet assigns each

block / plot a unique identification number called Home Identification Number. Any transaction which further happens with respect to the plot of land is initiated, carried through, and completed in the centralized computer system using the Home Identification Number. The transaction can be a zoning update, sale of plot, planning update, land use update, building permit request, blueprints, ownership details, mortgage details, lien details, sale of residence, commercial building updates, industrial building updates, foreclosure details, title and boundary disputes, construction disputes, condominium, cooperative and apartment details, contracted repair details, occurrence/impacts of natural events like hurricane, tornado, fire, flood, and earthquake etc. The transaction initiated, carried through and tracked can be adjusted and fine-tuned based on the type of use, personal housing, commercial or industrial development. Initially, the centralized system can link to the city-level building department for blueprints or building permits, etc. [2], the county office for deed records, etc. [3]. The centralized system will support information migration from the city and county offices to the system.

Access to the system is streamlined based on local privacy regulations by using the Home Identification number and an additional key/token generated by the system to get temporary access to the system/data if required. By this, the stakeholders will be in complete control with respect to privacy concerns.

The proposed centralized computer system will allow access to the workflow and information through a single source. Algorithm and data analysis can be built into the centralized computer system to suggest a more accurate property valuation based on the history, health, risk and current market trends. The proposed centralized computer system can support listing the property for sale.

4. Discussion, Results and Benefits

4.1. Document Management System Market Growth

From 2022 to 2030, the Global document management system market is expected to grow at a compound annual growth rate (CAGR) of 12.70% from USD 5.41 billion to USD 14.09 Billion [11] and among regional geographies, the North American region growth is expected to double by 2030 from USD 2.49 billion in 2022 [12]. Many of the county and city office is expected to use these document management systems to meet their needs.

4.2. Results

With such significant cumulative spending forecasted for the county and city offices in the background for their needs, the new proposed centralized computer system was presented, and feedback was obtained using purposive sampling. The outcome is that the proposed system improves workflow and process efficiency, contributes to cost savings, and improves maintainability compared to an existing model.

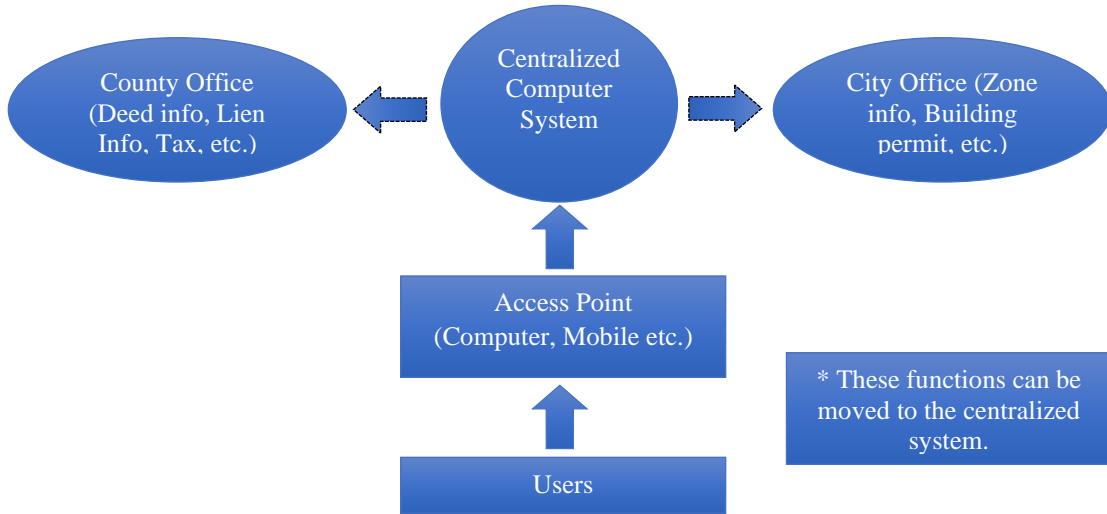


Fig. 3 Overview of home identification number system

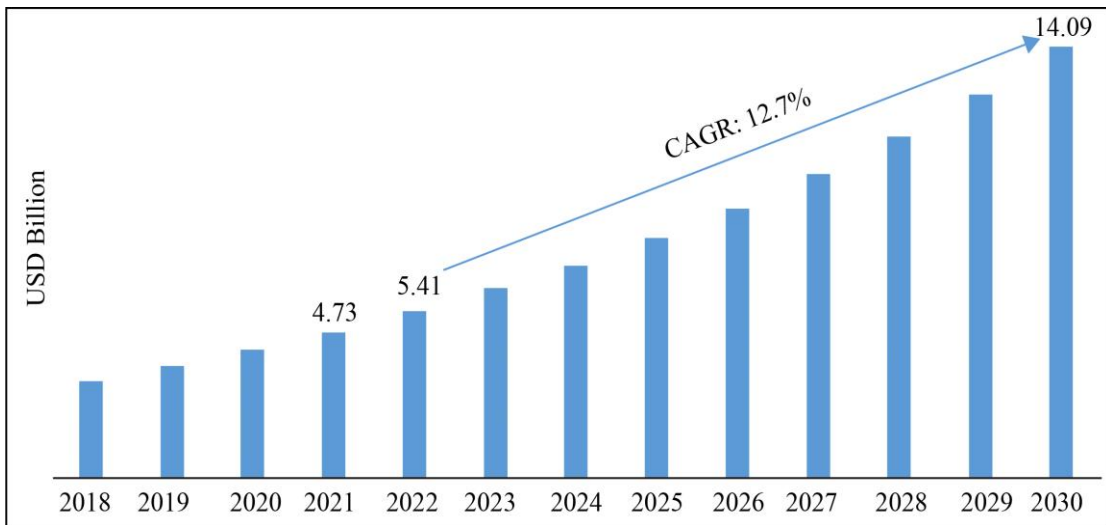


Fig. 4 Document management system global market growth [11]

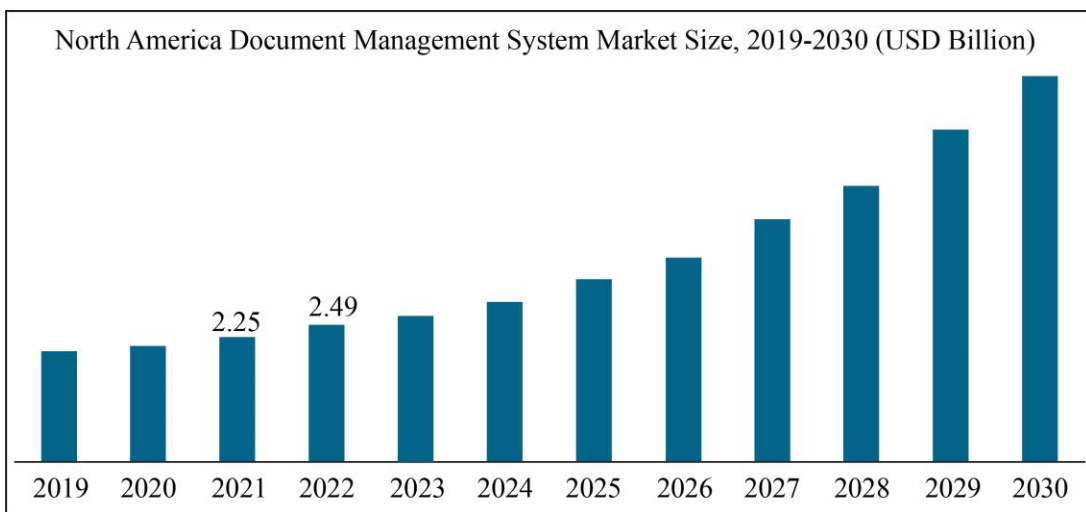


Fig. 5 Document Management System North American market growth [12]

The proposed system provides tremendous benefits for all the stakeholders like the city department, county department, buyer, seller, real estate agents, mortgage companies, insurance companies and government entities.

The proposed centralized computer system will eliminate transacting with multiple systems [1]. Ease of access to valuable information becomes much simpler. These will benefit in time, resource, cost, and effort savings (for example, the buyer can sit at home and access all the history information instead of contacting multiple departments or going through a realtor).

The city department and the county department can use this system for all their transactions and can slowly migrate away from their local systems.

The centralized computer system will reduce the misinformation and improve the accurate valuation of the property.

New property developers can transact through the same system with multiple departments to get the required authorization for the new construction.

The buyer can make an informed decision based on the history, health, suggested price, ask price and risk of the property before bidding. If it is too risky, the buyer can withdraw from the bidding.

Based on the suggested valuation and trend, the seller can decide to put the property on the market for selling or postpone it until the market condition improves. The seller can even use the information to cut down his losses by selling if the trend scenario looks deteriorating.

The real estate agents, based on the history, health and risk of the property, can advise the seller and buyer with accurate information. Real estate agents can improve their standing in the wider public sector with the proper advice.

The mortgage companies can include the health and risk of the property in their analysis before deciding on the mortgage terms. The mortgage companies can refuse the loan if it is a riskier investment. This improves the mortgage

company's financial fundamentals. The mortgage companies are protected from bad loans, and the possibility of them entering bankruptcy is minimized, thereby benefitting the wider society.

The insurance companies can provide a more accurate premium quotes benefitting home buyers. The insurance companies can refuse the insurance if it is too riskier. This improves the insurance company's financial fundamentals. The insurance companies are protected from bad insurance, and the possibility of them entering bankruptcy is minimized. The wider insurance rate hike for the general public because of prior poor insurance decisions can be minimized. All these benefit the wider society.

Government entities can use the system's data, analyse it, and make better policy decisions. The government can decide to relocate the people and prohibit any property transaction in a particular geography if the area is prone to disasters or deteriorating construction quality. The government can promote certain geographic locations for development when the data analysis better suits it.

5. Conclusion

For the Home Identification Number system to become effective, government entities should be involved with policy changes and support in enabling the infrastructure for this change. Who owns/maintains the system, individual investors or the public or both and what kind of regulations are needed are to be further analyzed by the government entities. The cost involved in building such a system and the cost savings by closing current individual systems spread across the different cities, towns and counties needs to be analysed further.

The proposed computer system can be implemented in the United States of America, India and other locations. System infrastructure needs to be built, and integration with the needed system needs to be planned and managed. Dismantling of unneeded systems to be managed.

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