

The Dynamics of Information Sharing: A First Step to Fight Urban Blight

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Abstract

The deterioration of living conditions within metropolitan areas presents a constant and costly challenge to city governments across the United States. Decaying housing quality and conditions, which eventually lead to a phenomenon known as urban blight, are consuming human resources and budgets of already financially stretched cities of all sizes. City governments are relying on innovative organizational and technological solutions, such as implementing an information sharing infrastructure, for tackling urban blight and suppress its consequences. An information sharing infrastructure could increase the availability of owner and property information of decaying dwellings giving city officials the ability to take action and better manage the potential onset of urban blight. Researchers had studied the urban decay phenomenon using System Dynamics as a method for modeling and simulating the endogenous and exogenous forces interacting in an urban setting and that lead to stagnation, deterioration and eventually blight. The purpose of this study is to analyze whether information sharing among municipal entities and external partners could be a contributing factor in slowing down the decaying process of houses in an urban setting. This analysis includes the creation of a conceptual dynamic model for sharing information and how such model could be integrated with an existing urban dynamics model.

Information Sharing in the Public Sector

Interoperability among technology platforms and the ability of exchanging useful, context-relevant data with external partners have proven to be a critical factor for organizations looking to improve the effectiveness of their operations (Harrison, Gil-Garcia, Pardo, & Thompson, 2006). Subsequently, information sharing becomes the mean for gathering data from disjointed systems for the purpose of improving government operations and serving citizens efficiently (Wenjing, 2011) through the development of data-supported policies (Gil-Garcia & Aldama-Nalda, 2011; Gil-Garcia, Chun, & Janssen, 2009). On the technology side, interoperability among systems, data and governance standards as well as designing more efficient processes are some of the most evident challenges to overcome when sharing information across public entities (Gil-Garcia et al., 2009). Faced with the compounded complexity of organizational and technology components, public managers are forced to build collaboration networks in order to source in resources or to supplement missing internal skillsets (Esteve, Boyne, Sierra, & Ysa, 2012). Gil-Garcia, Pardo, and De Tuya (2016) identified three major

factors linked to Information Sharing: Technology, Organizations and Policy. The ultimate implementation of Information requires a new organizational paradigm that fosters collaboration and constant interaction in order to effectively realize the benefits of moving information beyond institutional borders. Such benefits would materialize in the form of public value factors like improving the quality of services, efficiencies in the operation of government, new ways for measuring policy and service effectiveness and citizen participation. See Figure 1.

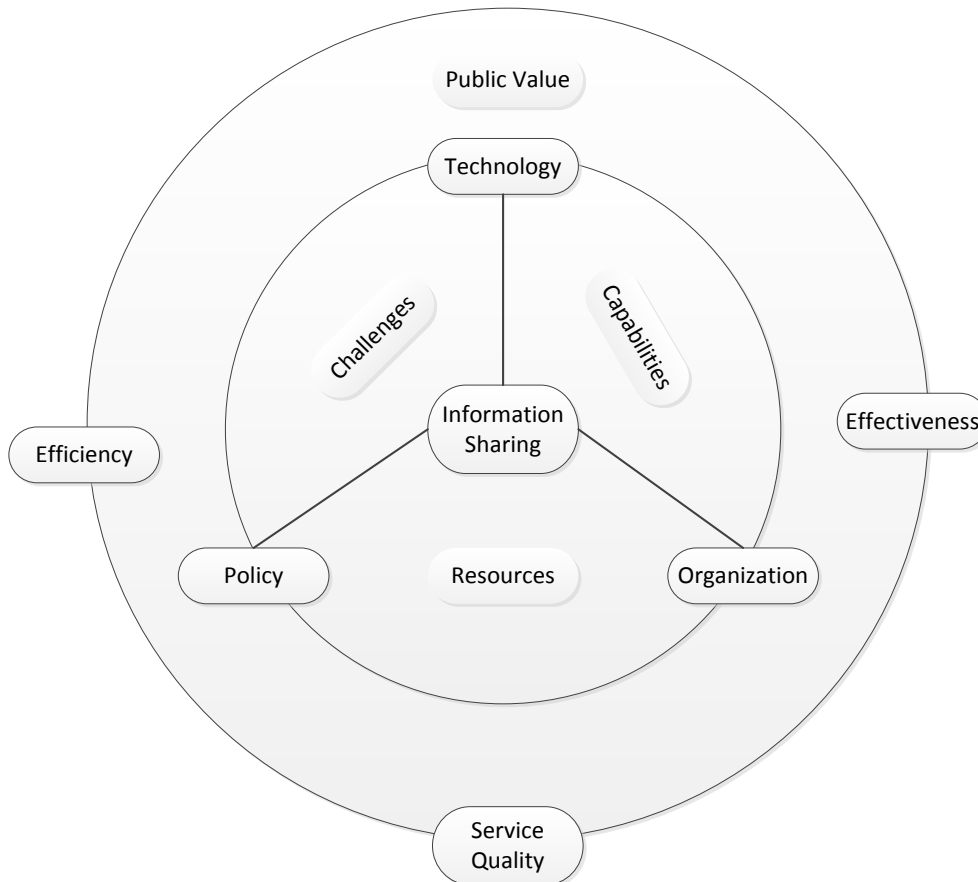


Figure 1. Creating Public Value through the enablement of Information Sharing capabilities - (Gil-Garcia et al., 2016)

Problem focus – How could information sharing be used to fight urban blight?

The factors that influence information sharing in the public sector, as stated by Gil-Garcia et al. (2016) and illustrated on Figure1, technology, organization and policy, interact among themselves and create challenges and opportunities and either allow or prevent public agencies from successfully becoming part of a collaborative network where information flows with few constraints. The outer factors of information sharing such as efficiency, effectiveness, quality of services and citizen participation are seen as outcomes of the dynamics of its inner factors (Gil-Garcia et al., 2016). Furthermore, the

materialization of the outer factors influences the inner factors creating actual feedback loops.

This paper will explore whether technology – in the form of an information sharing solution – and organizational elements could promote the creation of adequate policies to identify, manage and prevent urban blight. In order to accomplish such task, the paper will answer the following research questions:

RQ1: What are the elements of a conceptual dynamic model for information sharing?

RQ2: Would information sharing contribute to the prevention and management of urban blight?

- Would information sharing improve the problem (urban blight)?
- Or, would information sharing only be capable of improving the process (the presumptive cause of urban blight)?

RQ3: How would a dynamic model for information sharing be integrated with an urban dynamics model?

Context – Fighting Urban Blight in a Medium Size City in New York State

A city is a complex system where variables representing industries, population, housing, labor market and land interact and follow diverse patterns for development (Forrester, 1969). Cities go through a lifecycle where they grow and attract people; houses and businesses are built and demolished and the available land is occupied. Over time, growth ends while the interaction of the city's dynamic variables like population and economic conditions fluctuate. An urban area needs to be continuously monitored and sustained via a renewal process, otherwise aging housing starts to appear, which may degenerate into urban blight (Sanders & Sanders, 2004).

The city of study is located in the Capital District of New York State. This city's government made the decision to implement an information-sharing framework across its agencies and external partners. The main purpose of this initiative is to better manage the lifecycle of housing units – buildings, attached and detached homes – in order to identify early signs of decay and therefore being able to proactively manage the mitigation of it. The first step for city officials was to identify a process as the root cause or at least the trigger of the decaying of properties. After a rigorous analysis, two main non-dynamic scenarios that lead to housing decay were identified:

1. Non-foreclosure scenario – Property owners neglect their properties and eventually abandon them. Under this scenario, there is no clear identified motive that triggers the negative behavior of the owner other than lack of interest on the property.
2. Foreclosure scenario – Property owners default on their mortgage obligations and a foreclosure process is initiated against them. Properties are abandoned and neglected at different stages of the process.

With the number of distressed, blighted, and vacant properties in the City, the overall potential negative economic impact of this inventory could reach well over a \$10 million dollars over the next five to seven years.

This study will develop a conceptual dynamic model for sharing information related to the foreclosure process and will propose how such model could be integrated with an existing urban dynamics model. In specific, the study proposes that sharing timely, accurate information on property owners could slow the rate at which properties – housing units deteriorate giving city officials a better opportunity to detect the early signs of decay and prevent the spreading of blight throughout a neighborhood.

Audience – Who is interested on fighting urban blight?

City Departments	External Partners
Mayor’s Office	Banks
Buildings	Realtors
Information Technology	Community groups
Fire Department	Neighborhood associations
Police Department	Media Outlets
911 Dispatch	
Code Enforcement	
Corporate Counsel	
Finance	

Table 1 – Stakeholders involved in Sharing Code Enforcement Information

Since data is a contributing factor to the efficiency and effectiveness of an organization, it is necessary to reflect on how public entities administer it. Dawes (2010) views the government as a driver throughout the lifecycle of data assuming the roles of “collector, producer, provider and user”. On the other side, managing data is refereeing the dynamics of creating, maintaining, publishing, retaining and disposing of the data (Burke & Pardo, 2009; Thompson, Ravindran, & Nicosia, 2015). Table 1 lists the stakeholders with potential interest in sharing owner information in order to detect the early signs of housing decay. City agencies and departments as well as external partners expressed interest on specific steps of the process and therefore under very precise roles and responsibilities. The conceptual model being developed as part of this study should show the audience listed on Table 1 the interactions of endogenous and exogenous variables involved in the process of sharing information and how these variables interact with other urban dynamics indicators.

The Urban Dynamics Model and Urban Blight

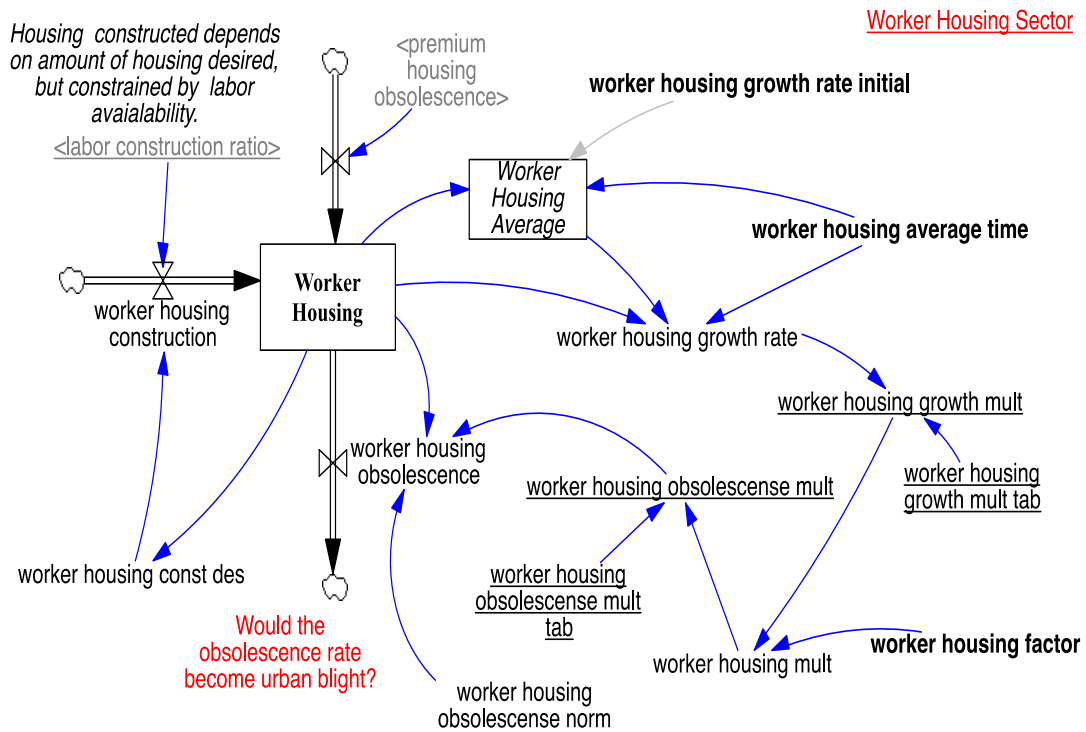


Figure 2 – Worker Housing Sector of Forrester’s Urban Dynamics Model - (Forrester, 1969)

Figure 2 shows the worker housing sector of Forrester’s urban dynamics model. A number of variables have been hidden for illustration purposes. The reduced model describes how the worker’s housing stock is built up by the new construction and the obsolescence of premium housing. A key variable in the model is the rate at which houses deteriorate (worker housing obsolescence mult). This variable determines the percentage of worker houses that deteriorate per year and it is a key contributor in the depletion of the worker housing stock. By extension, the premium housing sector of the model has also an obsolescence process with similar variables interacting and contributing to the depletion of the premium housing stock. In summary, housing obsolescence is observed throughout an urban environment, regardless of the potential housing socio-economic market, i.e. premium housing or worker housing and therefore the importance of identifying and manage early signs of property decay in both scenarios.

Sharing Information to Identify and Manage Property Decay

The Foreclosure Process in New York State

Paths of a Foreclosure

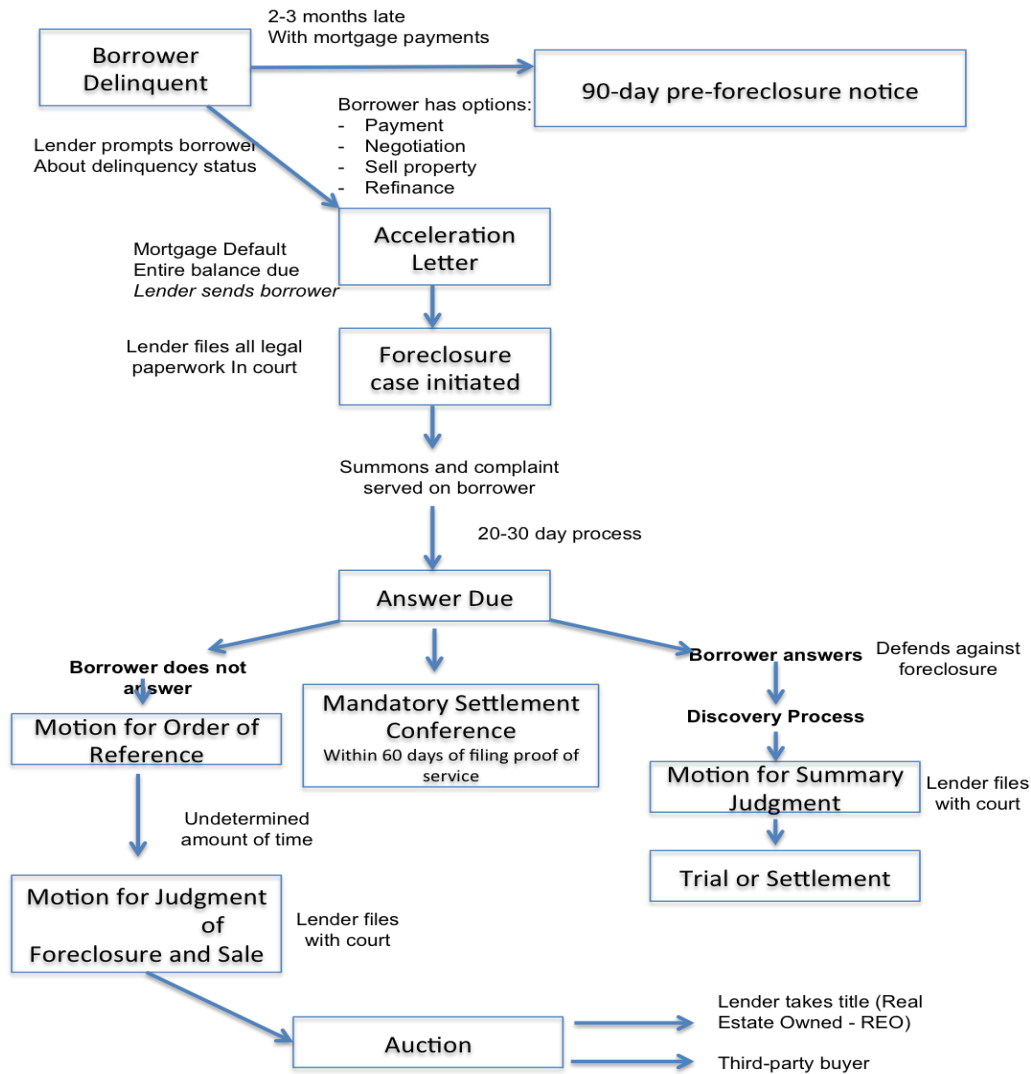


Figure 3 – The Foreclosure Process in New York State

Figure 3 shows the typical foreclosure process in New York State. The process is filled with information exchanges between lenders (traditionally banks and mortgage service organizations) and borrowers. However, such information is not always shared with city authorities or agencies advising them of the potential abandonment of properties. The vast majority of properties where owners (borrowers) fall in default are abandoned within the first 40 days after the loan becomes delinquent (Uzdavines, 2014; Weiss, 2015). The delinquency notice is most likely, not the only trigger of the decaying process of a property. Research also shows that the delinquent borrowers potentially neglect their properties even before the foreclosure proceedings are started (Uzdavines, 2014; Weiss, 2015).

A conceptual model for sharing foreclosure information

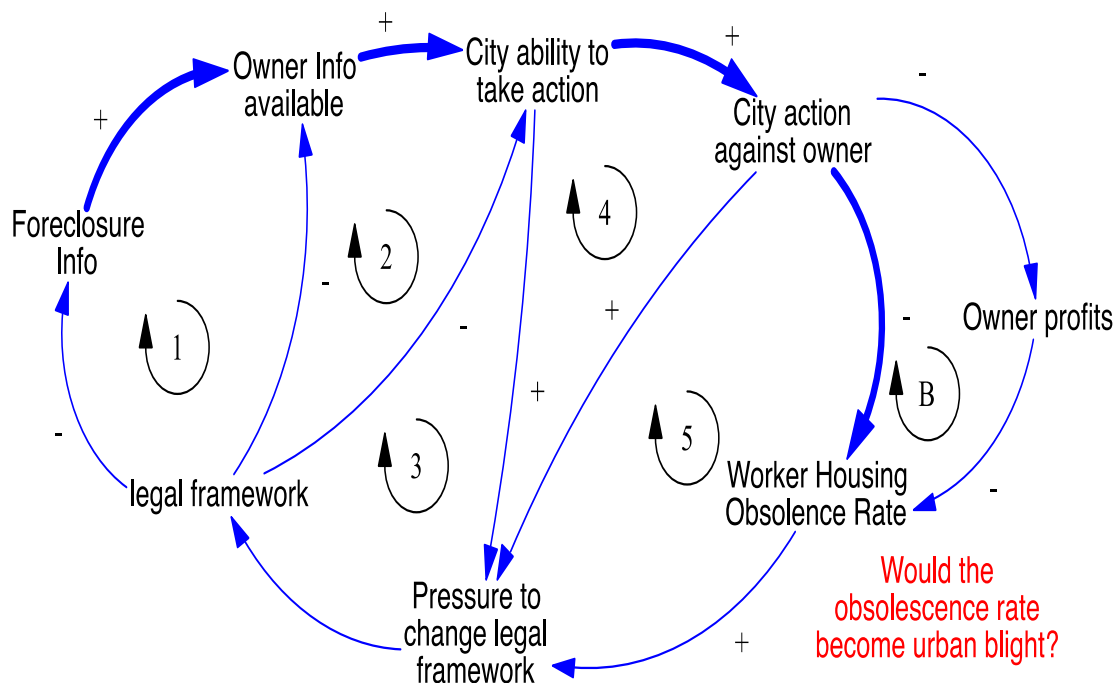


Figure 4 – Causal loop diagram for sharing foreclosure information

The conceptual model developed for this study, illustrated on Figure 4, argues that the increase of foreclosure information, via and information sharing infrastructure would increase the availability of data related to the ownership of decaying properties giving city officials the ability to take action and better manage the potential onset of urban blight. It is believed that by reaching out to delinquent, neglectful property owners, cities could eventually affect the obsolescence rate of properties (even by advising the owners not to abandon the property if nothing else), which as mentioned before is a significant contributing factor in the decaying of worker housing in Forrester's Urban Dynamics model. However, policy development against urban blight faces the extant legal framework that may currently prevent, supported by privacy, confidentiality and security risks, banks from sharing of owner-related information with city official or other stakeholders in the of the urban blight phenomenon. To that end, pressure for changing the existing legal framework, arguably becomes a variable in the model and a key contributor in the reduction of the obsolescence rate of properties. This new variable could be positively affected by city agencies before implementing any new policies or using supporting evidence (if available) on the actual reduction of the obsolescence rate.

Conclusions and Future Work

At a high level, the conceptual model being proposed in this study, sees policy development, operationalized as “pressure to change legal framework”, as a key variable for enabling the sharing of owner information across city agencies and external partners. Paradoxically, the model proposes that successful city policies should promote legislation that allows easier access to property owner information, creating a reinforcing loop that could trigger a decrease in the obsolescence rate of Worker Housing. Next steps for this study include the development of a more robust causal loop diagram that could lead to the construction of a true dynamic model that can be “inserted” into the Worker Housing sector of Forrester’s Urban Dynamics model. If built correctly, the information-sharing model should be transferable to the Premium Housing sector of the Urban Dynamics model since the obsolescence of premium housing may also lead to a different flavor of urban blight.

References

- Burke, B., & Pardo, T. A. (2009). IT Governance Capability: Laying the foundation for government interoperability. In T. R. F. o. S. U. o. N. York (Ed.), (pp. 22). Albany, NY: Center for Technology in Government.
- Dawes, S. S. (2010). Stewardship and usefulness: Policy principles for information-based transparency. *Government Information Quarterly*, 27(4), 377-383. doi: 10.1016/j.giq.2010.07.001
- Esteve, M., Boyne, G., Sierra, V., & Ysa, T. (2012). Organizational Collaboration in the Public Sector: Do Chief Executives Make a Difference? *Journal of Public Administration Research and Theory*, 23(4), 927-952. doi: 10.1093/jopart/mus035
- Forrester, J. W. (1969). *Urban dynamics*: Cambridge, Mass., M.I.T. Press [1969].
- Gil-Garcia, J. R., & Aldama-Nalda, A. (2011). *Government Information Sharing and Integration in Metropolitan Areas: A Conceptual Framework*.
- Gil-Garcia, J. R., Chun, A. S., & Janssen, M. (2009). Government information sharing and integration: Combining the social and the technical. *Information Polity*(14), 1-10. doi: 10.3233/IP-2009-0176
- Gil-Garcia, J. R., Pardo, T., & De Tuya, M. (2016). *Information Sharing in Smart Cities: Lessons from Services Integration Initiatives in Two Megalopolises*. Not Published.
- Harrison, T., Gil-Garcia, J. R., Pardo, T., & Thompson, F. (2006). *Learning about Interoperability for Emergency Response: Geographic Information Technologies and the World Trade Center Crisis*. Paper presented at the 39th Hawaii International Conference on System Sciences, Hawaii, USA.
- Sanders, P., & Sanders, F. (2004, July 25-29, 2004). *Spatial urban dynamics- A vision on the future of urban dynamics: Forrester revisited*. Paper presented at the 22nd International Conference, System Dynamics Society, Oxford, England, UK.
- Thompson, N., Ravindran, R., & Nicosia, S. (2015). Government data does not mean data governance: Lessons learned from a public sector application audit. *Government Information Quarterly*, 32(3), 316-322. doi: <http://dx.doi.org/10.1016/j.giq.2015.05.001>
- Uzdavines, M. L. (2014). Barking Dogs: Code Enforcement is All Bark and No Bite (Unless the Inspectors Have Assault Rifles). *Washburn Law Journal*, 54, 161.
- Weiss, M. (2015). Attack of the Zombie Properties. *Urban Lawyer*, 47(3), 485-499.
- Wenjing, L. (2011). Government information sharing: Principles, practice, and problems — An international perspective. *Government Information Quarterly*, 28(3), 363-373. doi: 10.1016/j.giq.2010.10.003