

# Understanding Shifting Dynamics of Power in State Governments through Social Networks

*Full paper*

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## Abstract

We use social network analysis to better understand historic data on the administration of local governments. Despite advances in e-government applications, the public sector lags behind in analytics because information is locked in legacy data formats. Can e-government researchers bridge the gap between legacy data and analytics? We argue that computational analytic methods, popular in big data applications, can explain patterns that have gone unquestioned in previous research on government. Specifically, we consider how explanations of state government authority can be explained using a network perspective. These data were originally designed to describe administrative differences US territories and states. We investigate methodological challenges in building a weighted social network to confirm existing measures for calculating the power of the state governor. This project reports on the initial step in a broader study to cover all 50 states across multiple years and agencies. We compare the states that experienced the greatest differences in gubernatorial appointment power between 1992 and 2012 Texas and Massachusetts. In addition, we identified that Information Systems agencies moved closer to gubernatorial control across all 50 states. Social network analysis improves existing measurements because it indicates the relationship between the governor and other top officials and agencies. An analytics approach explained where the power shifted across states and across time. Computational analysis of existing government data matches findings from previous studies as well as adding additional explanatory power.

## Keywords

e-government, social network analysis, gubernatorial power.

## Introduction

Big data and computational analytics are changing inquiry in information systems. Instead of relying on questions of simple variance, big data analysis can provide additional explanation about observable differences. This project reports on the first step in a broader study using analytics to better understand governance. With the proliferation of public sector information, e-government information systems researchers have particular opportunities to demonstrate the potential of computational analysis over existing methods. While big data and computational analysis is a popular new technique in information systems (Agarwal and Dhar 2014; Chen et al. 2012; Goes 2014; Kane et al. 2014; Sundararajan et al. 2013), its value is still debated within social sciences. Computational analysis is not uniformly accepted and many scholars question knowledge claims that emerge from analytics (Bisel et al. 2014; boyd and Crawford 2012; Lin et al. 2013; Ruppert et al. 2013; Weinberg et al. 2013).

To address those concerns, this study compares its findings to existing measures published by political scientists (Schlesinger 1965). We use social networking methods to analyze the administration of state governments. Specifically, we consider how organizational power is shared across multiple actors. While power has multiple dimensions, for the purpose of this paper we are focusing on the notion of power as control (Pfeffer and Salancik 1978; Smith et al. 2014). When a person has the ability to hire, he is likely to hire those with similar belief structures, who in turn are more likely to enact the changes requested by that person who made the appointment. In this study, we consider the power of the chief administrative

office, the governor, in US states. The governor appoints the leaders of executive agencies, such as Energy, Information Systems, or Education.

Networks provide novel tools to address concerns about organizations and power. Previous studies on power were conducted as in-depth case studies, yet computational methods could reveal patterns of power within organizations (Markus et al. 2013a; Markus et al. 2013b; Markus and Robey 1983; Robey and Boudreau 1999; Salancik 1977). The study of networks particularly lends itself to computational analysis. The relational aspects of large data sets enable observations across time and many groups (Sundararajan et al. 2013). This paper introduces specific methods for converting existing government data to social networks.

One way in which researchers have analyzed power within state government has been through the lens of gubernatorial power, in an attempt to find a correlation between gubernatorial powers and the ability of the governor to enact change. Political scientists measure gubernatorial power using Schlesinger's Index of the Formal Powers of the Governor (Schlesinger 1965). Called the Formal Power Index (FPI), this index quantifies governor power along four dimensions: measures (1) gubernatorial budget power, (2) appointment power, (3) veto power, and (4) tenure potential. However, each of these dimensions looks at gubernatorial power in a vacuum, without consideration of other actors who may be involved in each dimension. For example, in the case of appointment power, the FPI gives the governor a score based on his direct appointments, but fails to score others involved in the appointment of key personnel. The result is a score that could mean quite different things based on whether or not someone else scores higher than the governor. Social networking analysis seems to be an ideal method for understanding how other actors were involved in gubernatorial power. This paper argues that power within U.S. state government can be explained using methods that extended the single stakeholder perspective (i.e. the governor) to a network perspective. Analytics might provide a holistic picture needed to understand power within state government.

We base our analysis on data on gubernatorial power taken from *The Book of the States* which has been used in past political science studies (Beyle 1968; Ferguson 2012; Schlesinger 1965). These data were originally designed to describe administrative differences between US territories and states. Existing measures showed observable differences that could not be explained (Dometrius 1987). We compare the states that experienced the greatest differences in gubernatorial appointment power between 1992 and 2012, Texas and Massachusetts. We also examine which agencies were closest to the control of the governor. We specifically consider how the Information Systems agency, first identified in 1992, changed over time.

Through the use of social network analysis, we expand the power discussion to include other actors involved in state activities and demonstrate power dynamics within state government. The power structure within state government consists of both formal powers such as the ability to approve budgets, appoint positions, etc., and informal powers, such as political capital and party support. This paper demonstrates how social network analysis, using one measure of Schlesinger's FPI, namely the power to appoint department heads in the state agencies, can expand the discussion beyond a single numeric measure into a broader discussion of how power has shifted over time. Through specific state examples we show that measurements available through social network analysis (SNA) allow us to not only produce similar results as the FPI technique produces, but also produce measures of other actors in the appointment process, as well as network level measures that demonstrate the overall characteristics of the entire network. We show that changes occurring within states cannot be adequately explained using the legacy technique, yet we are able to glean additional insight through SNA that better helps to understand the changes occurring within the states.

In order to understand the changes occurring within state government we look at the states of Massachusetts and Texas, and compare those states and their changes from 1992 to 2012. These states were chosen due to the fact that the formal power index would have ranked the governor of Texas as having the least appointment power, suggesting a decentralized structure, and the governor of Massachusetts with the most appointment power, suggesting a centralized structure, in 1992. However, over the 20 year period in which the appointive power of the governor of Texas remained the lowest of all 50 states, the appointive power for the governor of Massachusetts declined the most of any of the 50 states over that same period. The FPI leaves us scratching our heads as to what is occurring within Massachusetts while, through SNA, we are able to show that the governor appears to have delegated the

responsibility to his cabinet secretary and, when viewed in this way, shows a continued trend toward centralized power under the governor and not a decline in power. Texas, while exhibiting a decentralized structure across both time periods, has still moved toward centralizing under the governor. The visuals provided by the social network tools give further proof that the power structure within Massachusetts is not changing as much as could have been interpreted using the FPI.

Our findings give us the necessary evidence to support moving more of the FPI over to social networks and we look to continued expansion of this work to help tackle the big data challenge of understanding power within state government.

## **Literature review**

### ***Index of the Formal Powers of the Governor***

Establishing quantitative measures for gubernatorial power has been of interest since Schlesinger (Schlesinger 1965) published his index of the Formal Power of the Governors in 1965. Over the years many have worked with this index, none more than Thad Beyle who as early as 1968, using both the original Book of the States data along with survey data, replicated the findings of Schlesinger (Beyle 1968). The current version of the composite index includes the personal powers (such as Ambition Ladder) and institutional powers (such as Appointment Power) (Ferguson 2012). These individual measures are often summed or averaged into a general composite index (the FPI), or are used individually based on the topic being studied.

This model has allowed researchers to make comparisons over more than a 60-year time period (1960 to 2012). The index has been used to explain the effectiveness with which policy change can be enacted at the state level (Barrilleaux 1999; Erikson et al. 1989), conflict between the governor and legislature (Clarke 1998), policy success (Ferguson 2003), and confidence in state government (Kelleher and Wolak 2007) to name just a few.

However the model hasn't been without its critics. Dometrius (Dometrius 1987) was particularly critical of the appointment power measure, arguing that as states have evolved and become more complex, the power has shifted away from some of the early agencies, but the index couldn't address these changes. He goes so far as to say that it is "problematic to include the index, or any of its components, in the analyses of the contemporary governorship."

While others (Krupnikov and Shipan 2012) have proposed different ways to calculate these measures, we aren't aware of any who have expanded the calculations beyond the sole actor of the governor. As Smith et al. state, "power is inherently a structural phenomenon where one actor's influence over another needs to be considered within a wider network of relationships" (Smith et al. 2014). To this end we suggest that the scope of the legacy index needs to be expanded to include the "wider network of relationships" which can be accomplished using social network analysis.

### ***Social Network Analysis***

A social network perspective provides a new means of evaluating research questions through an analysis of the network structure (Wasserman 1994). Modern social network analysis consists of these four features (Freeman 2004):

1. A foundation of systematic empirical data.
2. Structural knowledge generated from social actors and the connections between those social actors.
3. Reliance on knowledge emerging through graphical imagery.
4. Established in mathematical and/or computational models.

Social networks allow us to emphasize the relationships among actors that comprise the social system (Borgatti et al. 2013). These actors are called nodes and have attributes (for example, name, gender, age, tenure, etc.) that can distinguish each node from another. The relationships between the actors or nodes is called a link or edge. Edges can either be weighted or non-weighted. An example of a weighted network might be the frequency of interaction between the two nodes, or, as we will use, the relative power of the

link. Edges can also be directed or non-directed. A non-directed edge means that the link is equally valuable to each node, while a directed edge would indicate that the edge has a sender or originator, and a receiver.

A key concept in social networks is the notion of centrality. Centrality, in general, means the relative importance of one node over the other nodes in the network (Borgatti 2005; Borgatti et al. 2009; Wasserman 1994). One measure of centrality is degree centrality which is a measure of the number of nodes directly connected to the focal node. In the context of this paper we will use degree centrality as a means of mapping back to the original FPI measurements

## Methodology

We adopt a weighted network to emphasize that the power to appoint a position means more than the ability to approve that position. In fact, this weighting was inherent in the FPI, and lends itself quite well to being represented through a weighted network. We adopt directed links to emphasize that the power is uni-directional. When one party has the ability to appoint the other then they hold the power in that activity.

We utilize the data source, *The Book of the States (The Council of State Governments 1935-2012)*, as has been used by Schlesinger, Beyle, and Ferguson (Beyle 1968; Ferguson 2012; Schlesinger 1965). Published since 1935, the Book of the States identifies approximately 50 state agencies (the actual number varies on a year-to-year basis based on additions or subtractions to the table of State agencies, and will vary within states depending on whether they have such agencies), and identifies who is responsible for appointing and approving the head of each agency. This paper looks at the data over a 20 year period from 1992-2012. 1992 was the first year that Information Systems agencies were identified in the *Book of the States*. 2012 was the most recent.

## Legacy Weighting of FPI

A sample of the *Book of the States* dataset is provided in Table 1. In this table you can see that for each agency, by state, there is a code identified. This code represents the combination of who appoints and who approves the head of that agency for that state.

State or other jurisdiction	Adjutant general	Administration	Agriculture	Banking	Budget	Civil rights	Commerce
Alabama	GS	G	CE	GS	G	...	G
Alaska	GB	GB	AG	AG	G	GB	GB
Arizona	GS	GS	GD	GS	G	AT	GS
Arkansas	G	G	G	GS	A	...	GS
California	GS	GS(c )	G	GS	G	GS	N.A.
Colorado	GS	GS	GS	CS	G	CS	G
Connecticut	GE	GE	GE	GE	CS	C	...
Delaware	GS	GS	GS	GS	GS	CG	GS
Florida	G	G	CE	CE	G	AB	N.A.
Georgia	G	G	CE	G	G	G	BG
Hawaii	GS	GS(a-9)	GS	AG	GS	B	GS

**Table 1 Sample Book of the States Appointment Power**

Following the process employed by Schlesinger, using the legacy appointment power encoding (see Table 2), we were able to calculate the legacy FPI governor appointment power for each state from 1992 and 2012.

Code	Description
5	Governor has sole discretion to appoint position
4	Governor appoints position but it is approved by others
3	Governor shares appointment power
2	Other party appoints position and governor approves the appointment
1	Governor plays no formal role in the appointment

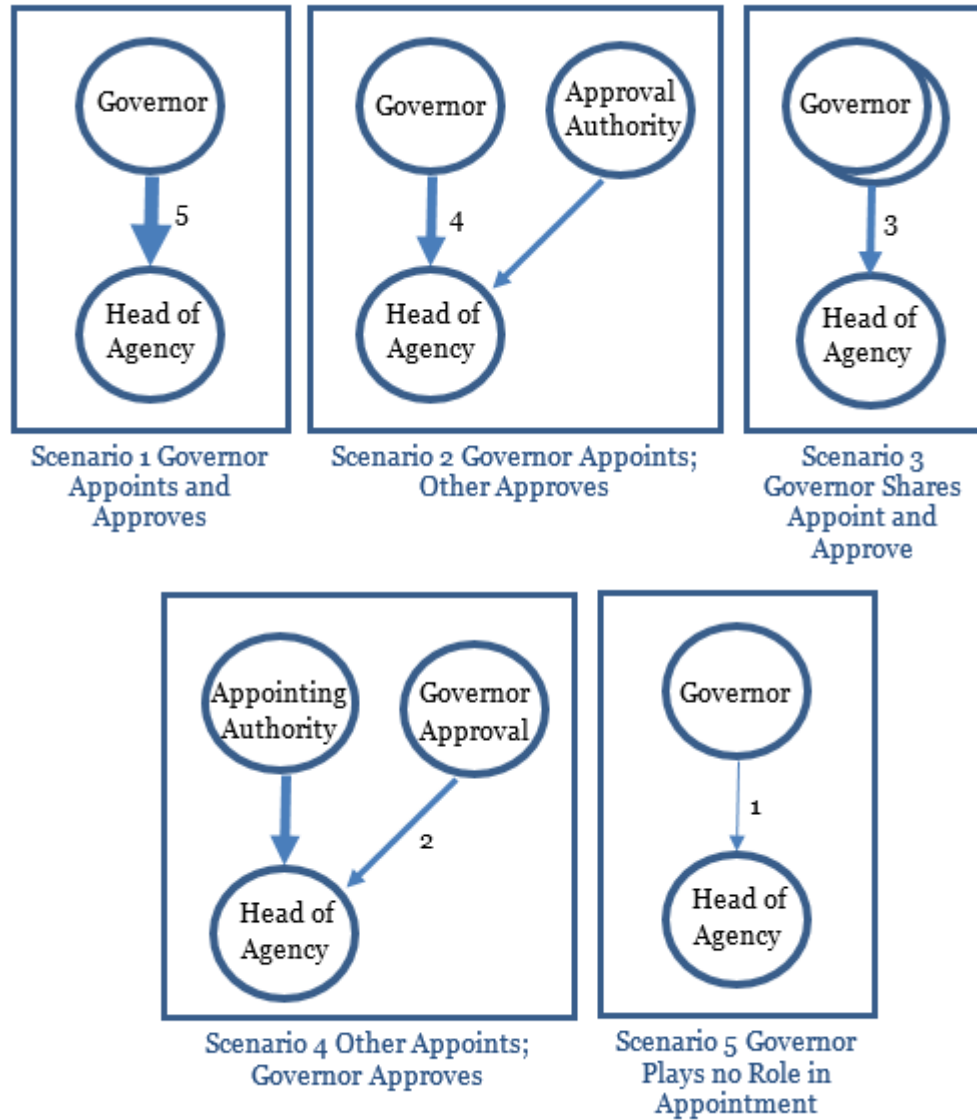
**Table 2 Legacy Appointment Power Encoding**

### ***Legacy Weighting converted to Social Network***

Next we attempted to convert the legacy encoding into values that we could use in social network analysis. We adopted a weighted network in order to capture the weighting that was achieved through the legacy encoding. In the scenarios (see Figure 1) used to present this work, all nodes are the same size while the arrows depicting the edges are sized according to their weight (so a wider arrow indicates more authority). We started with the first scenario, in which the governor has sole appointment and approval power. In the legacy encoding this would have a weight of 5, so in our network we are able to envision it appearing as seen in Figure 1, where the node representing the governor is connected to the node of the Head of the Agency with an edge that has a weight of 5.

To round out the remaining scenarios: scenario 2 covers the weighting when the governor has appointment power and another party has the ability to approve that appointment. Scenario 3 is the weighting when the appointment and approval power is shared. Scenario 4 covers the weighting when someone else appoints the position and the governor approves that appointment. The 5<sup>th</sup> and final scenario covers the situation when the governor plays no formal role in appointing or approving the position.

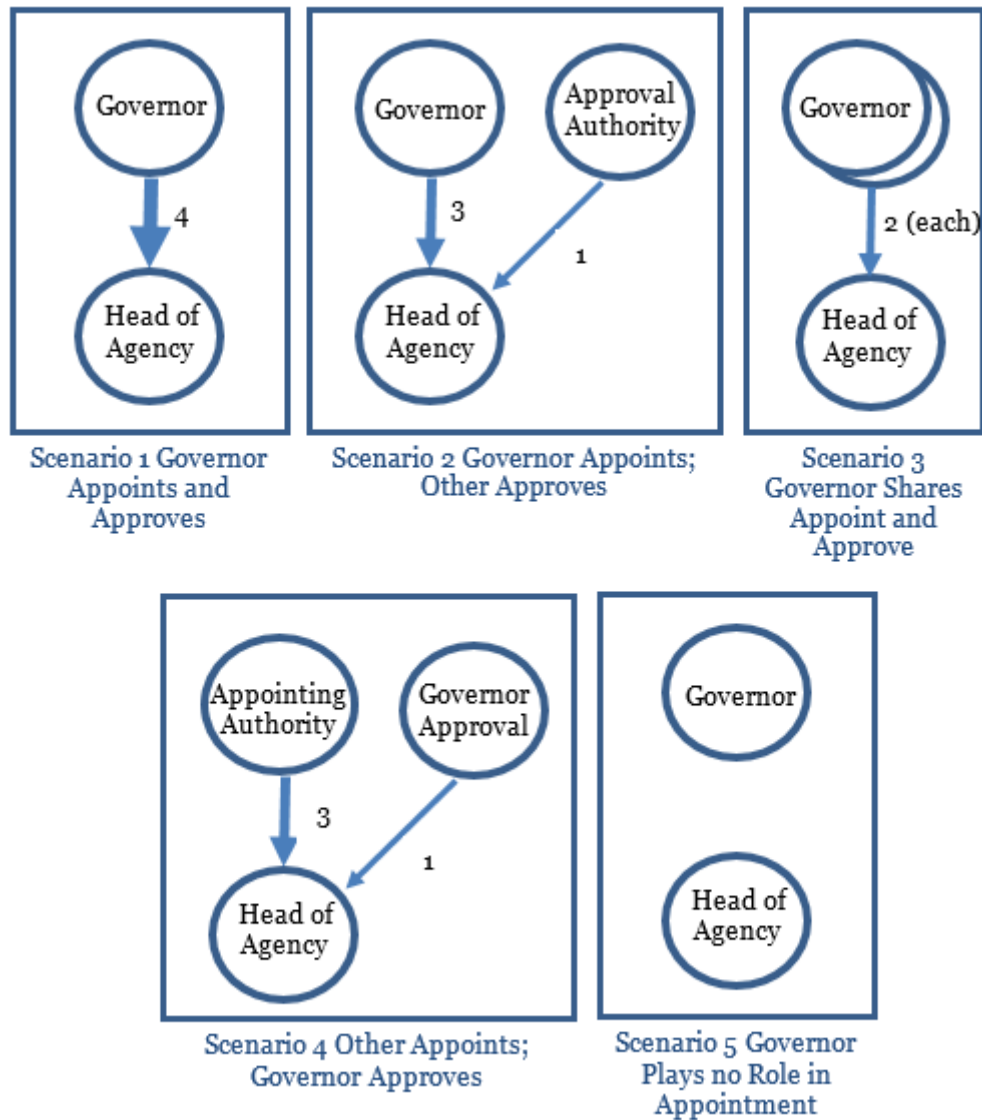
When we envision extending this encoding strategy to include all actors as nodes in the appointment and approval process a few issues immediately emerge. First, in scenario 1, in which a single person has both appointment and approval authority, he has a weight of 5, while in scenarios 2, 3, and 4 the combined weighting for the appointment and approval is 6. This suggests that scenario #1 may be underweighted (or 2, 3, and 4 are over-weighted). Second, in scenario 5 we are giving a weight of 1, even in the case where the governor plays no role in the process. If we adopt this across all nodes then each will be attached to each other with at least a weight of 1, which doesn't seem to make sense. Third, there are scenarios around shared responsibilities that aren't covered in this model. For example, if the governor shares the responsibility for approval, we have no direction as to how to weight that using the legacy encoding.



**Figure 1 Scenarios with Legacy Weighting**

### ***Revised Weighting***

Due to these challenges, we propose a revised weighting scheme (see Figure 2) that attempts to conform as closely as possible to the legacy weightings, while at the same time making sense from a social network perspective. We employ a strategy in which an appointment is afforded a weight of 3 and an approval is afforded a weight of 1. We also give no weight to nodes that are not directly involved in the process. We then apply these to all of our scenarios. In the case of shared responsibility we simply divided the weight by the number of those involved.



**Figure 2 Scenarios with Proposed Weighting**

## Network Creation

Using this weighting scheme we can now create the network. To create the network we need the nodes and the edges. In the context of the state appointment network, the nodes will be any person (identified by their title) who is either appointed or participates in the appointment process though recommending or approving the appointment. The edges represent the appointing or approving action. For example, if the Governor is responsible for filling the position overseeing the Energy Agency, but the appointment requires approval from the Secretary of State, then we would have 3 nodes (Governor, Head of Energy, and Sec of State) and 2 edges (one linking Governor with the Head of Energy, and the other linking the Secretary of State with the Head of Energy).

The nodes were identified in a two-step process. First we created a node for each head of agency identified in The Book of the States. This gave us an initial 51 nodes. We then used the coding scheme from the Book of the States to identify any additional nodes that were not listed as agency heads, but who had appointment or approval authority. This gave us an additional 7 nodes.

Finally we have an indicator that some agency heads are neither appointed or approved, but rather are elected positions. We view the election process as an appointment and approval by the general public, so we created a final node called “Voting Public” to account for this scenario. This gives us a final tally of 60 nodes. A partial list of nodes can be seen in Table 3.

Node	Name
1	Voting Public
2	Governor
3	Lieutenant Governor
4	Secretary of State
5	Attorney General
6	Treasurer
7	Adjutant General
8	Administration
9	Agriculture
10	Auditor
11	Banking

**Table 3 Partial List of Nodes**

From Node	To Node	Edge Weight
2	11	4
2	12	4
2	13	4
14	14	4
2	15	4

**Table 4 Partial List of Edges**

To create the edges we took all of the codes in the Book of the States and converted these codes to edge weightings. For the weighting value we used the “revised weightings” we identified earlier. A partial list of edges can be seen in Table 4 where each row corresponds to 1 edge. The first two columns refer to the nodes and the third column refers to the edge weight. For example, the first row indicates that node #2, which is the governor, has an edge to node #11, which is the head of the Banking agency, with a weight of 4, meaning the governor both appoints and approves that position.

## Results

In selecting the states to analyze we looked at the relative ranking using the appointment power of the FPI for 1992 (see Table 5 for top and bottom ranked states). You can see that the state with the highest gubernatorial appointive power (with a legacy score of 3.96 on a 5-point scale) was Massachusetts, while Texas was the state with the lowest gubernatorial power (with a legacy score of 1.16 on a 5-point scale). Our belief was that the state with the highest score would represent the most centralized state, while the state with the lowest score was the best candidate for a decentralized state. We chose the ranking from 1992 because we were interested in seeing how these states changed over the next 20 years.



State	Gubernatorial Appointment Power using FPI 1992	1992 Rank	Gubernatorial Appointment Power using FPI 2012	2012 Rank	Change
Massachusetts	3.96	1	3.07	7	-0.89
Pennsylvania	3.91	2	3.43	2	-0.48
Virginia	3.37	3	2.93	9	-0.43
California	3.15	4	3.34	4	0.19
Indiana	3.09	5	3.40	3	0.31
Missouri	1.87	45	2.09	46	0.22
Michigan	1.75	47	2.50	25	0.75
Mississippi	1.55	48	2.21	42	0.67
South Carolina	1.18	49	1.89	49	0.71
Texas	1.16	50	1.71	50	0.56

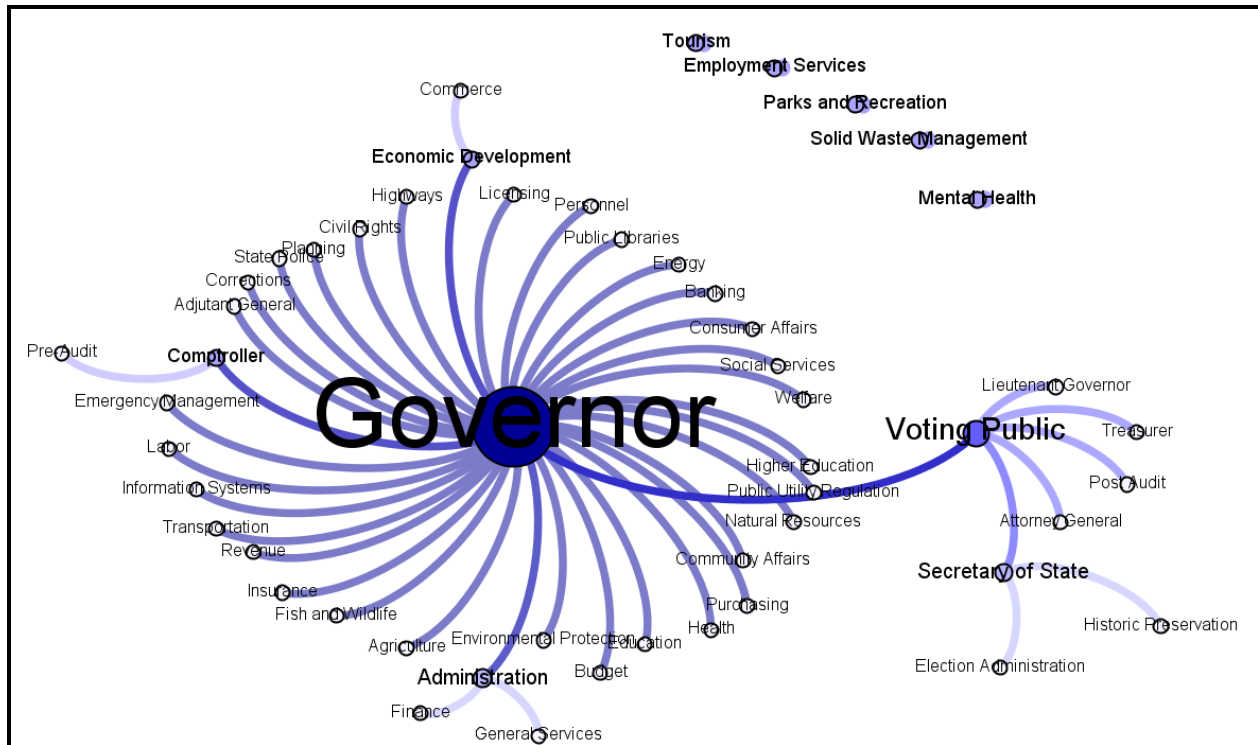
Table 5 States with Highest and Lowest Appointment Power

**Massachusetts**

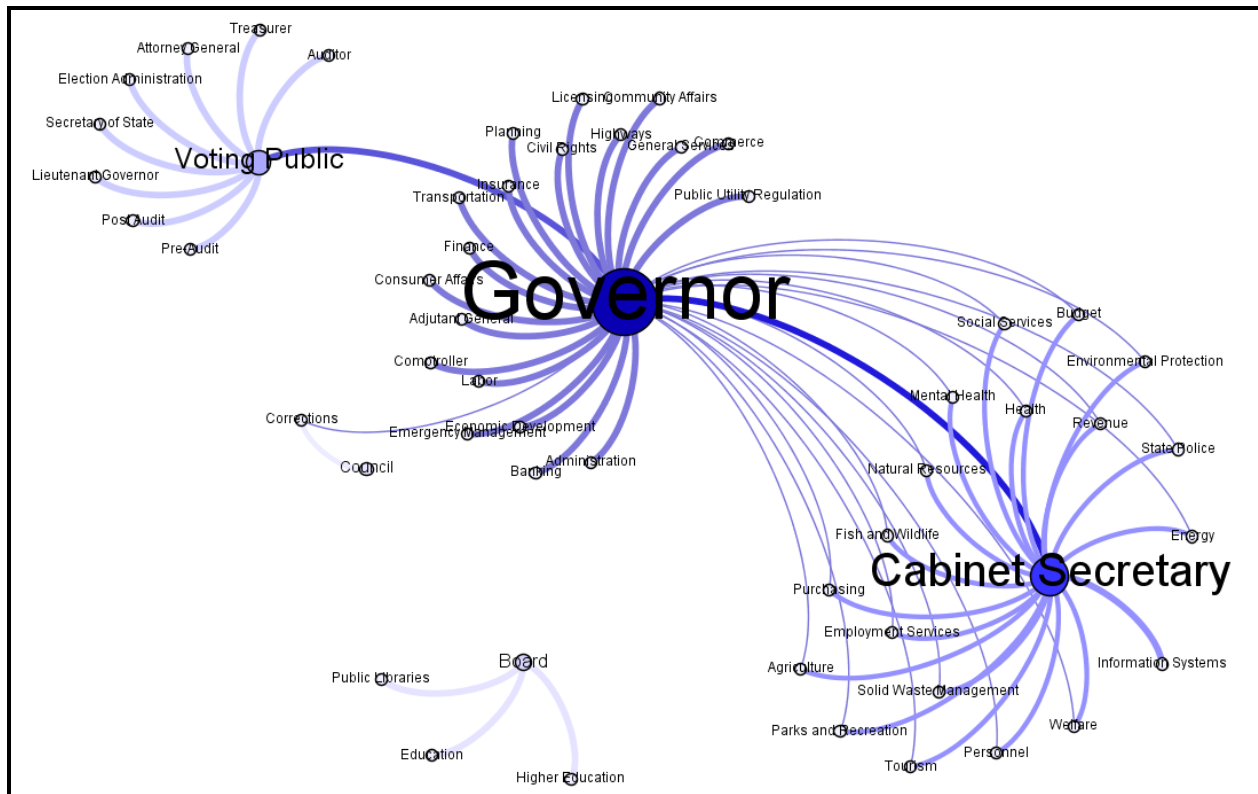
From Table 5 we see that the appointment power of the governor of Massachusetts was the highest of any governor in 1992, yet also dropped the most from 1992-2012. What the FPI is not able to tell us is where that power went, only that it appeared to be taken away from the governor. We begin with the appointment network of Massachusetts in 1992 as seen in Figure 3. What is shown appears to tell a story of centralized power, with the governor responsible for appointing most of the agency heads. Only 5 of the 46 agencies, or 10.9% of all agencies, appointed their own head of the agency. While there are some minor actors in the appointive process, none come close to challenging the power the governor wields.

Position	1992			2012		
	Legacy Appointment Power	Degree Centrality	Degree Centrality / # Agencies	Legacy Appointment Power	Degree Centrality	Degree Centrality / # Agencies
Governor	3.96	136	2.96	3.07	99	2.15
Cabinet Secretary	n/a	0	0	n/a	58	1.26
Voting Public	n/a	24	.52	n/a	36	.78
Boards	n/a	0	0	n/a	12	.26
Secretary of State	n/a	8	.17	n/a	0	0
Administration	n/a	8	.17	n/a	0	0

Table 6 SNA Centrality Measures for Massachusetts



**Figure 3 Appointment Network; Massachusetts, 1992**



**Figure 4 Appointment Network; Massachusetts, 2012**

However, based on the decrease in FPI score, we suspect that significant changes occurred in Massachusetts between 1992 and 2012, with power being taken away from the governor. Figure 4 shows the appointment network for Massachusetts for 2012. Contrary to the notion that power is being stripped from the governor, it appears that the governor has delegated the appointment authority to his cabinet secretary, while still retaining the approval authority for almost all appointments. There is no indication of any type of power shift outside of the governor's office, nor is power decentralizing. In fact, none of the 5 agencies that appointed their own agency head in 1992 were still doing so in 2012. All 5 agencies are now appointed by the cabinet secretary and approved by the governor.

Table 6 is the quantitative centrality measures for key nodes in the Massachusetts appointment network for 1992 and 2012. We can see that, when the governor and cabinet secretary roles are combined, the appointment power actually increased from 1992 to 2012. This contradicts the finding of the legacy FPI.

## Texas

Using the FPI figures, the appointment power of the governor of Texas ranked lowest of any state in both 1992 and 2012, but the increase in governor power over that time suggested a move toward centralization. First we look at the appointment network for 1992, which is presented in Figure 5. We can see that there are 9 agencies, representing 20% of all agencies, which appoint their own head. The governor indeed doesn't appear to have much power, playing a role in appointing only 3 agency heads, and in each of those cases the appointment needs to be approved by the senate. By 2012 (see Figure 7) the governor appoints 8 positions with none needing approval. Agencies appointing their own agency head decreased from 9 to 6. So, even though Texas ranked lowest in gubernatorial power over both time periods, we are seeing a move toward centralizing that power.

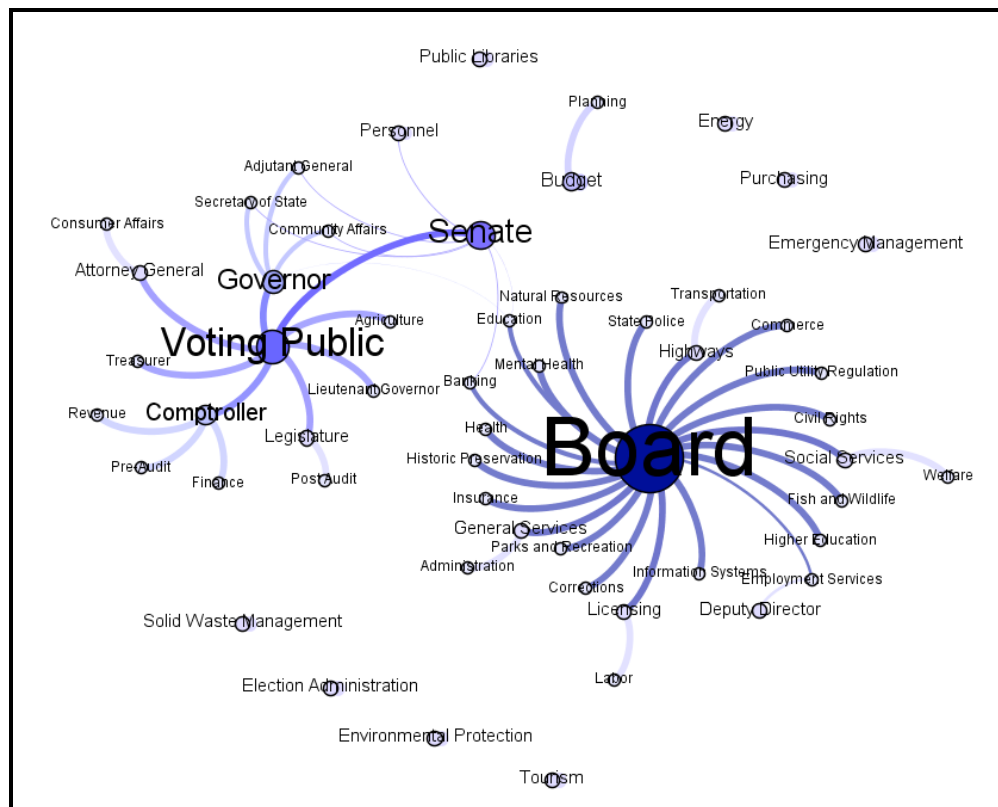
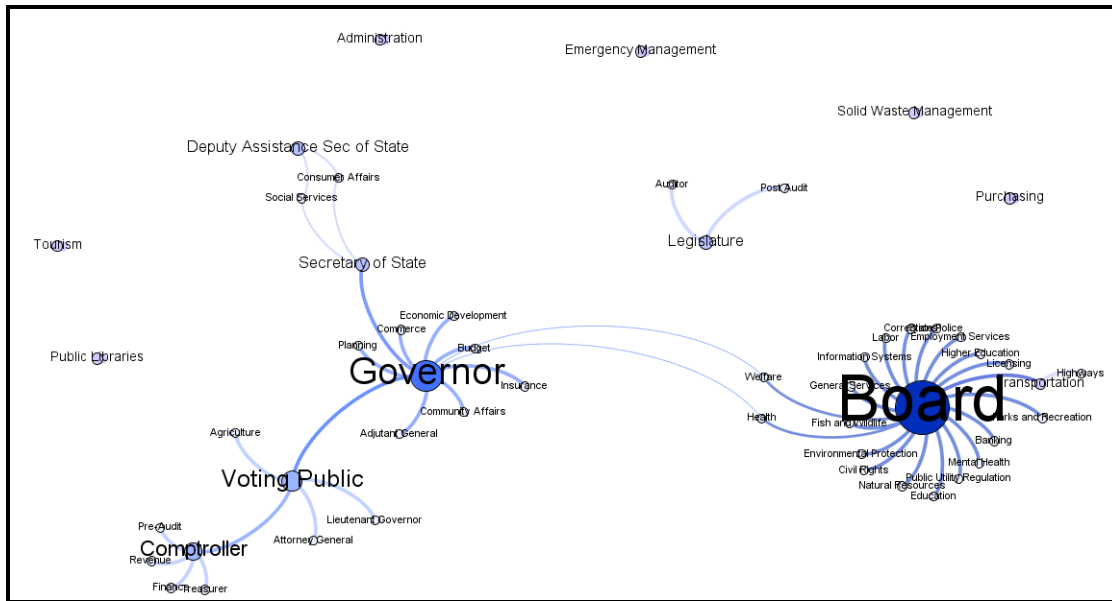


Figure 5 Appointment Network; Texas, 1992



**Figure 6 Appointment Network; Texas, 2012**

### Agencies

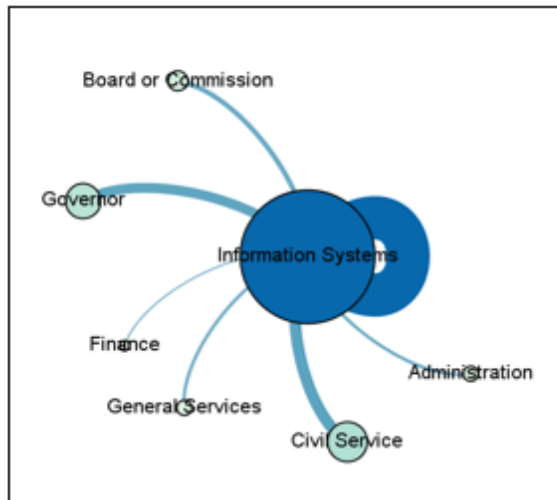
In selecting which agencies to analyze we followed the same process as we did with the states. We looked at the combined 50-state gubernatorial power for each agency for the years 1992 and 2012, and selected the agencies that appear to have the strongest move toward and away from the governor. As you can see in Table 7, Information Systems had the strongest move toward the governor while Energy had the strongest move away from the governor.

Figures 7 and 8 show the network for appointing the head of the Information Systems agency for all 50 states in 1992 and 2012 respectively. The nodes are sized according to their appointment power and represent who is responsible for appointing the agency head across all 50 states. You can see that the Information Systems node in 1992 is quite large in comparison to the other nodes. This is because the agency self-appoints its own head in 26 states in 1992 while the Governor only appoints the agency head in 6 states, representing a decentralized structure. However, by 2012 the Information Systems agency only appoints its own head in 15 states, while the Governor appoints the head in 25 states.

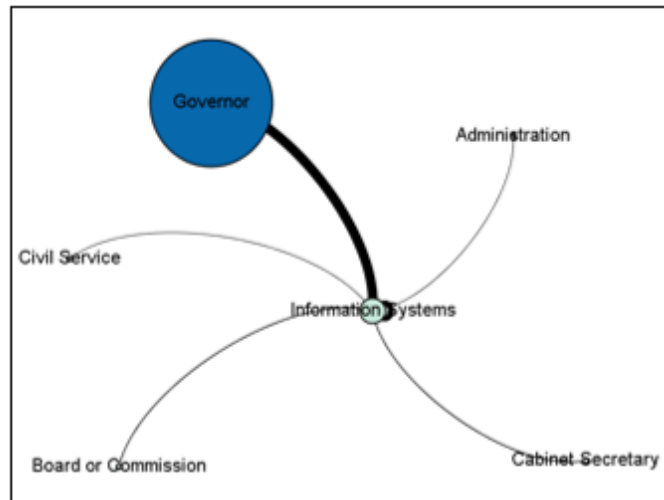
Figures 9 and 10 show how Energy agencies had the strongest move away from the governor from 1992 to 2012. Although you can see a slight decrease in the size of the governor node, if we consider delegated responsibility to the lieutenant governor and to the cabinet secretary then the overall strength of the governor has actually increased over this time period. Keep in mind that this is the agency that appeared to have the strongest move away from the governor using the FPI.

Agency	Governor FPI change
Energy	-0.48
Higher education	-0.29
Public library development	-0.27
Purchasing	-0.25
Election administration	-0.24
...	
Administration	0.66
Economic development	0.70
Social services	0.71
Commerce	0.89
Information systems	1.23

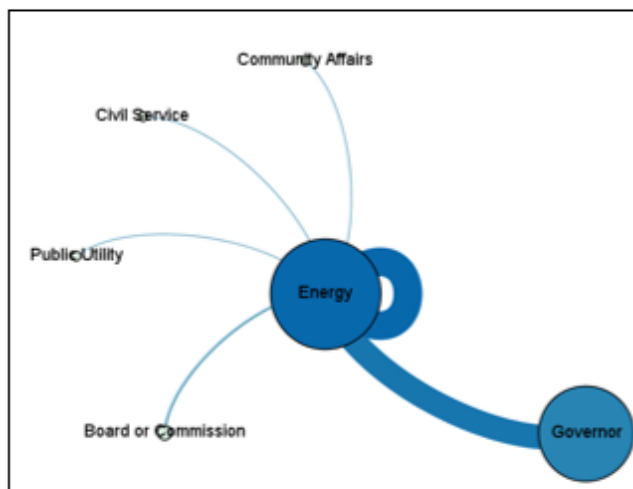
**Table 7 Change in Gubernatorial Power by Agency 1992-2012**



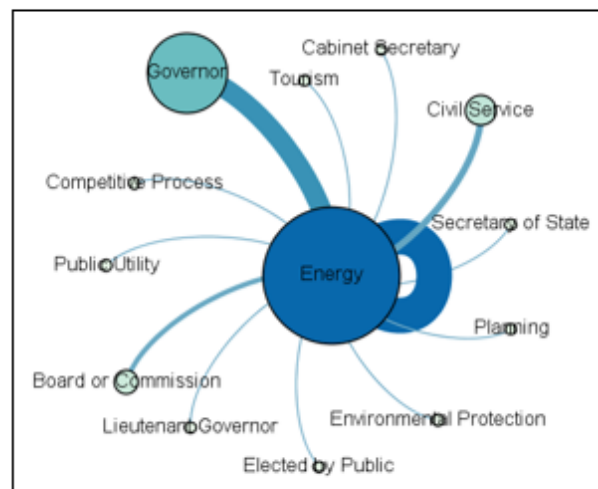
**Figure 7 Appointment Network;  
Information Systems Agency 1992**



**Figure 8 Appointment Network;  
Information Systems Agency 2012**



**Figure 9 Appointment Network;  
Energy Agency 1992**



**Figure 10 Appointment Network;  
Energy Agency 2012**

## Discussion and Limitations

Using the legacy FPI we saw a general trend toward more gubernatorial power, but there was evidence that some states who had a strong governor in 1992 were taking power away from the governor, while states with a weak governor in 1992 were giving more power to their governor. Our analysis of the state of Massachusetts contradicts this assumption, and shows that strong governor states may instead be adopting a delegated power structure. Similarly, the FPI numbers based on individual agencies, show a general trend toward granting the governor more power in appointing the heads of those agencies, but had some agencies moving away from the governor. When considering delegated authority as part of the governor authority that the agencies with the strongest move toward the governor would have been even stronger, and the agency with the strongest move away from the governor would have actually been considered as moving toward the governor. Valuable information can be obtained from filling out the

complete appointment network within state government. We have shown through direct examples that the single node method of calculating gubernatorial power can be misleading, and we have presented a new approach for the consideration of appointment power through networks. Based on the findings from Massachusetts and the Energy agency, we recommend that researchers using the FPI should consider changes to the weighting in cases where the governor has delegated the authority.

We expect that expanding on this work will provide additional insights, similar to this scenario, which could be used to recommend changes to the FPI, highlighting one of the benefits of utilizing SNA in this manner. In addition, we have shown that there is a benefit to seeing the entire appointment network across all 50 states, especially when considering the agency level trends across all states.

This method can also be used to evaluate changes in state agencies. The trend toward giving the governor the power to appoint the agency head certainly suggests that Information Systems has moved into a more prominent role over this time period. The purpose of this paper is not to make conclusions about the implications of such a change, rather, to highlight the benefits of using network analysis in analyzing the structure of state government.

Harking back to Freeman's four features of social network analysis we have:

- a) Used data from the Book of the States to populate our network. We have employed a uniform weighting strategy to arrive at an unbiased measurement of centrality, which is applied to all nodes in the network in the same manner.
- b) If one accepts that there is power in the appointment of key personnel, this power is shifting within states in different ways, beyond what can be accounted for by looking only at the power of the governor in isolation.
- c) The graphics highlight these changes and emphasize these structural changes in ways that are harder to understand through tables alone.
- d) The measures are also visually represented.

## ***Limitations***

This work is based on results from a few key states and agencies. A continuation of this research, including a comprehensive view across all 50 states, will help clarify whether the trend toward centralization is confirmed.

## **Conclusion**

Our contribution is a method by which the Index of the Formal Powers of the Governors can be recast in light of social network analysis. We have proposed a weighting scheme that can be employed and extended to all relevant parties in state government who participate in some way in the appointment process of key state government personnel. A measure of centrality (weighted out-degree / # of Agencies) can be utilized in the same manner that the original index has been used, preserving the ability to use the figures longitudinally, as well as perform direct governor comparisons between states as has been performed in other studies. Some states, such as Massachusetts, have moved beyond direct gubernatorial appointment, which makes not only the original index less effective, but also challenges researchers to find a centrality measure that looks beyond the immediate reach of the governor to avoid an under appreciation for the move toward centralization across states and agencies.

Scoring a network, instead of an individual, can lead to such questions such as a) if an individual is losing power, where is that power going, b) how powerful is one individual in relation to all the others, and c) how is the dynamic process of power evolving over time?

This project has shown how social network analysis could be used with legacy data. We offer a methodology for researchers and managers in the government domain who want to begin using analytics tools to understand existing data sets. The results of the social networking analysis explained where the power shifted across states and across time. Computational analysis of existing government data matches findings from previous studies as well as adding additional explanatory power.

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