Members

Sen. Brandt Hershman, Chairperson
Sen. Vi Simpson
Rep. Kathy Kreag Richardson
Rep. Linda Lawson

LEGISLATIVE COUNCIL DATA PROCESSING SUBCOMMITTEE

LSA Staff:

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Diane Powers, Fiscal Analyst for the Subcommittee

Authority: Reestablished by Legislative Council May 19, 2004

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MEETING MINUTES[1]

Meeting Date:	**May 10, 2012**
Meeting Time:	**10:00 A.M.**
Meeting Place:	**State House, 200 W. Washington St., Room 431**
Meeting City:	**Indianapolis, Indiana**
Meeting Number:	**1**

Members Present: **Sen. Brandt Hershman, Chairperson; Rep. Kathy Kreag Richardson. Special appointees Rep. Ryan Dvorak and Sen. Jean Breaux.**

Members Absent: **Sen. Vi Simpson; Rep. Linda Lawson.**

Senator Hershman called the meeting to order and announced that Rep. Ryan Dvorak and Sen. Jean Breaux were attending the meeting on behalf of Sen. Vi Simpson and Rep. Linda Lawson, respectively.

Jack Ross, Executive Director, Legislative Services Agency provided an introduction to the information to be provided during the meeting. He gave an overview of the current legislative computer system, its limitations, and staff efforts to develop both a short-term and long-term strategy for improvement.

Legislative iPad and Paperless Legislature Initiative

George T. Angelone, Deputy Director, Office of Bill Drafting and Research,

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[1] These minutes, exhibits, and other materials referenced in the minutes can be viewed electronically at http://www.in.gov/legislative Hard copies can be obtained in the Legislative Information Center in Room 230 of the State House in Indianapolis, Indiana. Requests for hard copies may be mailed to the Legislative Information Center, Legislative Services Agency, West Washington Street, Indianapolis, IN 46204-2789. A fee of $0.15 per page and mailing costs will be charged for hard copies.

Legislative Services Agency made a presentation summarized in the following documents distributed to Subcommittee members:

(1) 2012 Accomplishments of the legislative iPad and paperless legislature initiative (available as Exhibit 1).
(2) Summary of improvements suggested in the Ball State University report: *A retrospective on the 2012 Legislative Session paperless pilot and recommendations for future action* (available as Exhibit 2).
(3) Possible short-term steps that can be taken in the 2013 Session to improve the legislative iPad and paperless legislature initiative (available as Exhibit 3).

Mr. Angelone also distributed a copy of the Ball State University report: *A retrospective on the 2012 Legislative Session paperless pilot and recommendations for future action* (available as Exhibit 4). He introduced Gretchen Gutman. Associate Vice President, Governmental Relations, Ball State University and Andrew Hosey , Assistant Director, Digital Corps, Ball State University as persons who could answer additional questions concerning the Ball State University report. Mr. Angelone indicated that the recommendations in the above listed exhibits are provided to facilitate discussion among legislators.

Rep. Richardson asked if there had been a survey to determine legislator's views on the success of the iPad pilot project. Mr. Angelone indicated that the mid-session survey of legislators had been conducted and comments directly made by legislators to the Ball State University interns who were providing technical assistance to legislators had been reviewed. A post-session survey has not yet been conducted. In general, the comments suggest that there is broad interest in iPad adoption among legislators. Especially interesting were the legislator's observations concerning how useful the devices can be vis-á-vis reducing the amount of paper to be transported to committee hearings and sessions. Senator Hershman commented that his impression was that the iPad project was well-received.

Senator Hershman asked whether legislators had commented on whether wireless access through a cellular data connection in addition to WiFi network is needed, particularly in connection with meetings and other legislative activities outside the Statehouse. Bob Amos, Data Processing Coordinator, Legislative Services Agency, indicated that three legislators had requested a cellular data connection.

Rep. Dvorak indicated that he liked the concept of an open-source approach that permitted a broad range of devices to access information. He asked that more legislative information from past years be added to the system in a form that could be searched. Bob Amos indicated that any system that the legislature installs should permit the legislature to add additional historical information.

Sen. Breaux asked whether it was feasible to build a system that could be accessed by all types of computer devices. Mr. Angelone noted that the 2012 iPad pilot project was designed around one type of device, the iPad, because of the current difficulty with designing a system that can be accessed by different computer operating systems and different sized computer displays. However, through the use of modern web technologies (such as HTML5, jQuery and CSSS3), web applications can be built to provide optimal usage by traditional PCs, tablets and smart phones.

Sen. Breaux asked why the staff was recommending that the iPad pilot project be expanded in the 2013 Session only to four committees, rather than opening up the project to all documents, all legislators, and all committees. Mr. Angelone indicated that the

current legislative computer software system is 16 years old and does not have the capacity, particularly with the relatively small information technology (IT) staff that the General Assembly currently employs, to support a comprehensive legislative iPad and paperless legislature initiative. However, the staff believes that a small increase in the number of standing committees involved in the project can be supported. In addition, the staff believes that the staff can support an expansion of access to the "igaViewer" (which permits real-time access from a wireless device to all public legislative information) to all legislators and, with certain conditions, all members of the public on the public wireless system in the Statehouse. Bob Amos added that the heaviest demands on staff time are connected with operating the paperless committee packet initiative. The work associated with the "igaViewer' add relatively fewer demands on staff time.

Sen. Breaux asked if the number of IT staff employed by the General Assembly needed to be increased to carry out the iPad pilot project. Mr. Angelone indicated that no additional staff is needed to carry out the improvements contemplated for the 2013 session. He indicated that some outside contract services from Ball State University's Emerging Technologies, Media Development and Training Department will be needed on a short-term basis to develop these services.

Senator Hershman asked whether the iPad pilot project was merely highlighting the limitations of the legislature's current computer system or causing them. Mr. Angelone responded that the issues related to the aging computer software system would need to be addressed regardless of whether legislators used iPads. However, the legislative iPad and paperless legislature initiative would greatly benefit from improvements in the legislative computer software system.

Senator Hershman asked if any analysis had been done to determine how vote sheets and other legislative documents might be signed and filed electronically. In particular, he asked if any changes in House and Senate rules were needed. Mr. Angelone indicated that the Indiana General Assembly has already expressed its acceptance of digital signatures by enacting the Electronic Digital Signature Act (IC 5-24-3). With respect to the state and state agencies, the Act provides that a digital signature on a document received by or filed with the state is effective if it meets the following criteria:

(1) It is unique to the person using it.
(2) It is capable of verification.
(3) It is under the sole control of the person using it.
(4) It is linked to data in such a manner that if the data are changed, the digital signature is invalidated.
(5) It conforms to the rules adopted by the state board of accounts.

The authentication needs of the House and Senate are less stringent than might be needed by a court of law, since Article 4, Section 10 of the state constitution grants each chamber of the General Assembly the power to determine its own rules, which would include determinations related to the acceptability of digital signatures on documents. At a result, if the General Assembly wishes to permit digital signatures it would be useful for the House and Senate to incorporate language into their rules that specifies that digital signatures satisfy the signing requirements of the respective chamber. Similarly, if either or chamber wishes to permit electronic filing of documents, it would be useful for that chamber to specify in its rules that electronic filing satisfied the filing requirements of that chamber. Although the staff does not believe that the current legislative computer software system is capable of supporting digital signature and electronic filing functions for all legislative documents, the staff is believes that a limited test of using digital signatures on standing committee vote sheets is possible.

Social Media Usage Policy

Mr. Amos distributed a copy of his testimony to the members of the Subcommittee (available as Exhibit 5). He suggested that the Indiana House and Senate may wish to change its policies concerning the blocking access to social media sites from the legislative computer network. He indicated that legislators in other states are routinely using social media sites to carry out legislative business. He distributed the following documents to Subcommittee members describing use of social media sites in other states:

(1) A table from the National Conference of State Legislature (NCSL) compiling the legislative social media sites in other states (available as Exhibit 6).
(3) A table compiled by the National Association of Legislative Information Technology associated with NCSL, which describes the legislative policies of various state legislatures concerning the blocking of legislature or staff access to Facebook or other social media sites (available as Exhibit 7).

Mr. Amos indicated that the current policy in Indiana is to block legislator and staff access to social media sites from legislative computer networks unless a legislator or staff member specifically requests access and the access request meets various criteria. The criteria are designed to determine whether access is needed to do research on a particular legislative topic for a bill, to do constituent communications, or engage in other work-related purposes. About 195 legislators and staff, or about 50% of the members of the legislative branch, have exemptions from the general policy.

This approach sometimes causes computer problems for individuals who have been granted access. The implementation of an "exemption list" relies on knowing who an individual is and what access permissions they are allowed. This is based on network login ID, and what location you used when you logged in. If an individual logs in to the legislative network and then moves the individual's location to another computer or tries to access the legislative network without logging in, the individual may be denied access to services that the individual is permitted to have. These problems come up every week. The frequency of these problems is likely to increase as more individuals begin to use mobile devices, such as iPads and iPhones, to access social media sites.

Sen. Hershman noted that social media sites have become a legitimate tool for communication with constituents. Rep. Dvorak concurred that legislative staff are interacting with constituents with social media.

Long-Term Legislative Computer Software Strategy

Jack Ross explained that the General Assembly had contracted with Propylon to conduct a review of the capabilities of the legislature's current computer software system, analyze the flow of information through the legislative system, and to make recommendations for long-term improvements in the system. After investigating potential expert consultants in this field, Propylon was selected because of the company's understanding of the legislative process and IT systems, as well as its experience with legislatures in other states. He introduced the following Propylon employees: John Harrington, Chief Operations Officer, and Sean McGrath, Chief Technical Officer.

Mr. Harrington and Mr. McGrath provided the Subcommittee with a copy of Propylon's final report (available as Exhibit 8) and summarized the report using a PowerPoint presentation (available as Exhibit 9). They presented the following findings:

(1) The systems in place are designed to support current paper-centric processes and existing services.

(2) There is a growing demands for new services causing strain on existing systems.
(3) Staff time is currently fully devoted to the operational running of existing systems.
(4) No time and resources are available to look at new services.
(5) The Indiana legislature's IT support systems consist of many silos with limited integration.
(6) The legislature front door is increasingly becoming the website and on-line services.
(7) Staff has limited ability to add new services, such as:
(A) Publication to different consumers and devices.
(B) Reducing the time for on-line publishing of data.
(C) Making information easier to find.

Propylon made the following recommendations:

(1) Implement an enterprise information architecture to support the legislature:
(A) Single data sources replacing the silo based systems.
(B) Individual applications reading from the one data source ensures consistency.
(C) Architecture should support the adoption of new technologies consuming information.
(2) Take control over what is published on the Internet and when: Members, staff, the public, businesses, and agencies all depend on the information on-line.
(3) Implement better tools to support members decision making processes: Decision support systems ensuring members have fast access to what they need when they need it.
(4) Reduce paper-based processes.
(5) Provide for preservation of historic materials and on-line links to that information by providing permanent URLs and making other changes to assure property authentication of all changes to stored material.
(6) Develop solutions that permit easy access to bill status information and the information that legislators and staff are looking for.

Sen. Hershman asked how Propylon might approach a redesign of the legislature's current system. Rep. Dvorak asked what time frame for making changes would be involved and how would the legislature deal with the Web?

Propylon indicated that the focus should be on analyzing the flow of data through the legislative system and design a system to accommodate the practices of the legislature. The selection of the correct technology to use is a secondary consideration. Propylon suggested that there are many possible ways to phase-in the implementation of a new system. Business continuity is the overarching concern. One possible approach would be to divide the project into two phases of 15 months duration each. In the first phase, changes would be made to the legislature's Intranet, Website, budget bill drafting process, member services software. In the second phase, the new services would be expanded to non-budget bills and statute management. They suggested that to assure the quality and timeliness of information delivery over the Web, the legislature should use a redesigned system to assume the responsibilities currently carried out by access Indiana. They also suggested that the legislature's IT staff may need to be increased by five or six persons to accommodate the additional services provided to legislators and the public.

Sen. Breaux asked if the new system could facility the receipt of testimony in the Statehouse from individuals who are not present in the building? Mr. McGrath indicated

that other states are providing these services and improving their capacity to archive and research archived testimony.

Jeff Ford, IT analyst, Legislative Services Agency, presented information concerning IT staff operations in other states. He indicated that he contacted NCSL and called a number of states to prepare his report. He distributed the following information prepared by NCSL:

(1) A table compiling information about the size of information technology staff in selected state legislatures (available as Exhibit 10).
(2) A table compiling information about legislative bill drafting systems used in various states (available as Exhibit 11).

He indicated that, on average, states employ between 24 and 25 IT staff. States engaged in larger IT development projects have larger staffs. Texas has 160 IT staff members. Many of the states with small IT staffs rely on the executive branch to provide many of the computer services used by the legislature. Indiana has six nonpartisan IT staff employed by the Legislative Services Agency and three partisan employed by the House and Senate. He indicated that 21 states are currently engaged in IT development projects.

Jack Ross indicated that there are a number of issues to be discussed with the House and Senate leadership. They include budgets, staffing levels and contract options.

Sen. Hershman adjourned the meeting at 12:00 p.m.

Legislative iPad and Paperless Legislature Initiative **2012 Accomplishments**
1. Accomplishments in the 2012 Session:
a. Introduction of **igaViewer**: LegiSoft-style all-in-one browser
i. Accessible from any machine that has access to Internet, not just iPads
ii. Available to legislators and staff
b. Expansion of they types of devices that can be used to watch live video
c. Strengthen wireless capability in chambers and most committee rooms
d. Pilot test of iPads
i. Distribution of iPads to members of two standing committees
ii. Use for pre-meeting distribution of standing committee packets and proposed amendments to members of two standing committees
iii. Public access through FTP server
(1) Public access to committee packets at the same time legislators receive them
(2) Public access to committee amendments in two committees after amendments offered in public meeting
e. On-site training and assistance: Ball State University interns
2. General Observations
a. Summary of Ball State University Report: *A retrospective on the 2012 Legislative Session paperless pilot and recommendations for future action*: "[W]e observed a broad interest in iPad adoption among both Legislators and staff; especially interesting was the mid-session acquisition of iPads by the Senate Majority after they observed how useful the devices can be vis-a-vis reducing the amount of paper to be transported to committee hearings or session."
b. Obstacles to overcome
i. Significant manual "background" maintenance required to keep system running
ii. Interface screens used by legislators were off-the-shelf solutions that were not customized to the legislative process

Legislative iPad and Paperless Legislature Initiative **Improvements Suggested in Ball State University Report** ***A retrospective on the 2012 Legislative Session paperless pilot and recommendations for future action***			
a.	Identified two main areas for improvement and expansion of a long-term technology strategy		
	i.	Infrastructure overhaul: "[I]t is apparent that it is time for an overhaul. With the desired technological changes requested by LSA staff and the Legislative Council, it is impossible to move forward *[in the long term]* without such an overhaul.	
	ii.	Adopt a strategy of supporting a broad range of devices: "[I]mplementing any system specifically for a single consumer device is not an advisable strategy."	
		(1)	"Through the use of modern web technologies (such as HTML5, jQuery and CSSS3), web applications can be build to provide optimal usage by traditional PCs, tablets and smartphones".
b.	Specific recommendations		
	i.	Adopt technology to reduce personnel: Continue to add better tools to manage a large number of users with less manual maintenance	
	ii.	Rewrite code for **igaViewer**": Improve application to incorporate the lessons learned during the 2012 session	
	iii.	Provide greater wireless access to printers	
	iv.	Continue to provide personal training and assistance to legislators and staff during the transition period	
Representatives from Ball State University are here to answer any of your questions concerning the Report: (1) Gretchen Gutman, Associate Vice President, Governmental Relations; and (2) Andrew Hosey , Assistant Director, Digital Corps.			

Legislative iPad and Paperless Legislature Initiative **Possible Short-Term Steps for the 2013 Session** **(all of which can be taken within the current LSA budget)**			
a.	Continue use of iPads as a pilot project for an additional year		
	i.	Roll out to two additional standing committees, one each in the House and Senate, selected by the Speaker and the Pro Tem	
	ii.	Provide iPads to members of these committees.	
b.	Renew agreement with Ball State University for on-site training personal assistance for legislators and staff during the 2013 session with iPad use		
c.	Add features to **igaViewer** (primarily through a contract with Ball State University)		
	i.	Place committee packet information on igaViewer (but not proposed amendments)	
	ii.	Redesign to work better with devices other than iPads (android; windows) and move towards using modern web standards	
	iii.	Create a new "look and feel" that demonstrates more modern user interface design	
	iv.	Add Bill Watch functionality for legislators only	
	v.	Improve the functionality of auto attendant by providing supporting documents	
	vi.	Improve Committee screen in IgaViewer to allow access to packet information (standardized committee folder names)	
	vii.	Add Roll Call documents	
d.	Add features for standing committees		
	i.	Provide electronic vote sheet option for each committee:	
		(1)	Electronically record votes
		(2)	Electronically sign vote sheet
		(3)	Electronically file vote sheet and distribute in electronic from to LIC (but continue to require committee report to be filed and signed in paper form)
e.	Enhance bill and statute search tools		
	i.	Replace desktop version of Rocket Folio with an Internet browser version accessible from any computer that is connected to the Internet	

Legislative iPad and Paperless Legislature Initiative **Possible Short-Term Steps for the 2013 Session** **(all of which can be taken within the current LSA budget)**			
f.	Expand wireless access to legislative information		
	i.	Expand access to **igaViewer** to any legislator or staff member with a desktop, laptop, or tablet (iPad or another brand), regardless of whether they are a member of a standing committee using iPads.	
	ii.	Replace public FTP site with access to **igaViewer**.subject to authority of IT staff to block public access if bandwidth gets overloaded	
	iii.	Improve "strength" of public and private wireless access signal in all parts of the State House	
		(1)	More transmitters, as needed
		(2)	More bandwidth, as needed
		(3)	Possible creation of a public wireless system in the State House that is separate from the executive branch system
	iv.	Expand legislator and staff access to printers from wireless devices (still researching possible solutions)	
g.	Other improvements		
	1.	Eliminate jittery video from House chambers	
	2.	Eliminate dropped line in PDF documents viewed on iPads (researching)	

Exhibit 4

Report to the Legislative Services Agency

A retrospective on the 2012 Legislative Session paperless pilot and recommendations for future action.

April 2, 2012

Emerging Technologies and Media Development
Ball State University
2000 W. University, BC 209
Muncie, IN 47306

Thomas Fletcher Price, *Product Manager*

BALL STATE UNIVERSITY
EDUCATION REDEFINED

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Introduction

In cooperation with the Legislative Services Agency (LSA, the Agency), Ball State University's Department of Emerging Technologies (the Department) assisted the Indiana General Assembly's 2012 Legislative Session in a pilot program implementing iPads as an alternative to the paper distribution of legislative documents. This partnership was established by the 2011 Interim Legislative Council Data Processing Subcommittee after the Department completed a study on the flow of paper through the Statehouse[1] and a presentation to the Subcommittee on the Department's recommendations for the implementation of iPads for the 2012 Legislative Session.

During the 2012 Legislative Session, the Department provided two staff members (Thomas Fletcher Price, Andrew Hosey) and one graduate assistant (Brad Brutout) to LSA. These three were available on-site to assist and instruct legislators and staff in the use of iPads. Additionally, they staffed two committees (Senate Tax and Fiscal Policy, House Education). These two committees participated in the paperless pilot program by only distributing legislative documents to the committee members electronically.

Through observation, internal discussion as well as conversations with LSA staff, Legislators, the Department has identified two main areas for improvement and expansion of a long-term technology strategy. The primary recommendation is to overhaul and update the aging technology infrastructure. In conjunction with this process, LSA must provide for a new device culture within the Statehouse.

Infrastructure Overhaul

After discussing LSA's infrastructure with the IT staff and LSA's leadership, it is apparent that it is time for an overhaul. With the desired technological changes requested by LSA staff and the Legislative Council, it is impossible to move forward without such an overhaul. This project is paramount to the Agency's long term technology strategy.

While the Department is incapable of executing this scale of a technological project due to staffing limitations, we are willing to assist in the decision making process, RFP vetting and implementation.

New Device Ecosystem

As the Legislature transitions to a modern infrastructure, the future of personal computing must be considered. Since the introduction of the Apple iPad in 2010, the global and domestic tablet market has grown exponentially and is projected to only increase its pace.[2] Anecdotally, we observed a broad interest in iPad adoption among both Legislators and staff; especially interesting was the mid-session acquisition of iPads by the Senate Majority after they observed how useful the devices can be vis-à-vis reducing the amount of paper

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[1] Huer, Jonathan and Thomas Fletcher Price, "Report to the Legislative Council Data Processing Subcommittee: An examination of the flow of paper through the Indiana State Legislature and strategies for usage reduction" (Muncie, IN, 2011), 8.

[2] Satariano, Adam. "Apple's IPad Leads Surge in Tablet Shipments, Research Firm Says - Bloomberg." Bloomberg - Business & Financial News, Breaking News Headlines. http://www.bloomberg.com/news/2012-01-26/apple-s-ipad-leads-surge-in-tablet-shipments-research-firm-says.html (accessed March 22, 2012).

to be transported to committee hearings or session. Also notable was the lack of laptop use by the affected Legislators after the introduction of the iPads[3].

While Apple's iPad is currently the tablet market leader, it is important to consider how rapidly the consumer electronics market evolves. As noted in the Department's prior report:

> "Currently, the iPad is the market leader and is projected to maintain a 50% market share through 2014[4]. Therefore, the iPad is a safe recommendation for the members to adopt. However, the tablet market is rapidly evolving with Android tablets and Blackberry tablets gaining market share. [Microsoft is projected to release tablets in October 2012][5]. With the multiple uses of tablets, it is reasonable to assume that an increasing number of members and staff will have tablets of their own. All tablets would meet the top seven uses of laptops by members...."[6]

Device Agnosticism

The Department continues to express the need for a device agnostic system; designing or implementing any system specifically for a single consumer device is not an advisable strategy. Due to the rapidly evolving consumer electronics market and the extended nature of technology strategies, devices which are viable candidates at the inception of a project can quickly become outdated or even obsolete within months. For example, Apple has released three operating system (OS) updates and a hardware update since the paperless project began in October 2011. Additionally, Android has released three OS updates and four hardware changes; Blackberry has released one OS update.

Through the use of modern web technologies (such as HTML5, jQuery and CSS3), web applications can be built to provide optimal usage by traditional PCs, tablets and smartphones all from the same URL automatically and easily. Scaling, selective presentation of pertinent information and page realignment can all be easily controlled based on the device's screen size and user agent[7].

Recommended Changes

If LSA and the Legislative Council wish to continue rolling out iPads to Legislators, we suggest the following recommendations to improve the process. Many of these

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[3] Two exceptions to this were Rep. Clyde Kersey (D–Terre Haute) preferred his laptop on the House floor. He could not provide a reason for this preference. Rep. Cindy Noe (R-Indianapolis) preferred to use her laptop on the House floor because of the increased screen size.

[4] Pettey, Christy, and Holly Stevens. "Gartner Says Apple Will Have a Free Run in Tablet Market Holiday Season as Competitors Continue to Lag." Technology Research. http://www.gartner.com/it/page.jsp?id=1800514 (accessed October 25, 2011).

[5] Brodkin, Jon. "Windows 8 to debut on both x86 and ARM devices in October, report says." Ars Technica. http://arstechnica.com/business/news/2012/03/windows-8-to-debut-on-both-x86-and-arm-devices-in-october-report-says.ars (accessed March 22, 2012).

[6] Huer, Price 2011

[7] User agent in this context includes the browser being used as well as the version number. Because different browsers render a webpage differently, the user agent is often used for content negotiation, where the origin server selects suitable content or operating parameters for the response.

suggestions are based on technological innovations that have been developed or released in the past six months; further emphasizing the need for a nimble, adjustable technology strategy.

Recommendation #1: Apple Configurator

The present setup and administration process on all new iPads is a cumbersome and difficult process. At the inception of this pilot program, mobile device management (MDM) was a relatively nascent field in terms of enterprise deployment with Apple devices. After vetting several market leaders, LSA selected a third-party vendor, Zenprise MDM, to administer and deploy iPads to Legislators and staff. While this solution served well for the small scale deployment of the 2012 Legislative Session, the overall lack of necessary features and the cumbersome nature of the administration process make this solution unsuitable for a large scale deployment.

Following the announcement of the new iPad, Apple quietly released a new tool to help manage and deploy iPads and other iOS devices in an enterprise environment.[8] This application, Apple Configurator, provides the tools necessary to deploy these devices for free.[9] Importantly, Apple Configurator provides the ability to apply Volume Purchase Program (VPP) redemption codes to devices, as well as revoking them. In one scenario, this would enable LSA to provide copies of paid applications to personal devices of Legislators and staff, and then remove those applications once that device was no longer associated with the Statehouse. This would also alleviate the problems associated with the current app distribution strategy, and provide a significant cost savings to LSA if personal devices are supported.

Apple Configurator also eliminates the the most arduous process of iPad deployment: Apple ID creation. When distributing apps to the devices purchased through the VPP program under Zenprise, end users (*e.g.* Legislators, staff) are required to manually input redemption codes after creating an Apple ID. With Apple Configurator, an iPad administrator can push these apps to the device before it is delivered to the end user quickly and easily. This simple process change will reduce the time needed to deliver an iPad to an end user from an hour (60 minutes) to fifteen (15) minutes or less. Additionally, this eliminates the need to require end users to create Apple IDs, something that many users expressed concerns over.

Recommendation #2: IGA Viewer Rewrite

Aligning with the infrastructure reconstruction and a new, device-agnostic long term strategy, redeveloping the IGA Viewer[10] to embrace these ideologies. The current version of this web application was built on a truncated timeline without much guidance as to how anyone would use the application. Fortunately, we have a full session of data as to how the Legislators and staff have used their devices to access electronic information; this data can be used to rewrite the viewer.

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8 Metz, Cade. "Apple Sneaks Out Free Tool for Deploying iPad Army." Wired.com . http://www.wired.com/wiredenterprise/2012/03/apple-configurator/ (accessed March 23, 2012).

9 Zenprise MDM requires a licensing fee for each device deployed. Apple Configurator *does* require a computer using Apple's OSX operating system.

10 http://bills.iga.in.gov/igaviewer

The next iteration of this application *must* adhere to modern web standards as established by the World Wide Web Consortium[11] including HTML5, CSS3 compatibility and industry best practices. Further, it can be expanded to integrate authentication via LDAP and ActiveDirectory; this would enable LSA to distribute non-public committee documents via a secure channel to *all* committees by the 2013 session. Public access could also be provided to allow access to all public documents. This would provide a single, transparent portal for Legislators, staff and the public to access legislative documents easily while still offering the necessary security for confidential or non-public documents.

Expanding the capabilities of the IGA Viewer *may* have the added benefit of eliminating the need for the current WebDav folder system. This current system presents a cumbersome process for the Legislators and staff as they try to access data through the recommended application. Instead, they would be able to access the necessary documents via the web application. However, note taking and other annotations would still necessitate a third party application.

Development of this level of web application will require either expanding the current LSA IT staff to include a web developer and a web designer, or contracting with an established development team. Executing this level of development with the demands already placed on the LSA IT staff is out of the scope of their available resources.

Recommendation #3: Education & Training

Ultimately, any new system introduction will fail without proper education and training for Legislators, staff and any individuals responsible for supporting the new ecosystem. While the Department's contributions to this end were noticeable during the 2012 Legislative Session, continuing this partnership indefinitely is not feasible or manageable for either party. We suggest the creation of a new position.

This new position should be dedicated to implementing, developing strategies for and supporting all tertiary12 devices administered by LSA. Because these devices have a different implementation strategy and administration than traditional PCs, this is a role that cannot be fulfilled by the current IT staff while maintaining the commitment to their current roles. Whomever fills this role needs to be familiar with large-scale deployments of tablet devices as well as their maintenance and administration.

To further encourage the adoption and proper use of tablet devices in lieu of PCs or paper, each Legislator and staff member needs to receive appropriate training. While this was attempted in during the 2012 pilot program, the effectiveness of these sessions was limited due to the voluntary nature of the sessions. Providing individual training when each end user is initially given their tablet, as well as at least one follow up session after they've had a chance to use and experiment with the device is critical – oftentimes users do not know what questions they may have without first using the device for several weeks.

Recommendation #4: Printers

In January, Lantronix announced a new product, the xPrintServer.[13] This small, inexpensive device attaches to a networked printer and allows iOS devices to print wirelessly, eliminating the need to purchase specialty printers just for iPad use.

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[11] http://www.w3c.org

[12] Non-PC devices. Specifically, tablets.

[13] http://www.lantronix.com/it-management/mobile-print-servers/xprintserver.html

Final Thoughts

In our opinion, the pilot program to introduce iPads and a paperless environment to the 2012 Legislative Session was highly successful. While the large scale expansion of the current system to a larger test group is inadvisable, the introduction of minor changes to the mechanisms of support and deployment would allow for the rapid expansion of this project, possibly to the full assembly by 2013.

As noted, the most important long term step for the success of any technology strategy is the overhaul of the present infrastructure. It is an outdated system that inhibits the IT staff's ability to supply requested and required features. This is a large scale project that will require an established vendor with a proven history of enterprise level infrastructure changes.

However, expansion of a tablet computing ecosystem is viable in both the short and long terms. Success of such a system is dependent on one key ideology: device agnosticism. The rapidly evolving nature of the consumer electronics industry prevents basing any extended technology strategy on a single device.

Further, utilizing newly released tools, such as Apple Configurator or Lantronix's xPrinterServer, will allow for a simpler implementation process. Expanding and improving the IGA Viewer to adhere to modern web standards and increasing the overall feature set will decrease the onus on LSA's staff to maintain a complex, redundant file directory system by providing browser access to committee and legislative documents. By adhering to modern web standards, properly confidentiality and privacy can be provided for the necessary documents while still allowing transparent public access to the necessary documents easily.

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Exhibit 5

Social Media

I want to discuss our social media blocking policy, what other states are doing, and consider wether to change or keep our existing policy.

Social media sites have become more mainstream in todays world. They may be used for legitimate communications between individuals, as well as for corporate use in disseminating information, and even for support of software.

We recently had to make an exemption for one of our IT staff because of a software problem, and that software was only supported via facebook.

So what is our policy? Quite simply, by default, we block access to all social media, as well as adult content, gambling, racism and hate, militancy and extremist, and illegal sites. However, we maintain a comprehensive list of individuals that are exempt from specific categories. There are currently 195 people that are exempt from social media blocking and can access those sites.

Exemptions are allowed based on several criteria. It may be because of the necessity to do research on a particular topic for a bill, to check on potential employees, to do constituent communications, or other business purposes.

The problem we have today is that our exemption list relies on knowing who an individual is and what access permissions they are allowed. This is based on network login id, and what location you used when you logged in. Therefore, if you login and then move locations, or if you access network services without actually logging in, you may be denied access to services you are normally allowed to have. This can occur anytime you are using your phone, or some other device that does not login to the network. You are therefore assumed to be a guest, with no access to data, and no rights based on exemptions. Ipads are the prime example of this. You can't access blocked sites using an iPad if you are on the General Assembly network. And iPads do not have the software capability to log in and gain access all your normal permissions.

These issues come up every week. Someone will ask why they are being blocked. And it is normally because they are using a device that is not logged in.

I've given you a handout from NCSL that shows you what other state are doing with social media. As you can see, most states do use social medial. Some states activiely block access even though they use the sites, and Indiana is one of those states.

However, because of the issues we have in letting users get to these sites when they should be able to, and because these sites are really used for more legitimate purposes by most people and businesses, I would like the Subcommittee to consider recommending to the full council to change the policy on social media and allow access to these sites without a specific exemption, ~~for the default "blocked" policy~~.

Exhibit 6

Legislative Social Media Sites

Last update: April 25, 2012

Legislative caucuses are embracing social networking sites like Facebook, Twitter, and YouTube to communicate with constituents, and legislative agencies also increasingly have a presence in social media. This web page tracks legislative caucuses, chambers, agencies, committees and offices that use these tools. (Note: Some pages linked below may require registration or signing in (e.g., on Facebook) before they can be viewed.)

(See also:** Legislative Social Networking Policies **and** NCSL's Blog: The Thicket **(with links to state blogs and legislators' blogs), and follow NCSL on** Facebook **and on Twitter: @**NCSLCOMM**).

State	Site	Blog, Other	Facebook	Google+, MySpace	Twitter	YouTube
Alabama	House Republicans	Flickr	Facebook		Twitter	YouTube
	House Democrats	Blog	Facebook		Twitter	YouTube
	Senate Democrats		Facebook			
Alaska	House Democrats		Facebook		Twitter	YouTube
	House Republicans		Facebook		Twitter	
	Senate Democrats					
	Senate Republicans					
	Senate Bipartisan Working Group		Facebook	Google+	Twitter	YouTube
Arkansas	Senate	Flickr			Twitter	YouTube
	House	Flickr	Facebook		Twitter	
Arizona	House Democrats	Blog	Facebook		Twitter	YouTube
	House Republicans	Blog/Flickr	Facebook		Twitter	
	Senate Democrats	Blog	Facebook		Twitter	
	Senate Republicans	Blog	Facebook		Twitter	
California	Assembly Democrats		Facebook			YouTube
	Assembly Republicans				Twitter	
	Senate Democrats		Facebook		Twitter	YouTube
	Senate Republicans				Twitter	
Colorado	**House Democrats**	Blog	Facebook	Google+	Twitter	
	House Republicans	Blog	Facebook		Twitter	
	Senate Democrats	Blog	Facebook		Twitter	
	Senate Republicans		Facebook	Google+	Twitter	
	Legislative Council				Twitter	
	Office of Legislative Legal Services				Twitter	
	House and Senate Committees				**Twitter (see committee** web pages**)**	
Connecticut	House Democrats		Facebook		Twitter	YouTube
	House Republicans	Blog	Facebook		Twitter	YouTube
	Senate Democrats		Facebook		Twitter	YouTube
	Senate Republicans	Blog			Twitter	YouTube
	Office of Legislative Research	Blog				
Delaware	House Democrats		Facebook		Twitter	
	House Republicans		Facebook		Twitter	
	Senate Republicans					
Florida	Legislature				Twitter	
	Senate	Picasa			Twitter	YouTube
	Senate Republicans	Picasa	Facebook		Twitter	YouTube
	Senate Democrats	Picasa			Twitter	YouTube
	House		Facebook		Twitter	YouTube
	House Redistricting Committee				Twitter	
	House Democrats		Facebook		Twitter	
	OPPAGA				Twitter	

Georgia	House				Twitter	
	Senate				Twitter	YouTube
	House Democrats					YouTube
	Senate Democrats	Blog	Facebook			
Hawaii	Legislative Reference Bureau Library				Twitter	
	House Democrats	Blog			Twitter	YouTube
	House Republicans	Blog	Facebook		Twitter	
	Senate Democrats	Flickr	Facebook		Twitter	YouTube
	Senate Commerce & Consumer Protection Committee				Twitter	
	Senate Education Committee				Twitter	
	Senate Ways and Means				Twitter	
Idaho	**Senate Republicans**		Facebook			
	Senate Education Committee		Facebook		Twitter	
	Office of Performance Evaluations	LinkedIn	Facebook	Google+	Twitter	
Illinois	House Democrats					
	House Republicans	Vimeo	Facebook		Twitter	
	Senate Democrats	Blog	Facebook	MySpace	Twitter	YouTube
	Senate Republicans	Flickr	Facebook		Twitter	YouTube
Indiana	House Democrats		Facebook		Twitter	YouTube
	House Republicans		Facebook		Twitter	YouTube
	Senate Democrats	Google Moderator/Blog	Facebook		Twitter	YouTube
	Senate Republicans	Flickr			Twitter	YouTube
Iowa	House Democrats	Blog	Facebook		Twitter	YouTube
	House Republicans	Blog	Facebook		Twitter	YouTube
	Senate Democrats	Blog/Picasa	Facebook		Twitter	YouTube
	Senate Republicans	Blog			Twitter	YouTube
	Legislative Service Agency				Twitter	
Kansas	House Democrats		Facebook		Twitter	YouTube
	House Republicans		Facebook			
	Senate Democrats				Twitter	
	Senate Republicans					
Kentucky	House Democrats		Facebook			
	House Republicans	Flickr	Facebook		Twitter	YouTube
	Senate Democrats		Facebook			
Louisiana	Legislative Women's Caucus		Facebook			
	House of Representatives	Blog/Picasa	Facebook			YouTube
	House Public Information Office	Blog				
	House Redistricting		Facebook		Twitter	
	Poynter Legislative Research Library		Facebook			
Maine	House Democrats		Facebook		Twitter	
	House Republicans					
	Senate Democrats		Facebook			YouTube
	Senate Republicans	BlipTV	Facebook		Twitter	YouTube
	Senate				Twitter	
Maryland	House Democrats	Blog				
	House Republicans	Blog	Facebook			YouTube
	Senate Democrats		Facebook		Twitter	YouTube
	Senate Republicans		Facebook			YouTube
Massachusetts	**House Republicans**	Blog	Facebook			
	Senate Republicans	Blog	Facebook			
Michigan	House Democrats		Facebook		Twitter	YouTube
	House Republicans		Facebook		Twitter	YouTube
	Senate Democrats	Blog	Facebook		Twitter	YouTube
	Senate Republicans		Facebook		Twitter	

	Legislature				Twitter (bills) Twitter (meetings) Twitter (laws)	
Minnesota	House DFL		Facebook		Twitter	
	House Republicans	Blog	Facebook	Google+	Twitter	YouTube
	Senate				Twitter	
	Senate DFL		Facebook		Twitter	YouTube
	Senate Republicans		Facebook	Google+	Twitter	YouTube
	Legislative Auditor	LinkedIn	Facebook		Twitter	
	Legislative Reference Library				Twitter	
	House Fiscal Analysis Department				Twitter	
	House Public Information Services				Twitter	YouTube
	Senate Media Services				Twitter	YouTube
	Senate Counsel, Research, and Fiscal Analysis				Twitter	
Missouri	House Democrats				Twitter	
	House Communications Office				Twitter	YouTube
	Senate	Blog			Twitter	
Montana	Senate Democrats		Facebook			
Nebraska	Nebraska Legislature	Blog			Twitter	
Nevada	Assembly Democrats		Facebook		Twitter (list)	
	Senate Democrats	Blog	Facebook		Twitter	
	Senate Republicans		Facebook		Twitter	
	Secretary of Senate	Blog			Twitter	
New Hampshire	House of Representatives				Twitter	
	House Republicans		Facebook			
	Senate Democrats		Facebook			
	Senate Republicans		Facebook		Twitter	
New Jersey	Assembly Democrats	Vimeo	Facebook		Twitter	YouTube
	Assembly Republicans		Facebook		Twitter	YouTube
	Senate Democrats	Pinterest	Facebook	Google+	Twitter	YouTube
	Senate Republicans		Facebook	Google+	Twitter	YouTube
New Mexico	House Democrats		Facebook		Twitter	
	House Republicans		Facebook		Twitter	
	Senate Democrats		Facebook		Twitter	
	Legislature				Twitter	
New York	Assembly Democrats				Twitter	
	Senate	Blog	Facebook	Google+	Twitter	YouTube
	Senate Technology Team			Google+		
North Carolina	House Democrats		Facebook		Twitter	
	House Republicans	Blog	Facebook		Twitter	You Tube
	Senate Democrats		Facebook		Twitter	
	Senate Republicans		Facebook		Twitter	
Ohio	House Democrats	Blog	Facebook		Twitter	YouTube
	House Republicans	Blog	Facebook			YouTube
	Senate Democrats		Facebook		Twitter	YouTube
	Senate Republicans		Facebook		Twitter	YouTube
Oklahoma	House Republicans				Twitter	
	House Democrats		Facebook			
	Senate Democrats		Facebook			
	Senate Republicans		Facebook		Twitter	
	Senate				Twitter	
Oregon	Legislature					YouTube
	House Democrats		Facebook		Twitter	
	House Republicans		Facebook		Twitter	YouTube
	Senate Democrats	Blog/Flickr	Facebook		Twitter	

	Senate Republicans		Facebook		Twitter	
Pennsylvania	House Democrats		Facebook		Twitter	YouTube
	House Republicans		Facebook		Twitter	YouTube
	Senate Democrats		Facebook		Twitter	
	Senate Republicans	Vimeo			Twitter	
Rhode Island	Senate			Google+		YouTube
South Carolina	House Democrats				Twitter	
	House Republicans	Flickr	Facebook		Twitter	YouTube
	Senate Democrats	Blog				
	Senate Republicans	Flickr, UStream	Facebook		Twitter	YouTube
South Dakota	**House Democrats**				Twitter	
	Senate Democrats				Twitter	
	Senate Republicans				Twitter	
Tennessee	House Democrats		Facebook			
	House Republicans		Facebook			
	Senate Democrats		Facebook		Twitter	
	Senate Republicans		Facebook			
Texas	House Republicans		Facebook		Twitter	YouTube
	Legislature				Twitter	
	Legislative Reference Library				Twitter	
	Senate Committee on Business and Commerce	Blog				
	Legislative Council		Facebook		Twitter	
Utah	House Democrats		Facebook		Twitter	YouTube
	House Republicans				Twitter	
	House	Blog, Flickr, Soundcloud, Ustream	Facebook	Google+	Twitter	YouTube
	Senate	Blog, Flickr, Picasa, Ustream	Facebook	Google+	Twitter	YouTube
	Senate Democrats	Blog, Tumblr	Facebook		Twitter	YouTube
	Senate (current and former Utah Senate members and staff)	LinkedIn Group				
	Legislative Research			Google+		
Vermont	**House Republicans**		Facebook		Twitter	
Virginia	House				Twitter	YouTube
	Senate				Twitter	
	House Democrats	Blog	Facebook		Twitter	YouTube
	House Republicans	Blog, Flickr	Facebook		Twitter	YouTube
	Senate Democrats		Facebook			
	Senate Republicans	Flickr	Facebook		Twitter	YouTube
Washington	House Democrats	Blog, Flickr			Twitter	YouTube
	House Republicans	Flickr			Twitter	
	House					YouTube
	Senate Democrats	Blog, Google Moderator			Twitter	YouTube
	Senate Republicans	Blog/ Flickr	Facebook		Twitter	YouTube
	Legislature			Google+		
West Virginia	Legislature		Facebook		Twitter	
	House				Twitter	
	House Republicans		Facebook			
	Senate				Twitter	YouTube
	Senate Republicans		Facebook			
	House Redistricting Committee (and other House news)				Twitter	
	Senate Redistricting					YouTube
Wisconsin	Assembly Democrats	Blog	Facebook		Twitter	
	Assembly Republicans		Facebook			
	Senate Democrats	Flickr	Facebook		Twitter	
	Legislative Reference Bureau		Facebook		Twitter	YouTube

Wyoming	Legislature				Twitter	
(48 states*)						
DC Council	Council				Twitter	
Puerto Rico Senate	Senate	Vimeo			Twitter	YouTube

* States with no active social media sites found: Mississippi and North Dakota. Did we miss your official caucus or legislative social networking site? Contact Pam Greenberg, NCSL Denver Office, with updates and additions. (303) 364-7700 ext. 1413, pam.greenberg@ncsl.org.

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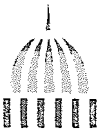
Exhibit 7



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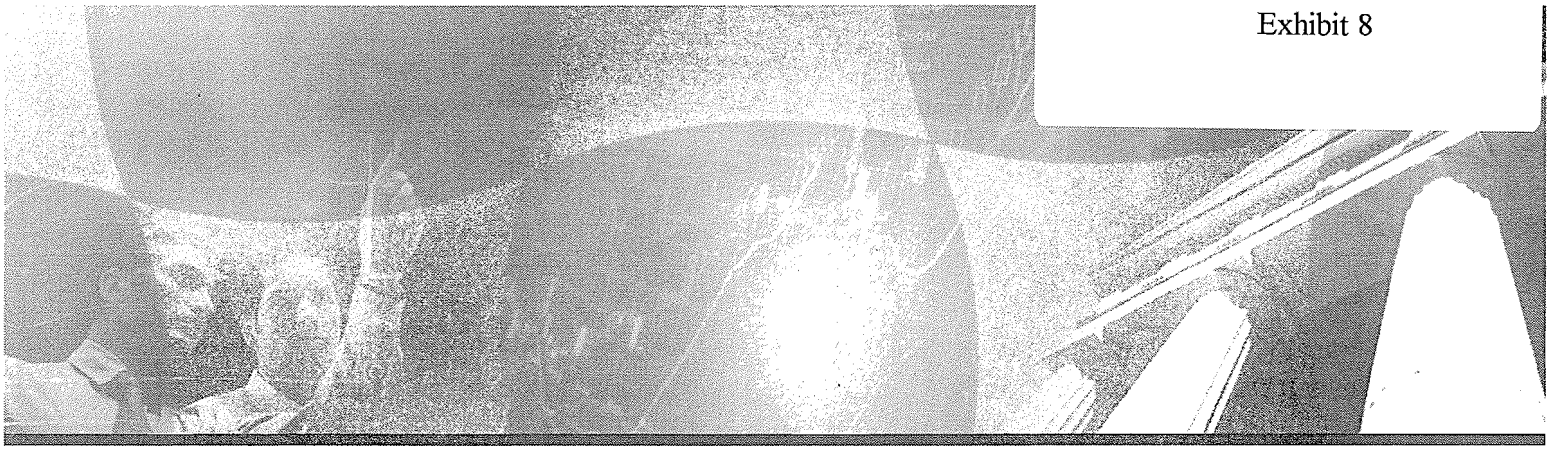
Blocking of Social Media Sites in State Legislatures

On February21, 2012, members of the electronic discussion group of the National Association of Legislative Information Technology were asked if their legislature blocks legislator or staff access to Facebook or other social media sites.

The table below shows the responses received from 13 states:

State	Are Sites Blocked?
Arkansas	For some. Legislators and House and Senate staff have full access to any and all social networking sites. The legislative research staff (joint support) is blocked from all social media sites.
Delaware	Yes. Delaware blocks all social sites for legislators and staff. Specific access is given by the core Information and Technology agency, once approved by the caucus and by the Government Information Center (sub-agency of the Department of State). The House and Senate generally limit approved access to Public Relations staff.
Hawaii Senate	No
Idaho	No
Illinois	No
Kansas	No
Maryland	No (see 2009 article about previous blocking of social media sites)
Massachusetts	No (see 2011 article about previous blocking of social media sites)
Michigan Senate	No
Montana	Yes. The state IT department blocks all social media access (YouTube, Facebook, Twitter) from the state network. In order to access these, an exception needs to be granted for each department.
Oregon	No
South Carolina	No
West Virginia	No

Exhibit 8



PROPYLON

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Statement of Work for the Indiana General Assembly

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Version	Final with editorial corrections

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1 Executive Summary

Propylon would like to thank the staff of the Indiana General Assembly (hereafter referred to as the Legislature) that contributed to this Statement of Work report. The help we received during this project from each of the divisions was very detailed and contributed greatly to the findings and recommendations of this report. The Legislature has built IT systems that, with the hard work of staff, get the job done. However as technology changes and demands on the Legislature, for the information it provides, increases the current systems need major upgrading/ replacement to allow staff to continue to deliver a service that they have been proud to deliver for years.

1.1 Background to Statement of Work

The Legislature recently conducted a successful pilot project involving the use of Apple iPads in the House Education and the Senate State Tax and Fiscal Policy Committees. The Legislature is interested in expanding this pilot into full production across all committees and more generally, using the benefits of technology to make legislative data available real-time on the web. This will help members, staff, agencies, the public and businesses to interact with the Legislature. This will also introduce efficiencies to the legislative processes and allow for the provision of new services.

The Legislature recognizes that paperless initiatives such as the iPads will create extra requirements on the existing IT systems and infrastructure. The Legislature is therefore conducting an end-to-end analysis of the existing systems/processes/infrastructure with a view to not only enabling the iPads roll-out, but also addressing some other issues with the current systems that have been identified by both staff and members.

Following discussions and demonstrations, Propylon was engaged to examine the existing systems, review where issues may exist and make recommendations for how the applications might be changed to better deliver the business goals of the Legislature. The Propylon OCDM (Output Centric Design Methodology) process was used to create a well defined scope and performance metrics for project success. The work was carried out over four weeks with a mixture of on-site meetings and off-site documentation work.

The recommendations made in this report are based on the information made available to Propylon during this process. All artifacts gathered have been stored in a data/document repository at the Legislature with shared access between the Legislature and Propylon.

1.2 Summary of Findings

During the analysis our team was able to identify a number of requirements for provision of new services as well as identify issues in the systems implemented today. The following summary list is a mix of current issues and new requirements:

- New requirements for information provision through technologies such as tablets/ ipads is putting an increasing strain on the current systems and IT infrastructure.
- Legislators are requesting more information to be available to the public in real-time as events are happening in the Legislature.
- Staff are restricted by the current systems in place as to the services they can provide.
- The IT staff and technicians in the divisions are consumed by maintaining the current systems. They do not have the capacity to provide additional services.
- A dependency has grown on key individuals which is a risk in the case where these staff are not available.
- The current IT systems need to be significantly upgraded/ replaced if the Legislature is going to be able to provide the new services required.

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- The Legislature needs complete control over what is published to the legislative website and when it is published. The Legislature currently does not have this and it causes many issues.
- The back-end business processes need to be reviewed and succession planning needs to be implemented.
- An IT architecture that manages the digital workflow of the legislative process, and all of the data in it, needs to be implemented in a way that provides easy access for members, staff, the public, businesses and agencies. This architecture needs to respect the privilege and procedural rules of the Legislature.
- The current systems technologies are difficult to find skills to support. This is a risk to IT service provision to the Legislature in the future.
- External requirements on the Legislature to produce and make available all information in a digital format, that is easy to search and navigate, are growing.
- The provision of member interfaces that are customized to each member is a growing requirement. These types of tools will provide major benefits to members and their staff to organize and make accessible the legislative information with a particular focus on the individual member.
- There is a requirement to reduce the amount of paper throughout the legislative process. This has a significant impact on the provenance requirements of digital material.
- Critical pieces of information are being stored in non-centralized areas that do not have redundancy.
- A single consistent view of all legislative data is required across organizational boundaries.

To meet the current challenges and provide the new services required, the first step that needs to be implemented is an information architecture that traces how all information moves through the systems and defines discrete points where that information should be published and in what format(s). At the heart of the proposed approach is a Legislative Information Architecture that is independent of any application, platform or vendor. The architecture encompasses all aspects of the legislative process end-to-end. We believe that this architecture will allow the Legislature to move forward with confidence, not only based on today's known initiatives such as the IGAViewer/ iPads but new initiatives that will doubtlessly come up in the future.

The systems that are in use today are not well integrated bringing the following risks:

- The current processes rely on individuals who understand what information needs to be acted on and when, to ensure the success of the legislative process. A number of these processes should be completed systematically allowing for automatic alerts to all necessary parties as these steps are completed.
- Where systems are not integrated, it can lead to inconsistencies in information between systems (the digest is an example of this, where it can be out of synch between the chamber and LSA).
- The automatic publication of information to the intra/ internet is problematic as the rules for publication are often dependent on events happening across systems.
- The lack of integration can cause delays in the legislative processing as the staff are forced to work around the fact that the systems are not automatically sharing information.
- Additional resource requirement for re-keying and moving of data limits the amount of time staff can spend on value added services (such as addition of meta-data for improved searching).

Implementing an overall information architecture that respects privilege and procedure while ensuring the benefits of an integrated system are realized is critical for the Legislature to solve the current issues in IT systems. This will also provide the new services required by the Legislature's stakeholders, which are:- the members, staff, public, businesses, and agencies.

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1.3 Summary of Recommendations

The recommendations set out in this section relates not only to the IT systems but also to the processes that these IT systems are being used to support. It is important for the Legislature to realize that the benefits of any new system will involve changes to existing business processes. If this is not done then old restrictions will be built into any new system preventing the benefits being delivered.

IT system Recommendations:

- Implement an Enterprise Information Architecture that covers how information is managed in systems across the Legislature.
- In the Enterprise Information Architecture ensure that the information items are treated as assets that are entered once and reused where possible.
- Take complete control over the website publishing. The Legislature should have the ability to control what is published, when it is published and have the ability to roll-back changes when something is published inadvertently.
- Provide a single source for bill status information across the Legislature. Remove tracking systems that are replicating information which can lead to consistency issues. Ensure that multiple interfaces can be built to the bill status information to allow the consumption of the data from a single consistent feed.
- Put all source code for applications in the divisions under source control to ensure that quality is built into the software and is maintained as the software changes over time. This will also make the applications easier to support.
- All legislative information should be stored in a central information system with rules implemented to protect privilege and procedure. Centralizing the legislative information should also simplify supporting the applications and allow for cross-training of staff to reduce risk.
- Remove unnecessary information silos while protecting procedure and quality, and supporting security and confidentiality considerations.
- Ensure all legislative data is stored on a centralized system that has fail-over and redundancy in place.
- Use reliable system notifications (persistent queues) to support the business process. This will ensure that notifications are persisted even when there are issues and will allow for more automation of system tasks.
- Provide the data feeds of legislative information in machine readable format (recommend a combination of REST, JSON and XML) for web based standards.
- Ensure that the new IT platform has interfaces that will support the provision of new services in the future.

There are also a number of project recommendations for the Legislature on items outside of the system architecture:

- Establish a Sponsor Group with stakeholders representing each of the groups investing in the new system. This should be a leadership group that sets high level goals for the project.
- Appoint a project manager that has responsibility of delivery of a new project. This should be completed as quickly as possible as the amount of planning involved is significant.
- The OCR processes need to be more tightly integrated with OBDAR and OFMA. We recommend appointing a business process change analyst/ manager that will work with the project manager to carry out this task.
- Establish defined protocols for interaction of LSA and Caucus attorneys to help reduce issues such as statute conflicts and re-keying. A new system implementation should make this interaction systematic where possible.

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- Cross-train staff where dependencies exist on individuals today. This is an important risk mitigation strategy.

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2 Introduction: Approach and Scope

To complete the Statement of Work we used the Propylon OCDM (Output Centric Design Methodology) as the process for ensuring the exercise was carried out in a structured fashion and covered scope correctly. The Propylon OCDM process has been created specifically to analyze legislative projects and provide a framework for our clients to get a deep understanding of the scope of the current systems in terms of what these systems must produce, when and where they must be produced, why they are produced and how they are produced. The starting point for legislative analysis is a discovery of the "as is" situation in terms of systems and processes. In order to get an overview of the Legislature as a whole, we start with a focus on the outputs produced. These outputs fall into two categories:

- Outputs produced for consumption internally e.g. amend/repeal reports, work management reports, confidential drafts, etc.
- Outputs produced for consumption both internally and externally e.g. bills, journals, calendars, statute books, bill status, website, etc.

In parallel to gathering and categorizing of outputs, the Propylon analysts ran a number of workshops with the Legislative staff to understand the processes in use today. The findings of these workshops were documented and used as a basis for the findings in this report and making recommendations on how to move forward.

Our technical staff had a number of meetings with the Legislative IT staff to fully understand the technologies currently being used to support the legislative process. This involved detailed question and answer sessions as well as demonstrations to get a full appreciation of how the existing technologies are used to support the processes and identify current issues.

The accumulated understanding of the outputs is then combined with an understanding of the current change drivers (business goals, pain points, success metrics) to synthesize a "to be" picture. The "as is" and "to be" material is then used to produce a phased implementation plan that addresses the critical business continuity imperatives that all Legislatures operate under. Finally, a set of recommendations is included covering a wide range of areas that touch on the IT environment of the Legislature.

In order to frame the statement of work project, a high level scope determination was made at the outset. All aspects of the operation of the Legislative Services Agency (LSA), including Indiana Administrative Code, have been analyzed with the following exceptions:

- The Page Office System
- Constituent Management Functions
- Human Resource functions
- The data warehousing project related to Property Tax (OFMA)
- The redistricting/reapportionment/reprecincting functions (OCD)

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3 Drivers and Success Metrics

In our analysis, a number of drivers and success metrics for change to the Legislature's current IT systems have been identified. These are outlined in the sections below. The list is not exhaustive for capturing each improvement or change that was suggested during the analysis but looks at rolling these up under summary headings.

3.1 Web-based Interaction with the Legislature

The requirements on the Legislature have been growing as the world of technology changes. The requests that LSA receive for new services is growing and the current systems are struggling to cope with the requests. The current systems are set-up to provide services as they were defined 14 years ago. The new requirements mean that each new service requirement is consuming more of the scarce human resources in the Legislature to the point where no new service can be added without effecting existing ones. The advent of tablets/ iPads is leading to even more demands as members, staff, the public, businesses and agencies expect to consume the information from the Legislature on-line as it is happening in real-time.

The ability for the Legislature to produce updates for what is happening in the legislative session in real-time (or as policy allows for it) is a key measure for the Legislature. The technology should not restrict the policy decision.

3.2 Paper Reduction and Paperless Committees

The iPad pilot in the House Education and Senate State Tax and Fiscal Policy Committees was very successful and there is a desire to move to full production mode. The recent report on paper usage in the Legislature suggests that a single bill currently results in 11,000 sheets of paper. The cost savings to the Legislature have been identified as significant. The Legislature wants to implement paperless committees in an efficient way that makes it easy for committee staff to publish committee information to the web.

The publishing of committee information to committee apps and websites should not be restricted to any one committee. The tools should be provided to all participating committees. The information architecture is a key enabler of ensuring this can be done in efficient way for each committee. The provision of data feeds is also important to ensure that multiple device types are supported for consuming the data. The number of these devices is constantly evolving.

3.3 Control of the Information Published to the Website

The staff appreciate that most people outside the Legislature depend on the legislative website as a source of information to follow what is happening during the legislative session. At some points in the session there is currently a 30 to 60 minute delay in updating the website which impacts both documents (i.e. bills) and bill status. This is a cause of frustration among staff and members of the public.

Some internal systems such as Legisoft are updated at periodic intervals rather than immediately. At times in the legislative session when things are moving fast, this delay is particularly problematic.

The Legislature needs to have the ability to control what is published to the web, when it is published, and update or remove an item where appropriate.

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3.4 Information Consistency

There are a large number of copies/variations/views available of critical business items such as:

- bill text
- fiscal note text
- bill sponsors
- bill digests
- bill status etc.

When faced with a discrepancy (for example, between Legisoft and the Website), determining which view to consider accurate and determining how the discrepancy came about, can be are problematic. This is frustrating for staff that are under time pressure to get the job done during session as it is for members when they need quick access for decision making.

The Enterprise Information Architecture should ensure that information in multiple applications is consistent and where possible read from the one source.

3.5 Business Rule Flexibility

The systems implemented today have hard coded rules that are being constantly worked around. These work-arounds are time consuming and only known to a very small number of staff. This introduces the risk of delays in the legislative process. Examples of the rules implemented include limitations in the amendment numbers and difficulties in switching between special and regular sessions. As the business changes in the Legislature the number of these work-arounds grows and consumes more staff time.

The staff in the Legislature require a system that will allow flexibility when dealing with events that are not frequent and are exception to normal work flows. The system should have tools that allow non-programming staff to configure the work where needed.

3.6 Legacy Technologies

There is concern about the status of some of the technologies that are foundational to the current systems.

- Visual Foxpro
- Borland Delphi
- Corel WordPerfect Macro Language
- Folio Views
- Apache Cocoon

The Legislature needs to be in a position where the system implemented is built on a technology stack that has a greater pool of people with the IT skills to support it.

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4 The Current Systems Architecture

4.1 Overview

Many of the current IT systems in the Legislature were implemented approximately 10 years ago. The core systems in place today took approximately two years to build. Since the systems were implemented , modifications, extensions and workarounds have been put in place to supplement the original systems.

The current situation can be characterized as stable but with a number of issues that require a lot of of staff time to address. In other words, the systems currently work but there is a limit to how well they can work because of the systemic issues present. The problem areas have been managed through the use of process-based workarounds such as well tested "break-fix"procedures combined with significant hard work and dedication on the part of key individuals in the Legislature.

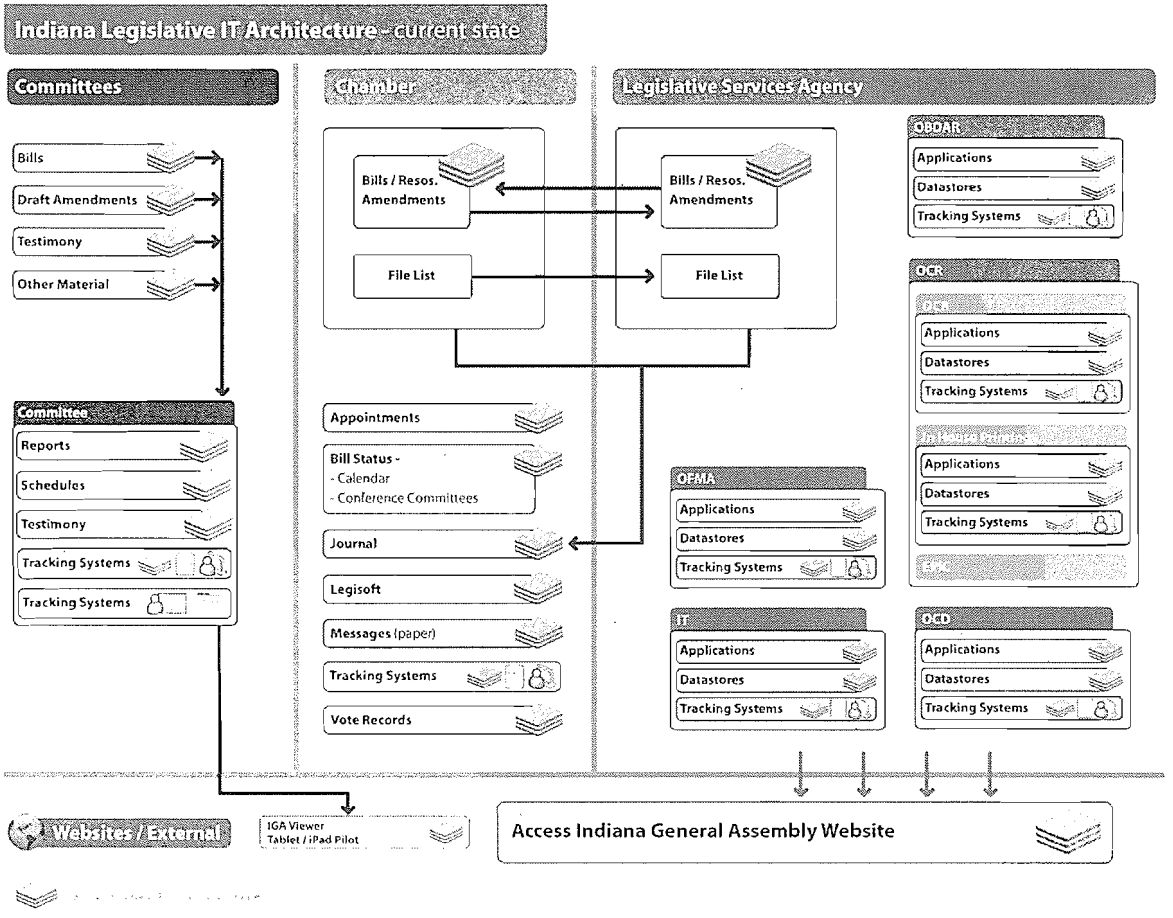

Figure 4.1: Current IT Architecture

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The primary issues we have found are discussed below under the following headings:

- Information Silos
- Information Consistency
- Information Latency
- Compare-centric and proofing-centric workflows
- Audit Trail
- Hard-wired Business Logic and Outputs
- Notifications

4.2 Information Silos

The Bill Drafting system and the Bill Status system are two of the main epicenters of IT in the Legislature[1]. Although there are some integrations between the two, many of the current challenges can be traced back to these two systems, their functionality and their interaction with the main organizational divisions: OBDAR, OCR/IHP, OFMA and Chambers/Committees.

The two systems are integrated to some degree by code internal to the systems themselves but much of the practical functionality of the Legislature's current systems can be traced to "glue" systems that intermediate between the business processes and the two back-end systems, often using shared network drives as the data store.

The "glue" takes a number of forms:

- A large set of WordPerfect macros ranging from small/simple to very large and complex (approximately 500+ between OBDAR, OCR, OFMA). Many of these are mission critical.
- A set of Delphi and Foxpro Applications (Used in Bill Status, Bill Drafting and in batch processing Robots etc.)
- A set of internal reports and internal cached data formats (e.g. Source Sheets, Last Action)
- Key knowledge workers who know all the workarounds to ensure the front office is not effected
- Data re-keying and manual data moving
- Ad-hoc tracking/management spreadsheets, documents and small databases (e.g. Excel and Microsoft Access)

There are problematic "lock-step" time dependencies between many of the component pieces and the glue. Many batch processes (the robots) trigger behavior based on time-stamps of files. When the robots need to be restarted, problems occur getting caught back up to date. There can be missing/duplicated data transfers, missing/duplicated notifications to other robots which cause negative event cascades to later parts of the workflow e.g. files on the website. These issues take up a large amount of time from technical staff in the IT department as well as a few key staff in the divisions of LSA. Some of these fixes are dependent on knowledge of individuals which poses a risk to the legislative process. Should these staff members be unable to attend work for any reason then the issues will take longer to fix and could cause real disruption to legislative business.

1 It is important to note from the outset that the Bill Drafting System is, in fact, a lot more than just a Bill Drafting system e.g. statute management and that Bill Status is also a lot more than just Bill Status e.g. Committees/Calendars

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4.3 Information Consistency

The current legislative workflows feature a large number of copies, conversions and variations of key assets such as bills, amendments, statute sections, etc. This is the result of many silos of information existing to manage the data as there is not one single IT architecture providing staff the ability to easily manage and version documents. In most workflow steps (from request through to enrolled bill) there are multiple copies made of WordPerfect files, PDF files, HTML files and Folio files. There are multiple entries made in database tables and tracking spreadsheets. A rough estimate is that at any one point in a typical 8 stage bill workflow, there are over 30 possibly different "views" available into the bill itself. Moreover, this causes a significant amount of time being spent in establishing which "view" should be considered accurate in the event that a discrepancy is identified.

There is very little content versioning at present. Due to the nature of the IT architecture it is easy to over-write important files accidentally. It is also difficult to keep the correct versions of related documents together, for example, the text of a fiscal note is the correct one for a given bill text. An LS can be modified (for example to make a correction) but there is no way to visually differentiate the LS as originally released by ODBAR and the LS post edit. Another example of the impact of this in a different area is when a motion is expunged in journals which can result in two copies of a journal for the same day having different contents yet with the same name.

Information consistency issues manifest in format conversions also. For example, every time a WordPerfect bill is converted to PDF or HTML or Folio Views there is scope for the introduction of variation. An example of this is the web pages being created at present for the website. This is happening outside of the control of the Legislature.

Bill information is split into a number of separate storage areas and, because of the silo nature of the current systems, these can get out of synch. Some examples:

- The source sheets that are critical to OCR's process are generated with human intervention. In other words, it is necessary for the user to remember to re-generate the source sheet to keep it in-synch with the bill text.
- Citation reports, which are critical to the statute update workflow, are created from the Source Sheets (which may be out of date) and cached (another possible way for them to get out of date).
- Bill Author and Sponsor information is split between multiple data stores that can get out of synch with each other and also occur in the text of the bills themselves.
- Bill digest information exists in multiple places that can get out of synch.

There are some significant re-keying points in the workflow. Re-keying is problematic for information consistency for a number of reasons:

- It introduces latency
- It can introduce human error. This can be managed by introduced additional proofing cycles but this has cost.
- It consumes scarce human resources
- Some examples of re-keying in the current systems:
    - The LS identifiers introduced each day in chamber (from the file-list), are manually entered into Bill Status by OBDAR
    - Vote totals are manually keyed into Bill Status from information coming out of the vote system as PDF files
    - The material that appears on interim committee appointment letters is entered into LSA computers three times and re-entered by chamber staff

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- There are at least three separate systems that need agency contact information but manage that data independently. (OBDAR, Bill Status and the Personnel tables in Bill Drafting.)

The legislative staff has devised a number of checks and balances in the system to manage the consistency issues. However this task will be become more difficult as new services are added. If new services are added through new silo systems it will only increase the number of workarounds and possibilities for consistency issues.

4.4 Information Latency

The issues of information latency are closely related to information consistency above. However, it is such an important aspect of the way the current IT systems operate that is is treated separately here.

When looking at any one of the many different "views" of bills currently available in the Legislature, it is not generally possible to tell if an inaccuracy is the result of a delayed update or a true inaccuracy. Some examples:

- Updates to the website are not under the control of the Legislature and can be 30-40 minutes behind chamber release
- Some updates to Legisoft are created by batch processes creating PDFs in the background and creating copies of files. These batch processes (known as "robots") may be simply busy, may be experiencing problems or may be just going through a normal 15 minute update cycle

There are situations that arise in which documents need to be withdrawn after they have been released. In the case of Legisoft, the Legislature has control but in the case of the website, the Legislature finds itself reliant on a third party to withdraw the document.

Note that these issues of latency and accuracy of the information published to the public apply to the existing databases (especially Bill Status) as well as the WordPerfect documents. For example, the bill status display on the website is driven by a separate bill status database from the Legislature's internal bill status database. It is sent to the external hosting company every 30 minutes.

4.5 Compare-centric and Proofing-centric Workflows

The current workflow involves a large amount of document compare and document proofing operations. There are two primary sources for compare/proofing:

- Bill amendments are created as separate documents from the bills they are amending. A merge algorithm attempts to work backwards from the amendment descriptions to make the necessary changes in the bill itself if the amendment is engrossed by IHP. Although the application that does this (the merge program) achieves 90%+ accuracy, the complete document must be proofed in its entirety because there is no way of knowing if/where the 10% merge inaccuracies may be in the output.
- Statute pull-ins into bill drafts are independent copies of statute section text. As bills go through the workflow they are amended and the text of statute sections they contain can be amended also. At any given point where it is necessary to determine if a section of statute in a bill is different from the statute database (or different from another instance of that statute section in another bill), document compare operations are required.

These can be resource intensive processes that add time to the production of important documents. The staff are limited by the systems they have at hand today to fulfill these functions.

4.6 Audit Trail

At present, the Legislature's staff spend a significant amount of time manually managing, tracking and manually determining provenance of bills, statute sections, fiscal notes, etc. The tracking/provenance systems are separate silo systems in the Legislature. There are a multiplicity of such systems and some individuals/offices create private

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tracking systems using, for example, Excel spreadsheets. Although these systems are run by individuals and possibly stored on their local machines, they are key to the process running smoothly. This is a risk to the Legislature as single dependencies should be avoided where possible.

4.7 Hard-wired Business Logic and Outputs

As business processes have changed over the last decade the volume of workarounds has increased. Examples include:

- The 99 amendment limit in the original design is now problematic
- Amendments to Resolutions was not envisaged in the original system
- Vehicle bill procedures have changed
- Handling of legislative deadlines such as bill introduction/hearing cut-off days is problematic as the logic sits inside Bill Status
- Special session setup, switching and handling has evolved and is problematic

For some changes in business processes, no workarounds are in place. Some examples:

- Sometimes, bills need to go to the "dog house" without a fiscal note. When this happens the tracking system lists them as "in review" as opposed to "released but fiscal note pending". Thus, reports can be inaccurate reflections of the status of a bill.
- Requests may come from the Senate with "Committee on Rules" as the author but OFMA needs the name of a person for whom the the notification letter should be sent.
- Members only have one e-mail address slot in the Bill Drafting system but many members have multiple e-mail addresses.
- OFMA cannot easily send copies of fiscal notes to all sponsors of a bill because the tracking system only makes available the original author.

Some outputs that have changed over the years are created in a hard-wired fashion (i.e. direct production of final PDF) that makes "tweaking" the outputs problematic. Some examples:

- Merging of calendar days from PDF-based reports coming from Bill Status
- Handling of the conference committee grid
- New custom bill status codes

These are only examples of rules that were implemented that require more flexibility as processes change. The staff have learned to live with the limitations and work around them but the requests for more new services and access to information is putting a strain on how much time they can spend on workarounds.

4.8 Notifications

There is currently no system receipting/notification protocols at important workflow checkpoints. For example, the only way for OFMA to know that a fiscal note should now be on the website is to check to see if it is there. If it is not there, it could be because the website service provider has it but has yet to get it onto the website. It could also be that they have not yet received it because the batch process (robot) has not yet run or because the robot has a problem.

A large number of different notification mechanisms are being used in the Legislature for business events such as "new committee report" or "request bill file transfer to chamber". Some examples:

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- Point to point e-mails and phone calls
- File drops into shared folders
- Automatic folder watchers (robots)
- printing documents to specific print queues
- staff monitoring chamber audio
- FTP (to Website and Chamber of Commerce)

The caucus staff (Attorneys and Fiscal Analysts) create many of their own tracking/notification systems in Excel. Leadership staff track conference committees, chamber staff keeping their own tracking lists to follow concurrence and enrolling with the governor's office, OBDAR sometimes uses spreadsheets to track the status of requests etc.

There are no audit trail records created as a byproduct of robot activity. For example a robot watches the viewfn/ folder to determine what fiscal notes have changed and thus need to be processed. However, OFMA have no way of knowing when the material is picked up or when it gets to Legisoft or to the Website.

There is significant use of "out of band" phone calls and point-to-point e-mails to trigger workflow movement.

OFMA fiscal analysts sometimes are unaware of amendments because Bill Status and Bill Drafting systems get out of sync.

4.9 Miscellaneous Challenges

- The requests for new services to be provided is putting pressure on a staff that is spending significant time working around the limitations of the current IT systems.
- There is increasing pressure on turnaround time for post-session work because the date to open up pre-filing is getting earlier each year.
- The line and page processing workflows (i.e. the Merge program, the Excel part of the Budget bill etc.) are heavily dependent on tight control over line and page numbers. The word processor configuration is sensitive to the exact details of the printer being used at the time a document is displayed on the screen. This "printer sensing" creates significant dependencies on precise control over fonts, page margins, printer drivers and physical printer types.
- Special session handling is semi-manual at present.
- Aspects of the current systems get slower at peak times (e.g. when the chamber file-lists get long) or getting slower as the overall volume of bills in the system gets higher (e.g. the conflicts report) or the bills get bigger (e.g. budget bills). This can have a negative snowballing effect. For example, a second reading amendment may need to be created and distributed to interested parties immediately, but the engrossed bill is not yet available. The scope for error in this is significant but the pressure to do it might also be very significant (e.g. session deadline), potentially creating a significant issue to be cleaned up later.
- There is a high percentage of clean-up code in the overall custom code base. An estimated 30% of the source code in the OCR system exists to clean up precise layout and content of documents so that downstream processes will function correctly.
- No statistics are available at present on what parts of the very large surface area of custom application code is actually being used.
- Workflow procedures become complicated at points where the legislative day differs from clock/calendar time. For example:

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  - Chamber days that extend past midnight yet might need to record events at 11:59
  - Formal adoption times for changes to bill digests. The change may have been formally adopted on one day yet recorded into the system a day later.
- Color images in handbooks require special treatment as EPIC is primarily paper focused (black and white) at present
- Indiana Registers are based on an XML based application but the Indiana Administrative Code is WordPerfect based. The existing system is a partial implementation of what was originally envisaged. There are some significant issues with the current design, specifically around managing the changes to the code. Moreover, the partial nature of the implementation has resulted in much of the pain associated with XML-based systems without the gain.
- There are problems with special character handling in the Indiana Administrative Code. When these occur, manual changes to the XML and possibly the style sheets are required. In the past there has also been issues which appear to be a bug in the Apache Cocoon/FOP software versions used. It is not known what parts of the system might break as part of an upgrade to address this bug.

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5 Root Cause Analysis

The seven primary issues identified earlier in this report can be addressed through the introduction of a Legislative Information Model/Architecture. Underlying this architecture are a number of guiding principles drawn from the field of Enterprise Architecture and industry best practice. These are discussed later in the section related to recommended features of any new system the Legislature might consider.

Here we will concentrate on the aspects that directly pertain to addressing the seven issues identified:

Issue	Remedies
Information Silos	Creation of an Enterprise Information Model, covering naming conventions, normative copies, permanent identifiers etc.
Information Consistency	Identification of normative electronic document for each critical legislative information object (bill, committee report, statute section, member, committee etc.), at each stage in the workflow. Managing bill information and meta-information as a single management unit
Information Latency	Electronic point-in-time citation. Replication based website. Robust notification channels
Compare-centric and Proofing-centric Workflows	Amendments in context. Metadata annotation of documents such as bills.
Audit Trail	Temporal, versioning database
Hard-wired Business Logic and Outputs	Flexibility business logic layers using edge-based design.
Notifications	Robust asynchronous integration points and normative, fault-tolerant notification channels.

5.1 Enterprise Information Model

Much of the work of a Legislature revolves around a small number of key information objects such as bills, statute sections, committees etc. By taking control over the naming and electronic citing of these key information objects, many problems associated with silos, tracking and notifications can be addressed.

The naming system in the Information Model should cover all the primary nouns that interact in the Legislative workflows. Examples include:

- Bills
- Statute Sections
- Members

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- Committees
- Amendments
- Bill Status Action Codes
- etc.

It should include all the information objects that appear in mission critical mappings such as:

- members ↔ committees
- sponsors ↔ bills
- staff ↔ committees
- statute sections ↔ bills
- etc.

At present, multiple sets of identifiers exist for these information objects, spread across the silo applications and across different workflows.

Ideally, the naming conventions would have the following attributes:

- Short and URL friendly
- Readily understandable
- Globally unique

5.2 Normative electronic documents

It is inevitable, given the way computers work, that there will be copies/variations made of critical information objects as the move through legislative workflows. At present in the Legislature, there are more copies/variants being made than would be ideal, however, there will always be some amount of copy/variation involved. Examples of inevitable copy/variant creation operations:

- When material moves from confidential areas to shared areas, copies are inevitably made
- When bill material is converted to web pages or when committee schedules are converted to iPad calendars, variants are inevitably made
- When sponsor information is loaded into a database for fast sorting/retrieval. copies of information present in the bill text are inevitably made

The goal of the Information Model is not to eliminate all copies/variants but to firmly establish which digital object will be considered correct, in the event of a discrepancy. We use the term "normative" for this concept. The Information Model should also allow for reporting on provenance to allow the full audit trail of the document to be systematically tracked throughout it's life-cycle.

Moreover, as the trend towards paperless operation of Legislatures accelerates, it is becoming increasingly important that it is possible to identify what copies of what digital artifacts are considered authentic in the legal sense. For example, in the sense of the Uniform Electronic Legal Materials model law from the Uniform Law Commission.

Closely related to the question of normativeness of content is the current split of bill information into document components and database components. Some information is present only in the document e.g. the text of a bill. Some is both in the document and in the database tables e.g. sponsor information and bill digest. Some is only in the database e.g. requester identifier. By managing all data related to a bill as a single management unit, all the issues related to the parts getting out of synch with each other can be addressed.

Normative concerns also apply to the statute-related metadata for bills currently created in the Source Sheets. Adding a section of statute to a bill is a copy/paste operation by a typist at present. There is no automatic associ-

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ation between a bill and the statute sections it relates to. The Source Sheets serve to capture this relationship but because they are separate documents they can get out of synch.

5.3 Amendments in Context

Although a certain amount of comparing and proof-reading is inevitable and proper in a Legislature the tools to support the process can be greatly improved by leveraging amendments-in-content. Simply put:

- Amendments to bill text can be created in such a way that engrossment is fully automated and 100% accurate in most cases
- Statute sections can be tracked in bills in such a way that the text of the statute is locked-down during the bill workflow, easing the burden on the proofing process

Moreover, basing bill amendatory cycles on amendments-in-context makes it straightforward to publish bill amendments in a form that many legislators/staff prefer to read. i.e. redline/strikeout directly in the text of the bill rather than "on line 7, page 6..." Summaries that remove unmodified material, distilling bills down to just the changed portions etc.

Amendments in context would also simplify the problem of performing updates to the OFMA spreadsheet used in budget bills as analysts would be able to tell at a glance, what the changes are. Amendments in context would also help fiscal analysts who spend a lot of time trying to determine what has changed in a bill in order to update its fiscal note.

5.4 Temporal, Versioning Database

In order to have a comprehensive, authoritative audit trail, it needs to be an automatic by-product of legislative workflows. For example:

- As a bill moves around a workflow, the history of its movements should be automatically tracked so that bill status becomes a report as opposed to a self-contained silo
- As the text of a statute section changes, a comprehensive history of the changes should be automatically generated so that it is always possible to explain how the text came to say what it says
- As a fiscal note moves through its internal workflow from first draft to approved version, a comprehensive history of the changes should be automatically generated so that it is always possible to explain how the text came to say what it says
- As any mission critical document in the Legislature changes over time, there should be an automatic snapshotting/versioning occurring so that any and all previous versions of the document can be recovered in the future.

5.5 Flexible business logic

There are two primary aspects to flexibility in the context of business logic in legislative workflows. Firstly, outputs such as calendars and committee schedules which are currently produced directly as PDFs can be produced in a "soft" form that would allow edits post generation but prior to final publication.

Secondly, business rules that are likely to change over time should sit within applications that connect to, but are distinct from, the core temporal versioning database. That way, changes to the business logic can be made without impacting the data layer.

The legislative staff should have abilities to reconfigure certain workflows when events happen that are outside of the norm. The legislative process can frequently throw up events that are outside of the norm.

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5.6 Robust Integration Points and Normative Notification Channels

The current batch processing mechanism know as "robots" is sound, conceptually, but requires the addition of fault-tolerance and load-balancing.

These need to be fault-tolerant because they are mission critical. It needs to be possible to monitor and react to health issues before they progress to impacting service. By making them load-balanced, two important benefits are derived. Firstly, individual instances can have failures with no disruption to service. Secondly, multiple instances can perform work in parallel in times when the workload is high.

Both can be achieved architecturally by the addition of asynchronous message queues. Simply put, robots would then behave like e-mail readers in the sense that messages simply queue up for them in the event that they are busy or offline. No messages are ever lost.

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6 Proposed Architecture

6.1 Introduction

The proposed architecture implements a central IT system for managing legislative information in a way that solves a number of the existing IT issues as well as providing the platform for the provision of the new services required in the Legislature. The proposed architecture anticipates that a number of new information services will be required that are not yet defined. It will support the provision of these services through implementation of an extensible framework and allow the Legislature IT staff to take ownership over building out these services in the future.

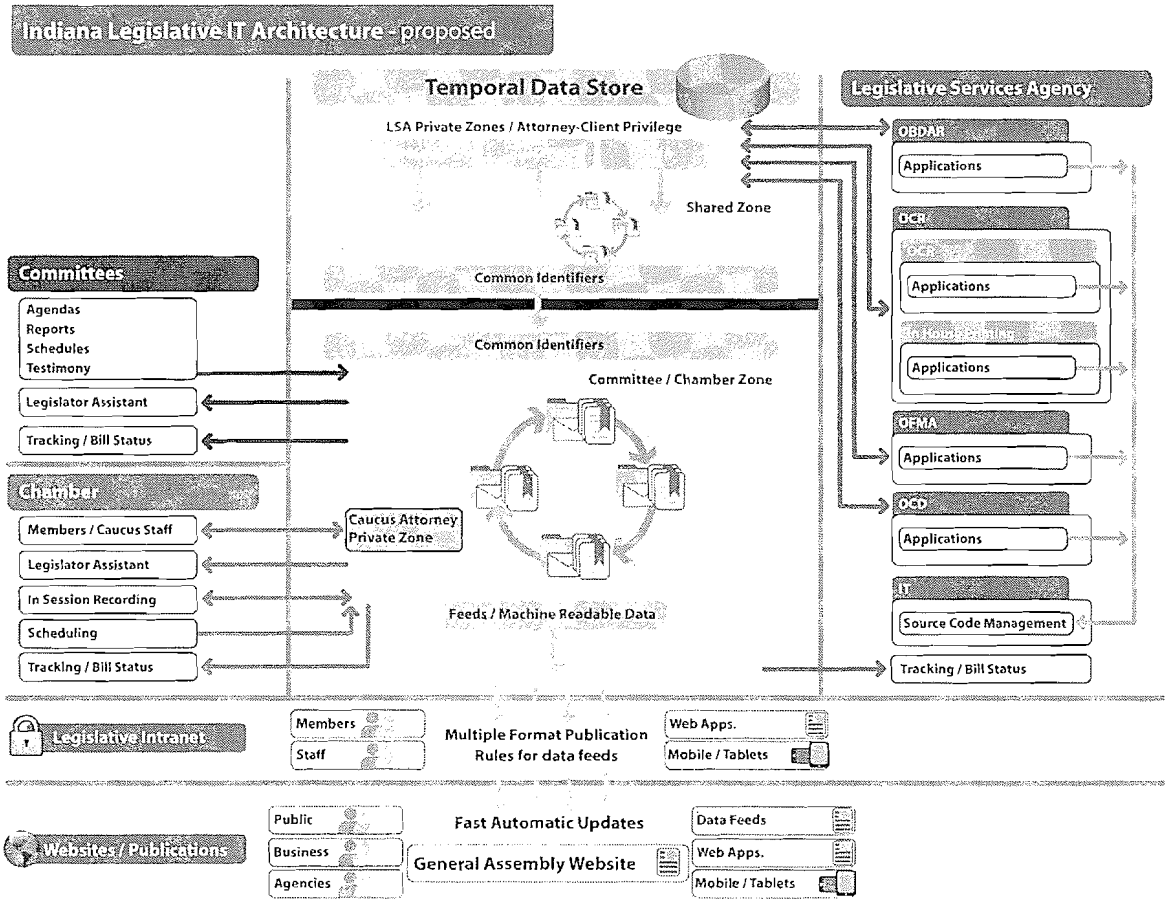

Figure 4.1: Proposed IT Architecture

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6.2 Recommended Features and Design Patterns

It is recommended that any proposed implementation of a system conforming to the above diagram be evaluated for support of the following Features and Design Patterns.

6.2.1 Information Governance

- Ownership of key legislative assets and applications should belong with the Legislature as a whole, not with any specific office function or application. The is especially true for assets that "flow" through the various offices and are thus shared assets out of necessity e.g. Bills.
- Naming conventions for all critical assets should be centrally managed. A single set of identifiers is required for any events/documents that need to be considered as a whole for reporting/workflow purposes.
- Control of privileged access to the assets of the enterprise needs to be managed and single-points-of-failure in people, processes and technology need to be carefully mitigated.
- Ownership and access to confidential information should be managed without the creation of silos that allow work to flow across access boundaries without latencies, re-keying etc.
- Implement "hand-shake procedures" at the office workflow boundaries so that the enterprise-wide tracking system can tell where an item is, when it arrived, when it departed, how long it was at any give point in the flow etc.
- Discrete pieces of information needed in a Legislative system should be entered exactly once. i.e. no duplication of data entry.
- The overall flow of information through the system should be controlled by policy. A clear separation between policy and operational concerns should be in place so that concepts such as turnaround-times, publishing release speeds and so on can be set in policy, rather than have the technology dictate these policies.
- Managing a corpus of law is a very significant QA/QC undertaking. There is no more important corpus of content in the State and yet, out of necessity, proposed modifications to it are made in parallel, under pressure during short time periods in Legislative sessions. This creates a classic Time/Cost/Quality triangle. It is very challenging to keep all three dimensions at the right levels at the same time i.e. keep time and cost down while keeping quality high. The best place to ensure that trade-offs occur in the right place is at the information governance level:
    - Insofar as practical and excluding information that is necessarily confidential, everybody in the Legislature should have access to as much information as possible about:
        - current master copy of the statute corpus
        - current proposed amendments extant across all bills
        - statute sections already changed this session by enrolled bills
        - bills that have not yet had a hearing, etc.
        - pending technical corrections
    - The more individuals looking at the corpus and the update cycle as it progresses through the legislative session, the more chance that potential problems will be found quickly. In an ideal world, post-session publishing work would be largely devoid of any work related to corpus inconsistencies.
- The Legislature's IT systems have many, many moving parts that are inter-related in complex ways. A small change to a WordPerfect macro in OBDAR could have knock on effects in OCR or OFMA. The critical co-de-

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pendencies make it imperative that all software components – from WordPerfect Macros to Database reports, client side and server side, be under full formal source code control and life cycle management.

There is currently no formal build process and no access to testing/staging/live environments for developers. There is no rigorous component level or application level versioning. This is accentuated by the fact that some of the most critical algorithms are "just WordPerfect macros". Word processors as a whole, make it difficult to put proper software engineering disciplines in place. It is easy for power end-users to roll-their-own macros using "Tools --> Record Macro". This is excellent for one-off activities but what tends to happen is that some of these one-off macros/reports become mission critical over time. However, they never transition to formal management and formal build/test/regression cycles.

- File naming conventions that remove important file-application association information should be avoided as part of the information governance model. For example, internally in OFMA ".fn" is used for fiscal note but the file itself may be a pdf or a WordPerfect file. The use of a naming convention to indicate workflow steps is not in itself particularly problematic but the underlying file type should be preserved also to allow operating systems such as Windows and iOS to know what to do with the file. i.e. "fiscal_note.fn.wpd". There are similar issues in ODBAR with .mn (meeting notice) files.
- A single role management system should form part of the information governance model. Currently a mixture of Microsoft Active Directory roles and Oracle Roles is used, combined with application-specific role-based access control logic.
- We recommend that the information governance model take into account the increasing importance of geo-spatial technologies as a tool for policy formation and legislation analysis. For example, the use of electronic interactive maps as tool for fiscal notes and tax/pension handbook created by OFMA.
- We recommend that the information governance model include an Inventory of all custom code that was created by external as well as internal entities, with a view to ensuring it is properly managed, backed up, versioned etc. Some examples:
  - Adobe Acrobat Plug-Ins used in Legisoft, originally created by an external contractor
  - Folio Views query links, fsr scripts created with help from Information Solution (Jerry Junker, Kentucky)
  - Configurations of Google Appliance used on Administrative Code website
  - The queuing software created by ICON for use by the EPIC/IHP groups.
  - The Apache Cocoon environment used in the Indiana Administrative Code (XML schemas, cocoon pipelines, style sheets, transforms, FOP configurations)
- We recommend a clear separation between historical and current data. For example, Bill Status is currently historical back to 1994. The ODBAR system has old drafts back to 1989. OFMA has Excel budget files back to 2011 and Lotus 123 budget files back to 2001 . From a data management perspective a balance needs to be found between access to historical artifacts, preservation, and work-in-progress data volumes.
- The information governance model can address questions of normative data. An example at present is Bill Subject indexes. Although they are clearly "attached" to bills they are not in the bill objects themselves at present (they are in the Bill Status system only). In the Information Model, bill text and all bill metadata – to include subject index terms – should be in the same information object in the temporal asset store.
- The Legislative Information Center and the House/Senate information centers should, as much as possible, be working off the same normative reference resources to ensure information consistency.
- Re-using identifiers should be avoided if they are a potential source of citation confusions/errors. Note that this will involve creating multi-level identifiers. i.e. referring to a house bill as a combination of (ses-

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sion, year, number). That way, bill numbers can reset because the session/year combination serves to uniquely pick out a set of numbers.

- A permanent URL naming convention should be created so that names of key assets such as bills, statute sections, committees etc. are:
  - Short
  - Meaningful
  - Permanent

  Invariably, this involves trade-offs and this is best dealt with as part of the information governance model.
- We recommend that the information governance model fully leverage hyperlinks. In many respects, legislative materials are ideal for the web because of the value that can be readily added to a corpus via hyperlinking. The web pages produced from the WordPerfect files do not contain hyperlinks.
- The Information Architecture needs to ensure it can accommodate platforms such as Facebook, Twitter and also supports Web 2.0 machine readable data formats such as RSS/Atom, vCalendar, vCard etc.
- We recommend that the information governance model prefer thin to thick client application development. LSA have approximately 500 desktop PCs. The management overhead of installing/maintaining/synchronizing software on this many desktops is significant. Overheads can be reduced by using as much thin client application approaches as possible. Moreover, the clear direction of the IT industry – and thus many of the IT suppliers Legislatures are dependent on is toward thin client, public/private cloud computing.

6.2.2 Fully Automatic Audit Trail of all workflow actions

The information processing in a Legislature can be conceptualized as an accounting system in which

- the statute at the start of a biennium is the equivalent of an "opening balance"
- a legislative session is the equivalent of an "accounting period"
- actions on bills processed during a session are the "ledgers"
- the codification of statute is the equivalent of "rolling forward" new balances

As with any accounting system, the audit-trail – the ledgers – constitutes the record of what happened. It is critical that the audit trail is comprehensive and automatic. It should not be the case that users could forget to update it or a developer's applications could fail to update it or update it incorrectly.

Just as in an accounting system, any errors that do happen (e.g. bill referred to wrong committee) should be left in place in the ledgers but with so called "contra-entries" added to reverse the action. This maintains the integrity of the audit-trail as the definitive record of what happened – including any clerical steps taken along with the business-level steps.

In the digital world, a number of words in common use are somewhat misleading and they can cause significant problems in Legislature:

- The word "copy" rarely can be understood to mean "exact copy"
  - A WordPerfect document may look different on my screen/printer/word-processor than it does on yours even though we are looking at exactly the same digital file contents
  - A PDF/RTF/Folio Views "copy" of a WordPerfect document may be substantially different from the original depending on a whole variety of factors

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- The word "send" can rarely be understood to mean what it does it the physical world. Every time a file is "sent" (via e-mail or network drive or ftp) the reality is that a new "copy" (see above) is made.

The creation of variants of a document such as a bill or a statute section is impossible to avoid. It is quite simply an unavoidable side-effect of the way computers work. Consequently, it is vital to have a clear understanding of which "copy" is considered authoritative for all audit-trail steps of critical information objects such as bills.

6.2.3 Robust content citation and content authentication

- The audit-trail should be leveraged as a source of provenance information so that the authenticity of electronic materials can be established.
- It should be possible to cite any document asset in the Legislative repository based on any desired point in time.
- Citations should, as far as practicable, take the form of hyperlinks so that the corpus can be navigated using RESTian API principles.

6.2.4 Machine readable data feeds

Rather than only publish rendered documents such as PDF or HTML, machine readable forms should also be generated so that new applications can be created quickly and so that Web technologies can be leveraged e.g. JSON, XML, vCalendar etc.

Examples of candidates for machine readable "feeds" include:

- Bill status
- Committee Schedules
- Chamber Calendars

6.2.5 Flexibility in Business Logic

In Legislatures, it is best to assume that any existing "rules" are temporary and seek to soft-code these in applications based at the edges of the core data model – not embedded within it. Some examples:

- Special sessions
- New type of concurrent resolution
- Add a fourth bill stage in the Senate
- Create a new status for a bill to be in
- Change the rules for ordering author/sponsor information in journal entries

6.2.6 Robust Notifications Framework

All non-confidential events in the Legislature should have a single reliable event source that applications can monitor. This event source should be tied to the audit-trail so that the information repository and the notifications can not get out of synch. The Information Architecture should explicitly specify the notification flows and separate the official methods from any informal notification methods.

Robots (batch processes) need to be asynchronous with message queues. The goal is not to design a system that is 100% reliable at the parts level. The goal is to make the systems as a whole, 100% reliable through fault-tolerant design i.e. redundancy, horizontal scalability and load-balancing.

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6.2.7 Bring Your Own Device Support

It should be possible for any web-enabled device to interact with the Legislature's applications. Either via web-native thin client applications, mini-apps or remote desktops.

6.2.8 Load Balancing

Many legislative workloads lend themselves to a "divide and conquer" approach. For example, if there are N bills that need to be processed for Chamber introduction, each of the N can be processed independently – by machines as well as by users – because there are few inter-dependencies.

6.2.9 Amendments in Context Capability

Application programs that merge descriptive amendments back into bills cannot be made 100% reliable because of the complexities of reverse engineering amendment actions from human-oriented amendment descriptions. Figures provided by the Legislature suggest about a 97-98% accuracy rate. This is an excellent rate but a 100% proofing is always required because it is not possible to know where the 2-3% of inaccuracies may lie.

100% accuracy in merging (engrossing) can be achieved if the workflow is re-ordered so that amendments are entered in-line into the bills and the amendatory instructions generated from the in-line forms.

The positive impact of this on the amount of work In House Printing (engross/enroll) has to do would be very significant with benefits ranging from turnaround time to reduced risk or errors occurring. The tools for staff in OCR could greatly help them to do their work.

6.3 Recommendations for short term consideration

The following are miscellaneous recommendations that can be considered in the short term and are independent of initiating any large project.

- We recommend requesting detailed website usage statistics from the external website. These can give valuable insights into what parts of the website are used and what are not used: volumes of traffic. peak times. geographic location etc. The usage data will also give insights into what the URL breakage exposure is, if the Legislature decides to move to a different website.
- We recommend full preventative monitoring of all automated agents i.e. robots. There are 5-6 critical robot processes at present but there is no easy way to monitor their health or be informed of malfunctions. It may seem that adding something to monitor these robots just creates one more thing to watch but once in place and trusted, it will significantly reduce what needs to be watched. Moreover, it is highly likely that some robot failures have warning signs that, if detected, could be resolved prior to any service outage taking place.
- Many of the sensitivities to printers and printer device drivers in the current systems are caused by the way the Word Processor implements its WYSIWYG by sensing the current printer configuration and adjusting the layout of words on the page accordingly. We recommend transitioning to a WYSIWYG configuration that is printer/device driver independent. As well as simplifying line/page handling (a critical part of legislative amendatory cycles), this will significantly reduce the likelihood of two printouts of the same file producing different results for different printers inside and outside the Legislature.
- We recommend that the Indiana Code DVD issues related to missing/malformed bookmarks be addressed upstream i.e. not fixed in the PDF files. This is because fixing the bookmark problems involves modifying the PDF files themselves. This is problematic in terms of the audit-trail and looking ahead, will be problematic for authenticity and digital signatures.

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- We recommend that all PDFs produced for consumption internally and especially for consumption externally be created using PDF/A. This is especially important for the Indiana Administrative Code which is already electronic only.
- We recommend role based naming of email addresses, folders etc. Rather than e-mail individuals or name workflow folders after individuals, we recommend the use of role-based naming. This is especially useful for e-mail notifications where multiple people can be trained in a particular role so that if one person is not available, others will get the same e-mail notifications. The existing Microsoft Exchange environment in the Legislature can readily be used to set up e-mail aliases for this.
- There exists currently a large number of different contact-management related documents are created by hand, especially by ODBAR. There is an Address Book application that could be considered as a central application for this.
- We recommend a complete spider of the current website for the Legislature and an analysis of its contents. It may be the case that over the years files have accumulated on the external servers that are not present in the Legislatures data center or backups.
- It is possible – though rare – in the current system for the same number be allocated to multiple PD or LS documents. Given the tracking difficulties that this can create, we would recommend addressing this independently of any other initiatives.
- The vote systems remain Windows XP based whilst the rest of the Legislature has transitioned to Windows 7. We recommend the use of Windows 7's XP compatibility mode to make these Windows 7 based at the base OS level. It may be possible to use Virtualized Desktop technology to put the two voting mini-data centers under the same backup/DR regime as the rest of the Legislatures IT infrastructure.
- OFMA drive C backups created centrally but this does not happen in OCR. Some users in OCR keeping important material on their drive Cs. We recommend either extend the OCR model to all desktops (i.e. all backups centralized) or recommend all users to not keep anything significant on drive C.
- Not all servers are virtualized currently. We recommend full virtualization of servers in order to be able to better leverage multi-core servers and drive down server costs by raising server utilization rates. Also, a fully virtualized server environment will facilitate disaster recovery.
- It is understood that at present, backup/disaster recovery is performed between the main data center in the LSA office building and the Legislature building. We understand that a staff member also takes a backup offsite periodically. We recommend a disaster recovery strategy that involves moving data/applications out of the reach of single-area incidents such as tornadoes. We also recommend a "cold-iron restore" be performed once a year from backup media to ensure that critical applications/data can be restored within a reasonable amount of time.
- We understand that there are plans to upgrade Oracle to Oracle 11G. We would recommend caution in that the term "upgrade" can be misleading for any non-trivial computer system component. The lack of testing/staging/live and the lack of regression testing in the current environment makes end-to-end testing of the existing suite of apps on top of an upgraded Oracle 11G difficult to perform and it is not clear what the value add of the upgrade is.

6.4 Longer Term Recommendations

- We recommend enriching the structure and content of fiscal notes. There is a lot of valuable information in fiscal notes under a variety of thematic headings that can be harvested for cross-the-board reporting on bills.

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- Creating accurate citations to Indiana Code from Administrative Code/Registers is problematic because the hyperlinks being created are always going to point to the Indiana Code as it is today, not at the time the cite was created in the Administrative Code/Register. We recommend that this be addressed by taking a consolidated view of how the Indiana Code corpus relates to the Indiana Administrative Code corpus.
- The voting systems are standalone entities at present with different code bases per chamber. The Legislature has a Cisco IP phone infrastructure with jacks on each chamber desk. IP Phones are becoming as powerful as laptops/tablets and this creates an opportunity to consider using IP Phone stations as voting devices in the future.

6.5 Recommended Phasing

There are multiple ways that the project could be implemented. The following phasing is one option based on the over-riding concerns of business continuity and bearing in mind the drivers and success metrics. We recommend that the project as a whole be split into two separate projects, each of 15 month duration:

- Project 1 : Intranet, Website, Budget Bill and Member Services
- Project 2 : Non-Budget Bills and Statute Management

6.5.1 Phase 1.1: Website

- The outputs currently sent to the external website provider are populated into the temporal database in a set of workflow folders corresponding to "published" phase of the workflows.
- An Intranet Legislative Portal is created that replaces Legisoft with a browser based environment. It connects to the temporal database to generate pages of information related to bills, committees etc. dynamically. i.e. as new material becomes available from the internal systems they are immediately visible on the website.
- Member, Committee and Bill pages created based on the Information Model naming conventions.
- WordPerfect files are processed into richly hyperlinked HTML and integrated with bill status pages, member pages, committee pages. All pages based on Permanent URL patterns. PDFs hyperlinked from the HTML pages.
- The internal site is replicated to create the Internet-facing website. The policy rules for defining what is published and when it is published is made configurable by state staff.
- RSS and ATOM-based feeds are created for Bills and Committees
- A RESTian API is created to allow machine readable content to be consumed
- The Intranet and Internet sites are created to be Tablet/Smartphone/WebTV friendly i.e. BYOD
- Some internal cleanup in performed in preparation for Phase 1.2 related to
  - macro suite consolidation (300+ macros at present. Estimated 20-30% overall size reduction),
  - creation of standard modules for saving documents and metadata
- Some internal "quick win" changes are instituted:
  - Load balancing of conflicts reporting to reduce the 24 hour interval
  - Load balancing of file list processing for faster turnaround time in busy session days
  - Generation of "soft" output formats for calendars and schedules rather than PDFs from existing Bill Status
  - Intranet WebForm to streamline submission of content to LSA from Members and caucus staff

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- Digest consistency
- The robots related to external publishing are revisited to trigger based on the presence of actionable content rather than at period intervals. E.g. bill status content dump is currently set to 30 minutes.

6.5.2 Phase 1.2:Budget Bill and Member Services

- The temporal database from Phase 1.1 is extended by adding Workflows, Author/Edit and Publishing methods for handling all aspects of the Budget Bill from drafting to amending to enrolling. Integration points created for:
  - Bill Status Integration
  - statute pull-in and post-session publication
  - Intranet/Internet publishing
- The Budget Bill process should tightly integrate spreadsheet and document technologies to provide users an easier way of managing changes to the bill. The Budget Bill process should also allow the amendments to be entered in context so it is easy to read the direct impact of proposed changes.
- All network drive mappings are changed so that all content is written into the Temporal Database: bills, fiscal notes, statute etc.
- All WordPerfect macros and applications modified to store what is currently document-oriented metadata "on top" of the WordPerfect files. E.g. Source Sheets
- All tracking systems and reporting sub-systems are reviewed and as many as possible changed to utilize temporal database queries. Some will be removable completely because of the availability of normative copies for all document-oriented assets.
- Website enhanced with Paperless Committees applications (HTML5 based, iPad devices). Makes extensive use of temporal database for retrieving normative assets and reporting on audit trails
- Legisoft features replicated on the Intranet and the current Legisoft application retired
- Temporal database is used for core Bill Status functions. Committee/calendar features of current Bill Status system replaced. This is then used as a single source of bill status information for all applications and workflows.
- The voting system could be replaced as part of this phase.

6.5.3 Phase 2.1: Non-Budget Bills and Statute Management

- Statute book converted to XML-based open data format
- All OBDAR/IHP/OCR functions related to bill drafting → statute codification replaced with XML-based open data format applications.
- Amendment cycles modified to utilize bill amendments in context. Amendment-in-context documents added to the Intranet.
- Bill drafting subsystem is statute-aware and can "lock" statute sections, thereby streamlining document compare workflows, post-session publishing, conflict detection etc.
- Corel WordPerfect usage minimized/eradicated except for IAC

6.5.4 Phase 2.2: Fully Paperless Legislature, Indiana Administrative Code Integration

- The Indiana Administrative Code is converted to XML based open data format

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- The Indiana Register XML format is migrated to the same XML notation being used for all Bills, Statute sections, the IAC etc.
- Existing IAC/Register website replaced with the consolidated Intranet/Internet websites.
- Point-in-time hyper-linking IAC <-> IC enabled.
- Normative copies established for Registers and the Indiana Administrative Code
- Digital signing and UELMA for the entire corpus
- Fiscal Notes enhanced with:
  - cross-fiscal note automatic reporting replacing some of the manual processes used in tracking today
  - Geo-Notes for interactive and static GIS based analysis
- Committee video streams integrated with committee agendas and hyperlinked

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7 Appendices

7.1 Appendix: Current Technology Stacks - COTS

Oracle Database	
Visual Foxpro v7	
Google Search Appliance	
Apache Cocoon	
Apache FOP	
Corel Wordperfect X5	
Folio Views	
Oracle Roles	
Oracle Forms	
FTP	ftp.iga.in.gov
WebDav	
Windows Media Files	IHETS (Video)
OpenText Web/RedDot	Web Application and Content Management System used by NIC to host the Legislature
Perl	Used by OpenText Web/RedDot CMS
WebTrends	User Tracking used by OpenText Web/RedDot
Wp2Html	http://www.brackenbeds.co.uk/Wp2Html/ Used by AccessIndiana to convert WordPerfect files to basic HTML.
Oracle AppServer/Java J2EE	Java JSP used by Access Indiana Oracle App Server used in Bill Drafting Application (with Oracle Forms, Oracle Roles and auto-generated JSP pages+servlets) Apache Tomcat used by Indiana Administrative Code
Corel WordPerfect PDF generator	Part of WordPerfect X5
Adobe InDesign	Used for OFMA-produced handbooks : Tax Handbook, Pensions Handbook
Google Maps	Used for Redistricting application
CityGate AutoBound	Used in "Find your Legislator" part of Web Site
ESRI ArcView	Used in OCD
USC Web Service	United States Census. Used in "Find your Legislator" part of Web Site
Microsoft Office (Word, Excel) 2007 and 2010 versions	House rules created in Word .docx. OFMA prepare the numbers-oriented portion of the budget bills in Excel Bubble attorneys, fiscal analysts make extensive use of Excel for ad-hoc tracking systems Property Tax Report
Microsoft Access	IRC, Citations Affected Report, Duplicate Citations Report, OCD OCD Use for GIS data Daily conflicts report (Access front end to Oracle backend)
Microsoft Publisher	Used by OCR
IRC	Distinct voting system software and hardware in House and Senate
Microsoft Windows 7	Staff desktops. Member Laptops.
Microsoft Outlook	
Microsoft Exchange	
Microsoft Active Directory	
Lockheed Martin, Internet Quorum	Used by caucus staff for constituent management.
VMWare ESXi 4.1	Server side virtualization
Windows 2008 and 2008 R2	Server side operating systems
Linux Red Hat Variants (from v5 to 6)	Server side operating systems
iFiles	Used by Committee staff as part of iPad prototype.

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Microsoft SQL Server	Used in the Data Warehousing project
Microsoft ASP.NET	Used for iPad prototype and for District Lookup application (find my legislator).
Citrix XEN Enterprise	Used as part of iPad initiative
Oracle Stored Procedures	Used in Bill Status
PCL5E	HP printer composition engine and drivers
CISCO RightFax	Sometimes LSA fax letters to agencies. Some fax of doghouse letters to Members. Usage declining.
TIFF	Used for page scanning of vote sheets in committee, testimony.
Web Services	Call tracker and District Lookup share a couple of Web Services
Microsoft SQL Express	Used in Call Tracker and District Lookup
KML	Files produced by OCD used in District Lookup
DeltaCompare	Used instead of WordPerfect compare in some situations but uses the rtf exports from WordPerfect http://www.workshare.com/products/wsdeltaview/
WordPerfect SDK	
USC	United States Census web service. Used in Find Your Legislator.
Google Geo-Locater	Used in Find Your Legislator.
Cisco Agent Desktop	Part of Call Tracking for incoming phone calls
Internet Explorer Browsers version 8 and 9	
Magenta Research	Aspects of the Senate audio/visual environment
Adobe Acrobat Distiller	Used by IHP.
Crystal Reports	Used by OCD
Windows Registry	Used as a form of cache for session-level information.
Borland Delphi	Used in Bill Drafting applications and in Legisoft
HP EVA 6400 Network Storage	
Oxygen XML Editor 7.2	Used for the Indiana Register
GoodReader	PDF Reader for iPads
Zenprise	Mobile Device Management

7.2 Appendix: Current Technology Stacks – Custom Code

- WordPerfect Macros
- Foxpro Applications e.g. Bill Status and Robots
- Folio FSR and build scripts
- WordPerfect SDK Tools
- Adobe Acrobat Plug-ins created by PDFDream
- Printer Queuing applications created by ICON

7.3 Appendix: Distinct Sources of Information about a Bill/Resolution

For an average bill that passes through the 8 typical phases of the Indiana legislative process, there are many. many potential sources of information that may not be identical. This can cause significant confusion at all points in the workflow.

The main distinct sources of information are:

- Bill Text WordPerfect File x 8
- Bill Text PDF of each WordPerfect with watermark for website x 8
- Bill Text PDF of each WordPerfect for internal use (e.g. doghouse) and Legisoft x 8

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- Green sheets (OCR. paper .Initialed by everyone who works on it.)
- Fiscal Notes x 8
- Folio Views infobase of Session Laws
- Folio Views infobase of Public Laws
- Bill Status Database Tables
- Tracking Database Entries
- Access Indiana Bill Status (different from internal)
- Paper jackets maintained by chamber staff
- Journals PDF
- Journals WordPerfect
- Journals Folio
- Author/Sponsor information in Bill Drafting
- Author/Sponsor information in Bill Status
- Source Sheets
- The Digest at the front of the bill
- The Digest in Bill Drafting
- Merge Mockups
- Bill Summary File (OCR)
- HTML pages created from WordPerfect by Access Indiana
- Chamber Tracking Spreadsheets
- caucus Staff Tracking Spreadsheets
- Comparison of Conference Committee Reports
- Conference Committee Grids
- Duplicate Citation Report
- Enrolled Acts Report
- Delta Compare Reports (processing the RTF – not the WordPerfect)
- Bill Certifications
- Chamber Filing Book
- State Records Commission PDFs

The reasons for potential differences between the variations can be split into a number of categories:

- Synchronization latencies e.g. website update delay
- Lossy conversions e.g. HTML pages produced from WordPerfect Files

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- Re-keying errors
- Re-keying latencies
- Silo data model mis-matches : e.g. Digests

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8 Statement of Work – Project Artifacts

8.1 Statement of Work Deliverable Documents

All deliverable documents are located at https://docs.lis.state.oh.us:9880/docs/sow_final_delivery

8.2 Project Artifacts

Documents gathered during the analysis – all located at http://10.100.50.40/repos/repo/ on the VPN (https://vpn.iga.in.gov)

Folder	Details
\received_documents\Macro Documentation	Details and descriptions of macros used by OBDAR, OCR, OFMA
\received_documents\Macro Documentation\Auto Convert	Instructions for using Auto Correct
\received_documents\Macros\obdmacros	OBDAR macros
\received_documents\Macros\ocrmacros	OCR macros
\received_documents\Macros\ofmmacros	OFMA macros
\received_documents\OBDAR\Manuals	OBDAR drafting manual
\received_documents\OCR\Manuals	OCR process manuals
\received_documents	Bill status ERD
\ocdm\archive_output_lists	Staff created output lists (later merged into main output list)
\ocdm\sample_documents\chamber_samples	Chamber sample documents
\ocdm\sample_documents\chamber_samples\tracking_h_maj_caucus	Caucus sample documents

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\ ocdm\sample_documents\chamber_samples\h_clerk_docs	House clerk sample documents
\ocdm\sample_documents\Interim	Interim committee sample documents
\ocdm\sample_documents\Jeff\Samples	Sample documents from Jeff Ford
\ocdm\sample_documents\OBDAR	Sample documents from OBDAR
\ocdm\sample_documents\OBDAR\Administrative	Administrative sample documents
\ocdm\sample_documents\OCR	OCR sample documents
\ocdm\sample_documents\OCR\House&SenateJournal-SamplePages	Journal samples
\ocdm\sample_documents\OCR\Manuals	OCR manuals
\ocdm\sample_documents\OFMA	OFMA sample docs
\ocdm\sample_documents\Varnie\Samples	Chamber samples from Varnie Karmo

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About Propylon

Propylon is a world leader in legislative and regulatory data processing and document management. With a large pool of expert consultants and analysts, and a world class software development team dedicated to legislative and regulatory domains, we have considerably broader and deeper expertise that any other vendor in the market. We pride ourselves on having some of the leading world domain technical authorities on our team and contribute to development of global standards relevant to legislative data processing.

Our software solutions cover the different departments in the Legislature providing an integrated information architecture for the legislative staff to enter information once and get the most value out of it in multiple places. Our drafting solutions introduce efficiencies such as automatic engrossment that allows for the return of amended bills more quickly. Our Chamber solutions integrate chamber actions to allow for generation of the Journal, Calendar and Bill Status information reducing risks of data entry error and cutting down on the end of day legislative processes. Our Research tools provide efficiencies in the integration of data from multiple sources for the production of the research divisions publications. The results of integrated information management are better tools for staff, members and the public. Staff can easily generate reports of the information they need, legislators can be provided their own portal to access all legislative information and the public website can be automatically updated as required.

Propylon has introduced cost saving for Legislatures by heavily reducing print and composition costs through the provision of electronic camera ready publications. Also, the consolidation of applications and services has reduced support and maintenance costs. Efficiencies of the application allow staff to be redeployed to higher value tasks such as better provisioning of electronic material to members and the public.

Propylon's work in the state Legislatures of Kansas, North Dakota, and Pennsylvania as well as the Irish Parliament, Irish Office of the Attorney General, Welsh Assembly and with legal publisher LexisNexis demonstrates our ability to deliver innovative and cost effective technical solutions for authoring, managing and publishing complex legislative documents.

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The Legislative Software Leader

Indiana General Assembly

Legislative Council Data Processing Subcommittee
May 10, 2012

Exhibit 9

Summary of Findings

- Systems in place that support the current paper centric processes and existing services
- Growing demands for new services causing strain on existing systems
- Staff time devoted to the operational running of existing systems
    - No time/resources available to look at new services
- The legislature's IT support systems consist of many silos with limited integration
- The legislature front door is increasingly the website and on-line services
- Staff are restricted in their ability to add new services
    - Publication to different consumers and devices
    - Reducing the time for on-line publishing of data
    - Make information easier to find

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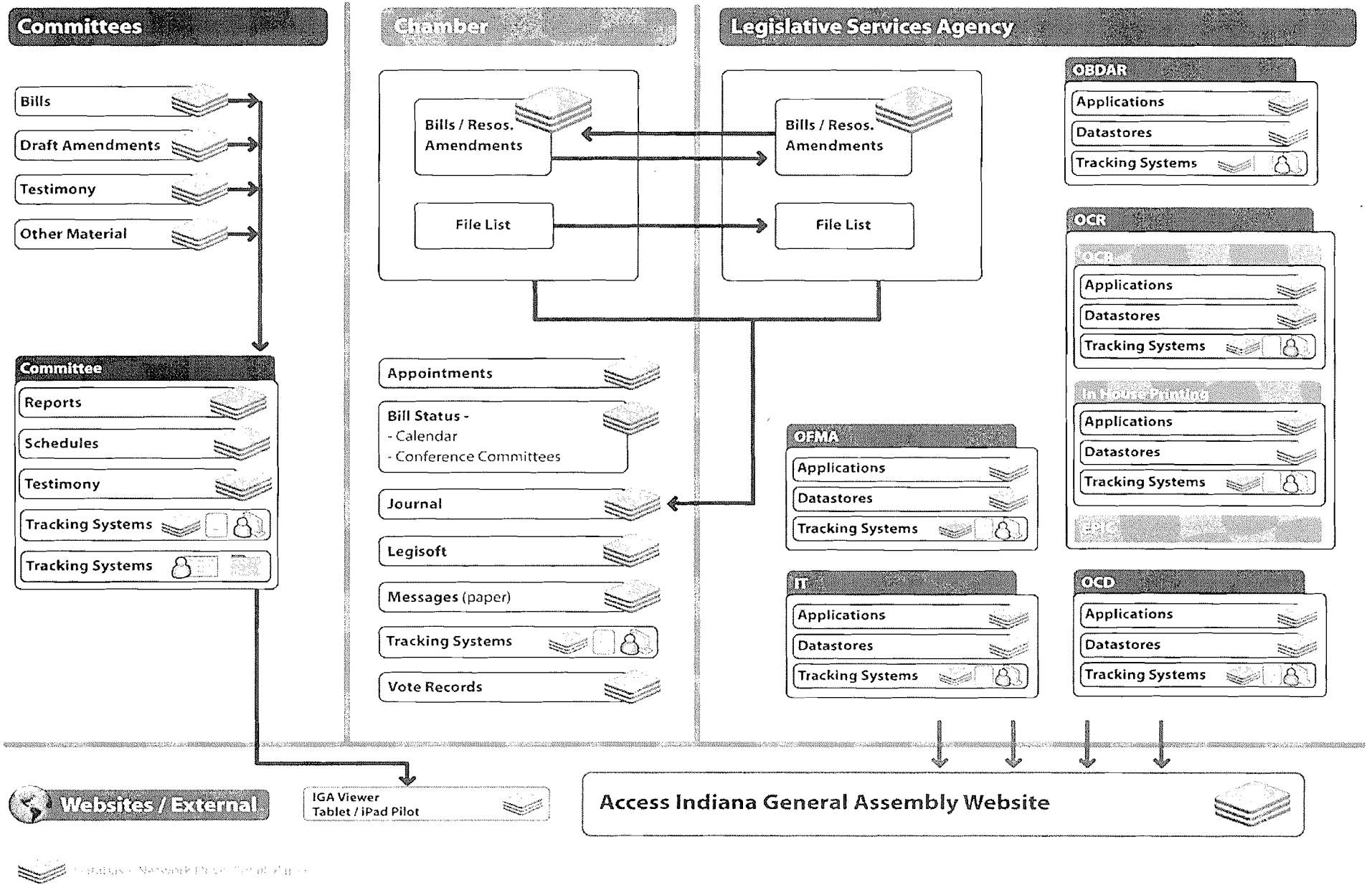
Indiana Legislative IT Architecture - current state



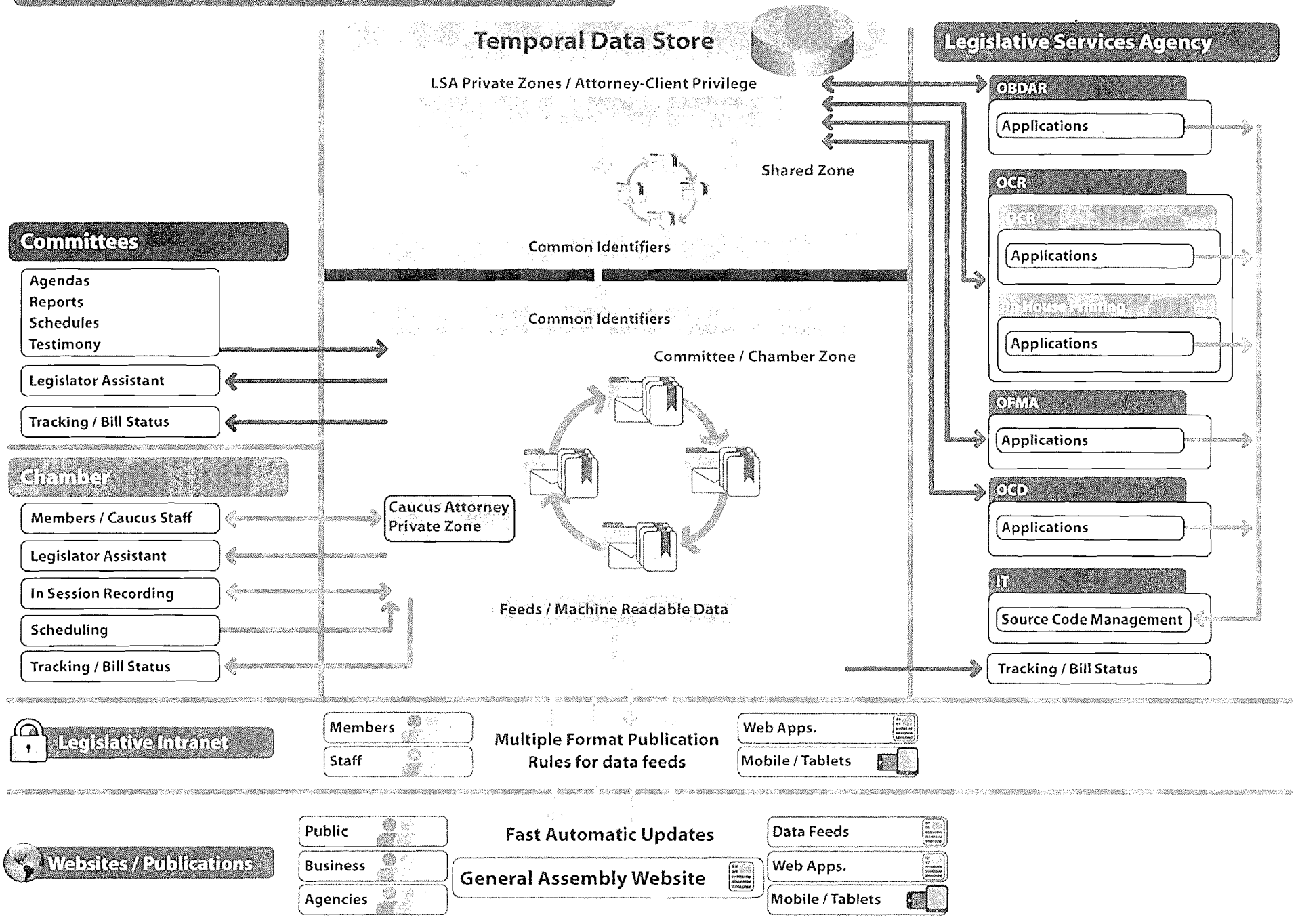
Drivers and Success Metrics

- On-line interaction with the Legislature becoming a primary front-door
- More is expected from a technically more sophisticated public
  - New devices are increasing awareness of what people can do on-line
- The requirements for new services is growing quickly as technologies continue to change
- Members require new services to allow easier consumption and filtering of large amounts of information
  - Access to the exact information you need, when you need it
- Enable the new services through enterprise information architecture
  - Not an IT project; a business led legislative transformation project
  - Put the tools in the hands of staff to provide new services
  - Take all stakeholder requirements into account

Recommendations

- Implement an enterprise information architecture to support the legislature
  - Single data sources replacing the silo based systems
  - Individual applications reading from the one data source ensures consistency
  - Architecture should support the adoption of new technologies consuming information
- Take control over what is published and when
  - Members, staff, the public, businesses, agencies all depend on the information on-line
- Implement better tools to support members decision making processes
  - Decision support systems ensuring members have fast access to what they need when they need it
- Reduce paper based processes
- Preservation of historic materials and links
  - Permanent URLs, Authenticity
- Simple answers to bill status information and finding the information you are looking for

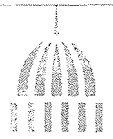
Indiana Legislative IT Architecture - proposed



Recommended Phasing

- Many possible ways to phase the implementation
- Business continuity is the overarching concern
- Two projects of 15 month duration each:
    - Project 1:Intranet, Website, Budget Bill and Member Services
        - 2 phases
    - Project 2:Non-Budget Bills and Statute Management
        - 2 phases

Exhibit 10



NATIONAL CONFERENCE *of* STATE LEGISLATURES

The Forum for America's Ideas

Size of Information Technology Staff in Selected State Legislatures†
2010-2011

State	No. of Central Nonpartisan IT Staff	No. of House IT Nonpartisan Staff	No. of Senate IT Nonpartisan Staff	Other Staff
Alaska	20	0	0	1 session only staff; additional teleconferencing staff
Arizona	8			Additional broadcast staff (4) and interns (6)
Arkansas	17	0	0	0
Connecticut	25			
Delaware	4			
Idaho	10	0	0	0
Iowa	17	0	0	0
Kansas	9 / 4 / 4[1]	0	0	0
Louisiana	32[2]	2	2	0
Maine	11	0	0	0
Maryland	30	unknown	unknown	unknown
Montana*	16	0	0	3 interns
Nebraska	10	0	0	0
Nevada*	24 (3 legal)	0	0	3 session-only staff and 4 temporary redistricting staff
New Hampshire	7	1	1	0
New Mexico	4	3 session-only	2 session-only	One full-time contract IT employee
New Jersey	35	unknown	unknown	unknown
North Carolina	36			Additional temporary and admin. staff
North Dakota*	4	0	0	0
Oklahoma	3	6	4	0
Pennsylvania	33	unknown	unknown	unknown
Rhode Island	8	0	0	0
South Carolina	18[3]			
South Dakota	2	0	0	
Tennessee	18	0	0	0
Texas	160	0	0	unknown
Utah	11	0	0	0
Vermont	5 / 2[4]	0	0	0
Virginia	16	7	5	1 contract employee in House
West Virginia	11	2	1	0
Wyoming	5	0	0	0

Source: Legislative websites or interviews with legislative information technology directors, December 2010-February 2011.

†Does not include IT staff that may be employed in legislative audit agencies. May include vacant positions.

*Biennial legislatures

[1] 5 in Legislative Administrative Services, 2 in Revisor of Statutes Office, 3 in Legislative Research Dept.
[2] Central IT staff are contract employees of Public Systems Associates.
[3] Does not include additional administrative staff
[4] Legislative Council - 5 IT positions; Fiscal Office: 2 IT positions

Exhibit 11

NATIONAL CONFERENCE
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The Forum for America's Ideas
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303-364-7700 FAX: 303-364-7800

Legislative Bill Drafting Systems

State	Approx. Dates	Implementation	Contact
California		California's drafting system stores content in an Oracle XML database in a schema-based system, according to a carefully defined structure that automates many of the legislative processes. The California Legislative Data Center worked with Oracle, Linsonic, and the Xcential Group to establish a data model. Source	Mendora Servin Information Technology Specialist Legislative Counsel Bureau 1100 J Street Suite 200 Sacramento, CA 95814 (916) 445-4965 Mendora.servin@lc.state.ca.us
Florida Senate		Arbortext	
Florida House		Leagis is a custom-developed system for creating, processing and tracking legislation, integrated with Microsoft Office. Uses Microsoft Office Open XML file format.	Scott McPherson Chief Information Officer Florida Legislature House of Representatives 402 South Monroe Street Tallahassee, FL 32399-1100 (850) 921-7762 scott.mcpherson@myfloridahouse.gov
Idaho	2009 Legislative Session	"GEMS Application" Java front end customization Completed, 2009 Session GEMS Functions Bill Drafting Bill Tracking Docket & Journals Web Update GEMS Technology XML Oracle Database Arbortext Summary (see page 11)	Norma Clark (development manager) nclark@lso.idaho.gov (208) 334-4849
Illinois		Illinois Legislature Replaces Legacy Apps with State-of-the-Art Systems (NALIT Newsletter article) (scroll	Tim Rice, Executive Director, Illinois Legislative Information System

State	Approx. Dates	Implementation	Contact
		to page 4)	tim.rice@ilga.gov (217) 558-7654
Iowa		Iowa has administrative code in XML. In Nov. 2008. As of 11/09, is drafting and publishing Iowa Code and bill drafts as XML.	Glen Dickinson Division Director, Computer Services Legislative Services Agency Ola Babcock Miller Building 1112 E. Grand Ave. Des Moines, IA 50319-0233 515-281-4616
Kansas		Kansas Legislative Information Services System (KLISS), an enterprise wide integration of bill processing using open source technologies. The system integrates 15 applications organized under three service groups as follows: **Lawmaking Services** 1. Bill Drafting 2. Bill Amendment 3. Enrolled Bills 4. Statute Publication **Chamber Automation** 5. Bill Status 6. Calendars 7. Journals 8. Messages between chambers/to Governor **Decision Support** 9. Bill Explainer 10. Supp Notes 11. Fiscal Notes 12. Conference Committee Report Briefs 13. Appropriations 14. Interim Committee Reports 15. Meeting Minutes and Agenda **Vendor:** Propylon	Terri Clark Assistant Director- Division of Computer Services Kansas Legislature 300 SW 10th St Room 529-S Topeka, KS 66612 E-Mail: terric@las.state.ks.us
Maine	2007	Arbortext, XML	Scott Clark Director, Legislative Information Services Maine State Legislature Voice: (207) 287-1625 Scott.clark@legislature.maine.gov
Maryland	2005	Arbortext, XML *Bill Drafting with MS Word and XML at the Maryland Legislature:* (NALIT	Janice Hendry Senior Manager General Assembly 410-946-5300

State	Approx. Dates	Implementation	Contact
		Newsletter article) Presentation from NALIT 2006 Seminar session.	jan@mlis.state.md.us
Massachusetts	2012	Legislative Automated Workflow System (LAWS). Provides an automated system for legislative staff to electronically file and manage a bill through its entire lifecycle, from drafting and filing to engrossing and enactment. Includes modules for: Bill drafting and filing, Clerks' module, Counsel module, Committee module, versioning module. Fully integrated with Ways and Means budget application, the hearing room screens, and the public facing site (www.malegislature.gov). *Vendor: Tallan*	Edward Bell CIO - Massachusetts Legislature Room 15 24 Beacon St Boston, MA 02133 (617) 722-2800 Edward.Bell@MALegislature.gov
Michigan Legislative Service Bureau		In January 2005 the office implemented an in-house bill drafting / statutes compilation project involving XML. It was a two year project and was well-received. It's a web-based system that opens in a browser for drafting, status, statute search, and statute updates. They've put the Michigan Compiled Laws (MCL) into an XML database and have a custom search engine built against that database. This is the only part that's currently using XML. For bill drafting, the drafters use Word. They search the MCL, then import the relevant section into Word. They use Word to complete the formatting of the bill draft. Now that Microsoft has announced that the next release of Word will support XML, they will look at further development http://www.xml.com/pub/a/2001/05/09/legalxml.html	Darlene DePeel, Michigan Legislative Service Bureau ddepeel@legislature.mi.gov 517-373-5648
Minnesota	July	XTEND system	Tim Orr

State	Approx. Dates	Implementation	Contact
	2005	Epic, Oracle db, Custom applications in Sun J2EE, Arbortext ACL, Perl, PHP Presentation from NALIT 2004 Seminar session: XML Editors, Sept. 11, 2004 Minnesota's XTEND System, Tim Orr, Systems Analyst/Programmer II, Office of the Revisor of Statutes, Minnesota and Devan Shepherd, Principal, XML Planning Group, Minnesota	Analyst/Programmer Office of the Revisor of Statutes timothy.orr@revisor.leg.state.mn.us 1.651.297.7165
Nebraska	2006	The Nebraska bill drafting office is using a bill drafting system based upon XML that uses customized Arbortext Epic Editor software. The next phase of development is a publishing system for the statute books. For the 2006 statute supplement, the newly enacted laws will be incorporated into the mainframe publishing system and the books will be published using the mainframe. By the end of the 2007 legislative session, publishing will be done using XML and Epic Editor. The final phase of development will be a document management system. *Legislative Lawyer*, Legal Services Staff Section, April 2006	Richard Brown Assistant Clerk Unicameral Legislature Nebraska Legislature Rm 2018 State Capitol Bldg PO Box 94604 Lincoln, NE 68509-4604 E-Mail: dbrown@unicam.state.ne.us (402) 471-2429
North Dakota		XML-based system. Initially contracted with XMaLpha and Arbortext. Bismarck Tribune article. *Final system completed with Propylon in 2010.*	Jason J. Steckler Information Technology Director North Dakota Legislative Council Bismarck ND 58505 (701) 328-2916 jjsteckler@nd.gov
Ohio		Ohio was the one of the first states to move to an XML-based legislative information system. Ohio used a consultant project manager and developed the system in-house with consultants.	Kurt McDowell Director Legislative Information Systems Ohio General Assembly 77 South High St. 22nd Floor Columbus, OH 43215 (614) 752-7442

State	Approx. Dates	Implementation	Contact
			mcdowell@lis.state.oh.us
Oregon		XMaLpha Technologies awarded contract to provide quality assurance during the development of a bill drafting application. XMaLpha Technologies worked with an in-house team of professionals to create a specification of bill drafting requirements. XMaLpha is assisting management with oversight and quality assurance during the build phase of the solution. *Previous vendor*: Propylon	Shancy Saban CIO Oregon Legislative Assembly Room 141 900 Court Street, NE Salem, OR 97301 (503) 986-1916 shancy.saban@state.or.us
Pennsylvania		*Vendor: Propylon*	Kathy Sullivan Executive Director Legislative Data Processing Center Pennsylvania General Assembly Senate Box 64 G-27 N Ofc Bldg Harrisburg, PA 17120 E-Mail: ksullivan@legis.state.pa.us (717) 787-7358
Texas	2003	SALSA-- system uses and Arbortext's Epic editor to create and update legislative documents stored as XML In-house.	Mike Talajkowski IS/Applications. Texas Legislative Council 463-1160 (x 1668) mike.talajkowski@tlc.state.tx.us
Vermont	2011	Contracted with International Roll Call for legislative management system, without electronic voting.	Duncan W. Goss Director of Information Technology Vermont Legislative Council 115 State Street Montpelier, VT 05633-5301 dgoss@leg.state.vt.us 802-828-2231
Washington	2006	XML stored in FileNet DMS. Data stored in SQL Server. Development environment: .NET on Windows 2003 servers. See NALIT Newsletter article. *Developed in-house*	Ronda Tentarelli Applications Support Manager Legislative Service Center Washington Legislature 2404 Chandler Court SW Olympia, WA 98502-6034 (360) 786-7725 Ronda.Tentarelli@leg.wa.gov
Wyoming	April 2012	SharePoint. Building the bill drafting functionality--hope	Jamie Schaub IT Manager

State	Approx. Dates	Implementation	Contact
		to move bill drafting in production this summer. Will also include other functionality, including committee applications--both Interim and in-session--after the bill drafting component is completed.	Wyoming Legislative Service Office 307-777-6877 Jamie.schaub@wyoleg.gov

Created October 2005; partial updates thereafter.

NCSL Contact: Pam Greenberg, NCSL Denver Office, 303-364-7700 ext. 1413, pam.greenberg@ncsl.org