

INFORMATIONAL REPORT
OF THE
LEGISLATIVE COUNCIL DATA PROCESSING SUBCOMMITTEE



Indiana Legislative Services Agency
200 W. Washington Street, Suite 301
Indianapolis, Indiana 46204

November, 2011

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2011

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A copy of this report is available on the Internet. Reports, minutes, and notices are organized by committee. This report and other documents for this Committee can be accessed from the General Assembly Homepage at <http://www.in.gov/legislative/>.

I. STATUTORY AND LEGISLATIVE COUNCIL DIRECTIVES

On June 7, 2011, the Legislative Council assigned the following study topic to the Subcommittee:

Studying and report back to the Legislative Council regarding the potential savings to be realized through the use of iPad-type technology in the General Assembly. Include in the study a review of what other states are doing and an analysis of the potential cost savings, flexibility and convenience of such devices.

II. INTRODUCTION AND REASONS FOR STUDY

The Indiana General Assembly literally uses tons of paper every year to carry out its responsibilities. The House of Representatives and the Senate have been taking steps to incorporate new technology into the legislative process to reduce the costs related to producing, copying, distributing, storing, and retrieving legislative information in paper format. The recent release of tablet computer devices such as the iPads has the potential of providing additional opportunities to improve the legislative process.

III. SUMMARY OF WORK PROGRAM

The Subcommittee met twice in 2011, once in September and once in November. At the first meeting the Subcommittee heard testimony from three witnesses and adopted a work plan. The work plan directed staff to do the following:

- (1) Engage Ball State University to interview legislative staff, map the flow and use of paper documents in the Indiana House of Representatives and Senate, and prepare recommendations on:
 - (A) how best to convert each legislative task to a paperless process; and
 - (B) whether iPad-type devices are suitable to support the legislative activities of legislators or staff, or both.
- (2) Conduct a survey of the use of iPads and other paperless systems in other state legislatures.
- (3) Distribute iPads to members of the DP Subcommittee for the purpose of receiving legislator comments on the usefulness of these devices. HP State 500's were also made available to members of the DP Subcommittee who requested them.
- (4) Compile additional information concerning the use of iPad-type devices and the implementation of a paperless system in the General Assembly.

For purposes of these studies, the term "paperless" was assumed to mean a legislative process in which paper is eliminated or greatly reduced.

In the second meeting, the Subcommittee received the reports prepared by legislative staff and Ball State University, heard testimony for IHETS and Indiana Interactive, LLC, and adopted a final report by a vote of 3 - 0.

IV. SUMMARY OF TESTIMONY

The Committee:

- (1) heard testimony from 10 witnesses;
- (2) received a staff report describing efforts by other state legislatures to undertake paperless initiatives and integrate mobile computing devices such as tablets into the legislative process; and
- (3) received the results of a study conducted by Jonathan Blake Huer, Director of Emerging Technologies at Ball State University in a report entitled "An Examination of the Flow of Paper through the Indiana State Legislature and Strategies for Usage Reduction".

Representatives of Indiana Interactive, LLC, (the vendor providing Internet access to the State of Indiana) discussed the computer design and programming services that Indiana Interactive, LLC could provide. They demonstrated a prototype design of several enhancements they could make, including the delivery of an electronic committee voting system and an application that could aggregate all of the information concerning bills being considered on a particular day into an easy-to-read format. Indiana Interactive, LLC, also discussed its proposal to add programs that would permit the General Assembly's website to detect the type of device accessing the site and optimize the display of the information for viewing on the device.

IHETS, the provider of equipment and services used to provide live video to the Internet of legislative meetings discussed the cost and steps necessary to permit streaming of live video of legislative meetings to iPads and other mobile devices that do not use Windows Media Player.

The study conducted by Ball State University concluded that the distribution of iPads or other tablet devices to legislators would have many benefits. However, additional changes to the computer hardware and software used by the General Assembly and the rules governing the conduct of the General Assembly are needed to address the reasons why so much paper is used in the legislative process.

The staff of the Legislative Services Agency presented the results of a survey of other state legislatures. At least 18 other state legislatures are conducting initiatives to reduce the amount of paper used in the legislative process. These other states report both cost reduction and other benefits from these initiatives. The survey indicated that tablet devices are more frequently being used by state legislators to carry out their legislative functions. States are making changes in their computer systems to accommodate the use of tablets and other mobile devices.

The staff of the Legislative Services Agency also demonstrated a process that could be used to electronically distribute committee packets and amendments to committee members and a custom web page that legislators could use to easily access legislative information on the floor of the House of Representatives or the Senate.

V. COMMITTEE FINDINGS AND RECOMMENDATIONS

FINDINGS

The Subcommittee made the following findings:

Terminology

1. The following definitions apply throughout this report.
2. 3G (4G or Edge) 3G, 4G, or 4G refers to Internet access over cellular signals similar to a cell phone. These names are based on your cellular carriers network and the networks are not compatible between carriers, (i.e., a Verizon iPad does not work on the AT&T network). Typically, tablets are either Wi-Fi only or they are Wi-Fi and 3G/4G. If no Wi-Fi network is available, cellular service allows the user to connect. These networks have a monthly access fee, however, certain eInk readers have lifetime 3G Internet access for free.
3. Bill Status Bill Status is one of three programs used by legislators to access electronic information about the legislative session. Bill Status is not used to access electronic copies of bills, motion, or fiscal notes.
4. Committee packet A committee packet consists of a copy of the notice of a committee meeting and a copy of each bill and fiscal note for each bill that will be considered at the committee meeting.
5. Cloud The cloud refers to data storage and software applications maintained by a vendor at a remote location. Most computers and users store their data on the hard drive located inside their personal device or on a server attached to a network that they own. When using the cloud, the data is stored on servers which can be located miles or continents away. This permits a person to access the person's data from anywhere, anytime the person has Internet access and provides protection against data loss if an individual personal device is lost or damaged. Cloud applications also allow software to be updated easily to add needed features or make

corrections to eliminate flaws in the software. Cloud services can be written to allow a copy to be stored locally for times when Internet access is not available.

6. Firewall A firewall is a device or set of devices designed to permit or deny network transmissions based upon a set of rules and is frequently used to protect networks from unauthorized access while permitting legitimate communications to pass.
7. Internet website The publicly accessible legislative Internet website is one of three programs used by legislators to access electronic copies of bills, motions, fiscal notes and other legislative information. The website has substantially all of the information accessible from Bill Status and LegiSoft. The website is maintained by Indiana Interactive, LLC.
8. LegiSoft LegiSoft is one of three programs used by legislators to access electronic copies of bills, motions, fiscal notes, and other legislative information.
9. Mobile device A mobile device (also known as a handheld device, handheld computer or simply handheld) is a small, hand-held computing device, typically having a display screen with touch input or miniature keyboard (or both). Usually less than 2 pounds, this class of devices includes tablets, smart phones, and personal data assistants.
10. Smart phone A smart phone is a high-end mobile phone that combines computing functions such as access to email and the Internet and the functions of a camera or a personal data assistant.
11. Tablet A tablet, as commonly used today, is a simple computer that has no physical keyboard (although an external keyboard can be attached wirelessly or through a physical connection). It is simple in form, consisting primarily of a screen ranging from 7-10 inches diagonally. A stylus or other pen type device can be used to draw, write notes or interact with the device. However, most tablets do not have native handwriting recognition (although third-party handwriting applications can be loaded). They frequently have GPS, Wi-Fi, and cameras built in. The HP Slate 500, the Samsung Galaxy Tab 10.1, and the iPad 2 are different brands of tablet devices.
12. Wi-Fi Wi-Fi refers to a local wireless Internet signal. This signal has

limited range such as within a building, but has faster speeds and can be secured.

Paper Usage

1. The General Assembly literally uses tons of paper to carry out its legislative duties. The General Assembly has tracked the number of copies made on its four largest copying machines. These machines are primarily used to make copies of bills, motions, and committee reports distributed to legislators, staff, and the public. Since 2000, the number of copies (i.e., an image of a page produced on one side of a piece of paper) produced in each session has ranged from 2,357,000 copies to 6,900,000 copies. In the 2011 "long" session, the General Assembly produced 3,760,188 copies. Even though the General Assembly double sides all documents, this amounts to annually usage of between 5.90 and 17.25 tons of paper. In total, the General Assembly has used 130.25 tons of paper between 2000 and 2011 to carry out its core functions.

2. The amount of paper used in the session would have been even greater had the General Assembly not adopted procedures and technology that permitted legislators, legislative staff, and the public to electronically follow the actions of the General Assembly. Among these efforts are the following:

- a. Development of a publicly accessible website.
- b. Development of additional internal programs such as "LegiSoft" that permit electronic access to bills, motions, and other legislative information.
- c. Issuance of laptop computers to legislators.
- d. "Wiring" the State House to permit legislators to obtain electronic access to legislative information in committee rooms and on the chamber floors.
- e. Statutory changes that require state agencies to file reports with the General Assembly in electronic form rather than paper format.
- f. Legislative rule changes that permit some documents to be distributed to legislators electronically.
- g. Distribution of the Public Acts on CDs.
- h. Reduction in the number of copies of the Indiana Code that are printed.
- i. Publication of the Indiana Register and the Indiana Administrative Code solely in electronic form.

Recently, the House of Representatives has taken additional steps to permit legislators to elect to receive electronic copies of bills and floor motions in lieu of paper copies. The new program was one factor that permitted the General Assembly to make 39% fewer copies in 2011 than the General Assembly made in the previous "long" session in 2009.

3. Studies of a broad range of organizations suggest that continued use of paper documents imposes costs that extend beyond the cost of the paper used, including the following types of costs:

- a. SUPPLIES: Cost of paper, copying equipment, copying supplies, filing cabinets, filing folders, and other storage media.
- b. COPYING: Cost of maintaining and operating copying equipment, including personnel needed to copy documents, identify which documents should be copied, and verifying that documents have been correctly copied.
- c. STORAGE: Costs of filing documents, filing cabinets, and the room space needed for storing copies in every location where the information will be used.
- d. DISTRIBUTION: Cost of transporting copies to every location where the information will be used.
- e. DOCUMENT RETRIEVAL: Costs related to searching for and retrieving the most up-to-date and accurate version of a document, including lost files.
- f. DISASTER RECOVERY: Costs to replace destroyed documents or destroyed filing cabinets.

4. The costs of filing and retrieving documents can be substantial. A frequently cited 1987 study by Coopers & Lybrand (now PricewaterhouseCoopers), on the time and money spent on paper in today's typical organization found:

- (a) Companies spend \$20 in labor to file a document, \$120 in labor to find a misfiled document, and \$220 in labor to reproduce a lost document.
- (b) Seven and one-half percent of all documents get lost and 3% of the remainder get misfiled.
- (c) Professionals spend 5% to 15% of their time reading information but up to 50% percent of their time looking for it.

5. Based on the actual paper, equipment, and labor costs incurred in 2011 Session to copy documents and estimating that the legislative staff devoted only 5% of their time to distributing, filing, and retrieving paper documents, the costs of using paper documents in the 2011 Session exceeded \$550,000.

6. The General Assembly also incurs non-monetary costs as a result of continuing to rely on paper documents. For example, in a survey of Indiana legislators and legislative staff noted difficulties with standing committee scheduling. Several interviewees commented on receiving multiple committee schedules in a single day, each containing full printings of each bill. A more efficient way to distribute a committee schedule and distribute bill information, without printing duplicative packets, would effect a significant paper reduction.

7. The survey of Indiana legislators and staff indicated that paper copies of legislative documents are perceived to be the best medium for the following reasons:

- (a) NOTE-TAKING: Legislators and legislative staff use the paper copies of bills, committee reports, motions and fiscal notes to write and store personal notes and comments on pending legislation.

(b) DOCUMENT COMPARISON: Legislators and legislative staff use the paper copies of bills, committee reports, and motions to facilitate compare the differences between two or more documents.

(c) TECHNICAL RELIABILITY: Legislators and legislative staff use the paper copies of bills, committee reports, motions, and journals to guarantee continuation of the legislative process in the event of a power failure or other technical failure in the electronic system.

(d) FACTUAL RELIABILITY: Legislators and legislative staff use the paper copies of bills, committee reports, motions and fiscal notes to provide assurance that the printed document is the latest and most accurate version.

(e) LEGISLATIVE RULES: Legislators and legislative staff use the paper copies of bills, committee reports, motions and fiscal notes to adhere to legislative rules and procedural requirements.

Paperless Initiatives in Other State Legislatures

1. All states now have publicly available legislative Internet websites where legislative bills are made available in electronic format to legislators and the public. State legislatures report experiencing a significant reduction in the number of public and legislator requests for bills in paper format as a result.

2. Eighteen state legislatures have reported taking additional steps to substitute electronic distribution of bills, motions, and other legislative documents for distribution in paper format. States reported that they have fully converted one or more legislative activities to a paperless process include the following:

Arizona	Oklahoma
Florida (Senate)	Rhode Island
Hawaii (Senate)	Wisconsin (House of Representatives)
Minnesota	

A number of other state legislatures have initiated steps to reduce paper use but continue to permit legislators to elect to use paper or electronic copies, including:

Kansas	New Jersey
Maine	Pennsylvania
Ohio	Washington
Oregon	West Virginia
Montana	Virginia
Nevada	

Oregon does not require legislators to use electronic copies of documents but charges legislators for paper copies that they request. The New York legislature passed a measure

in 2011 (for the first of two required times) to permit a referendum on an amendment to the New York Constitution that would require the state legislature to go paperless.

3. Legislative activities that have become paperless in at least one state include the following:

(a) CHAMBER AUTOMATION

- i. Filing of bills
- ii. Voting
- iii. Distribution of bills, motions, and fiscal notes
- iv. Distribution of chamber calendars and journals
- v. Messages between the House and Senate

(b) COMMITTEE MEETING AUTOMATION

- i. Distribution of committee meeting notices, bill packets, policy statements, amendments, and fiscal notes
- ii. Submission of testimony and handouts
- iii. Witness sign-up
- iv. Electronic attendance sheets and attendance reports

(c) ELECTRONIC NOTE STORAGE

- i. Electronic note taking
- ii. Storage of a legislator's notes in files that are accessible only by that legislator

(d) ELECTRONIC PUBLICATION

- i. Acts published solely in electronic format
- ii. Statutory codes published solely in electronic format

(e) AUTHENTICATION

- i. Legislative documents archived in electronic format
- ii. Authentication technologies are applied, such as checksums, public key infrastructure, steganography, and digital signatures, that permits authentication of the electronic copy as the "official" copy of the document

4. Hawaii reported a 60% reduction in paper usage, West Virginia reported an 80% reduction in paper usage, and other states have equally dramatic paper usage reductions, as well.

5. Most states require some change in legislative procedural rules to permit filing or distribution of electronic copies. Not all states legislatures that consider themselves to be "paperless" eliminated the requirement that the original of a bill or motion be filed and transmitted between the House and Senate in paper format.

6. Paperless initiatives in most states required an initial expense to make changes in computer hardware and software. One trend is converting software programs developed a decade or more ago into web services that are easier to maintain and modify and can be

viewed on the Internet accessible devices. In Michigan, Virginia, and Wyoming, some of these functions, in particular email, spreadsheet, and word-processing functions, are being acquired through cloud computing services. Costs are reduced by eliminating the need for government agencies to purchase, maintain and upgrade their own servers and software. State government-wide cloud computing service initiatives are also being evaluated or undertaken in California, Colorado, Minnesota, and Utah.

7. Some state legislatures have instituted formal policies to govern the type of personal information and personal applications that can be accessed by legislators and legislative staff on a tablet. Many of these states also have similar policies for use of laptops by legislators and legislative staff.

Use of iPads and Other Mobile Devices in Other State Legislatures

1. The number of legislators who are adopting mobile technology, smart phones and tablets to carry out their legislative duties is increasing:

- (a) Connecticut reports that 6% of Connecticut legislators own and use iPads.
- (b) Hawaii reports that 25% of Hawaii state legislators own and use iPads.
- (c) Kansas reports that 18% of Kansas state legislators own and use an iPad.
- (d) Minnesota estimates that 50% of Minnesota legislators will have iPads before the end of 2011.
- (e) Oregon reports that 13% of Oregon legislators have a personal tablet.
- (f) Virginia and Vermont have distributed iPads to legislative committees for pilot tests of iPads.
- (g) The West Virginia Senate has issued iPads to all members of the Senate.
- (h) Alaska provided laptops and iPads to all state legislators.

2. State legislatures are responding to increased use of mobile devices by legislators and the public in primarily four ways:

- (a) **NO ACTION:** Continued study of possible changes without implementing improvements to the publicly available Internet website or to publicly available wireless networks.
- (b) **LIMITED SUPPORT:** Legislative information technology staff assist legislators to connect tablets and other mobile devices to the legislature's password protected intranet website, wireless networks, and the legislature's publicly available Internet website outside the "firewall".
- (c) **INTERNET ACCESS IMPROVEMENTS:** Development of a publicly available legislative internet website and publicly available wireless networks that support a broad range of mobile devices. Items (c) and (d) may be developed together.
- (d) **FULL INTEGRATION:** Full integration of mobile devices into the legislative process and installation of hardware and software that improves the delivery of

information to these devices.

3. Access to legislative email, calendars, and contact databases is the single support service most frequently provided to legislators.
4. Internet access improvements needed to facilitate the use of mobile devices are similar to the improvements needed to implement successful paperless initiatives. Internet access improvements that have been made in at least one state include the following:
 - (a) REAL TIME ACCESS: Improvements designed to decrease the delay between the time that a legislative event occurs, such as the filing of a motion, and the time that the legislative information appears on the publicly available legislative Internet website.
 - (b) MOBILE SITE OPTIMIZATION: Improvements designed to give a web page the capacity to detect what type of mobile device has accessed the page and rearrange the information on the page to improve downloading and viewing and, if the mobile devices has the capacity, to permit use of touch screen features.
 - (c) USER DEFINED SERVICES: Improvements designed to allow a user to select a subset of the information available on the publicly available legislative Internet website, arrange it in the format selected by the user, and receive notices of changes in the selected information.
 - (d) AUTHENTICATION: Improvements designed to guarantee that the electronic copy of a document is an accurate and complete copy of the official version of the document.

Suitability of Using iPads or other Similar Tablet Devices to Replace Legislator Laptops

1. The Indiana General Assembly provides legislators with laptop computers in lieu of providing the legislator with a desktop computer. The laptop computers are fully functional computers. They are loaded with Microsoft Windows operating software, Microsoft Outlook, and Microsoft Office.
2. The Indiana General Assembly does not have a policy of providing legislators with a tablet device. The legislative information technology staff, however, provides limited support to members who purchase a tablet device. The limited support primarily consists of providing access to legislative email, calendars, and contact databases.
3. Not all tablet devices are similarly configured. For example, the HP Slate 500 uses the Microsoft Windows operating software, the Samsung Galaxy Tab 10.1 uses the Android Honeycomb 3.1 operating software, and the iPad uses the iOS 5 operating software.
4. Tablets typically have better battery life than laptops, cost less, and weigh less. The following table compares the specifications of the Latitude Dell E5510 laptop computer that is provided to members of the Indiana House of Representatives with the

specifications for an iPad 2:

Comparison of Specifications of Latitude Dell E5510 Laptop and Apple iPad 2		
Features	Latitude E5510	Apple iPad 2
Processor:	Intel i5 (2.67GHz)	1GHz dual-core Apple A5 custom
RAM Memory:	4GB (1.17GHz)	512MB (1.66MHz) (unconfirmed report)
Hard Drive	120GB	16GB to 64GB of storage on solid state drive
Wireless:	DW 1501 wireless N	Wi-Fi (802.11a/b/g/n)
webcam:	Yes	Yes (front & back)
Bluetooth:	No	Yes
Monitor	15.6-inch (diagonal) without touch screen technology	9.7-inch (diagonal) with Multi-Touch display
CD rom	cd/dvd rom	None
Keyboard	Yes	No (optional accessory)
Firewire	Yes	No
USB ports	4	None: 30-pin dock connector to USB cable
Battery life	7 Hr. 5 min.	10 Hr.
Weight	6.1 lb (9 cell battery)	1.33 lb w/o 3G 1.34 lb w/ 3G
Height	14.61" (371 mm)	9.50" (241.2 mm)
Width	1.33" (33.8 mm)	7.31" (185.7 mm)
Depth	9.84" (250 mm)	0.34" (8.8 mm)
Approximate Cost w/ Software	\$1,500	\$800 (16 GB; WiFi & 3G capacity; keyboard; cover; 5 applications)

5. The authors of a recent article in the *Journal of Accountancy*¹ identified the following as the types of tasks for which an iPad 2 (and more generally any tablet) is best suited:

¹ Drew, Jeff, "The iPad Decision" *Journal of Accountancy* (October 2011).

- (a) TRAVELING: The devices easily fit in a briefcase or bag.
- (b) USE IN MEETINGS: The device stores all of the critical information needed for a meeting in an easily retrievable format, and the information can be easily updated. A tablet lays flat on a table so that the screen does not create a barrier between the participants in the meeting. With the camera on the front of the device, the device can be used to facilitate face-to-face meetings with individuals who are not in the same room through video-calling.
- (c) USE AS A SECOND MONITOR: The devices can be used to display a critical document while another device, such as a laptop, is used to perform work related to the document.
- (d) COMMUNICATING: The devices work with Microsoft Exchange email accounts, as well as other email services. In addition, third-party applications permit the use of online meeting services such as webEx and GoToMeeting.
- (e) TAKING NOTES: Note-taking applications are available that permit notes to be emailed, stored on the device, or stored by third-party cloud computing services. Notes can be typed or hand-written. Some applications convert hand-written notes to typed notes.
- (f) INSTANT-ON: Most of the time there is very little boot-up time before the devices are ready to be used.

6. There are over 140,000 applications available for the iPad 2. Although not all are as robust as software written for a laptop computer, iPad applications are far less expensive. Many applications can be purchased without charge or at a cost of less than \$10. The following table lists the current price of purchasing a number of popular business applications.

Purchase Price for Popular Business Applications that Run on an iPad		
Product	Function	Purchase Price
Pages	Word processing	\$9.99
Numbers	Spreadsheet	\$9.99
Keynote	Presentations	\$9.99
Penultimate	Note-taking software with handwriting capabilities	\$1.99
Goodreader	Document reader	\$4.99
Cisco AnyConnect	Permits remote access to another computer via a virtual personal network connection	Free

7. Third-party applications, such as Goodreader, iFile, and iAnnotate, permit a user to read documents in all of the formats used in the legislative process, including Adobe

PDF, Microsoft Word, or Rich Text Format (RTF), which is one of the types of formats in which WordPerfect documents can be formatted.

8. Legislators have access to legislative information from three electronic sources: the LegiSoft computer program, the Bill Status computer program, and the General Assembly's website. LegiSoft and Bill Status are available only to legislators from the General Assembly's internal computer network. The General Assembly's website is available to publicly available. Legislators can access from LegiSoft all of the information in Bill Status. Without any changes in legislative hardware or software, legislators can access, through the General Assembly's website, nearly all of the legislative information that is available through LegiSoft and Bill Status. The following table compares the legislative information accessible through LegiSoft to the legislative information that is available on the General Assembly's website.

Comparison of Content Accessible from LegiSoft to Content Accessible from General Assembly's Website			
Category	Content	LegiSoft	Legislative Website
Explore	Bills (bills, fiscal notes, and amendments arranged by bill)	X	X
	Resolutions	X	X
	Calendars	X	X
	Schedules (standing committees)	X	X
	Reports	X	50%
Today	Chamber Bills (list)	X	X
	Calendar	X	X
Go To	Bill	X	X
	Resolution	X	X
	Report	X	Some
Search	Search	X	X
Link to	WordPerfect 11	X	
Other	Bill Watch	X	
Applications	Outlook	X	

Comparison of Content Accessible from LegiSoft to Content Accessible from General Assembly's Website			
Category	Content	LegiSoft	Legislative Website
Bill Watch	Bill Watch Items	X	
	Annotation	X	
	Auto Attendant	X	
	Roll Calls	X	
	Email PDF with/without annotations	X	
	Interim Study Committees		X
	Publications (e.g., Fiscal Handbook)		X
	Other Legal Material (e.g, Indiana Administrative Code)		X
	House & Senate Rules; Drafting Manual; Journals		X
	Archives (past sessions & past interim material)		X

9. It can be concluded from a survey of Indiana legislators and legislative staff that legislators and staff have the basic skills to use tablets:

- (a) 76% legislators and 77% of legislative staff reported in the survey that they use a smart phone on a daily basis and 56% of the respondents rated themselves as very comfortable with using smart phones.
- (b) 40% of legislators who have personal tablets rated themselves as very comfortable with using tablets.
- (c) 82% of legislators and staff responding to the survey reported that they have a wireless network at home and 94% reported having at least average cell reception at home.

Even though the reported comfort level is high, a period of retraining would speed integration into the legislative process because the techniques used to operate a tablet are different from the techniques used to operate a laptop. The level of retraining would most likely not exceed the level of training legislators received when the General Assembly initially issued laptop computers to legislators.

10. The top seven uses of a tablet and a laptop are the same according to the results of the survey:

- (a) Reading email.
- (b) Sending email.
- (c) Checking legislative information.
- (d) Keeping in contact with constituents and friends.
- (e) Reading news sites.
- (f) Using general applications.
- (g) Surfing the Internet for general information.

The survey indicates that legislators use tablets more frequently to take notes than they use laptop computers.

11. Although tablets are adequate for the entry of a small amount of data on an electronic form, writing short emails or letters, or adding an electronic signature to a document, the small display screen and lack of a full-sized keyboard on tablet devices makes tablets unsuitable for creating long documents or large spreadsheets. Most legislative staff and legislators who do most of their own work are likely to find a laptop to be more useful than a tablet.

12. A number of technical issues would need to be resolved before tablets could be fully integrated into the legislative process:

- (a) **SOFTWARE LIMITATIONS:** Tablets use proprietary software. In particular, Microsoft Office, Corel WordPerfect, Windows Media Player, and Adobe Flash Player do not run on iPads and iPhones. Alternative software would need to be installed on an iPad to replace these applications. Making legislative web-casts of meetings viewable on an iPad would also require changes in the hardware and software used to video-broadcast these meetings.
- (b) **SECURITY:** Without the addition of third-party software, the databases and software most often used to store legislative information do not have the capacity to recognize whether it is "safe" for iPads or iPhones to access the database or software. However, the corporation making these products indicates that it is working on a solution.
- (c) **PROGRAMMING LANGUAGE:** The number of programmers available to build custom applications for iPads and iPhones is limited because the programming language used on these devices is not widely used in any other device. Greater use of widely-sold applications and, possibly, cloud computing services might be used to bridge this gap. Conversion of computer programs into web services that use the capabilities of a web browser such as Internet Explorer or Safari, to display data would also reduce programming time and expense.
- (d) **WIRELESS ACCESS REQUIREMENTS:** iPads and iPhones require Internet access to carry out many functions, do not have as much data storage capacity as the typical laptop or desktop computer, and do not have Ethernet or USB

connections. As a result, these devices require installation of a strong wireless network that can simultaneously support a large number of users. An evaluation would need to be undertaken to determine if the wireless networks in the State House are adequate. Outside the State House a home wireless network or a wireless 3G connection would be useful. However, documents could be downloaded at the State House and stored on the device to reduce the need for accessing a wireless network outside the State House.

(e) ENTERPRISE CONTROL: Until recently, the capability to efficiently make changes in a large number of iPad and iPhone devices in a single operation was missing from these devices. The corporation making these products indicates that they are improving the ability to manage these devices from a central location.

(f) NAMING CONVENTIONS: Legislative computer files that are not named properly are not readable on most tablets. File extensions such as ".pdf", ".rtf", and ".docx" must be added to make files readable.

(g) WIRELESS PRINTING: iPads and iPhones require wireless access to printers. Most printers currently in use in the General Assembly do not have that capacity.

(h) REAL TIME ACCESS: Legislative documents and other information appears on the publicly available legislative Internet website as much as 30 to 60 minutes after the information becomes public. The issue is primarily a function of how the information is transferred from the legislative network to the provider of the publicly available legislative Internet website and the steps required to translate the data into a format that can be viewed on the publicly available legislative Internet website.

(i) MOBILE DEVICE OPTIMIZATION: Information on the internal legislative network and on the publicly available legislative Internet website is formatted to be viewed on a full-sized computer display screen with a computer mouse device. Software could be added to detect what type of device is accessing the information and reformat the information in a way that it is easier to be used on a smaller touch-sensitive screen.

(j) SERVER CONFIGURATION: The servers and software used by the General Assembly are not optimally configured to deliver information to tablet devices. The General Assembly owns software that could be adapted to this purpose (e.g., Microsoft Sharepoint). The General Assembly does not have the physical hardware or expertise to implement the solution with current personnel. The General Assembly would need outside vendor assistance to develop a solution internally or would need to purchase these services as cloud services.

Suitability of Using iPads and Other Tablet Devices to Carry Out a Strategy to Reduce the Use of Paper in the Legislative Process

1. iPads and other tablet devices are more portable and less expensive than laptops (particularly after the addition of software) and are better suited to providing quick access to legislative information in meeting rooms, on the floor of the House or Senate, in

constituent meetings, and all other locations where legislators carry out their legislative duties.

2. iPads and other tablet devices are well suited to taking and storing notes and comments about pending legislation.

3. Aside from note-taking and facilitating access to legislative documents in a wide variety of locations, full integration of iPads or other tablet devices into the legislative process (without additional changes to legislative hardware and software) is no more likely than the use of laptops to eliminate the reasons why paper is used in the legislative process.

4. Four of the five factors that cause legislators and staff to use paper in the legislative process would still need to be addressed before tablets would become a better option than laptop computers. Additional solutions would need to be found to address the following:

(a) **DOCUMENT COMPARISON:** Paper documents are frequently laid out side-by-side to facilitate comparison of two or more documents, such as a motion and the bill that the motion proposes to amend. Although there are third-party applications that permit two or more documents to be placed side-by-side on a tablet, the screen may be too small to permit easy comparison. Placement of dual desktop monitors with key staff members may be one way of resolving this issue. Use of document comparison software that merges documents and highlights the differences between the documents may be another option.

(b) **TECHNICAL RELIABILITY:** Computer systems are more reliable than they were even a few years ago. However, proper disaster recovery planning is necessary to assure the integrity and continuation of the legislative process in the event of an unforeseen power failure or other technical failure.

(c) **FACTUAL RELIABILITY:** Legislator signatures, time stamps, and the printing of text are the primary means used to assure proper authorization of most legislative actions and to provide assurance that the printed document is the latest and most accurate version. New internal controls would need to be implemented if legislative material is published only as an electronic record. The National Conference of Commissioners on Uniform State Laws has suggested in the recently adopted Uniform Electronic Legal Material Act that the following three criteria for authenticating an electronic copy of a document:

i. The official publisher must be provided for users to determine that the record is unaltered from the official copy.

ii. The official publisher must ensure the integrity of the record, provide for backup and disaster recovery of the record, and ensure the continuing usability of the material.

iii. The official publisher must provide a system that makes the record reasonably available for use by the public on a permanent basis.

(d) LEGISLATIVE RULES: Various internal House and Senate rules require posting or distribution of certain legislative documents in paper format and personal signatures in some cases. The rules could be changed to the extent permitted by the state constitution and to the extent that alternative methods are implemented to assure the factual reliability of legislative actions and legislative documents. One approach utilized in some other states is to permit all documents to be distributed in electronic format except for one paper copy that is used as the official version of the document or one notice that is posted on a bulletin board in paper format.

Readiness of the General Assembly to Adopt Tablet Technology

Limited Support for Tablet Devices

1. If access to Microsoft Outlook and the legislative information on the publicly available legislative Internet website meets the needs of legislators to carry out their legislative duties, the General Assembly currently has the capability to provide limited support for tablet computers. The General Assembly could immediately adopt a policy of distributing tablets to legislators. The least expensive approach would be to phase-in the purchase of tablets and to give some or all legislators an option of receiving a tablet or a laptop, but not both. The policy might provide that some or all legislators would become eligible for a tablet only in the year that the legislator's laptop would normally be replaced. If all legislators selected a tablet, the lower cost of tablets would result in a \$105,000 savings over that period.
2. The General Assembly already owns most of the hardware and software that is needed to support an increased number of tablet devices. The legislative staff has already taken the following steps:
 - (a) Configured tablets purchased by legislators, when requested, to access Microsoft Outlook and the legislative information on the publicly available legislative Internet website.
 - (b) Arranged to acquire, without charge, configuration software that can be used to set- up iPads for use by legislators.
 - (c) Created and demonstrated a proto-type of a custom web page for legislators that would facilitate easy access to legislative information from the floor of the House or Senate with a tablet that uses a smaller touch-sensitive screen.
 - (d) Worked with Indiana Interactive, LLC to reduce the delay between the time that legislative information becomes public and the time the information appears on the publicly available legislative Internet website.
3. Making the following additional expenditures would increase the usefulness of these devices:
 - (a) Replacing desktop printers with printers that have wireless capabilities.

- (b) Increasing the number of wireless access points in the State House and the band-width of the legislative wireless network to accommodate greater numbers of users.
- (c) Purchasing a third-party application that would give greater control to information technology staff to wirelessly update settings and manage a large number of tablets being used on the legislative network.
- (d) Adding the capacity to the publicly available legislative Internet website to detect the type of tablet or other mobile device accessing the website and automatically optimize the display of the information for viewing on the device.
- (e) Adding the capacity to stream live video of legislative meetings to iPads and other mobile devices that do not use Windows Media Player.
- (f) Providing training to legislators to improve their ability to use the features of tablet devices.

A cost estimate for these additional expenditures is not yet available.

4. To reduce costs, printers could be replaced on the same printer replacement schedule that is currently in use. The expenditures listed in 3(c) and 3(d) above would also benefit any member of the public who accesses the publicly available legislative Internet website.
5. Giving legislators an opportunity to access legislative information outside the State House in locations where Wi-Fi services are unavailable would increase the usefulness of these devices. The General Assembly could address this issue by entering into a group purchase contract with a commercial carrier to provide 3G data services to legislators. To reduce costs, these services could be charged to the individual legislator who elects to use them.

Undertaking a Paperless Initiative that Builds on the Advantages of Tablet Devices

1. If the General Assembly seeks to make electronic access to bills, reports, motions, fiscal notes, and other legislative information more useful to legislators than accessing the same information in paper form, then the General Assembly faces a learning curve that requires the conversion that most likely will take two to four years.
2. Implementation of a solution in phases would have the following benefits:
 - (a) It would permit the General Assembly to make changes without large up-front costs that would require a special appropriation.
 - (b) It would increase the General Assembly's ability to tailor the changes to the needs of legislators.
 - (c) It would allow legislative staff and legislators time to receive the training needed to use the new paperless system.
 - (d) Any necessary changes in the rules of the House and Senate could be made incrementally as the new technology is demonstrated to remove the need for the old rules.

(e) It would permit the General Assembly to develop a solution that takes into account rapidly changing advances in technology.

3. In identifying which legislative activities to convert to a paperless process, priority should be given to procedures where the use of paper is clearly less useful than electronic documents. The distribution of committee packets and proposed committee amendments to members of a committee is clearly one of the legislative activities that could benefit from a paperless process. Implementation of a pilot project in the 2012 Session using one committee in the Senate and one committee in the House of Representatives would greatly improve the legislature's understanding of how to adapt technology to reduce the need for paper copies in the legislative process. It does not appear that any changes in the House or Senate rules are needed to carry out this pilot project.

4. The legislative staff has developed and demonstrated to the Subcommittee a process that could be used to conduct a pilot project to test electronic distribution of committee packets and proposed committee amendments to a limited number of committees. The process was designed to permit committee members to download packets and proposed amendments to an iPad 2. Once downloaded, the committee members have the ability to review, write notes on, and annotate their copies of the documents while they are in the State House or at another location. The process is described in flowchart form in Appendix A.

5. The process is a temporary solution and does not have all of the features that would be needed to provide services to all committees. To reduce expenses, some steps that might eventually be automated in a permanent implementation would need to be carried out by staff. It is estimated that the staff would not need to take more time to do these steps than they are required to take to prepare and distribute paper copies of committee packets and proposed committee amendments.

6. The following expenditures would facilitate a successful pilot project:

- (a) Purchase of an iPad 2 for each member of a committee participating in the pilot project and selected staff members. The total cost for 32 of these devices is estimated to be \$25,600.
- (b) Contracting with an outside group such as a state university to provide interns who are familiar with the use of iPads to assist legislators and staff with the pilot project during the 2012 Session. The cost of such a contract is estimated to be \$22,000.

7. Development of solutions to convert additional legislative activities to paperless processes should be undertaken after the adjournment of the 2012 Session. These efforts could involve changes such as the following:

- (a) Authorization of electronic filing of bills and motions.
- (b) Permission to substitute e-signatures for hand-written signatures.

- (c) Expand the circumstances when electronic distribution of a bill or motion begins the period when the bill or motion is considered "laid on the desk" of a legislator.
- (d) Expansion of a program of distributing all committee packets and pre-distribution of all committee amendments in electronic format to all committees in a form that could be accessed by an iPad or other mobile devices.
- (e) Preservation and storage of electronic copies of legislative documents in a manner that permits the electronic copy to be authenticated in a court of law as an official copy of the document.

RECOMMENDATIONS

The Subcommittee made the following recommendations:

Use of Tablet Devices in the Legislative Process

1. **LIMITED SUPPORT:** The General Assembly should continue its practice of assisting legislators to connect privately owned tablet devices and smart phones to the email, contact database, and calendaring functions provided by Microsoft Outlook. Access should be given only to the legislative wireless networks and websites that are outside the firewall.
2. **OPTION TO RECEIVE TABLET:** The General Assembly should consider distributing tablets with Wi-Fi and 3G capabilities to legislators. To save costs, the General Assembly might consider phasing-in the distribution of tablets over several years or giving some or all legislators an option of receiving a laptop or a tablet, but not both.
3. **REPLACING PRINTERS:** The General Assembly should purchase desktop printers that have a wireless capacity. To save costs, the General Assembly might consider phasing-in the purchase of wireless desktop printers over several years and reducing the total number of desktop printers that are purchased.
4. **INCREASE WIRELESS CAPACITY:** The General Assembly should increase the number of wireless access points in the State House and increase the band-width of the wireless networks used in the State House to accommodate greater numbers of users. To save costs, the General Assembly might add capacity only after there is a demonstrated need for the additional capacity. These improvements would benefit both legislators and members of the public who use the legislature's wireless networks in the State House.
5. **ENTERPRISE MANAGEMENT SOFTWARE:** The General Assembly should acquire the necessary enterprise management software to give greater control to the legislature's

information technology staff to wirelessly update settings and manage a large number of iPads being used on the legislative network.

6. OPTIMIZE INTERNET DISPLAY: The General Assembly should add the capacity to the General Assembly's website to detect the type of tablet or other mobile device accessing the website and automatically optimize the display of the information for viewing on the device. This feature would be available to both legislators and the public.

7. VIDEO STREAMING: The General Assembly should add the capacity to stream live video of legislative meetings to iPads and other mobile devices that do not use Windows Media Player. This feature would be available to both legislators and the public.

8. AVAILABILITY OF 3G SERVICE CONTRACT: The General Assembly should enter into a group purchasing agreement with a commercial provider of 3G data communication services that would permit legislators to purchase a monthly contract to obtain access to a 3G network at a fixed rate. Legislators would be required to pay for the contract through direct billing from the commercial provider or through an offset against the legislator's subsistence allowance payments.

9. REVIEW OF COMPUTER USE POLICIES IN 2012 INTERIM: The Legislative Council should direct the Data Processing Subcommittee to evaluate whether a computer use policy should be adopted.

Paperless Initiative Using Tablet Devices

1. COMMITTEE PILOT PROJECT: The House of Representatives and the Senate should each select at least one standing committee to test electronic distribution of committee packets for committee meetings in lieu of paper packets in the 2012 Session. In addition, if a selected committee has a policy of pre-distributing proposed amendments to committee members, the pilot project should permit committee members and any other person selected by the committee chair to receive copies of the proposed amendments in an electronic format in lieu of receiving paper copies. The pilot project should be conducted using the process developed by the staff and demonstrated to the Subcommittee at its November 14 meeting and iPad 2 tablets purchased for committee members and key staff. The General Assembly should enter into the necessary contracts to provide adequate training during the 2012 session to committee members involved in the pilot project.

2. PILOT CUSTOM LEGISLATIVE website: The General Assembly should make available to legislators who participate in the committee pilot project a custom web page that permits easy access to legislative information from the floor of the House or Senate with a tablet that uses a smaller touch-sensitive screen as a test of the technology. The

pilot project should be conducted using the custom web page created by the staff and demonstrated to the Subcommittee at its November 14 meeting.

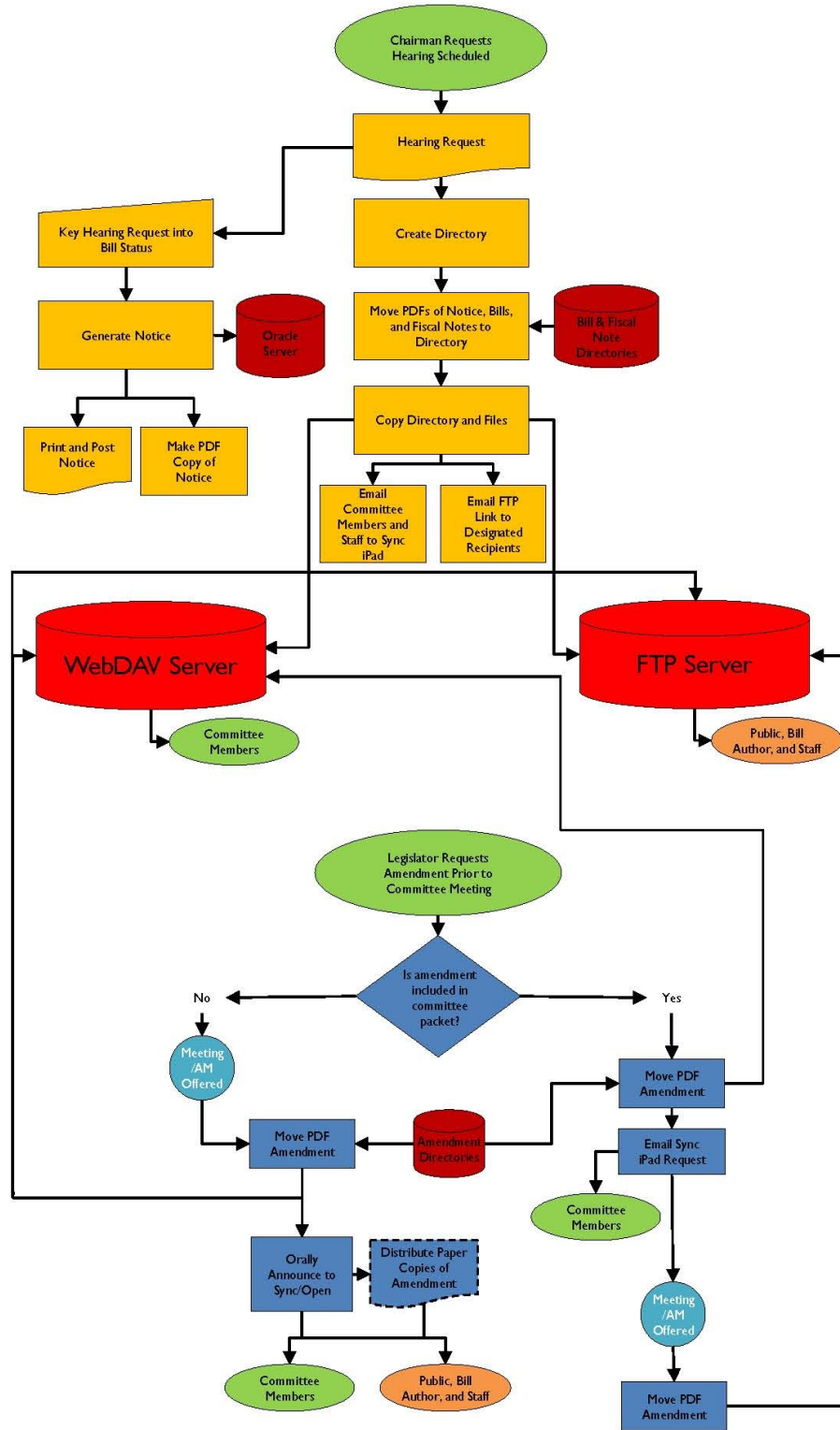
3. SELECTION OF ADDITIONAL LEGISLATIVE ACTIVITIES TO CONVERT TO PAPERLESS PROCESSES: The Legislative Council should direct the Data Processing Subcommittee to begin reviewing proposals and implementing proposals to convert additional legislative activities to paperless processes. The proposals should provide improvements that adequately address the reasons why paper continues to be used in the legislative process. Proposals considered by the Data Processing Subcommittee should include the following:

- (a) Authorization of electronic filing of bills and motions.
- (b) Permission to substitute e-signatures for a hand-written signatures.
- (c) Expand the circumstances when electronic distribution of a bill or motion begins the period when the bill or motion is considered "laid on the desk" of a legislator.
- (d) Expansion of a program of distributing all committee packets and pre-distribution of all committee amendments in electronic format to all committees in a form that could be accessed by an iPad or another mobile devices.
- (e) Preservation and storage of electronic copies of legislative documents in a manner that permits the electronic copy to be authenticated in a court of law as an official copy of the document.

The proposals should be developed and implemented at a pace that does not require excessive expenditures in any single year.

4. CONSIDERATION OF HOUSE AND SENATE RULE CHANGES IN 2013 SESSION: The House of Representatives and the Senate should consider changes in their rules to permit greater use of electronic copies in a legislative activity when the legislative staff have demonstrated that a paperless process can adequately substitute for the use of paper documents in that activity.

APPENDIX A: WORKFLOW FOR DISTRIBUTION OF COMMITTEE PACKETS & AMENDMENTS



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