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From: Tim Orr

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Recommendation to increase staff in Revisor information services (IS) unit

Summary

Operation of the legislature depends on the Revisor's Office. Operation of the Revisor's Office depends on information technology (IT). Operation of IT depends on IS staff. Given these dependencies, the consequences of poor IT operation, and the growing IT workload - 7 new FTE's should be hired in the IS-unit.

This paper provides facts about the IT workload and offers a plan to hire 7 new FTEs over two years (2015-2016).

Introduction

Operation of the legislature depends on the products and services from the Revisor's Office.

Table 1. Revisor Products & Services

Revisor Products & Services	Customers							
	Legislature					**Executive Branch**		**Judicial Branch**
	House	**Senate**	**LCC**	**LRL**	**ROS**	**103 Agencies**	**State Register**	
1. S.O.B Computer Room	☑	☑	☑	☑	☑			
2. VOIP Phones	☑	☑	☑	☑	☑			
3. WiFi, 3 buildings	☑	☑		☑				
4. Virtual servers			☑	☑	☑			
5. Printers (10)	☑	☑	☑					
6. Bill Drafting	☑	☑	☑		☑			
7. Senate Journal		☑						
8. Remote Access					☑			
9. Intranet apps	☑	☑			☑			
10. Bill Status System	☑	☑			☑			
11. Public web site	☑	☑	☑	☑	☑	☑		☑
12. Legal Publishing: • Engrossments • Statutes • Laws • Admin Rules • State Register • Court Rules	☑	☑	☑	☑	☑	☑		☑
13. Administrative Rule Drafting					☑	☑	☑	

Operation of the Revisor's Office depends on information technology (IT). Each technology is dependent on other technologies. In figure 1, left-side technologies function only when right-side technologies are operational. Technologies are dependent on each other like links in a chain.

Figure 1. Dependencies of the information technologies

| Help Desk | Web, Intranet | XTEND | Database | Computers | Network | Computer Room |

Operation of information technologies depends on IS staff. One or more persons maintain each technology.

Figure 2. Mapping of IT to IS staff. Consultants in square brackets, [Consultant].

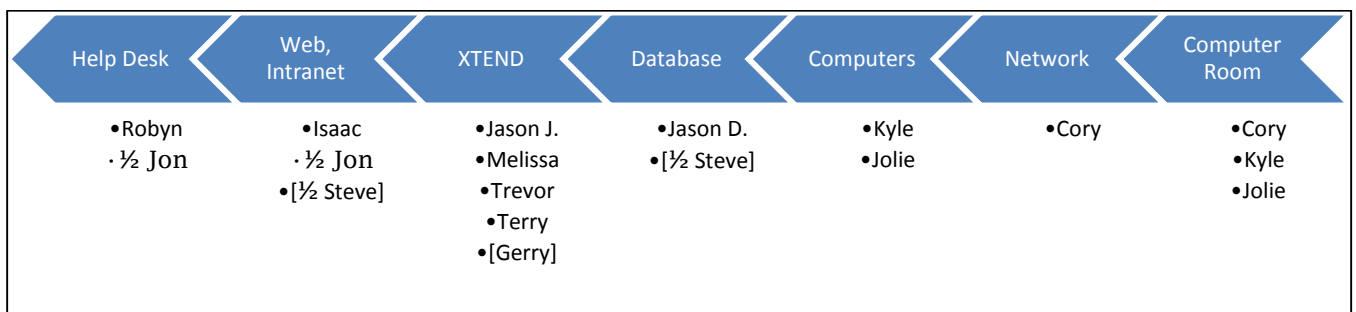| Help Desk	Web, Intranet	XTEND	Database	Computers	Network	Computer Room
•Robyn · ½ Jon	•Isaac · ½ Jon •[½ Steve]	•Jason J. •Melissa •Trevor •Terry •[Gerry]	•Jason D. •[½ Steve]	•Kyle •Jolie	•Cory	•Cory •Kyle •Jolie

Figure 3 combines these facts to show the contribution of IS staff to the office's products/services. As one example, Legal Publishing of statutes requires a Network that is maintained by a Network Administrator. Stated another way, no Network Administrator – no statutes.

Figure 3. Three examples of product-technology-people relationships
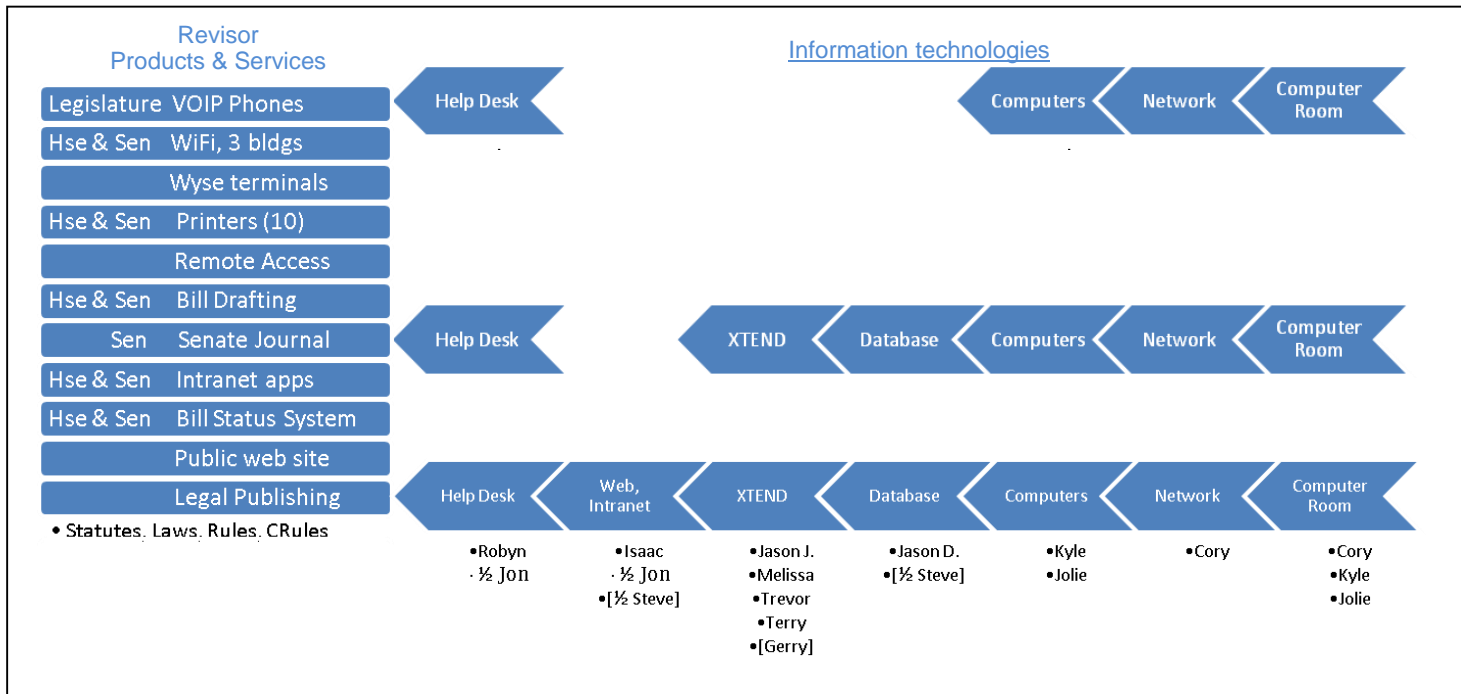
The need for additional IS FTEs

Several conditions drive the need for additional IS FTEs.

1. Backlog of work grows annually
2. Annual legislative sessions and law publishing limit development windows
3. Continuous vendor upgrades impact customized programming
4. Software development procedure lacks sufficient testing
5. Single-person points of failure

Backlog of work grows annually

Since 2008 (the year the majority of XTEND consultants were released) the amount of necessary IS work has increased. The IS-unit is not able to complete 100% of the necessary work each year, so a percentage is postponed to the following year. Over the 6 years since 2008 a significant backlog of IT work has accumulated. Figure 4 lists the backlog in each technology area.

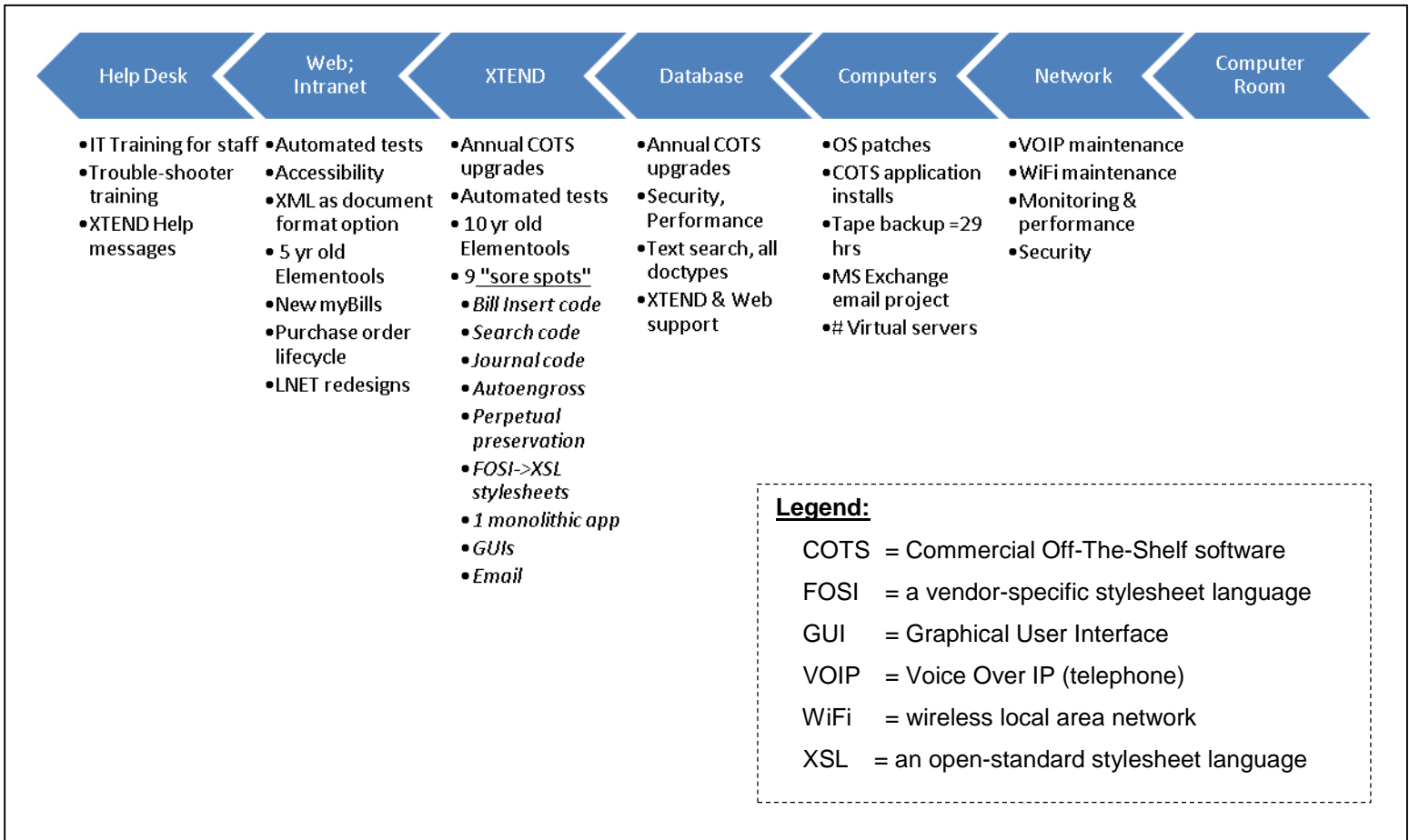An application called Elementool is used to track software defects in production code.

- XTEND has 166 production defects[1]. The earliest defect was reported in 2004 (#378).
- The Web/Intranet has 27 production defects[1]. The earliest defect was reported in 2010 (#3538).

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[1] Number of defects with a severity between Medium and ShowStopper.
The severity levels are: Low Medium High Critical ShowStopper.

If the Minnesota Administrative Rule Status System (MARSS) phase 1 is approved, it will add new work in each information technology.

Figure 4. Backlog of IT projects

Help Desk	Web; Intranet	XTEND	Database	Computers	Network	Computer Room

• IT Training for staff
• Trouble-shooter training
• XTEND Help messages
	• Automated tests
	• Accessibility
	• XML as document format option
	• 5 yr old Elementools
	• New myBills
	• Purchase order lifecycle
	• LNET redesigns
		• Annual COTS upgrades
		• Automated tests
		• 10 yr old Elementools
		• 9 "sore spots"
		  • *Bill Insert code*
		  • *Search code*
		  • *Journal code*
		  • *Autoengross*
		  • *Perpetual preservation*
		  • *FOSI->XSL stylesheets*
		  • *1 monolithic app*
		  • *GUIs*
		  • *Email*
			• Annual COTS upgrades
			• Security, Performance
			• Text search, all doctypes
			• XTEND & Web support
				• OS patches
				• COTS application installs
				• Tape backup =29 hrs
				• MS Exchange email project
				• # Virtual servers
					• VOIP maintenance
					• WiFi maintenance
					• Monitoring & performance
					• Security	

Legend:

COTS = Commercial Off-The-Shelf software

FOSI = a vendor-specific stylesheet language

GUI = Graphical User Interface

VOIP = Voice Over IP (telephone)

WiFi = wireless local area network

XSL = an open-standard stylesheet language

**Annual legislative sessions and law publishing limit development windows**

The legislature's schedule and the office's publishing schedule must not be delayed by IT work. During session, IS priorities are repairing defects, performance tuning, and security. After session the publishing schedule is the priority for the entire office. Therefore IT work must be completed on schedule or wait until the next "major IT delivery" date. See figure 5 for these dates.

IT delivery dates have been missed due to:

- insufficient staff to work complex problems;
- the absence of a person in one IT area.

The absence of 1 person can prevent other IT areas from proceeding. For example, if the database administrator is out, then a new database table is not created, and XTEND code cannot be developed (to populate the table), and the Web code cannot be developed (to retrieve the data).

Figure 5. Deploy major IT changes, 4 times per year
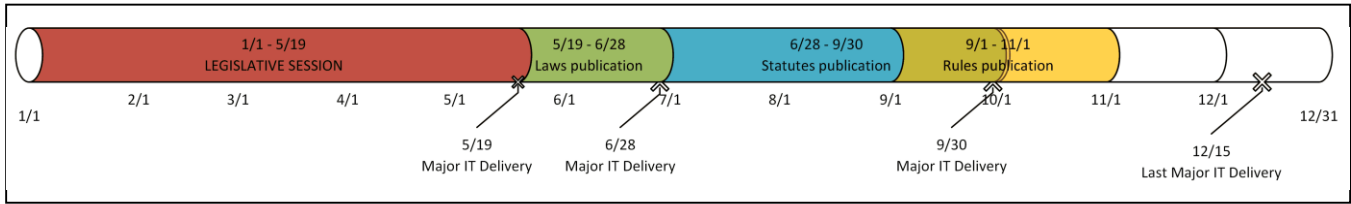
Continuous vendor upgrades impact customized programming

Revisor custom software applications (e.g. XTEND and the web site) are built on top of commercial off-the-shelf (COTS) software products. Annually, one or more of these vendors release new versions of their products and announce end-of-support dates for their existing products. New versions must be installed to retain support from the vendor and to utilize new features. However installation of new COTS version is time consuming because it often requires changing custom application(s) followed by full system testing. Installation of a vendor's new version can consume one major IT delivery date.

Figure 6. Vendor/Application. COTS software, installation sequence.
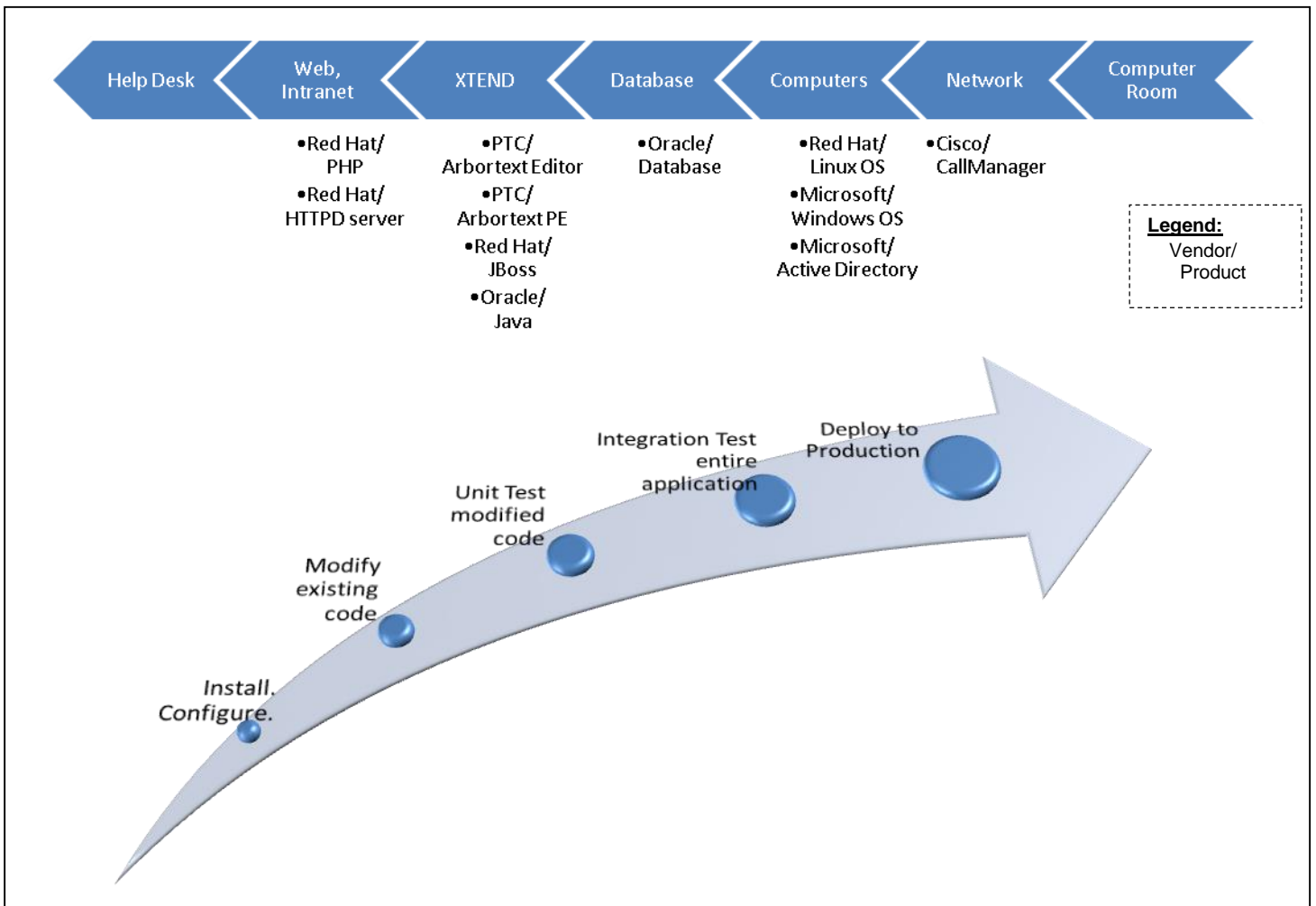
Software development procedure lacks sufficient testing

To meet the specific needs of the legislature, the office has written custom software applications. A deficient software development procedure is being used to develop and maintain XTEND, the public Web site, and intranet applications. The deficiency is in testing, specifically: automated and manual testing.

The cause of this deficiency is insufficient IS staff. Maintaining existing automated tests and developing new tests for new features is a full-time job. XTEND and the Web/Intranet code have 1400 and 0 automated tests, respectively. They should have 2800 and 100 tests, respectively. Manual testing is not a full-time job, but should be a full-time job for 1-4 weeks prior to a major IT delivery. Today a single Help Desk person performs the manual testing, between other duties.

Testing is needed after installation of a new COTS application version and after every modification to custom code. Testing finds defects before users encounter them in production. Defects that persist in the production environment waste users' and programmers' time; and can corrupt the office's database and official publications.

Single-person points of failure

Several technologies are being managed by a single staff person. See figure 7. These single points of failure present risks to IS, office, and legislative operations. The risks are:

- the absence of 1 person can delay IS project schedules
- an extended absence of 1 person during a legislative session can disrupt the session
- successor mentoring is impossible after the mentor retires. Successor training takes a minimum of 1 year.

Figure 7. Single points of failure
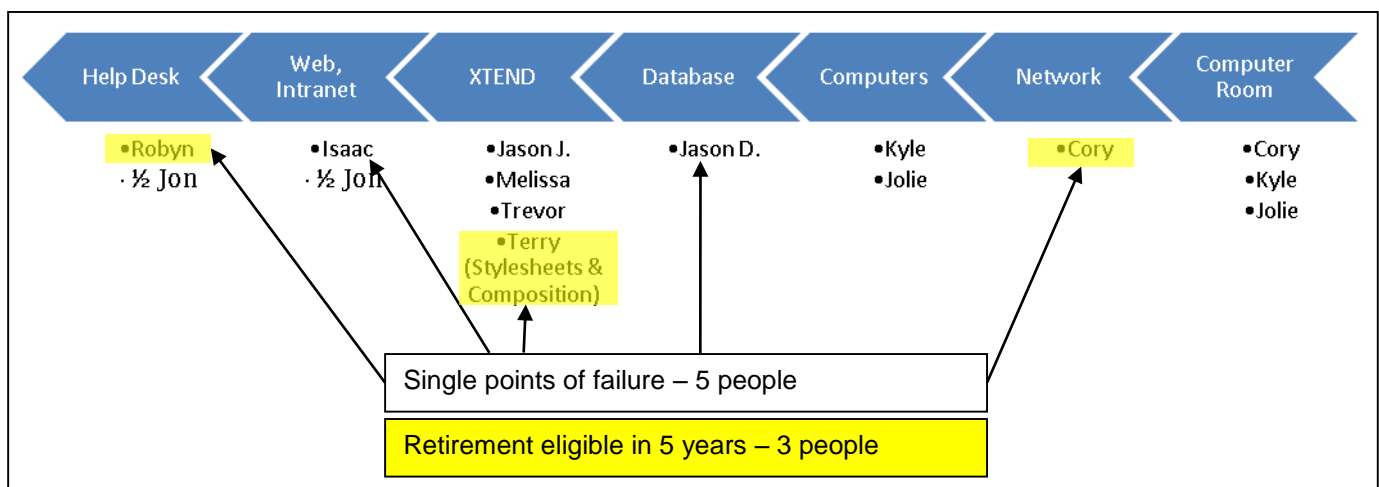
Recommendation #1. Hire new FTE staff

Hiring 7 new IS staff is recommended to improve the quantity and quality of IS work and to reduce the risks to office and legislative operations. Hiring can occur over two years.

In 2015 new staff should be hired to address most of the single-point of failure issues.   The 2015 legislative session can be used to authorize additional hiring in 2016. The office has received positive comments from the House and Senate authors of HF2724/SF2467 regarding the creation of a Minnesota Administrative Rule Status System (MARSS) if appropriations can be obtained in the 2015 legislative session. If a law is passed in the 2015 session, additional new staff could be hired in 2016.

The next page contains a 2 year hiring plan.

NOTE – EXISTING IS STAFF CANNOT BUILD THE MARSS SYSTEM AND MAINTAIN EXISTING SOFTWARE.

	LCC Level $ Range	Job Title of new hire	Duties
July 2015			
1.	9 $50-92K	Systems Analyst/Programmer I	Network Administrator #2 (Solves a single point of failure)❶
2.	10 $55-101K	Systems Analyst/Programmer II	XSL-FO stylesheet programmer ❶ • Convert 51 FOSI stylesheets to XSL-FO • Support book & web composition
3.	9 $50-92K	Systems Analyst/Programmer I	Web Programmer #2 ❶ • Maintain intranet pages used by ROS, House, Senate • Backup on public web site • Improve accessibility
4.	9 $50-92K	Systems Analyst/Programmer I	XTEND software tester • Develop and maintain automated tests • Develop and maintain manual testing procedures and documents • Report test results • Develop automated web tests
5.	10 $55-101K	Systems Analyst/Programmer II	Business Process Modeler (BPM) and Programmer • Develop and maintain XTEND workflows • Develop and maintain MARSS workflows
January 2016 – for MARSS project. Included in executive branch proposal.			

6.	10 $55-101K	Systems Analyst/Programmer II
		
		Can be contractor-to-hire.
			Database Administrator (DBA) for MARSS ❶
			• Design, build, maintain database tables
			• Migrate existing data into new database
			• Develop SQL code for programmers
			• After MARSS delivery:
			   o primary person for maintaining MARSS database
			   o backup for other DBA

7.	11 $66-123K	Software Developer – MARSS application
		
		Can be contractor-to-hire.
			MARSS project manager & web developer
			• Responsible for technical (IS) completion of MARSS project.
			• Writes MARSS web programs.
			• After MARSS delivery:
			   o primary person for maintaining MARSS software
			   o plans and monitors all ROS web programming tasks

	7 $43 – 78K	Legal Editor	*Not an IS position.* *The position was included in the fiscal note for HF2724/SF2467. It is included here for completeness.* Rulemaking Record Administrator • Monitors the completeness and consistency of each rulemaking record • Communicates with agencies and OAH to fix discrepancies

The 5th position, Business Process Modeler (BPM) and Programmer, will design and develop automated workflows for legislative document processing and for the MARSS system. Existing, manual, legislative workflows that could be automated are:

a) Bill, Resolution, Amendment request processing
b) Bill draft processing (Replace the paper folder checklist)
c) Change applications' (XTEND, Web, Intranet) default settings to reflect:
   (1) final laws have been published
   (2) new bill drafting numbers (15-xxxx)
   (3) the last year of official published statutes (for bill drafting and web pages)
   (4) the year of statutes being edited
   (5) the current legislative session (88), session year (2013), session type (1st special)
d) Conference committee report, web publishing
e) Engrossing and Enrolling
f) Editing, composition, publication of:
   (1) Laws
   (2) Statutes
   (3) Administrative Rules
   (4) Court Rules

MARSS system workflows will include:
g) data ingest from agencies
h) quality control of each rulemaking record, and reporting to the administrator

Recommendation #2. Consultant phase out

The 2 consultants should be retained at their current levels until new staff are hired.

The Systems Specialties consultant (Steve) serves as a backup for two technologies. Without the consultant the office would have single points of failure for web/intranet and database administrator (DBA) operations.

Database Tasks

+ Backup to staff DBA.
+ Work index publishing issues.
+ After 12c install, re-write SQL code that creates database views.

Web/Intranet Tasks

+ Backup to staff Web programmer.
+ Write SQL code to retrieve Admin Rules as they existed on a specific day.
+ Delete obsolete web pages.
+ Improve bulk download of bill status info to reduce load on public web server.

The EnterpriseJ consultant (Gerry) serves as a backup for a single point of failure – XTEND Stylesheets & Composition. Also, the consultant has the legislative and XTEND experience to address any XTEND issue.

+ 22.5 months[2] of work to fix sore spots
+ 152 Elementool issues
+ New issues from Statutes Ch. 3E features
+ Support 125 users in House, Senate, and Revisor's Office (during 2015 session)

Systems Specialties – proposed contract extension for ...... 7/1/2014 – January 2016
    Total Week: 78 weeks
    Hours/week: x 20 hours/wk
    Total Hours: 1560 hrs
    Hourly rate: x $120/hr
  Total Cost: $187,200

EnterpriseJ – proposed contract extension for .... 7/1/2014 – July 2015
    Total Week: 52 weeks
    Hours/week: x 32 hours/wk
    Total Hours: 1664 hrs
    Hourly rate: x $125/hr
    Total Cost: $208,000.

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2 Consultants for 7/1/2014 – January 2016
    Total Cost: $395,200.

Current status of contractors - Both consultants are under contract at recommended levels through 6/30/2015, funded by Revisor carryforward.

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[2] Estimate based on: 9 "sore spot" projects" x 2.5 months/project = 22.5 months