



**A Report to the
Governor, Lieutenant Governor, Speaker of the House,
and Chairs of the Senate and House Appropriations
Committees**

By the

Mississippi Data Management Working Group
(as created by House Bill 649, 2017 Regular Session)

November 28, 2018



MISSISSIPPI DATA MANAGEMENT WORKING GROUP

Department of Information
Technology Services

Legislative Budget Office

Institutions of Higher Learning

Department of Finance and
Administration

Department of Health

Administrative Office of the Courts

Joint Legislative Committee on Performance
Evaluation and Expenditure Review

Division of Medicaid

Department of Revenue

Governor of the State of Mississippi
Lieutenant Governor of the State of Mississippi
Speaker of the Mississippi House of Representatives
Chairs of the Appropriations Committees in the Mississippi House of Representatives and the
Mississippi Senate

During the 2017 Regular Session, the Mississippi Legislature enacted HB 649 establishing the Mississippi Data Management Working Group (MDMWG). HB 649 tasked the MDMWG to conduct a multi-faceted examination of our state's management of data, then to prepare a report for the Legislature on the findings and make recommendations for improving our data management practices.

Every day, state governments make decisions that affect the lives of their citizens. Legislators and governors determine which policies to enact and what public problems to address. State agencies establish how programs should be run and where budget dollars are best spent. Data lies at the heart of these critical decisions. Mississippi state government continues to collect and store a vast amount of data at increasing rates each year. To effectively serve the public, our state officials at every level of Mississippi government are tasked with ensuring that these crucial decisions are prudent and well informed.

The demands on government in the digital era requires data management to be strategic. While researchers have explored the use of administrative data in various areas of state government, little has been published on this trend more broadly. In 2016, the Pew Charitable Trusts interviewed state leaders across the U.S. noting ways in which some governments have employed innovative approaches, beyond traditional uses of administrative data, to accomplish the following: crafting policy responses to complex problems, improving service delivery, managing existing resources, and examining policy and program effectiveness.

Over the last 18 months, members of the MDMWG have diligently worked more than 3,400 hours to fulfill the directives set forth in HB 649, and respectfully submit the report herein.

Mississippi Data Management Working Group

Executive Summary

Authority

H.B. 649 (2017 Regular Session)¹ created the Mississippi Data Management Working Group (MDMWG or Working Group) for the purpose of researching and reporting on the quality, utility, and accessibility of data maintained and analyzed by the three branches of Mississippi state government. H.B. 649 lays a preliminary groundwork for exploring the current condition of state data and how the data can be better managed as a strategic asset. To carry out its responsibilities, the MDMWG conducted a 65-question online survey of 112 state government entities.

Findings of the Working Group

It is important to note that the MDMWG survey asked about *all* agency databases, not just those databases that an agency might consider to be critical to carrying out its mission. Therefore, in interpreting survey results it is not possible to compare the management of “mission critical” databases to “non-mission-critical” databases. Based on general estimates provided by the survey respondents, the MDMWG found that Mississippi state government:

- *holds significantly more unstructured data (14,562 terabytes in documents and files, such as Word, Excel; media files) than structured data (3,763 terabytes in 47,196 databases) and includes both production*

and nonproduction—e.g., test, training, development—databases.

- *has a data landscape that is dominated by a small number of entities that hold most of the data. These entities vary in size from small to large when measured by total number of employees.*
- *will expend approximately \$204 million (excluding staffing costs) for the five-year period ending June 30, 2019, to maintain the state’s databases, with a wide range in reported unit costs.*

Data Quality

A majority of agencies maintain some documentation of quality controls—e.g., data dictionaries, user manuals, table layouts, codebooks, training material—necessary to ensure data quality. A significant portion of the state’s structured data is administered by third-party vendors. The variability in controls over data quality across state agencies suggest that appropriate standardization of these controls could improve the state’s ability to ensure the quality of its data.

Data Accessibility

Accessibility of data is partly a function of being able to obtain the data and partly a function of the data being available in a format that lends itself to a variety of uses.

¹H.B. 649 is also known as Chapter 315, Laws of 2017. The law went into effect on July 1, 2017 and stands repealed on December 2, 2018.

Survey results indicate that the majority of data is not openly accessible; however, the survey did not ask for percentage of confidential or sensitive data that cannot be shared by some agencies due to state or federal laws—e.g. HIPAA, FERPA.² With respect to the second aspect of accessibility, data being available in a format that lends itself to a variety of uses, survey results indicate that the state’s databases are in a wide variety of formats possibly driven by differences in agency missions and goals. Decision makers need access to accurate information in a useful form in order to make sound business decisions.

Data Utility

Data must be accessible and reasonably documented in order to be useful and have utility. The most frequently used Database Management System (DBMS) in the state is Microsoft Access, which contains less than 1% of all state data per survey results. In terms of volume, most of the state’s data resides in such database systems as Oracle, DB2, Microsoft SQL, Lotus Notes, and email databases, which typically require highly skilled technical personnel to implement, maintain, and support. The diversity of data formats reported by state agencies, the prevalence of outsourced systems among some agencies, and the inconsistency of important forms of documentation suggest the state has progress to make in ensuring that its data are useful.

Developing Data as a Strategic Asset

What does it mean to manage data as a strategic asset?

²HIPAA refers to the Health Insurance Portability and Accountability Act of 1996; FERPA refers to the Family Educational Rights and Privacy Act of 1974.

According to the National Association of State Chief Information Officers (NASCIO):

“data that has intelligence or intellectual property applied to it becomes information and information is the fuel needed by the business of government to execute programs and make informed decisions. ... for data and information to be considered “strategic,” their generation and utilization must be in support of, and tied back to, specific business [in this case government] goals. ...Information that is not available, useful, and consumable cannot be used to make informed decisions. ... information must be reliable, based on data supported by standards, and validated by business rules....”

Other proponents note that the practice of managing data as a strategic asset facilitates discoveries that go beyond the subject matter of an individual dataset, such as improved social policy and cost savings identified through the analysis of relationships between isolated datasets.

What are best practices for managing data as a strategic asset?

The U.S. Office of Management and Budget’s (OMB) Open Data Policy for Managing Information as an Asset is a good source of best practices. While developed for the federal government, the best practices for data management contained therein are equally applicable to government at all levels.

As shown in the exhibit on page 120, OMB’s seven principles of open data align with the objectives of H.B. 649 by making government data accessible (subject to privacy, confidentiality, security, or other valid restrictions), usable, and descriptive of its quality.

What actions are recommended by NASCIO for moving the process of managing data as a strategic asset forward?

Recognizing the importance of promoting and advancing data management across the state government enterprise, including the need for more data sharing, NASCIO makes the following recommendations for advancing enterprise data management:

- *Assemble an early organizational structure, roles and responsibilities that will form the early governance and management of data management. Identify and recruit champions who will support a data management operating discipline with funding and authority.*
- *Develop a communications strategy for delivering a compelling message regarding data management and its value to government and citizens.*
- *Clearly articulate organizational strengths and weaknesses related to data management.*
- *Clearly describe the risks state government faces if “data management” is not properly managed.*

Developing the State’s Data as a Strategic Asset

The Working Group identified three recommendations for the Legislature to consider in moving forward in developing the state’s data as a strategic asset. It should be noted that the implementation of each of the following recommendations could carry substantial unknown costs:

- 1) procure an in-depth study into the questions that were raised as a result of the survey;
- 2) secure appropriate skilled resources to develop a data strategy for building a statewide data model and

establishing a data governance structure; and

- 3) conduct appropriate cost-benefit analysis to support the recommended data strategy that is developed after additional information is gathered.

While Section 4(2) of H.B. 649 directs the Working Group to include in its report draft legislation that addresses the concerns stated therein, the members of the Working Group agreed that there should be further discussion and consideration of the content of this report before developing a specific plan for legislative action to move the state forward in the development of its data as a strategic asset.

Report of the Mississippi Data Management Working Group

November 28, 2018

Authority

H.B. 649 (2017 Regular Session)³ created the Mississippi Data Management Working Group for the purpose of researching and reporting on issues related to the quality, utility, and accessibility of data maintained by all agencies, boards, commissions, departments, and committees of the executive, legislative, and judicial branches of Mississippi state government. Acknowledging the importance of data-driven decision-making to the efficient and effective operation of state government, H.B. 649 lays a preliminary groundwork for exploring the current condition of state data and how it can be better managed as a strategic asset. The text of H.B. 649 can be found in Appendix A on page 11.

Composition of the Working Group

Section 2(1) of H.B. 649 created the Mississippi Data Management Working Group (hereinafter referred to as MDMWG or the Working Group), composed of the following nine members or their designees:

- (a) *The Executive Director of the Mississippi Department of Information Technology Services;*
- (b) *The Executive Director of the Mississippi Department of Finance and Administration;*
- (c) *The Executive Director of the Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER);*
- (d) *The Executive Director of the Legislative Budget Office;*
- (e) *The Mississippi State Health Officer;*
- (f) *The Executive Director of the Mississippi Division of Medicaid;*
- (g) *The Commissioner of Higher Education;*
- (h) *The Executive Director of the Mississippi Administrative Office of the Courts; and*
- (i) *The Commissioner of Revenue.*

Appendix B on page 14 lists MDMWG members and their designees who attended one or more meetings of the Working Group.

In accordance with Section 2(2) of H.B. 649, within 30 days of the July 1 effective date of the act, the MDMWG held its organizational meeting on July 18, 2017, and elected from its membership both a chairperson, the Executive Director of the Mississippi Department of Information Technology Services (ITS), and a vice chairperson, the Executive Director of the

³H.B. 649 is also known as Chapter 315, Laws of 2017. The law went into effect on July 1, 2017, and stands repealed on December 2, 2018.

Legislative Budget Office (LBO). While H.B. 649 did not provide for the election of a Secretary, staff of ITS served in this capacity, handling all administrative functions in support of the Working Group, including, but not limited to, recording minutes, notifying members of meetings, obtaining contact information for survey recipients, and following up with late respondents to encourage survey completion.

At its meeting of September 26, 2017, the MDMWG agreed to invite additional agencies/entities to attend future meetings of the Working Group and participate in an advisory capacity. The minutes reflect that the Working Group extended invitations to the Mississippi departments of Archives and History, Child Protection Services, Education, Human Services, Transportation, as well as the Mississippi Community College Board, the Mississippi Health Information Network, and the National Strategic Planning and Analysis Research Center at Mississippi State University. At its meeting of October 17, 2017, the MDMWG added the Mississippi Department of Corrections to the list of invitees. Staff representing the following invited state agencies attended one or more meetings of the MDMWG: Department of Archives and History, Department of Corrections, Department of Human Services, and Mississippi Department of Transportation. Appendix C on page 15 lists the staff from these agencies who attended MDMWG meetings, by agency represented.

Responsibilities of the Working Group

Section 3(1) of H.B. 649 charges the MDMWG with determining, through its research:

- (a) The identity of any and all financial and nonfinancial databases maintained by the three branches of state government;*
- (b) The degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner;*
- (c) The existence of policies regarding the retention and archiving of past years' database files;*
- (d) Any standards for uniformity of database architecture;*
- (e) The transparency and Internet accessibility of such databases that are established for public access and use;*
- (f) The degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility of assessing agency and program effectiveness and efficiency;*
- (g) The general volume, source and format of unstructured data not currently found in databases;*
- (h) Any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information;*
- (i) The existence of one or more data dictionaries for any and all databases;*
- (j) The existence of any audit procedures implemented by such entities to ensure reliability of data;*
- (k) Issues related to the public ownership of the databases of such entities;*
- (l) Issues related to security of such databases;*
- (m) Costs of maintaining databases; and*
- (n) Any other matter that the working group considers merited to study and comment.*

Section 4(1) of H.B. 649 requires the MDMWG to prepare and present a report to the Speaker of the House, the Lieutenant Governor, the Governor, and the Chairs of the House and Senate Appropriations Committees, no later than December 1, 2018, containing the following issues:

- (a) Findings or conclusions regarding the quality, accessibility and utility of the databases of state government;
- (b) Findings or conclusions regarding the volume, source, format and expected growth of unstructured data of the state government;
- (c) Specific conclusions found regarding the issues described in Section 3 of the act; and
- (d) Any other issues related to managing data as a strategic asset that merits reporting as determined by the Mississippi Data Management Working Group.

Section 4(2) of H.B. 649 requires the MDMWG to include in its report draft legislation that addresses the concerns stated therein.

Section 5 of H.B. 649 repeals the act effective on December 2, 2018.

Formation of Committees To Carry out Responsibilities of the Working Group

At its meeting of August 15, 2017, under the authority granted in Section 2(2) of H.B. 649, the chair of the MDMWG established four committees to complete the responsibilities of the working group. A fifth committee, the Survey Support Committee, was later added following final adoption of the survey instrument to assist survey participants in completing the survey. The following table shows the primary responsibilities of each committee. Appendix D on page 16 contains a list of committee members.

Committee	Responsibilities
Legal	<ul style="list-style-type: none"> • Compile list of entities to be surveyed • Develop survey questions • Determine and report legal concerns • Draft bill language, as needed
Financial	<ul style="list-style-type: none"> • Create method to determine costs of the state's databases • Develop survey questions
Security	<ul style="list-style-type: none"> • Develop survey questions • Determine and report data security concerns as related to the survey
Survey and Data Analysis	<ul style="list-style-type: none"> • Develop and oversee creation of the survey instrument • Analyze data collected through the survey
Survey Support	<ul style="list-style-type: none"> • Answer individual questions from survey participants • Staff the nine survey informational sessions scheduled at the Department of Information Technology Services to assist survey participants

Since its inception, the Working Group has held 19 meetings of the full membership, culminating in its final official act on November 28, 2018, the approval of the release of this report to the recipients designated in the act. The majority of the meetings of the MDMWG

focused on issues related to the development and administration of an online survey of state agencies, boards, and commissions designed to address the issues identified for review in H.B. 649. In total, members of the Working Group report having worked approximately 3,400 hours fulfilling their responsibilities under the law.

Identification of State Agencies, Boards, and Commissions To Include in the Working Group's Survey

In compiling its final list of entities to include in the survey, the Legal Committee compared lists of state agencies, boards, and commissions maintained by the Office of the Secretary of State (“Blue Book”), Legislative Budget Office, Department of Finance and Administration (filtered by Mississippi Public Meeting Notice website and reviewed by staff of Mississippi’s Accountability System for Government Information and Collaboration, MAGIC, for consistency with the entities included in MAGIC) and Joint Legislative Committee on Performance Evaluation and Expenditure Review. This process yielded a combined list of 122 distinct entities, of which 98 entities appeared on all four lists and were therefore included in the initial list of agencies to be surveyed. The Legal Committee considered each of the 24 entities that did not appear on all four lists on an individual basis. The Legal Committee and DFA staff recommended excluding 7 of the 24 entities either because the named entity:

- *no longer met the definition of a state agency (e.g., Mississippi Coast Coliseum Commission);*
- *was subordinate to another surveyed entity and would therefore be included in that agency’s survey response (e.g., the Mississippi Autism Board, a subordinate unit of the Office of the Secretary of State); or*
- *did not clearly meet the definition of a state agency, such as entities that have never received a state appropriation (e.g., Mississippi Business Finance Corporation).*

During a working call held on January 10, 2018, the MDMWG approved the resulting list of 115 entities to include in the survey. The Working Group subsequently removed two entities, the Mississippi Institute for Forest Inventory and Pearl River Basin Development District, from the list after it was determined that they were no longer functioning as state agencies. A third entity, the Commercial Mobile Radio Service Board, was also removed because of its limited functions, resulting in a final list of 112 entities included in the survey (see Appendix E on page 18).

Development of Survey Instrument

The Working Group developed its survey instrument over the course of approximately six months. The Working Group piloted its survey in order to identify any problems with the instrument before the official launch, such as a lack of clarity in definitions or instructions. The following six entities participated in the pilot survey: Department of Archives and History, Office of the Attorney General, Department of Corrections, State Board of Cosmetology, Mississippi Supreme Court, and Office of the State Treasurer. The pilot agencies provided useful feedback that assisted the Working Group in refining its final survey instrument.

The Working Group selected Qualtrics survey software as the platform for its online survey. A fillable PDF version of the survey was released on April 26, 2018, followed by an email sent on May 4, 2018, containing a link to the online Qualtrics survey. See Appendix F, beginning on page 22, for the survey instrument and Appendix G, beginning on page 51, for the survey’s Quick Reference Guide. The survey contains 65 questions, organized by the following topics:

- *unstructured data (Questions 1-5);*
- *structured data (Questions 6-23);*
- *architecture, data reliability, and standards (Questions 24-33);*
- *transparency, Internet accessibility, and public ownership of data (Questions 34-39);*
- *remote connectivity for other state government entity access (Questions 40-42);*
- *legal requirements (Questions 43-49);*
- *security of databases (Questions 50-56); and*
- *costs of maintaining databases (Questions 57-65).*

The survey also included background questions, such as the name of the agency and primary respondent completing the survey (including his or her contact information), a list of all “divisions, departments, facilities, sub-agencies, and other entities” included in the survey response, and the total number of both full-time equivalent (FTE) and contract staff employed by the entities included in the response.

The Working Group held nine informational sessions to assist agencies having questions or difficulties in completing the survey. Data collection ended on July 11, 2018, with a 100% survey response rate.

Analysis of Survey Responses

Confidentiality of Individual Responses to Survey

Before discussing survey results, it is important to note that survey respondents were assured that their individual responses to the survey would be kept confidential. The instructions to survey respondents explicitly state, “The final report produced by the MDMWG will not contain any agency-specific information but will only contain aggregate, statewide, summarized information.” As further assurance to participating agencies, Section 4(2) of H.B. 649 states “Upon presenting the report, all files, research, and records gathered by the Mississippi Data Management Working Group shall become work files of the PEER Committee.” By PEER Committee rule, all PEER work files are confidential and therefore cannot be shared or otherwise released to any person or entity.

Abiding by the commitment to protect the confidentiality of individual survey responses, neither the following cautions concerning interpretation of the survey data nor the analysis of survey results present agency-specific information.

Cautions in Interpreting Survey Results

Before discussing the Working Group’s analysis of survey responses, it is important to discuss a few cautions in drawing conclusions from the data provided by the survey respondents.

First, it should be noted that much of the data presented in this report are general estimates rather than precise measurements. In fact, many survey questions requested estimates rather than precise measurements so as to maximize agency participation.

Second, while the Working Group reports a 100% survey response rate, not all of the responses received were complete—i.e., several respondents did not answer all survey questions that applied to them. Of the 112 entities included in the survey (Appendix E, page 18), two agencies only provided requested background information—e.g., name of agency and primary respondent—without answering any of the 65 survey questions, and an additional six agencies left numerous survey questions blank. Many more agencies left a few questions blank. One agency reported volumes of data so questionably large that their responses were removed from the analysis.

Also, in interpreting survey results, it should be noted that the MDMWG survey questions asked about all agency databases, not just those the agency might consider to be “mission critical”—i.e., databases that agency executives, personnel, and constituents rely on to make important and informed decisions. Also, production and nonproduction (test, training, development) databases were included in the survey responses. Members of the Working Group suggested that any database that the agency deems important enough to maintain should be included in the survey. It is unknown how the decision to include all databases impacted the survey results; however, in the absence of an operational definition of “mission critical” databases, any effect would have been solely subjective and not generalizable. Nevertheless, it is important to note that while the survey quantifies the numbers and sizes of databases, it does not report how “mission critical” databases are managed in comparison to “non-mission-critical” databases. Further, the survey does not report how many “mission-critical” databases are already shared.

Analysis of Survey Responses and Summary of Conclusions Drawn from Responses

Appendix H on pages 64 through 118 presents the Working Group’s analysis of the responses to each survey question. The analysis for each question includes the following:

- *a graphical representation of the data reported;*
- *a reference to the specific mandate(s) in H.B. 649 that the question seeks to address; and*
- *an analysis of any conclusions that can be drawn from the data reported.*

The following table presents summary statistics of estimates provided by survey respondents for selected survey questions. As the table shows, survey respondents estimated holding significantly more unstructured data⁴ (14,562 terabytes⁵) than structured data (3,763 terabytes held in 47,196 databases). Estimated actual and projected costs of maintaining these databases, excluding staffing costs, totaled approximately \$204 million for the five-year period ending June 30, 2019.

⁴The MDMWG Survey Quick Reference Guide (see page 51) defines unstructured data as electronic data that are not found in structured data formats—e.g., documents, such as Word, Excel, PowerPoint, or PDF; media files, such as pictures, videos, or music; or other raw data, including operating system volumes. The guide instructed survey respondents to include unstructured data on all machines—e.g., laptops and desktops.

⁵A terabyte is a unit of information equal to 1 million million (10¹²) or strictly, 2⁴⁰ bytes.

Total of Estimates Provided by All Surveyed Entities in Response to Selected Survey Questions, as Indicated in the First Column

Unstructured Data		
1	Amount of unstructured data not currently found in databases	14,562 terabytes
2	Five-year growth of unstructured data	14,326 terabytes
Structured Data		
6	Number of databases currently in use	47,196
9	Amount of structured data	3,763 terabytes
10	Five-year growth of structured data	3,260 terabytes
21	Amount of data stored offsite	3,271 terabytes
Costs of Maintaining Databases (Excluding Staffing Costs)		
57	Hardware costs for all databases (FY 2015-FY 2019)	\$25,774,576
58	Software costs for all databases (FY 2015-FY 2019)	\$42,085,221
59	Hardware maintenance and support costs for all databases (FY 2015-FY 2019)	\$30,270,660
60	Software maintenance and support costs for all databases (FY 2015-FY 2019)	\$87,905,594
61	Cost to provide security for all databases for FY 2015-FY 2019	\$4,878,700
62	Cost to provide disaster recovery/business continuity for all databases for FY 2015-FY 2019	\$7,587,675
63	Cost for liability insurance related to data loss or data breaches for all databases for FY 2015-FY 2019	\$848,180
64	Cost for liability insurance related to equipment loss in the event of a disaster for all databases for FY 2015-FY 2019	\$4,936,324
	Total costs of maintaining databases for FY 2015-FY 2019	\$204,286,930

The Working Group’s analysis of survey responses by size of the responding entity (measured by the total number of full-time equivalent and contractual employees) revealed that size was not a statistically significant influence on the variables measured in the survey. The following discussion focuses on the broad conclusions drawn from the survey responses, undifferentiated by agency size, regarding the quality, utility, and accessibility of the databases of state government.

Data Quality

The survey revealed that controls over data quality are highly variable across state government. A majority of agencies maintain some documentation of quality controls—e.g., data dictionaries, user manuals, table layouts, codebooks, explicit training material for new users—that one would expect to ensure data quality. A minority of agencies have had a federal-standard data reliability audit of any of their databases. The purpose of a data reliability audit is to test the validity (whether the data actually represents what is purportedly being measured), reliability (whether the measure can be depended on to be accurate), completeness, and accuracy of electronic data.

The survey further revealed that most agencies have at least some structured data administered by a vendor. Many agencies have all of their structured data administered in this way. The variability in controls over data quality across state agencies suggest that appropriate standardization of these controls could improve the state's ability to ensure the quality of its data.

Data Accessibility

Accessibility of data are partly a function of being able to obtain the data and partly a function of the data being available in a format that lends itself to a variety of uses. The first aspect of accessibility (being able to obtain the data) is addressed in such survey questions as numbers 34 through 41. Survey results indicate that the majority of data are not openly accessible; however, the survey did not ask for percentage of confidential or sensitive data that cannot be shared by some agencies due to state or federal laws—e.g., HIPAA, FERPA.⁶ With respect to the second aspect of accessibility (data being available in a format that lends itself to a variety of uses), survey questions, such as numbers 10 and 26 through 31, indicate that the state's databases are in a wide variety of formats possibly driven by differences in agency missions and goals.

Data Utility

The most frequently used database management system (DBMS) in the state is Microsoft Access, which contains less than 1% of all state data per survey results. In terms of volume, most of the state's data resides in database systems, such as Oracle, DB2, Microsoft SQL, Lotus Notes, and email databases, which typically require highly skilled technical personnel to implement, maintain, and support. While Microsoft Access is not highly scalable—i.e., has limited capacity to effectively handle growth—it has the advantage of not placing great technical demands on its users. The second most frequently used DBMS is FoxPro. FoxPro has not been supported in several years, meaning that all problems with the system must either be resolved by agency staff or by outsourcing the service at a high cost to the agency. Database Management Systems controlled by third-party vendor applications also rank above the median in terms of their frequency of use.

Data must be accessible and reasonably documented in order to be useful and have utility. The diversity of data formats reported by state agencies, the prevalence of outsourced systems among some agencies, and the inconsistency of important forms of documentation suggest the state has progress to make in ensuring that its data are useful.

Other Broad Conclusions

Other broad conclusions drawn from an analysis of the survey responses include the following:

⁶HIPAA refers to the Health Insurance Portability and Accountability Act of 1996; FERPA refers to the Family Educational Rights and Privacy Act of 1974.

First, issues surrounding data management in Mississippi are not evenly distributed among state agencies. In almost every respect in which numbers are available—data volume, data growth, cost, and database count—there are a few large-scale agencies and a large number of small-scale agencies, though scale is not necessarily correlated with agency size based on total number of FTEs and contract employees. In fact, the entities reporting the largest data volume ranged in size from five total employees to more than 8,000 total employees. The difference in scale between large- and small-scale entities often spans many orders of magnitude. This fact has consequences for understanding the present and planning for the future. Regarding the present, the state data landscape is dominated by a small number of agencies. Therefore, understanding that landscape depends disproportionately on those agencies' answers to questions like those in this survey. Regarding planning for the future, solutions that target a small number of appropriately chosen agencies can affect a large portion of the state's data.

Second, unit costs for various aspects of agency data administration vary considerably, with some agencies paying significantly more per unit of data than others. The reasons for this and other observed variations in the data would require further review beyond the scope of the survey. While some agencies may have more exacting technical needs than others, the variability in agency costs of their data solutions suggests that cost savings may be possible for some agencies.

Developing the State's Data as a Strategic Asset

Appendix I on page 119 presents a discussion of managing data as a strategic asset, focusing on answering the following questions:

- *What does it mean to manage data as a strategic asset, and what benefits does it offer to state government?*
- *What are best practices for managing data as a strategic asset?*
- *What actions are recommended by the National Association of State Chief Information Officers (NASCIO)⁷ for moving the process of managing data as a strategic asset forward?*

Decision makers need access to accurate information in a useful form in order to make sound business decisions. However, data are not merely a local asset. Information is a specifically strategic asset. While small datasets guide daily decisions and large datasets inform operations, relations among large datasets are important to a state's large-scale, multiagency efforts to achieve its broadest goals.

The Working Group identified three recommendations for the Legislature to consider in moving forward in developing the state's data as a strategic asset. It should be noted that the

⁷According to its website, <https://www.nascio.org/AboutNASCIO>, the National Association of State Chief Information Officers is “a non-profit 501(c)(3) association representing state chief information officers and information technology executives and managers from the states, territories, and the District of Columbia.”

implementation of each of the following recommendations could carry substantial unknown costs:

1. *procure an in-depth study into the questions that were raised as a result of the survey;*
2. *secure appropriate skilled resources to develop a data strategy for building a statewide data model and establishing a data governance structure; and*
3. *develop appropriate cost-benefit analysis to support the data strategy that is decided upon after additional information is gathered.*

While Section 4(2) of H.B. 649 directs the Working Group to include in its report draft legislation that addresses the concerns stated therein, the members of the Working Group agreed that there should be further discussion and consideration of the content of this report before developing a specific plan for legislative action to move the state forward in the development of its data as a strategic asset.

Appendix A: H.B. 649, Chapter 315, Laws of 2017

MISSISSIPPI LEGISLATURE

2017 Regular Session

To: Technology

By: Representative Johnson (87th)

**House Bill 649
(As Sent to Governor)**

AN ACT TO DECLARE STATE POLICY WITH RESPECT TO MANAGING DATA AS A STRATEGIC ASSET; TO CREATE THE MISSISSIPPI DATA MANAGEMENT WORKING GROUP; TO PROVIDE THAT THE MISSISSIPPI DATA MANAGEMENT WORKING GROUP SHALL BE RESPONSIBLE FOR STUDYING STATE AGENCY DATA SOURCES; TO ESTABLISH THE MEMBERSHIP AND REPORTING REQUIREMENTS OF THE MISSISSIPPI DATA MANAGEMENT WORKING GROUP; TO PROVIDE THE DATE OF REPEAL FOR THE MISSISSIPPI DATA MANAGEMENT WORKING GROUP; AND FOR RELATED PURPOSES.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MISSISSIPPI:

SECTION 1. The Legislature finds:

- (a) That the public expects programs of state government to be managed effectively and efficiently,
- (b) That the accomplishment of these ends requires that lawmakers and managers make data-driven decisions,
- (c) That the quality of any data-driven decisions will be impacted by the quality, utility, and accessibility of the data that is maintained and analyzed by state government entities, and
- (d) That the volume of state government data in unstructured formats is rising dramatically due to the use of new technologies.

SECTION 2. (1) To assist in achieving the ends of effective and efficient management, there is created the Mississippi Database Management Working Group. This working group shall be composed of the following nine (9) members:

- (a) The Executive Director of the Mississippi Department of Information Technology Services, or his or her designee;
- (b) The Executive Director of the Mississippi Department of Finance and Administration, or his or her designee;
- (c) The Executive Director of the Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER), or his or her designee;
- (d) The Executive Director of the Legislative Budget Office, or his or her designee;
- (e) The Mississippi State Health Officer, or his or her designee;
- (f) The Executive Director of the Mississippi Division of Medicaid, or his or her designee;
- (g) The Commissioner of Higher Education, or his or her designee;
- (h) The Executive Director of the Mississippi Administrative Office of the Courts, or his or her designee; and
- (i) The Commissioner of Revenue, or his or her designee.

(2) The Executive Director of the Department of Information Technology Services, or his or her designee shall call the first meeting of the Mississippi Data Management Working Group which shall organize within thirty (30) days of the effective date of this act. At its first meeting, the

working group shall elect a chairperson and vice chairperson from its membership. The group shall develop a plan for completing the working group's activities and responsibilities. The elected chairperson may create committees and appoint members of the working group to serve on each committee as he or she deems necessary to complete the responsibilities of the working group.

(3) All working group members shall serve without compensation, however, members shall be entitled to receive reimbursement for any official travel as provided for in Section 25-3-41. The working group shall have the authority to establish any policies and procedures it determines are necessary and proper for the completion of its responsibilities.

(4) All agencies of the executive branch and agencies and committees of the legislative and judicial branches shall cooperate with the working group in carrying out its responsibilities as provided for in this act.

SECTION 3. (1) The Mississippi Data Management Working Group shall research and report on issues related to the quality, utility and accessibility of data maintained by all agencies, boards, commissions, departments and committees of the executive, legislative, and judicial branches of Mississippi state government. Based on its research the working group shall determine and ascertain, the following:

(a) The identity of any and all financial and nonfinancial databases that such entities maintain;

(b) The degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner;

(c) The existence of policies regarding the retention and archiving of past years' database files;

(d) Any standards for uniformity of database architecture;

(e) The transparency and Internet accessibility of such databases that are established for public access and use;

(f) The degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency;

(g) The general volume, source and format of unstructured data not currently found in databases;

(h) Any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information;

(i) The existence of one or more data dictionaries for any and all databases;

(j) The existence of any audit procedures implemented by such entities to ensure reliability of data;

(k) Issues related to the public ownership of the databases of such entities;

(l) Issues related to security of such databases;

(m) Costs of maintaining databases;

(n) Any other matter that the working group considers merited to study and comment.

(2) All files and records of the working group shall, upon completion of the report required by Section 3 of this act, become work files of the PEER Committee.

SECTION 4. (1) Not later than December 1, 2018, the Mississippi Data Management Working Group shall prepare and present a report to the Speaker of the Mississippi House of Representatives, the Lieutenant Governor of the State of Mississippi, the Governor of the State of Mississippi and the Chairs

of the Appropriations Committees in the Mississippi House of Representatives and the Mississippi Senate. The final report shall be available for public viewing on the website of the Mississippi Department of Information Technology Services. The report shall contain the following issues:

(a) Findings or conclusions regarding the quality, accessibility and utility of the databases of state government;

(b) Findings or conclusions regarding the volume, source, format and expected growth of unstructured data of the state government;

(c) Specific conclusions found regarding the issues described in Section 3 of this act; and

(d) Any other issue related to managing data as a strategic asset that merits reporting as determined by the Mississippi Data Management Working Group.

(2) The report required under the provisions of this Section 4 shall also contain draft legislation that addresses the concerns stated in the report. Upon presenting the report, all files, research and records gathered by the Mississippi Data Management Working Group shall become work files of the PEER Committee.

SECTION 5. Sections 1 through 5 of this act shall stand repealed on December 2, 2018.

SECTION 6. This act shall take effect and be in force from and after July 1, 2017.

Appendix B: List of MDMWG Members and/or Their Designees, by State Agency, Who Attended One or More Meetings of the Working Group

Agency	Member	Designee(s)
Department of Information Technology Services		
	Dr. Craig Orgeron, Executive Director, Chair of MDMWG	Michele Blocker, Debra Brown, Dr. Billy Rials, Jay Woods (Office of the Attorney General, assigned to ITS)
Department of Finance and Administration		
	Laura Jackson, Executive Director	Jenny Bearss, Lisa Dunn, Michael Gonzalez, Diane Langham, Preston Pierce, David Pitcock, Becky Thompson
Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER)		
	James Barber, Executive Director	Kirby Arinder, Ted Booth, Linda Triplett
Legislative Budget Office		
	Tony Greer, Executive Director, Vice Chair of MDMWG	Mimi Berry, Randy Dickerson, Misti Munroe,
Department of Health		
	Dr. Mary Currier, State Health Officer	Kevin Gray
Mississippi Division of Medicaid		
		Rita Rutland, Sheila Kearney
Institutions of Higher Learning		
	Dr. Glenn Boyce, Commissioner of Higher Education	Eric Atchison, Dr. Jim Hood, John Pearce,
Supreme Court, Administrative Office of the Courts		
	Kevin Lackey, Director, Administrative Office of the Courts	Brandon Fulton
Department of Revenue		
		Jennifer Morgan, Jennifer Wentworth, Mickey Yates, Drew Maddox

Appendix C: List, by State Agency, of Others in Attendance at One or More Meetings of the MDMWG

Agency	Employee(s) in Attendance
Department of Archives and History	
	Bob Dent, David Pilcher
Department of Corrections	
	Audrey McAfee
Department of Human Services	
	Mark Allen, Mike Bullard
Mississippi Department of Transportation	
	Ben Cohen

Appendix D: Members of MDMWG Committees, by Agency of Employment

Committee	Members (Agency of Employment in Parentheses)
Financial	<ul style="list-style-type: none"> • Jennifer Wentworth (DOR), Chair • James Barber (PEER) • Lisa Dunn (DFA) • Diane Langham (DFA) • Misti Munroe (LBO) • John Pearce (IHL)
Legal	<ul style="list-style-type: none"> • Jay Woods (ITS/AG), Chair • Ted Booth (PEER) • Sherry Johnson (DHS), non-voting (advisory) • Brandon Fulton (SCT), non-voting (advisory)
Security	<ul style="list-style-type: none"> • Sheila Kearney (DOM), Chair • Randy Dickerson (LBO) • Jenny Bearss (DFA) • Preston Pierce (DFA) • Mickey Yates (DOR) • Eric Atchison (IHL) • Kevin Gray (MSDH) • Mike Bullard (DHS), non-voting (advisory) • Audrey McAfee (DOC), non-voting (advisory)
Survey and Data Analysis	<ul style="list-style-type: none"> • Kirby Arinder (PEER), Chair • Billy Rials (ITS) • Linda Triplett (PEER) • Randy Dickerson (LBO) • Mimi Berry (LBO) • Becky Thompson (DFA) • David Pitcock (DFA) • Jennifer Morgan (DOR) • Rita Rutland (DOM) • Eric Atchison (IHL) • Ben Cohen (MDOT), non-voting (advisory)
Survey Support Committee	<ul style="list-style-type: none"> • Kirby Arinder (PEER) • Eric Atchison (IHL) • Debra Brown (ITS) • Randy Dickerson (LBO) • Michael Gonzalez (DFA) • David Pitcock (DFA) • Billy Rials (ITS) • Becky Thompson (DFA)

	<ul style="list-style-type: none"> • <i>Jennifer Wentworth (DOR)</i> • <i>Bob Dent (MDAH), non-voting (advisory)</i>
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Key to Agency Abbreviations:

AG: Office of the Attorney General

DFA: Department of Finance and Administration

DHS: Department of Human Services

DOM: Mississippi Division of Medicaid

DOR: Department of Revenue

IHL: Institutions of Higher Learning

ITS: Department of Information Technology Services

LBO: Legislative Budget Office

MDAH: Mississippi Department of Archives and History

MDOT: Mississippi Department of Transportation

MSDH: Mississippi State Department of Health

PEER: Joint Legislative Committee on Performance Evaluation and Expenditure Review

SCT: The Supreme Court of Mississippi

Appendix E: List of State Agencies, Boards, and Commissions Included in the Working Group's Survey

	Name
1	PUBLIC ACCOUNTANCY, STATE BOARD OF
2	AGRICULTURE AND COMMERCE, DEPARTMENT OF
3	ALCORN STATE UNIVERSITY
4	ARCHITECTURE, STATE BOARD OF
5	ARCHIVES AND HISTORY, DEPARTMENT OF
6	ARTS, MISSISSIPPI COMMISSION OF THE
7	ATHLETIC COMMISSION
8	ATTORNEY GENERAL, OFFICE OF THE
9	AUCTIONEER COMMISSION
10	STATE AUDITOR, OFFICE OF THE
11	BANKING AND CONSUMER FINANCE, DEPARTMENT OF
12	BAR ADMISSIONS, BOARD OF
13	BARBER EXAMINERS, STATE BOARD OF
14	BLIND, MISSISSIPPI INDUSTRIES FOR THE
15	CAPITAL POST-CONVICTION COUNSEL
16	CHARTER SCHOOL AUTHORIZER BOARD, MISSISSIPPI
17	CHILD PROTECTIVE SERVICES, DEPARTMENT OF
18	CHIROPRACTIC EXAMINERS, BOARD OF
19	COMMUNITY COLLEGE BOARD
20	CONTRACTORS, STATE BAORD OF
21	CORRECTIONS, DEPARTMENT OF
22	COSMETOLOGY, STATE BOARD OF
23	EXAMINERS FOR LICENSED PROFESSIONAL COUNSELORS, STATE BOARD OF
24	CERTIFIED COURT REPORTERS, BOARD OF
25	DELTA STATE UNIVERSITY
26	DENTAL EXAMINERS, STATE BOARD OF
27	DEVELOPMENT AUTHORITY, MISSISSIPPI
28	DISTRICT ATTORNEYS
29	EDUCATION, STATE DEPARTMENT OF
30	EMERGENCY MANAGEMENT AGENCY, MISSISSIPPI
31	EMPLOYMENT SECURITY, DEPARTMENT OF
32	LICENSURE FOR PROFESSIONAL ENGINEERS AND SURVEYORS, MISSISSIPPI BOARD OF

33	<i>ENVIRONMENTAL QUALITY, DEPARTMENT OF</i>
34	<i>ETHICS COMMISSION</i>
35	<i>FINANCE AND ADMINISTRATION, DEPARTMENT OF</i>
36	<i>FORESTERS, BOARD OF REGISTRATION FOR</i>
37	<i>FORESTRY COMMISSION, MISSISSIPPI</i>
38	<i>FUNERAL SERVICES, STATE BOARD OF</i>
39	<i>GAMING COMMISSION</i>
40	<i>REGISTERED PROFESSIONAL GEOLOGISTS, BOARD OF</i>
41	<i>GOVERNOR, OFFICE OF THE</i>
42	<i>GRAND GULF MILITARY MONUMENT COMMISSION</i>
43	<i>HEALTH, DEPARTMENT OF</i>
44	<i>HEALTH INFORMATION NETWORK</i>
45	<i>HUMAN SERVICES, DEPARTMENT OF</i>
46	<i>INSTITUTIONS OF HIGHER LEARNING (ALL DIVISIONS)</i>
47	<i>INFORMATION TECHNOLOGY SERVICES, DEPARTMENT OF</i>
48	<i>INSURANCE, DEPARTMENT OF</i>
49	<i>JACKSON STATE UNIVERSITY</i>
50	<i>JOINT LEGISLATIVE REAPPORTIONMENT</i>
51	<i>JUDICIAL PERFORMANCE, COMMISSION ON</i>
52	<i>JOINT LEGISLATIVE BUDGET COMMITTEE</i>
53	<i>LIBRARY COMMISSION, MISSISSIPPI</i>
54	<i>MARINE RESOURCES, MISSISSIPPI DEPARTMENT OF</i>
55	<i>MASSAGE THERAPY, MISSISSIPPI STATE BOARD OF</i>
56	<i>MEDICAID, MISSISSIPPI DIVISION OF</i>
57	<i>MEDICAL LICENSURE, STATE BOARD OF</i>
58	<i>MENTAL HEALTH, DEPARTMENT OF</i>
59	<i>MILITARY DEPARTMENT, MISSISSIPPI</i>
60	<i>MISSISSIPPI STATE UNIVERSITY</i>
61	<i>MISSISSIPPI UNIVERSITY FOR WOMEN</i>
62	<i>MISSISSIPPI VALLEY STATE UNIVERSITY</i>
63	<i>MOTOR VEHICLE COMMISSION, STATE OF MISSISSIPPI</i>
64	<i>NURSING, MISSISSIPPI BOARD OF</i>
65	<i>NURSING HOME ADMINISTRATORS</i>
66	<i>OIL AND GAS BOARD, STATE</i>

67	<i>OPTOMETRY, MISSISSIPPI STATE BOARD OF</i>
68	<i>PAT HARRISON WATERWAY DISTRICT</i>
69	<i>PEARL RIVER VALLEY WATER SUPPLY DISTRICT</i>
70	<i>JOINT LEGISLATIVE COMMITTEE ON PERFORMANCE EVALUATION AND EXPENDITURE REVIEW (PEER)</i>
71	<i>PERSONNEL BOARD, MISSISSIPPI STATE</i>
72	<i>PHARMACY, BOARD OF</i>
73	<i>PHYSICAL THERAPISTS, MISSISSIPPI STATE BOARD OF</i>
74	<i>PORT AUTHORITY AT GULFPORT, MS STATE</i>
75	<i>PSYCHOLOGY, MISSISSIPPI BOARD OF</i>
76	<i>PUBLIC BROADCASTING, MISSISSIPPI (ETV)</i>
77	<i>PUBLIC DEFENDER, OFFICE OF STATE</i>
78	<i>PUBLIC EMPLOYEES' RETIREMENT SYSTEM, MISSISSIPPI</i>
79	<i>PUBLIC SAFETY, DEPARTMENT OF</i>
80	<i>PUBLIC SERVICE COMMISSION, MISSISSIPPI</i>
81	<i>PUBLIC UTILITIES STAFF, MISSISSIPPI</i>
82	<i>REAL ESTATE APPRAISER LICENSING AND CERTIFICATION BOARD, MISSISSIPPI</i>
83	<i>REAL ESTATE COMMISSION, MISSISSIPPI</i>
84	<i>REHABILITATION SERVICES, DEPARTMENT OF</i>
85	<i>REVENUE, DEPARTMENT OF</i>
86	<i>RIVER PARKWAY COMMISSION, MISSISSIPPI</i>
87	<i>SECRETARY OF STATE, OFFICE OF THE</i>
88	<i>EXAMINERS FOR SOCIAL WORKERS & MARRIAGE AND FAMILY THERAPISTS, BOARD OF</i>
89	<i>SOIL AND WATER CONSERVATION COMMISSION, MISSISSIPPI</i>
90	<i>STATE AID ROAD CONSTRUCTION, OFFICE OF</i>
91	<i>STATUS OF WOMEN, MISSISSIPPI COMMISSION ON THE</i>
92	<i>SUPREME COURT, MISSISSIPPI</i>
93	<i>TAX APPEALS BOARD, STATE</i>
94	<i>TENN-TOMBIGBEE WATERWAY DEVELOPMENT AUTHORITY</i>
95	<i>TOMBIGBEE RIVER VALLEY WATER MANAGEMENT DISTRICT</i>
96	<i>TRANSPORTATION, MISSISSIPPI DEPARTMENT OF</i>
97	<i>TREASURER, OFFICE OF THE STATE</i>
98	<i>UNIVERSITY OF MISSISSIPPI</i>
99	<i>UNIVERSITY OF MISSISSIPPI MEDICAL CENTER</i>
100	<i>UNIVERSITY OF SOUTHERN MISSISSIPPI</i>
101	<i>VETERANS AFFAIRS BOARD</i>

102	VETERANS HOME PURCHASE BOARD
103	VETERANS MONUMENT COMMISSION, MISSISSIPPI
104	VETERINARY MEDICINE, STATE BOARD OF
105	WILDLIFE FISHERIES AND PARKS, DEPARTMENT OF
106	WIRELESS COMMUNICATION COMMISSION
107	WORKERS COMPENSATION COMMISSION
108	STATE WORKFORCE INVESTMENT BOARD
109	YELLOW CREEK-STATE INLAND PORT AUTHORITY
110	HOUSE OF REPRESENTATIVES, MISSISSIPPI
111	LEGISLATIVE JOINT OPERATION
112	SENATE, MISSISSIPPI STATE

Mississippi Data Management Working Group Survey

INTRODUCTION

Welcome and thank you for taking the time and effort to complete the Mississippi Data Management Working Group Survey – an important survey that will help our state improve its data management practices.

During the 2017 session, the Legislature enacted HB 649. HB 649 recognizes the large and growing role that data plays in running an efficient and effective government. The Bill also acknowledges the increasing *opportunities* and *challenges* inherent in handling enormous amounts of data. In order to begin addressing these opportunities and challenges HB 649 established the Mississippi Database Management Working Group (MDMWG) and tasked it with conducting a multi-faceted examination of our state's management of its many sets of data. The ultimate responsibility of the Working Group is to report to the Legislature findings and recommendations for ways to improve our data management practices. This report is due by December 1, 2018. You can read HB 649 in entirety at <http://billstatus.ls.state.ms.us/documents/2017/html/HB/0600-0699/HB0649PS.htm>.

Thank you again for your participation.

PARTICIPATION REQUIREMENTS:

HB649 requires that all agencies, boards, commissions, departments, and committees of the executive, legislative, and judicial branches of Mississippi state government participate in this research survey.

CONFIDENTIALITY OF RECORDS:

HB 649 expressly states that “the report, all files, research and records gathered by the Mississippi Data Management Working Group shall become work files of the PEER Committee” access to which is governed by PEER rules and not the Public Records Act of 1983. Only the researchers designated by the MDMWG will have access to the data collected. The final report produced by the MDMWG will not contain any agency-specific information but will only contain aggregate, statewide, summarized information.

METHODS AND PROCEDURES:

It is highly recommended that each agency follow the procedures outlined in the instructional materials provided to the Primary Survey Respondent. Any questions or comments concerning the survey should be directed to MDMWG@its.ms.gov.

Mississippi Data Management Working Group Survey

AGENCY

Please Select Your Agency

▼ Department of ____
▼ Board of ____

COLLECTIVE RESPONSE

Please list all Divisions, Departments, Facilities, Sub-Agencies, and Other Entities included in this Survey Response:

AGENCY DEMOGRAPHICS:

Please indicate the number of full time employees in your agency (Including Divisions, Departments, Facilities, Sub-Agencies, and Other Entities as indicated in Collective Response):

Please indicate the number of contract employees in your agency (Including Divisions, Departments, Facilities, Sub-Agencies, and Other Entities as indicated in Collective Response):

RESPONDENT CONTACT INFORMATION

Please Provide Your Primary Survey Respondent Contact Information:

Name: _____

Title: _____

Email: _____

Phone Number: _____

March 23, 2018

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Mississippi Data Management Working Group Survey

UNSTRUCTURED DATA

The initial section of this survey applies to only Unstructured Data.

Question 1. Estimate the amount (in Terabytes) of your agency's Unstructured Data not currently found in databases.

Question 2. What is the estimated five-year growth (in Terabytes) of Unstructured Data in your agency?

Question 3. What is the format of your agency's Unstructured Data not currently found in databases? Select all that apply.

- Office documents (Word, Excel, PowerPoint, PDFs, etc.)
 - Media (Pictures, Videos, etc.)
 - Raw Data
 - Other
-

Question 4. What is the source of your agency's Unstructured Data not currently found in databases? Select all that apply.

- Agency staff
 - Public
 - External third parties
 - Other
-

Question 5. Please provide any additional comments regarding Unstructured Data in your agency:

Mississippi Data Management Working Group Survey

STRUCTURED DATA

The remainder of this survey applies to Structured Data residing in databases and database management systems (DBMS). Structured Data includes any formalized data not found in unstructured formats.

Question 6. Please provide an estimate of the number of databases currently in use by your agency: _____

Mississippi Data Management Working Group Survey

Question 7. Choose the database management systems (DBMS) your agency utilizes. Select all that apply.

- MySQL
 - IBM DB2
 - Oracle
 - PostgreSQL
 - Microsoft SQL Server
 - MongoDB
 - MariaDB
 - Sybase
 - SQLite
 - Adabas
 - Access
 - Email
 - Foxpro
 - DBMS integrated into a vendor application (unknown back-end structure)
 - Lotus Notes
 - Other (please specify)
-

Mississippi Data Management Working Group Survey

Question 8. Regarding your estimated _____ databases in your agency, indicate the number of each in use in your agency? Total must equal _____

MySQL: _____

IBM DB2: _____

Oracle: _____

PostgreSQL: _____

Microsoft SQL Server: _____

MongoDb: _____

MariaDB: _____

Sybase: _____

SQLite: _____

Adabas: _____

Access: _____

Email: _____

Foxpro: _____

DBMS integrated into a vendor application (unknown back-end structure): _____

Lotus Notes: _____

Other: (please specify) _____

Total: _____

Mississippi Data Management Working Group Survey

Question 9. What is the estimated size (in Terabytes) of each DBMS in your agency?

MySQL: _____

IBM DB2: _____

Oracle: _____

PostgreSQL: _____

Microsoft SQL Server: _____

MongoDb: _____

MariaDB: _____

Sybase: _____

SQLite: _____

Adabas: _____

Access: _____

Email: _____

Foxpro: _____

DBMS integrated into a vendor application (unknown back-end structure): _____

Lotus Notes: _____

Other: (please specify) _____

Total: _____

Mississippi Data Management Working Group Survey

Question 12. What methods are used for backup of your agency's databases? Select all that apply.

- Tape – Unencrypted
 - Tape - Encrypted
 - Disk – Unencrypted
 - Disk - Encrypted
 - Cloud – Unencrypted
 - Cloud - Encrypted
 - No Backups
-

Question 13. Are there any third parties involved in the backup of your agency's databases?

- Yes
 - No
-

Question 14. Are there any third parties involved in the maintenance of your agency's databases?

- Yes
 - No
-

Mississippi Data Management Working Group Survey

Question 15. Does your agency have policies regarding the retention and archiving of past years' database files?

- Yes
 - No (If selected, survey will proceed to Question 18)
-

Question 16. Are these retention and archiving policies on file with the Mississippi Department of Archives and History?

- Yes
 - No
-

Mississippi Data Management Working Group Survey

Question 17. Please identify which applicable Federal or State retention policies that accommodate your agency's data retention policy for databases. Select all that apply.

- Mississippi Enterprise Security Policy
- Health Insurance Portability and Accountability Act (HIPAA)
- Family Educational Rights and Privacy Act (FERPA)
- Payment Card Industry Data Security Standard (PCI-DSS)
- Federal Information Security and Modernization Act (FISMA)
- CMS Minimum Acceptable Risk Standards (CMS MARS-E)
- FBI Criminal Justice Information Services (CJIS)
- Social Security Administration (SSA)
- IRS Publication 1075
- NIST Special Publication 800 series
- NIST Federal Information Processing Standards (FIPS) Publication 199 and 200
- Center for Internet Security (CIS) critical controls
- CIS Benchmarks
- National Cybersecurity Framework
- Other

- None

Mississippi Data Management Working Group Survey

Question 18. Does your agency utilize offsite archival of past years' database files?

- Yes
 - No (If selected, survey will proceed to Question 23)
-

Question 19. What is the media for your agency's offsite archival of past years' database files? Select all that apply.

- Tape – Unencrypted
 - Tape - Encrypted
 - Disk – Unencrypted
 - Disk - Encrypted
 - Cloud – Unencrypted
 - Cloud - Encrypted
 - Other
-

Question 20. Where are your agency's offsite database archives stored? Select all that apply.

- Mississippi Department of Archives and History
- Mississippi Department of Information Technology Services
- Other State Agency Location
- Third Party Location

Mississippi Data Management Working Group Survey

Question 21. Estimate the amount (in Terabytes) of your agency's data that is archived offsite.

Question 22. What is the maximum number of years of data that your agency maintains both online and offsite?

- Less than 1 Year
 - 1 - 3 Years
 - 4 - 6 Years
 - 7 - 10 Years
 - More than 10 Years
-

Question 23. Please provide any additional comments regarding the general attributes of your agency's Structured Data:

Mississippi Data Management Working Group Survey

ARCHITECTURE, DATA RELIABILITY, AND STANDARDS

Question 24. Does your agency's database(s) have access controls in place to verify that the user of an access request has been authorized by the data management owner?

- Yes
 - No (If selected, survey will proceed to Question 26)
-

Question 25. Is there a formal policy or procedure in place documenting these access controls for agency employees to follow?

- Yes
 - No
-

Question 26. Which of the following documents does your agency maintain for each database? Select all that apply.

- User manual
 - Data dictionary
 - System documentation
 - Table layouts
 - Codebooks
 - Data quality assurance program materials
 - Explicit training material for new users
 - Explicit response plan for data breaches
 - Other
-

Mississippi Data Management Working Group Survey

Question 27. Do your agency databases contain audit trails of users creating and updating records with date/time stamps?

- Yes
 - No
 - Unknown, Explain
-

Question 28. Do your agency databases have a formal change request process to evaluate, review, and document changes?

- Yes
 - No
 - Unknown, Explain
-

Question 29. Do your agency databases enforce data validation rules?

- Yes
 - No
 - Unknown, Explain
-

Question 30. Does your agency use any form of non-normalized data?

- Yes
 - No
 - Unknown, Explain
-

Question 31. Please indicate the percentage of your agency's databases that have ever undergone a data reliability audit conforming to the guidelines contained in the United States Government Accountability Office publication: GAO-09-680G Assessing Data Reliability.
% _____

Mississippi Data Management Working Group Survey

Question 32. For the purposes of this survey, databases can be managed in two broad categories:

1. Directly Managed by Agency Staff - Agency has direct control of the database, including format, structure, audit, validation, normalization, and overall administration. This also includes vendor contracted management of agency controlled DBMS.
2. Vendor Managed Through Application Interface - The vendor provides an application to the agency, which typically includes a database. The application's database is directly managed by the application's interface. Agency staff only access the data in the application database through the vendor supplied application interface.

Percent of your agency's databases that are Directly Managed by Agency Staff: _____

Percent of your agency's databases that are Vendor Managed through Application Interface:

Total: _____

Question 33. Please provide any additional comments regarding your agency's Architecture, Data Reliability, and Standards:

Mississippi Data Management Working Group Survey

TRANSPARENCY, INTERNET ACCESSIBILITY, AND PUBLIC OWNERSHIP OF DATA

Question 34. What percentage of your agency's databases are accessed by the public through the Internet?

0 10 20 30 40 50 60 70 80 90 100

Choose %

Question 35. You selected _____% as the percentage of your agency's databases that are accessed by the public through the Internet. Of the databases that make up the _____% indicated in the previous question, what percentage of your agency's databases require a User-id and Password?

0 10 20 30 40 50 60 70 80 90 100

Choose %

Question 36. Is there a standard process for obtaining public access to databases that are accessible through the Internet?

- Yes
- No (If selected, survey will proceed to Question 39)

Question 37. Is the process for obtaining access to the public databases through the Internet documented and readily available for users?

- Yes
- No

Mississippi Data Management Working Group Survey

Question 38. Does your agency provide contact support for public users that have issues or questions pertaining to accessing databases that are accessible through the Internet?

Yes

No

Question 39. Please provide any additional comments concerning public Internet access of your agency's data:

Mississippi Data Management Working Group Survey

REMOTE CONNECTIVITY FOR OTHER STATE GOVERNMENT ENTITY ACCESS

Question 40. Does your agency provide remote access to your agency's databases for other agencies and/or committees charged with the responsibility of assessing agency and program effectiveness and efficiency?

Yes

No

Question 41. Are there any Federal or State statutes or regulations that prohibit remote access to your agency's databases for other agencies and/or committees charged with the responsibility of assessing agency and program effectiveness and efficiency?

Yes

No

Question 42. Please provide any additional comments concerning remote access of your agency's data by other agencies:

Mississippi Data Management Working Group Survey

LEGAL REQUIREMENTS

Question 43. Does your agency have written agreements or contracts with any and all vendors that provide IT services for your agency wherein the vendor has access to or maintenance of your agency's data?

- Yes
 - No (If selected, survey will proceed to Question 49)
-

Question 44. Do the written agreements or contracts contain provisions that address the following subjects? Select all that apply.

- Confidential information
 - Ownership, use and restrictions on use (of data)
 - Warranty guaranteeing that the vendor's software contains no viruses
 - Prohibition against assignment of subcontracting without agency's prior approval
 - Record retention and access (by agency) to records
 - Compliance with the State of Mississippi's Enterprise Security Policy
-

Question 45. Do the written agreements or contracts contain provisions addressing the duty of the vendor to destroy and verify the destruction of any personal identifiable information (PII) or personal health information (PHI) in the vendor's possession upon conclusion of the contract?

- Yes
 - No
-

Mississippi Data Management Working Group Survey

Question 46. Do the written agreements or contracts contain provisions for agency audit of vendor's security procedures?

Yes

No

Question 47. Do the written agreements or contracts contain language indemnifying the agency for any loss or damages resulting from the unauthorized release of PII/PHI?

Yes

No

Question 48. Does your agency have written procedures to follow when auditors or other parties seek access to PII/PHI when conducting research on audit projects for research purposes?

Yes

No

Question 49. Please provide any additional comments concerning any legal issues with the data in your agency:

Mississippi Data Management Working Group Survey

SECURITY OF DATABASES

Question 50. How current is your agency is with operating system versions, patches, and security standards for servers that provide agency-hosted website access.

- 100% of servers are current
 - 76-99% of servers are current
 - 51-75% of servers are current
 - 0-50% of servers are current
 - Unsure
 - N/A
-

Question 51. How current is your agency's third party maintained servers are with operating system versions, patches, and security standards.

- 100% of servers are current
 - 76-99% of servers are current
 - 51-75% of servers are current
 - 0-50% of servers are current
 - Unsure
 - N/A
-

Mississippi Data Management Working Group Survey

Question 52. Estimate the average time it takes your agency to bring systems and databases to the current patch level once a patch has been released by vendor.

- Less than 24 Hours
 - 2 - 7 Days
 - 1 - 3 Weeks
 - 1 - 3 Months
 - 3 - 6 Months
 - 6 Months - 1 Year
 - More than 1 Year
-

Question 53. What security measures does your agency have in place to control access to databases identified at the beginning of this survey? Select all that apply.

- User-id and password
 - Password requirements for content and frequency of change adhere to National Institute of Standards and Technology (NIST) standards
 - Multi-factor authentication
 - Secure website / encrypted transmission of data
 - User-id inactivated after a specific period of inactivity
 - Security questions used for password resets
 - Other
-

Mississippi Data Management Working Group Survey

Question 54. What regulatory entities dictate the access to or restriction of confidential information contained in your agency's database files? Select all that apply.

- Mississippi Enterprise Security Policy
 - Health Insurance Portability and Accountability Act (HIPAA)
 - Family Educational Rights and Privacy Act (FERPA)
 - Payment Card Industry Data Security Standard (PCI-DSS)
 - Federal Information Security and Modernization Act (FISMA)
 - CMS Minimum Acceptable Risk Standards (CMS MARS-E)
 - FBI Criminal Justice Information Services (CJIS)
 - Social Security Administration (SSA)
 - IRS Publication 1075
 - NIST Special Publication 800 series
 - NIST Federal Information Processing Standards (FIPS) Publication 199 and 200
 - Center for Internet Security (CIS) Critical Controls
 - CIS Benchmarks
 - National Cybersecurity Framework
 - Other
-

Mississippi Data Management Working Group Survey

Question 55. What concerns do you have about public ownership of database files and the challenges of securing or protecting data as required? Select all that apply.

- Confidential (non-public) data intermingled with public data
 - Assumptions made from data queries without adequate understanding of the data
 - Quality of data loaded into Transparency (additional internal agency QA needed)
 - State's vulnerability to financial penalties if security or privacy breaches occur
 - Personal liability for security or privacy breaches
 - Other
-

Question 56. Please provide any additional comments concerning security issues or public ownership issues associated with your agency's data:

Mississippi Data Management Working Group Survey

COSTS OF MAINTAINING DATABASES

Question 57.

The final section of the survey will collect information regarding the cost associated with the databases in your agency. Each response should be based on a collective total for **FY2015 - FY2019**.

Note - If the hardware is used for multiple systems, split the costs accordingly. Ongoing maintenance and support should not be included here.

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol. (Example \$3,245.42 should be entered as 3245)

What is the estimated hardware cost for all databases for FY2015 - FY2019?

Question 58. What is the estimated software cost for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol. (Example \$3,245.42 should be entered as 3245)

Question 59. What is the estimated hardware maintenance and support cost for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol. (Example \$3,245.42 should be entered as 3245)

Question 60. What is the estimated software maintenance and support cost for all databases for FY2015 - FY2019?

Note - This cost should include the ongoing license costs.

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol. (Example \$3,245.42 should be entered as 3245)

Mississippi Data Management Working Group Survey

Question 61. What is the estimated cost to provide security for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol.
(Example \$3,245.42 should be entered as 3245)

- Security costs accounted for in previous question(s)
- Amount (Specify) _____
-

Question 62. What is the estimated cost to provide disaster recovery / business continuity for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol.
(Example \$3,245.42 should be entered as 3245)

- DR/BC cost accounted for in previous question(s)
- Amount (please specify) _____
-

Question 63. What is the estimated cost for liability insurance related to data loss or data breaches for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol.
(Example \$3,245.42 should be entered as 3245)

- Insurance costs accounted for in previous question(s)
- Amount (please specify) _____
-

Mississippi Data Management Working Group Survey

Question 64. What is the estimated cost for liability insurance related to equipment loss in the event of a disaster for all databases for FY2015 - FY2019?

Enter numbers only, rounded to the nearest dollar amount. Do not include the \$ symbol.
(Example \$3,245.42 should be entered as 3245)

- Equipment loss insurance cost accounted for in previous question(s)
- Amount (please specify) _____

Question 65. Please provide any additional comments concerning any financial cost associated with your agency's data:

Mississippi Data Management Working Group Survey

END

Survey Complete.

Thank you for your time and support of this project.

You have reached the end of the MDMWG survey. If you wish to review any questions, please click the survey BACK navigation button (bottom left) and edit any response. If ready to submit, please click the NEXT navigation button (bottom right).

The next screen will display the survey questions with your responses. You may print the completed survey using your browser print function.

Appendix G: Mississippi Data Management Working Group Survey Quick Reference Guide

MISSISSIPPI DATA MANAGEMENT WORKING GROUP

Mississippi Department of Information
Technology Services
Legislative Budget Office
Institutions of Higher Learning

Mississippi Department of Finance and
Administration
Mississippi Department of Health
Mississippi Administrative Office of the Courts

Joint Legislative Committee on Performance
Evaluation and Expenditure Review
Mississippi Division of Medicaid
Mississippi Department of Revenue

**DATA ANALYSIS SURVEY
QUICK REFERENCE GUIDE**



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[Editor’s Note: Contents herein have been edited slightly for style and consistency only.]

Overview

During the 2017 session, the Legislature enacted H.B. 649 establishing the Mississippi Database Management Working Group (MDMWG). H.B. 649 tasked the MDMWG to conduct a multifaceted examination of our state’s management of data and then to prepare a report for the Legislature on the findings and make recommendations for improving our data management practices. As defined in H.B. 649, all agencies of the executive branch, and agencies and committees of the legislative and judicial branches shall participate in this study. For the purpose of this survey, the term “agency” will include all agencies, boards, commissions, and institutes of higher learning.

The final date for completing the survey is June 21, 2018.

This Quick Reference Guide provides the following:

- *methods for getting assistance,*
- *suggestions for organizing and preparing a collective response,*
- *instructions for using the online survey tool,*
- *glossary of terms,*
- *acronyms.*

Survey Assistance

In an effort to guide agencies through this process, the MDMWG has created reference documentation, scheduled informational sessions, and established a Survey Support Committee.

- **Reference Material**

The MDMWG has created a SharePoint site for reference guides and documents to assist you with the survey. During the data-collection phase, the Survey Support Committee will add information to the reference documents based on the feedback from agencies.

- *Quick Reference Guide*
- *H.B. 649*
- *MDMWG Survey (fillable PDF version)*

The Clarifications in Appendix B of this Quick Reference Guide, pages 61–63, contain additional information that might be helpful in clarifying the intent and scope of certain questions. This document will be updated throughout the survey process response period based on questions and feedback from you and other agencies.

Review the reference material available on the MDMWG SharePoint site: <http://bit.ly/2FiSTL>.

- **Informational Sessions**

Informational Sessions are scheduled throughout the data-collection phase for those interested in attending.

Date	Time	Location
Tuesday, May 1, 2018	8:30-10:00 a.m.	ITS Classroom 107
Thursday, May 3, 2018	3:00-4:30 p.m.	ITS Classroom 107
Wednesday, May 9, 2018	3:00-4:30 p.m.	ITS Classroom 107
Tuesday, May 15, 2018	8:30-10:00 a.m.	ITS Classroom 107
Tuesday, May 22, 2018	8:30-10:00 a.m.	ITS Classroom 107
Thursday, May 31, 2018	8:30-10:00 a.m.	ITS Classroom 107
Tuesday, June 5, 2018	3:00-4:30 p.m.	ITS Classroom 107
Thursday, June 14, 2018	8:30-10:00 a.m.	ITS Classroom 107
Monday, June 18, 2018	10:00-11:30 a.m.	ITS Classroom 107

You may register for the informational sessions through the LSO Employee Self-Service application at the following link: <http://www.dfa.ms.gov/dfa-offices/mmrs/legacy-training-materials/lso-training-material/>.

Course name: MDMWG Survey Informational Session
 Course Code: MDMWG

See [Appendix A](#) for instructions to register for an Informational Session.

- **Survey Support Committee**

You may submit questions to the Survey Support Committee through the email address MDMWG@its.ms.gov. The Survey Support Committee will respond to you from their own agency email address.

Answering the Survey Questions

Your agency’s response to each survey question should be a collective answer about the data in all departments, divisions, facilities, and sub-agencies in your organization. With that in mind, the MDMWG recommends that you first collect the answers in an offline copy (or copies) of the survey, and then prepare a collective response to enter into the online survey tool. As mentioned earlier, a fillable PDF version of the survey is available for download on the SharePoint site: <http://bit.ly/2FiiSTL>.

Other suggestions for the data collection and collective response include:

1. *Designate a Primary Agency Survey Respondent for your agency and send the person’s name, email address, and telephone number to MDMWG@its.ms.gov. The Primary Survey Respondent will receive an email with the link from Qualtrics (survey tool).*

NOTE: If a Primary Agency Survey Respondent has not been identified for your organization, the Executive Director of your agency will receive the email from Qualtrics.

2. *Review reference material from MDMWG. This Quick Reference Guide and other helpful documents are available on the following the MDMWG SharePoint site.*
3. *Identify all departments, divisions, facilities, sub-agencies, etc., that will be included in your agency’s survey response.*

4. Designate a contact person(s) in each of the identified areas to assist in the data collection for that specific area.
5. Download the PDF version of the survey that is available on the MDMWG SharePoint site.
6. Distribute copies of the survey to the identified contacts in your organization that will be assisting in the data collection.
7. Review the survey for clarity and review it with the other identified agency contacts.
8. Note any questions or areas that need clarification.
9. Attend an Informational Session if you have questions or need clarification on any of the survey questions.
10. Submit your questions to the Survey Support Committee through the MDMWG@its.ms.gov email address.
11. Collect all survey responses from your departments, divisions, facilities, and sub-agencies.
12. Merge all offline survey responses into one survey response to be used for input into the online survey.
13. Review the collective agency survey response for completion and accuracy.
14. Input your collective agency survey response into the Qualtrics application.

Entering Your Agency's Survey Response in the Online Survey

The Primary Survey Respondent or Executive Director for your agency will receive an email containing a link to the Qualtrics web-based survey tool. Use this link to complete the survey.

- For security purposes, we recommend that you copy the link into a web browser to access Qualtrics rather than clicking on the link inside the email.
- It is not necessary to complete the entire online survey in one session.
- Use only the Qualtrics navigation arrows at the bottom of each page to navigate through the survey. **Using the web browser buttons could result in the loss of data.**
- The online submission is the complete survey requirement.
- Once you have completed the survey, you may print the questions with your responses by using the browser print functionality.
- Send any questions or issues to the email address MDMWG@its.ms.gov.
- If needed, you may attend one of the informational sessions and complete the online survey on-site during that time.

Glossary of Terms

- **Access Control** - A way of limiting access to a system or to physical or virtual resources. In computing, access control is a process by which users are granted access and certain privileges to systems, resources, or information.
- **Codebooks** - A user-accessible collection of metadata focusing on the properties of a database's variables. This should include, but may not be limited to, names of all variables; their associated tables; a natural language definition of each variable; each variable's data type (e.g., nominal, ordinal, factor, date); the precision and units for appropriate variables; and possible values and their natural language definitions for factor or categorical variables.
- **Data Dictionary** - A user-accessible collection of metadata. This should include, but may not be limited to, names of all tables and their associated variables; the relations among tables; the type and size of each field; and any constraints on variables.

- *Data Quality Assurance Program Materials* - Written materials documenting all means taken to ensure the reliability of inferences made from a collection of data. The nature of a good quality assurance plan necessarily varies by the purpose of a collection of data, but it should document specific mechanisms to ensure that the data are appropriately accurate (not at variance with the facts they purport to represent), timely (not out of date), and precise (not subject to inappropriate levels of measurement error or vagueness). This should include, but may not be limited to, documentation of the mechanisms of data collection and entry and of software-based mechanisms in place to ensure resistance to insertion, deletion, and editing-based errors.
- *Database* - Gartner, Inc., an information technology research and consulting firm, describes a database as any collection of data or information that is specially organized for rapid search and retrieval by a computer.
- *Database Management System (DBMS)* - A complete software system used to define, create, manage, update and query a database.
- *Disaster Recovery/Business Continuity (DR/BCP)* - A written plan for continuing organizational functions in this context, specifically organizational functions dependent on data collection, preservation, and analysis—through major disruptions (e.g., building fires or major malware attacks).
- *National Institute of Standards and Technology (NIST)* - A unit of the U.S. Commerce Department, NIST promotes and maintains measurement standards. For more information, see <https://www.nist.gov>.
- *Personally Identifiable Information (PII)* - Information that can be used to distinguish or trace an individual's identity, such as name, Social Security number, biometric records, etc., alone, or when combined with other personal or identifying information that is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name, etc.
- *Protected Health Information (PHI)* - any information about health status, provision of health care, or payment for health care that is created or collected by a covered entity (or a business associate of a covered entity), and can be linked to a specific individual. This is interpreted rather broadly and includes any part of a patient's medical record or payment history.
- *Structured Data* - Information concerning structured and unstructured data will be collected during this survey. Structured data are typically found in a commercial database system. Databases are structured to facilitate the storage, retrieval, modification, and deletion of data in conjunction with various data-processing operations. A database management system (DBMS) extracts information from the database in response to queries. The information in these files may be broken down into records, each of which consists of one or more fields. Fields are the basic units of data storage, and each field typically contains information pertaining to one aspect or attribute of the entity described by the database. Records are also organized into tables that include information about relationships between its various fields. Although structured data are applied loosely to any collection of information in computer files, a database in the strict sense provides cross-referencing, structured, and index capabilities.

Gartner, Inc. describes structured data or a DBMS as a complete software system that supports and manages data in one or many databases that can perform relational processing and support access and data availability from independent analytical tools and interfaces. Structured data are contained within a complete software system that supports and manages data in one or many file management systems (most commonly a database or multiple databases) that can perform relational processing (even if data are not stored in a relational structure) and support access and data availability from independent analytical tools and interfaces, for which the primary use case is analytical. Examples of structured data include, but are not limited to, the following: SQL, DB2, Oracle, Sybase, Adabas, Access, and email.
- *System Documentation* - User-accessible text explaining the functioning of an instance of software. This may include but is not necessarily limited to documentation of code, architecture, and system requirements.
- *Table Layouts* - A user-accessible collection of metadata focusing on relations among tables in a database.

- *Terabytes - To be consistent in all responses, the survey is measuring data in terabytes. For the purpose of this survey, one terabyte equals approximately 1,000 gigabytes. You may use the following reference table:*

Actual Size	Size in Terabytes (Survey Response)
1 Terabyte	1.0
500 Gigabytes	0.5
250 Gigabytes	0.25
100 Gigabytes	0.1
25 Gigabytes	0.025
1 Gigabyte	0.001
800 Megabytes	0.0008
500 Megabytes	0.0005
250 Megabytes	0.00025
100 Megabytes	0.0001
50 Megabytes	0.00005
10 Megabytes	0.00001
1 Megabyte	0.000001

- *Unstructured Data - Unstructured data are simply all remaining data not found in structured data formats. For the purpose of this survey, unstructured data are considered to be such documents as Word, Excel, PowerPoint, or PDF; media files, such as pictures, videos, or music; or other raw data. Include unstructured data on all machines, including laptops, desktops, etc. This measurement should include the operating system.*
- *User Manual - User-accessible text explaining how to operate an instance of software.*

Acronyms

- *DBMS - Database Management System*
- *DR/BCP - Disaster Recovery/Business Continuity*
- *MDMWG - Mississippi Data Management Working Group*
- *NIST - National Institute of Standards and Technology*
- *PHI - Protected Health Information*
- *PII - Personally Identifiable Information*

Appendix A

Instructions To Register for an Informational Session

You may register for the informational sessions through the LSO Employee Self-Service application at the following link: <http://www.dfa.ms.gov/dfa-offices/mmrs/legacy-training-materials/Iso-training-material/>.

1. Login with MAGIC Access ID and Password
2. Select the Employee Self-Service Tab along the top banner



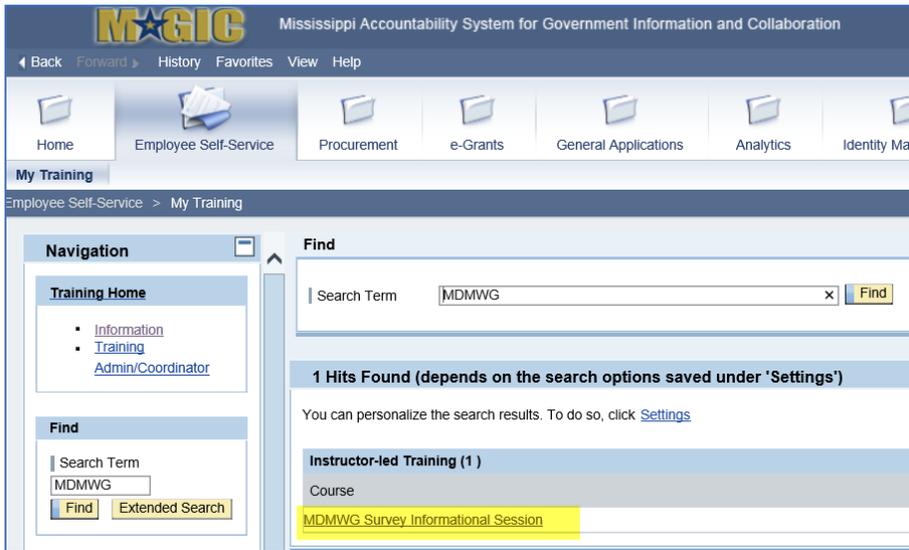
3. Type the Course Code - MDMWG in the Search Term box

Course name: MDMWG Survey Informational Session

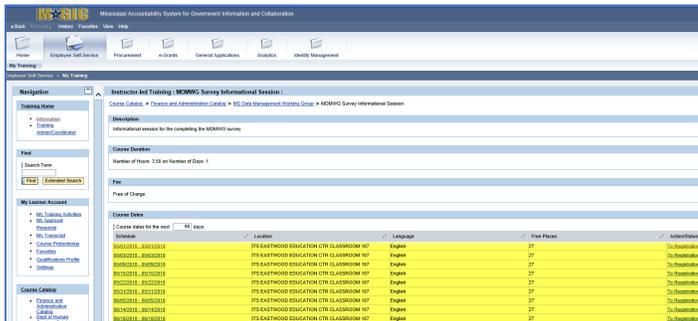
Course Code: MDMWG



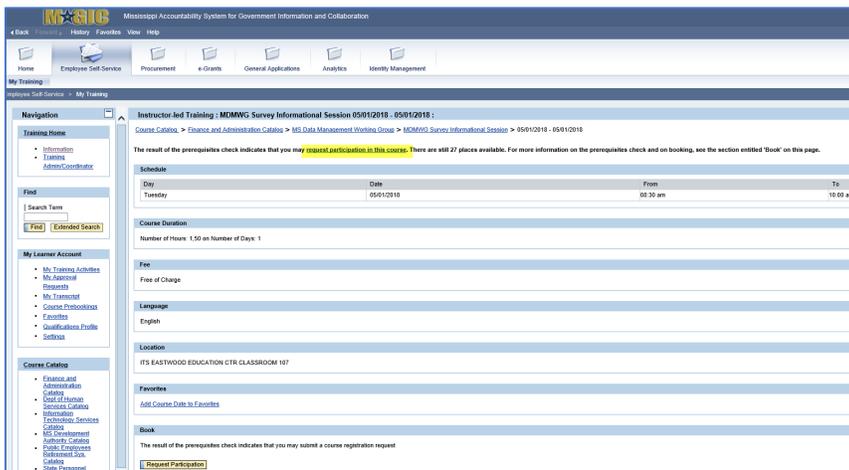
4. Select MDMWG Survey Informational Session in the Instructor-led Training Course list



5. Select the Course Date from the list



6. Select Request Participation in this course



Appendix B

Clarifications

- *Does this survey include paper or physical data? No, the MDMWG survey is only intended to collect information regarding electronic data.*
- *Demographics - For the purpose of this survey, a full-time employee will be in a SPAHRS PIN. A contract employee would be considered an independent contractor or contract worker not someone who is employed by a vendor. Please contact your human resource department for this information. For IHLs, a 9-month professor under contract will be considered a full-time employee.*
- *Questions 1-3 - Unstructured data are simply all remaining data that are not found in structured data formats.*
 - *For the purpose of this survey, Unstructured Data are considered to be such documents as Word, Excel, PowerPoint, or PDF; media files, such as pictures, videos, or music; or other raw data.*
 - *Include unstructured data on all machines, including laptops, desktops, etc. This measurement should include the operating system.*
- *Question 4: What is the source of your agency's unstructured data not currently found in databases? This is referring to the "source" of the unstructured data. How/where are the data created or who creates the data?*
 - *External third party*
 - *Any entity that has a contractual obligation, contract, MOU, etc., with your agency that inputs or creates unstructured data*
 - *Public*
 - *Individual members of the public that utilize services provided by your agency that inputs or creates unstructured data*
- *Question 9 - Estimated Size in Terabytes of Each DBMS.*
 - *This includes all agency databases, including your agency's mission database and those databases supporting your systems*
- *Questions 13 and 14 - Are there any third parties involved in the backup of your agency's databases? Are there any third parties involved in the maintenance of your agency's databases?*
 - *Third parties in this question would be any other entity other than your agency staff that is involved with the maintenance or backup of your agencies databases.*
- *Question 24 - Access Controls*
 - *This is referring to electronic access controls, not physical access controls (door locks, office space, etc.).*
- *Questions 27-30 - Database Architecture*
 - *These questions are yes/no. If an agency has multiple databases and the answer is yes for one (1) database then the answer these type questions is "yes."*
- *Question 29 - Data Validation*
 - *Data validation is the process of ensuring that data elements individually and jointly belong to the set of acceptable values. For instance, a data element representing the mass of an object could not acceptably have the value "purple;" masses can have only numeric values. A data element representing an individual's birth date, even if it contains a legitimate date, cannot validly contain values subsequent to that individual's death date; the two values are jointly unacceptable, even if they*

are individually acceptable. Successful data validation cannot guarantee that data are correct, but unsuccessful validation guarantees that they are incorrect.

- **Question 30 - Non-Normalized Data**
 - Normalized data obey structural rules first presented by E.F. Codd in "A Relational Model of Data for Large Shared Data Banks": <https://www.seas.upenn.edu/~zives/03f/cis550/codd.pdf>. These rules are intended to decrease redundancy and improve reliability of operations like insertion and deletion. Non-normalized data are data that do not at least meet the requirements of Codd's first normal form (That is, non-technically, that each attribute has a single column, that each individual has a single row, and that each set of related data has a single table).
- **Question 31 - GAO-09-680G Assessing Data Reliability**
 - The GAO-09-680G Assessing Data Reliability document was published in July 2009 by the US Government Accountability Office to explain what data reliability means and provide a framework for assessing the reliability of computer-processed data. For more information, <https://www.gao.gov/assets/80/77213.pdf>.
- **Question 32 - Managed by Agency Staff**
 - If the agency has control of the fundamental management of the database, such as changing structure, format, etc., the database is managed locally by the agency.
 - The agency is serving as the DBA for the databases.
 - A vendor contracted by the agency to administer the database would be considered managed by agency staff for the purposes of this survey.
- **Question 32 - Vendor Managed through Application Interface**
 - This option includes situations where the vendor completely manages the entire application including the database.
 - If agency staff can only access the database via the interface with no control over structure, format, etc., the database is essentially managed by the vendor.
 - The agency is serving as a user and the vendor is the DBA.
- **Questions 43-48 - Legal Requirements**
 - These questions are yes/no. If an agency has multiple contracts and the answer is yes for one (1) contract then the answer these type questions is "yes."
- **Questions 57-65 - Costs**
 - These questions concerning cost do not apply to unstructured data, only structured data
 - The estimated cost information should include all amounts paid for previous years and projections for future years. These estimated costs are not restrictive of the funding source; all costs should be included regardless if they were paid by general, federal, special, or other funds.
- **Question 57 - Hardware Costs**
 - Only hardware purchased in FY 2015 - FY 2019 should be included in this total. If hardware was purchase prior to FY 2015, even if it is still in use, should not be included in this total.
 - Desktops - If a desktop has a database (i.e., Access) the desktop cost should be included.
- **Question 60 - Software Maintenance and Support Costs**
- **Question 61 - Costs to Provide Security - Should agencies include the costs associated with every piece of their security program (firewalls, IPS, AV, etc.)? Or is this only attempting to capture any security measures directly**

installed on a database? Could the financial committee provide clarification instructions for agencies to use when answering this question?

- Include all costs related to securing the agency's data, both structured and unstructured, including any licensing, hardware, and software purchases. These costs should include every piece of the agency's security program, such as firewalls, IPS, security audits, anti-virus, etc.*
- Question 62: What is the estimated cost to provide disaster recovery/business continuity for all databases for FY 2015 - FY 2019?*
 - Include all costs related to providing disaster recovery/business continuity for the agency's data, both structured and unstructured, including any licensing, hardware, and software purchases. These costs should include contracts for offsite storage, backup products, DRaaS, etc.*

Appendix H: Question by Question Analysis of Survey Responses

Note: The data reported in the responses to each survey question are displayed graphically in either a donut chart (i.e., a pie chart with a hole in the middle), a bar chart, or a histogram. Donut charts are used to graphically display binary (yes/no) survey response data. Bar charts are used to graphically display the count of survey responses reported in discrete categories. Histograms are used to graphically display survey response data that are reported across a numerical range. A histogram presents a series of filled rectangles whose width (x axis of the graph) shows the frequency/volume of the variable being measured and whose height (y axis of the graph) shows the count/number of survey respondents whose reported data fall into each frequency interval.

See Appendix G, pages 55-57, for definitions of selected terms, e.g., “unstructured data,” included in the questions and pages 61-63 for clarification of individual questions, where applicable.

While the analysis of each question includes a link to the specific mandate(s) in the law that the question seeks to address, the following table lists all survey questions that relate to each mandate.

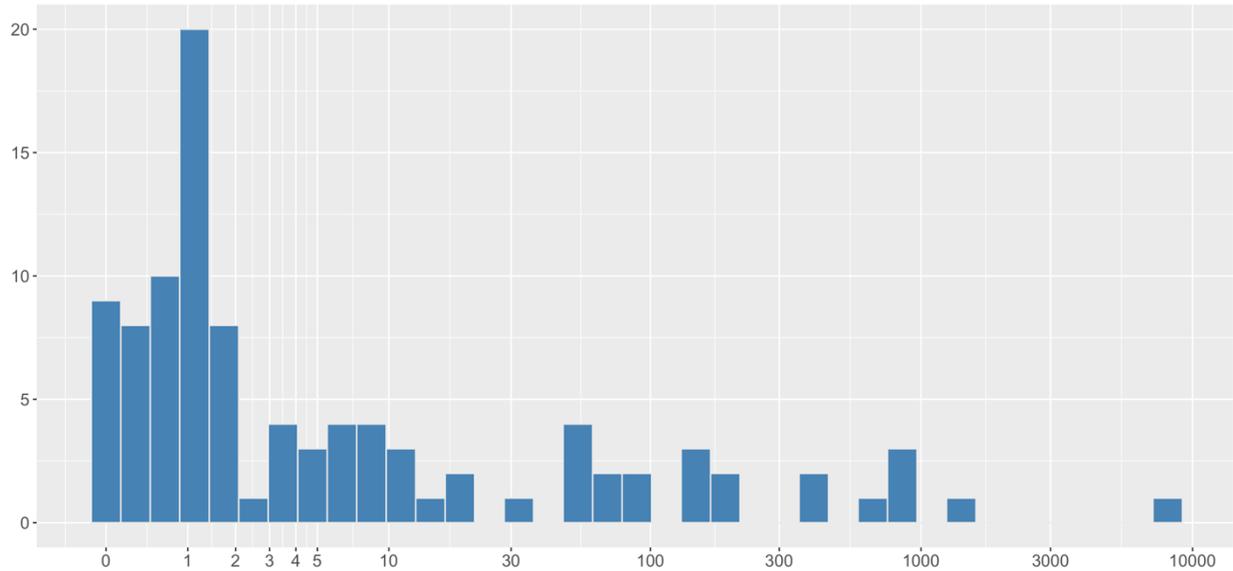
H.B. 649	Mandate	Related Survey Questions
Section 3		
(a)	The identity of any and all financial and nonfinancial databases that such entities maintain	6, 7, 8, 9, 10
(b)	The degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner	11, 12, 13, 14
(c)	The existence of policies regarding the retention and archiving of past years' database files	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 26, 43, 44
(d)	Any standards for uniformity of database architecture	26, 32
(e)	The transparency and Internet accessibility of such databases that are established for public access and use	24, 25, 26, 32, 34, 35, 36, 37, 38, 43, 44, 53
(f)	The degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency	24, 25, 26, 32, 34, 35, 36, 37, 38, 40, 41, 43, 44, 48, 53
(g)	The general volume, source and format of unstructured data not currently found in databases	1, 3, 4, 5
(h)	Any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information	24, 25, 43, 44, 45, 47, 48, 54
(i)	The existence of one or more data dictionaries for any and all databases	26, 32
(j)	The existence of any audit procedures implemented by such entities to ensure reliability of data	27, 30, 31, 32
(k)	Issues related to the public ownership of the databases of such entities	32, 55
(l)	Issues related to the security of such databases	12, 18, 19, 20, 21, 22, 24, 25, 32, 43, 44, 45, 46, 47, 50, 51, 52, 53
(m)	Costs of maintaining databases	13, 14, 32, 57, 58, 59, 60, 61, 62, 63, 64
Section 4		
(a)	Findings or conclusions regarding the quality, accessibility, and utility of the databases of state government	27, 28, 29, 30, 31
(b)	Findings or conclusions regarding the volume, source, format and expected growth of unstructured data of the state government	2, 5

SURVEY QUESTIONS RELATED TO UNSTRUCTURED DATA

QUESTION 1

Estimate the amount (in terabytes) of your agency's unstructured data not currently found in databases.

Question 1



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(g) the general volume, source and format of unstructured data not currently found in databases

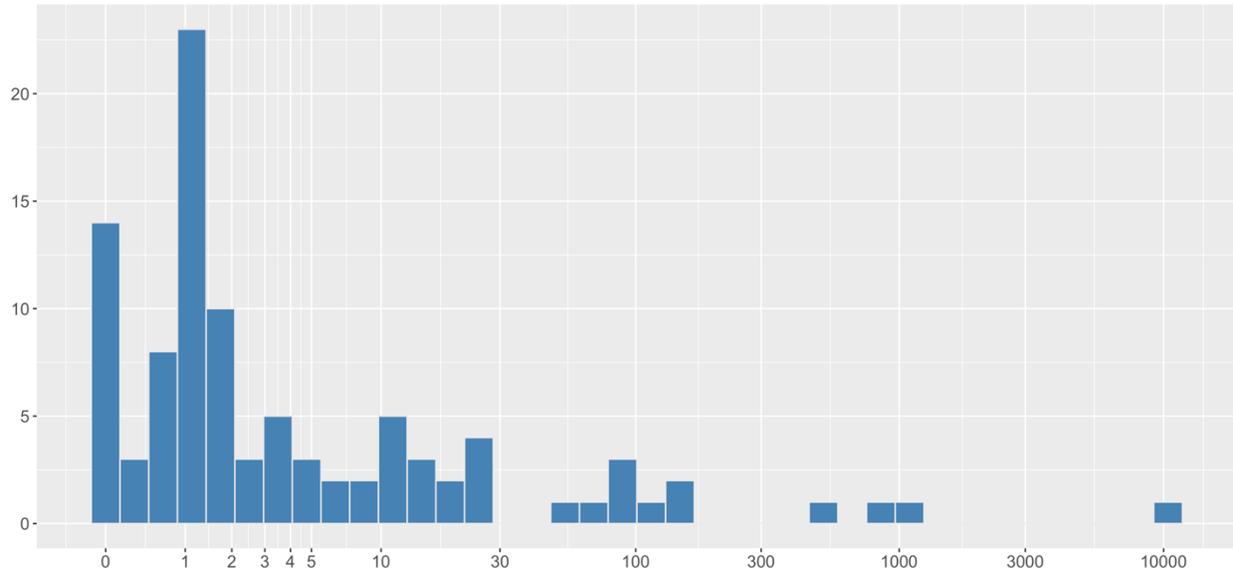
Analysis:

This histogram demonstrates the pattern that most agencies estimate relatively small amounts (in terabytes) of unstructured data, with a few agencies reporting extremely large amounts.

QUESTION 2

What is the estimated five-year growth (in terabytes) of unstructured data in your agency?

Question 2



Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

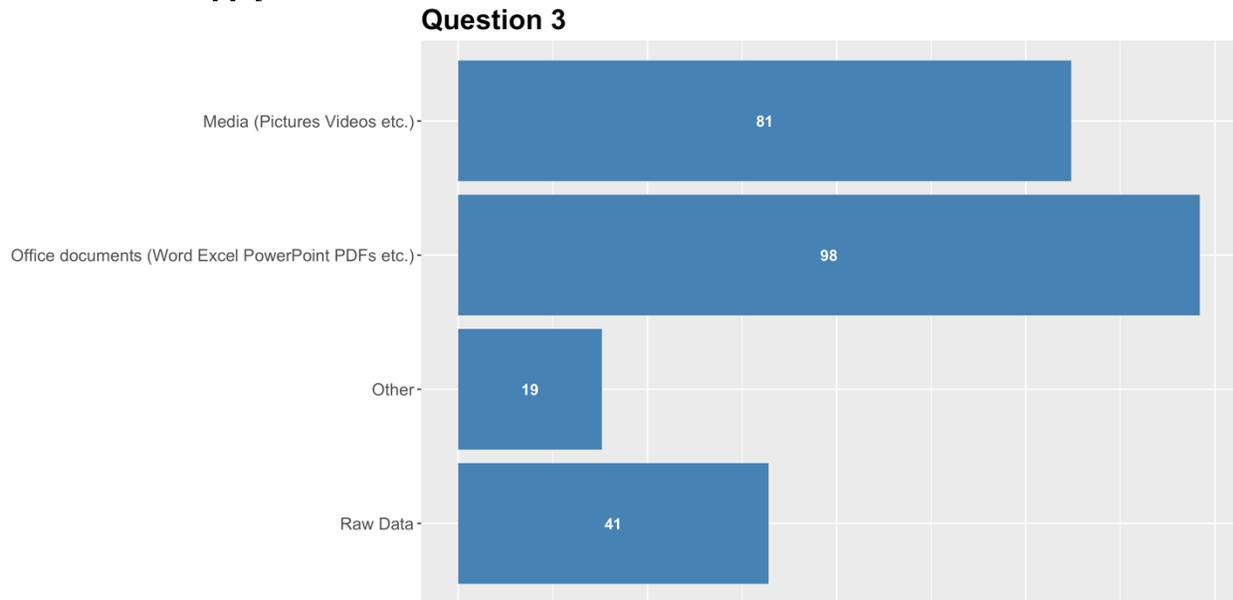
(b) findings or conclusions regarding the volume, source, format and expected growth of unstructured data of the state government

Analysis

This histogram demonstrates the pattern that most agencies estimate relatively small amounts (in terabytes) of unstructured data growth, with a few agencies reporting extremely large amounts of growth.

QUESTION 3

What is the format of your agency's unstructured data not currently found in databases?
Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(g) the general volume, source and format of unstructured data not currently found in databases

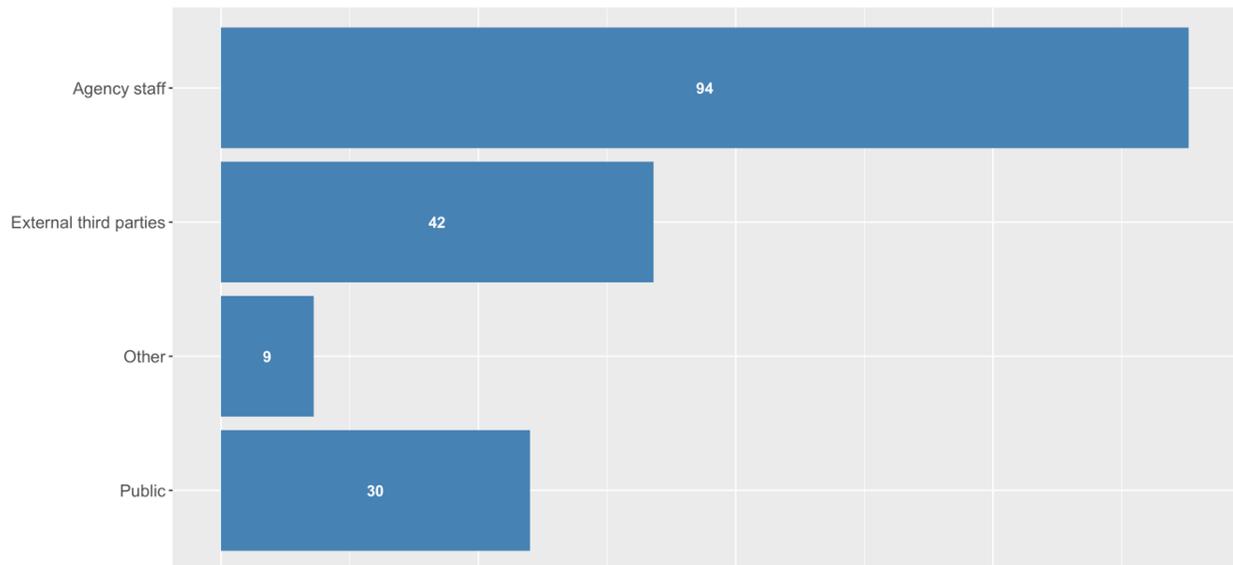
Analysis

“Office documents” and “media” were the most frequently chosen responses for Question 3. Answers provided in the “Other” category included operating systems and program/application files.

QUESTION 4

What is the source of your agency's unstructured data not currently found in databases?
Select all that apply.

Question 4



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(g) the general volume, source and format of unstructured data not currently found in databases

Analysis

While the most frequently chosen response for Question 4 was “agency staff,” it is not possible to conclude from this fact that agency staff generate most of the volume of unstructured data in the state. Question 4 allowed survey respondents to choose more than one answer, which many agencies did, and respondents were not asked the proportion of their unstructured data generated by each choice.

QUESTION 5

Please provide any additional comments regarding unstructured data in your agency.

Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(g) the general volume, source and format of unstructured data not currently found in databases

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

(b) findings or conclusions regarding the volume, source, format, and expected growth of unstructured data of the state government

Analysis

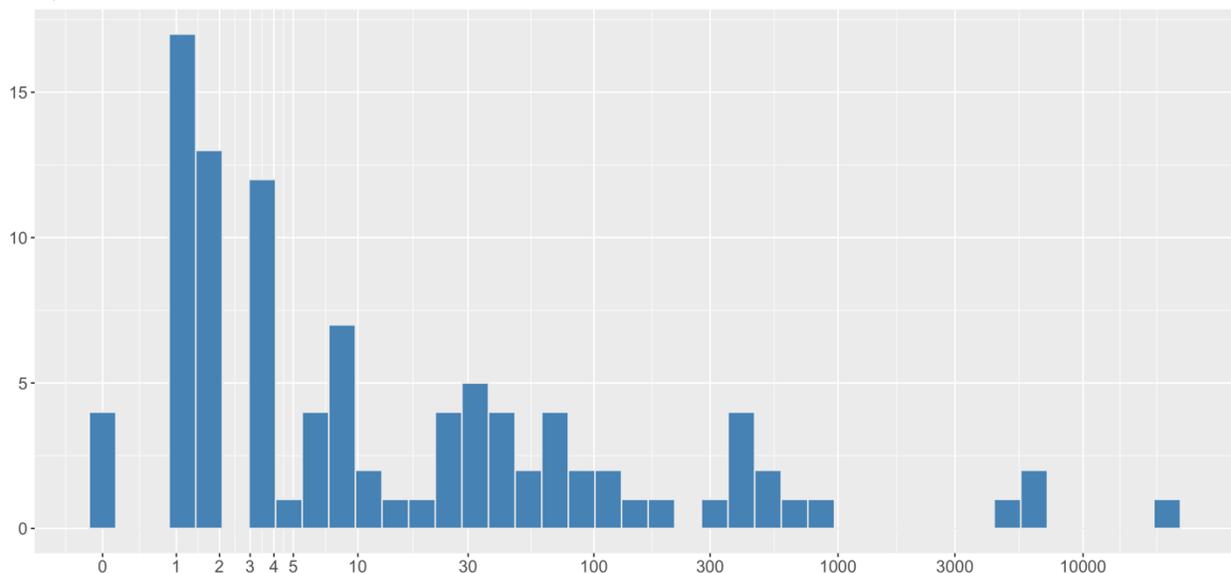
Twenty-five survey respondents provided comments regarding their unstructured data. Most of the respondents used the comments section to further clarify their answers to Questions 1 through 4. Some expressed the difficulty in estimating current volume of unstructured data and projected five-year growth.

SURVEY QUESTIONS RELATED TO STRUCTURED DATA

QUESTION 6

Please provide an estimate of the number of databases currently in use by your agency.

Question 6



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

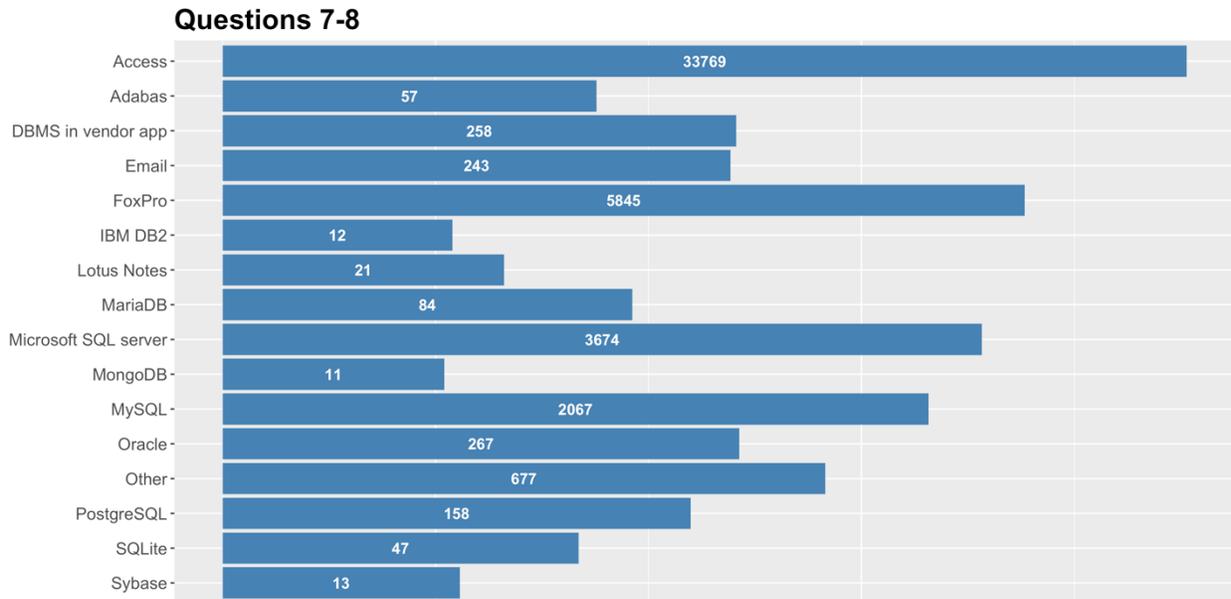
(a) the identity of any and all financial and nonfinancial databases that such entities maintain

Analysis

One agency provided an anomalously high number of databases, considering individual map tiles to be databases. Because no other agency with GIS data employed this definition, the anomalous data were consolidated for the graphic above. Three agencies' reported total database count did not match their total database breakdown reported in answer to Question 8. In addition to the two agencies that left most questions blank, 30 agencies reported no email even though they responded to the survey through their agency-provided email.

QUESTION 7

Choose the database management systems (DBMS) your agency utilizes. Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(a) the identity of any and all financial and nonfinancial databases that such entities maintain

Analysis

The total count of databases under a given DBMS is provided in white on the appropriate horizontal bar. As shown in the graph, Access was by far the most commonly used DBMS reported by survey respondents, followed by FoxPro and Microsoft SQL server.

QUESTION 8

Regarding your estimated [see response to Question 6] databases in your agency, indicate the number of each in use in your agency. Total must equal total in response to Question 6.

Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

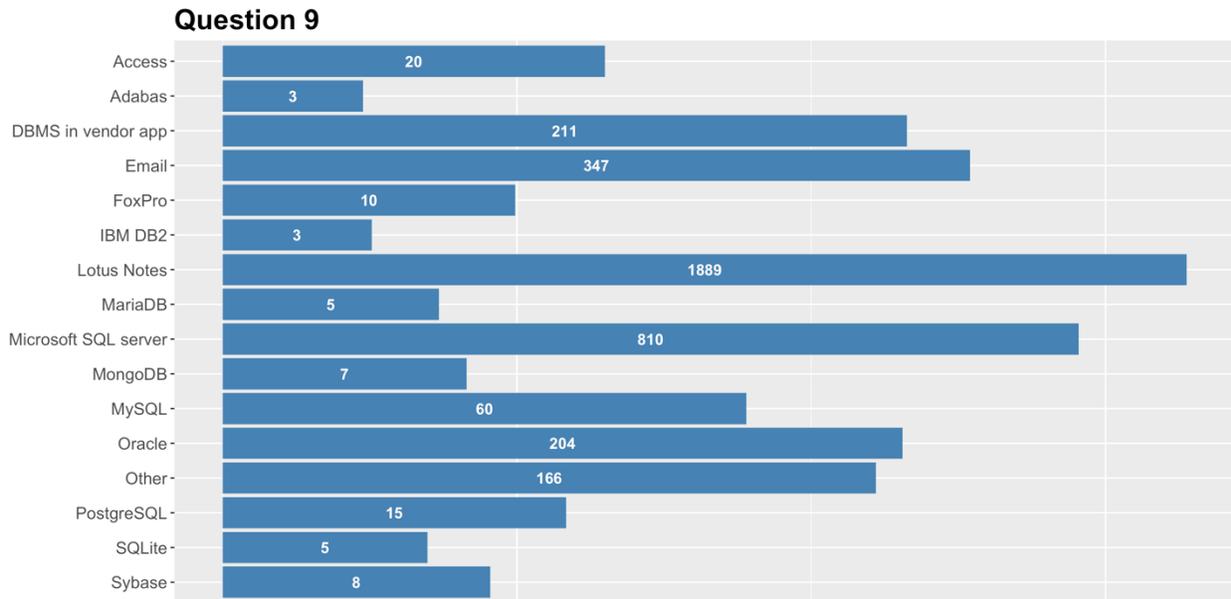
(a) the identity of any and all financial and nonfinancial databases that such entities maintain

Analysis

See Question 7.

QUESTION 9

What is the estimated size (in terabytes) of each DBMS in your agency?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

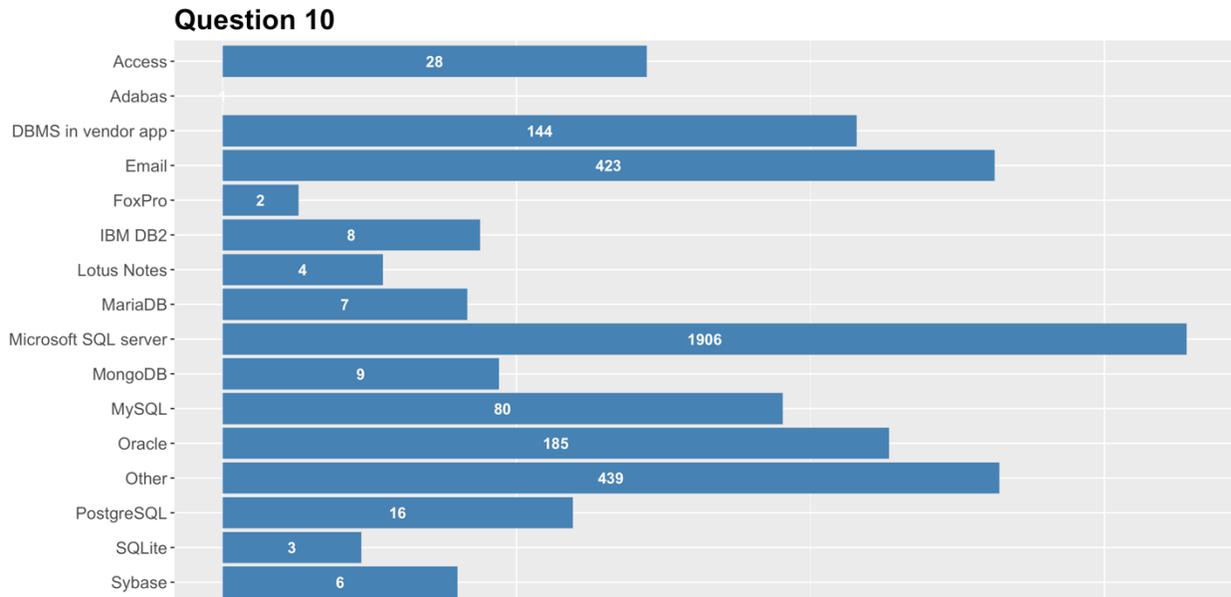
(a) the identity of any and all financial and nonfinancial databases that such entities maintain

Analysis

The total volume of data under a given DBMS is provided in white on the appropriate horizontal bar. Survey respondents reported that Lotus Notes and Microsoft SQL server were the database management systems holding the largest quantities of data. According to the survey responses, a majority of the state's structured data reside in a single database. Technical specifications for the DBMS indicated suggest that this database could not hold the volume of data reported. It is possible that either the number of databases or volume of data was misreported; in either case, the resolution of this apparent inconsistency affects conclusions regarding the statewide data landscape.

QUESTION 10

What is the estimated five-year growth (in terabytes) for each DBMS in your agency?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(a) the identity of any and all financial and nonfinancial databases that such entities maintain

Analysis

The total growth of data under a given DBMS is provided in white on the appropriate horizontal bar. Survey respondents reported the greatest estimated five-year growth in the data maintained in Microsoft SQL server. It should be noted that some survey respondents report a large disparity between database size and growth. For example, some agencies indicate no reported growth in a relatively high use DBMS while others project growth in a currently unused DBMS. This is not inherently unreasonable, but warrants further review.

QUESTION 11

Please provide an estimate of the percentage of databases that are updated on the following schedule (only DAILY, only WEEKLY, only MONTHLY, only QUARTERLY, only YEARLY). Each option must have a response.

No graph is provided for this question; see analysis that follows.

Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

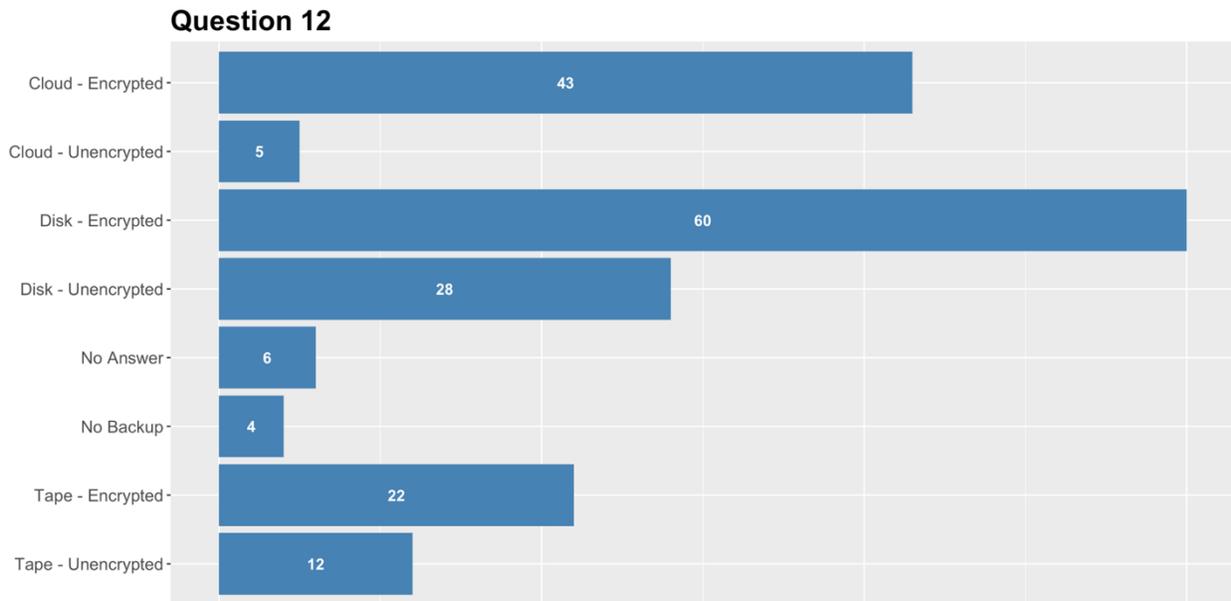
(b) the degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner

Analysis

It is likely that the wording of Question 11 was confusing to many survey respondents so the answers were not consistent. Therefore, this information is not presented graphically.

QUESTION 12

What methods are used for backup of your agency's databases? Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

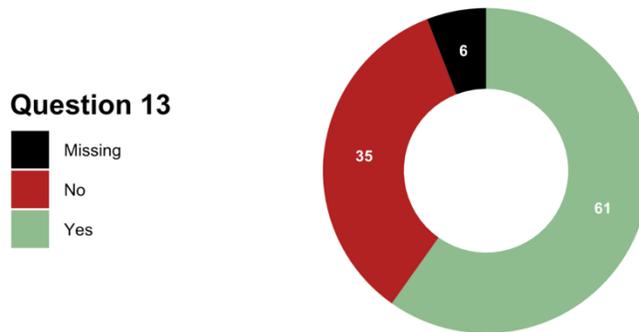
- (b) the degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

Analysis

According to survey respondents, encrypted backup of agency databases is more common than unencrypted. Some agencies either have no backup or did not answer Question 12.

QUESTION 13

Are there any third parties involved in the backup of your agency's databases?



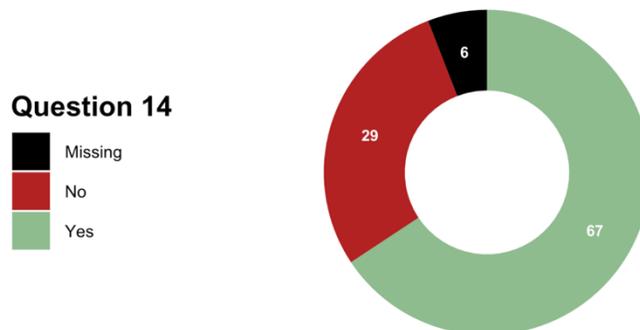
Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (b) the degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (m) costs of maintaining databases

Analysis

About $\frac{2}{3}$ of survey respondents reported involving third parties in their data backup. Future analysis could determine how many third parties this represents, and whether consolidation of these services is a viable option.

QUESTION 14



Are there any third parties involved in the maintenance of your agency's databases?

Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

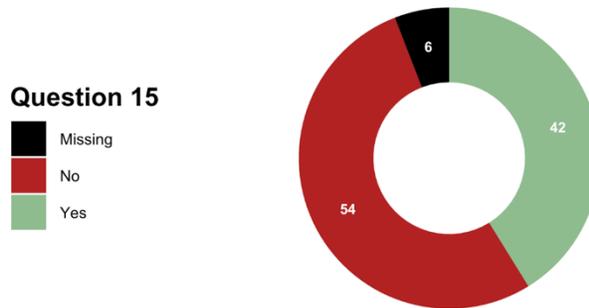
- (b) the degree to which those databases are kept current, as well as any standards each entity has developed for ensuring that data are maintained and updated in a timely and accurate manner
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (m) costs of maintaining databases

Analysis

See Question 13.

QUESTION 15

Does your agency have policies regarding the retention and archiving of past years' database files?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

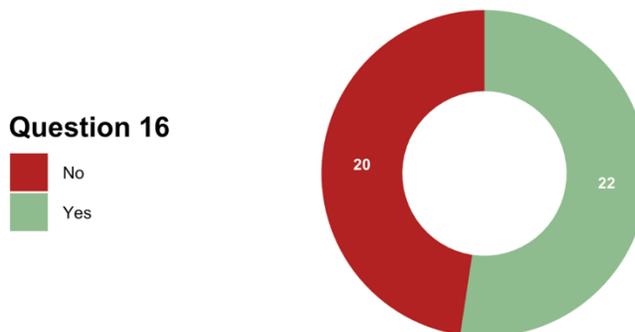
(c) the existence of policies regarding the retention and archiving of past years' database files

Analysis

A minority of agencies have these policies, which are required by MISS. CODE ANN. Sections 25-59-1 and 25-59-15 (1972).

QUESTION 16

Are these retention and archiving policies on file with the Mississippi Department of Archives and History?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

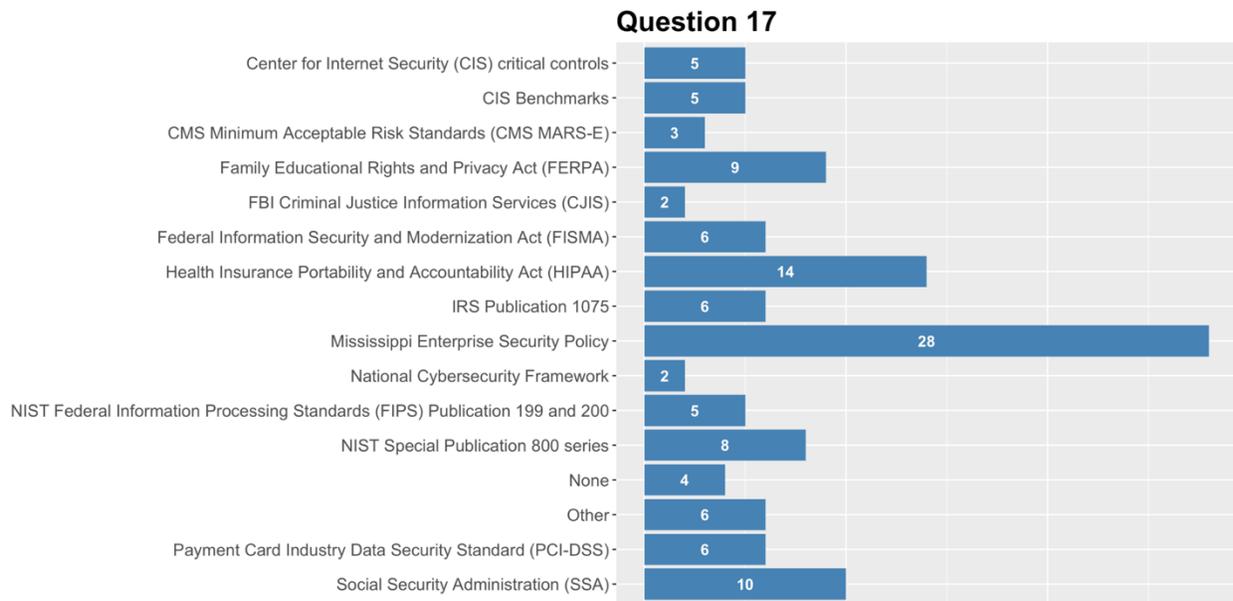
(c) the existence of policies regarding the retention and archiving of past years' database files

Analysis

See Question 15. MISS. CODE ANN. Sections 25-59-1 and 25-59-15 (1972) require that agencies have their archiving policies on file with the Department of Archives and History.

QUESTION 17

Please identify which applicable federal or state retention policies that accommodate your agency's data-retention policy for databases. Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

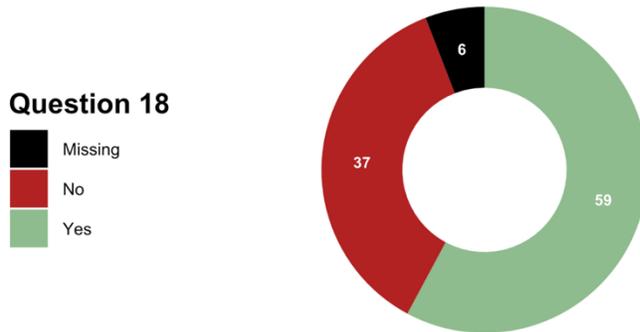
(c) the existence of policies regarding the retention and archiving of past years' database files

Analysis

The Mississippi Department of Information Technology Service's Mississippi Enterprise Security Policy is the most frequent governor of agency retention policy, followed by a set of federal laws.

QUESTION 18

Does your agency utilize offsite archival of past years' database files?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

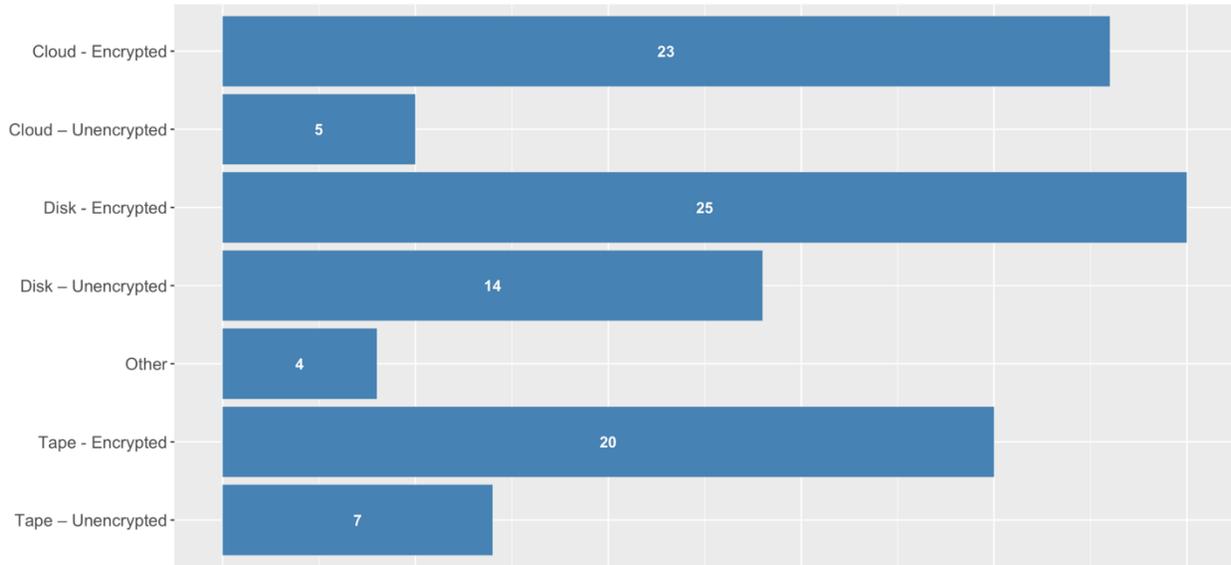
Analysis

According to the survey responses, most agencies utilize offsite archival of past years' database files.

QUESTION 19

What is the media for your agency's offsite archival of past years' database files? Select all that apply.

Question 19



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

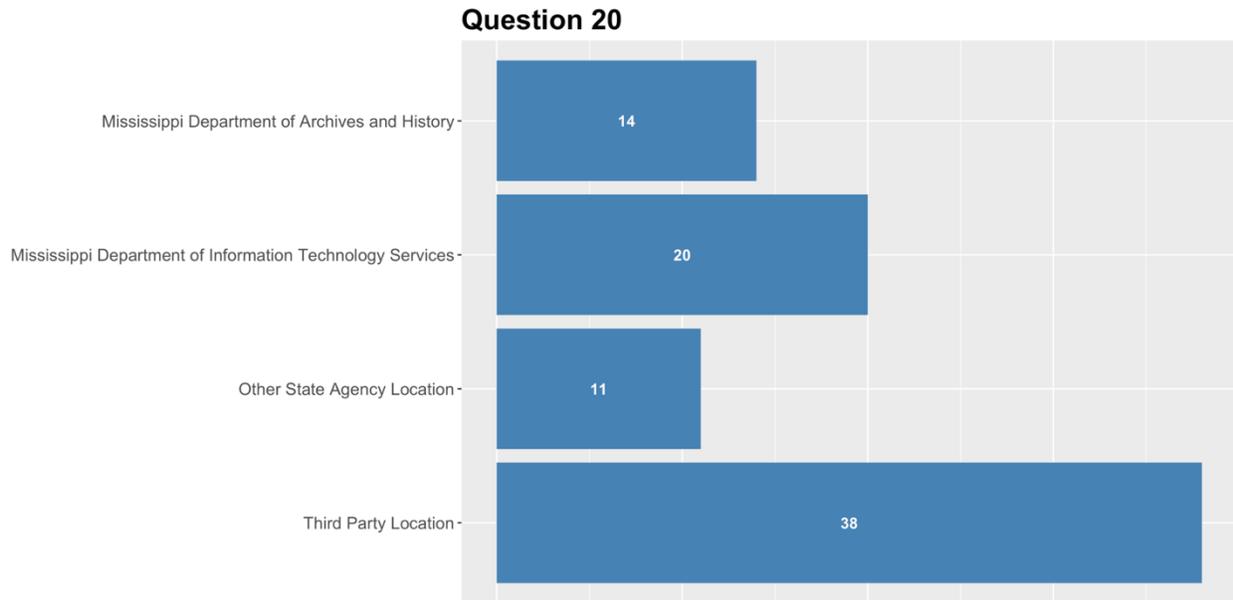
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

Analysis

Encrypted media in all forms outnumber unencrypted media.

QUESTION 20

Where are your agency's offsite database archives stored? Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

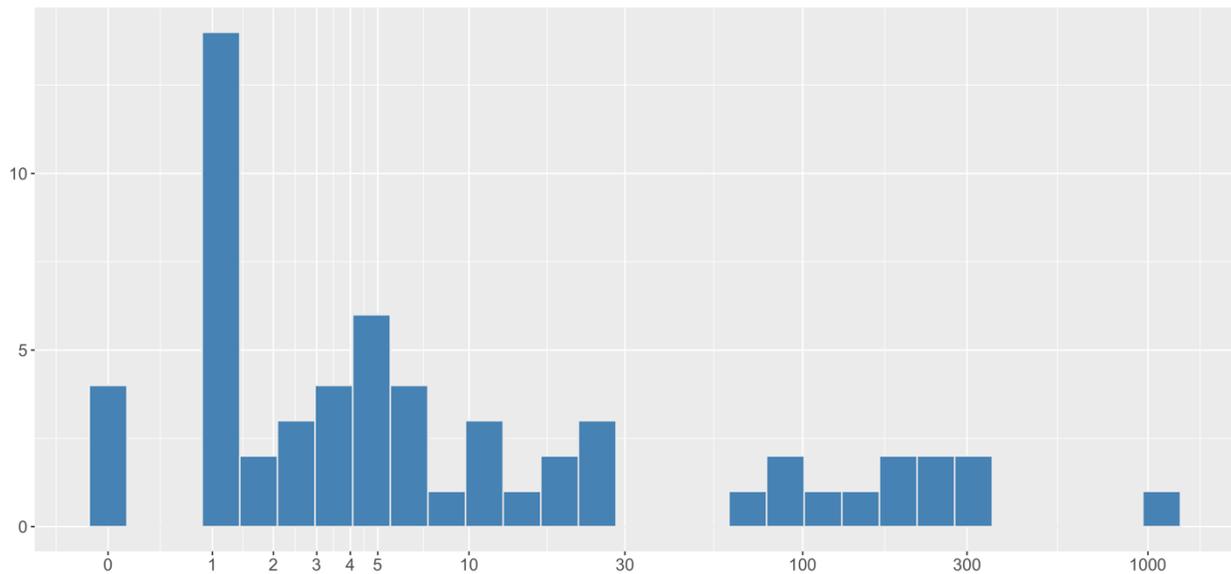
Analysis

A plurality of offsite archives is stored at third-party locations.

QUESTION 21

Estimate the amount (in terabytes) of your agency's data that is archived offsite.

Question 21



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

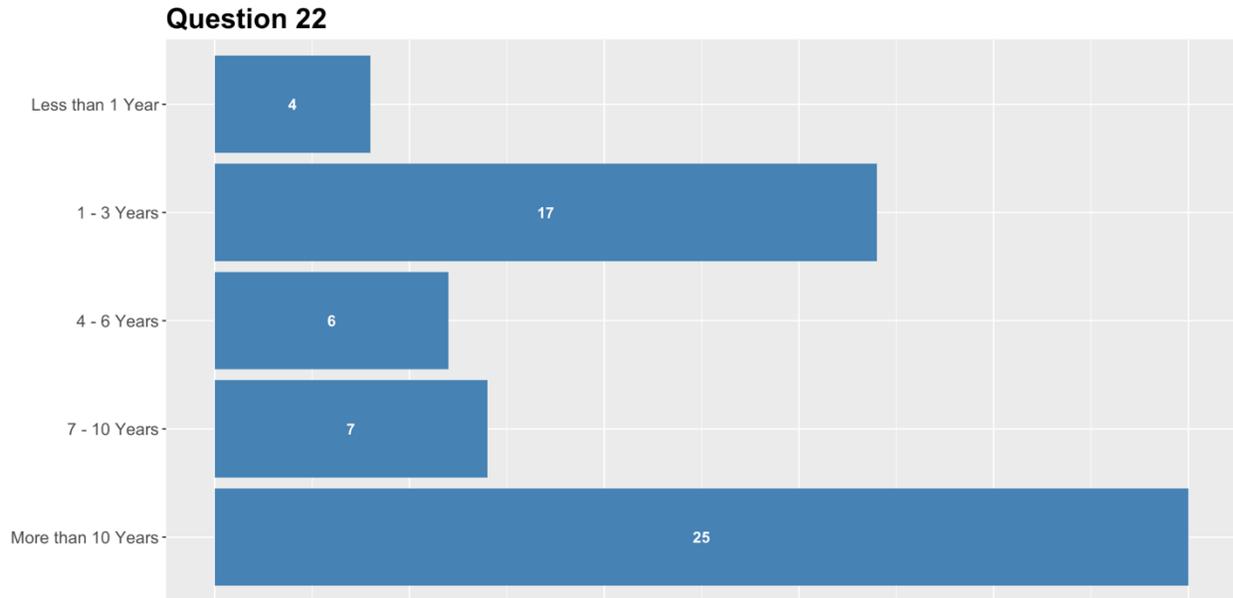
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

Analysis

The typical pattern of a small number of high-volume users and a large number of low-volume users is repeated here.

QUESTION 22

What is the maximum number of years of data that your agency maintains both online and offsite?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (c) the existence of policies regarding the retention and archiving of past years' database files
- (l) issues related to security of such databases

Analysis

The plurality of agencies maintains more than a decade of data.

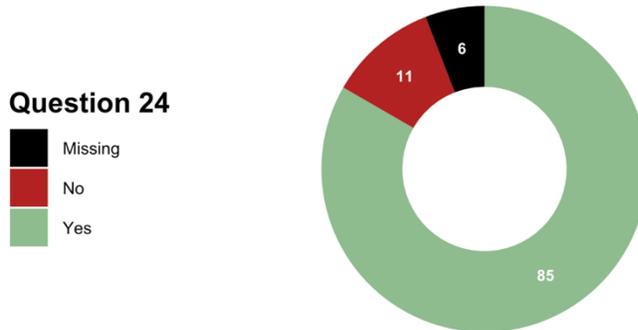
QUESTION 23

Please provide any additional comments regarding the general attributes of your agency's structured data.

Twenty-four survey respondents provided comments regarding their structured data. One survey respondent used the comments section to explain that only 7% of its thousands of databases are considered "agency critical." It is important to note that the MDMWG survey questions asked about all agency databases, not just those that the agency deems critical. While the issue of whether to restrict the questions to "agency critical" databases was discussed, there was a lack of consensus as to how to define an "agency critical" database. It is unknown how this decision impacted the survey results.

QUESTION 24

Does your agency's database(s) have access controls in place to verify that the user of an access request has been authorized by the data management owner?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information
- (l) issues related to security of such databases

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

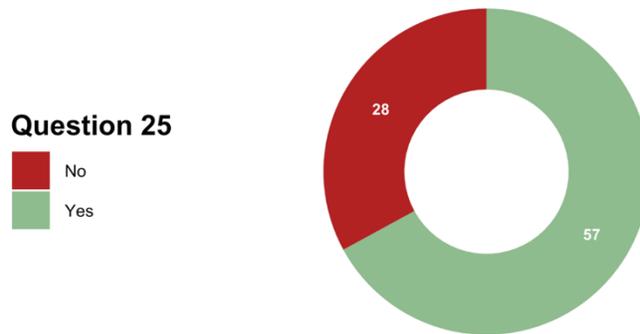
- (a) Findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

Proper access controls prevent users from taking unauthorized actions on the database. The majority of agencies employ some access controls.

QUESTION 25

Is there a formal policy or procedure in place documenting these access controls for agency employees to follow?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information
- (l) issues related to security of such databases

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

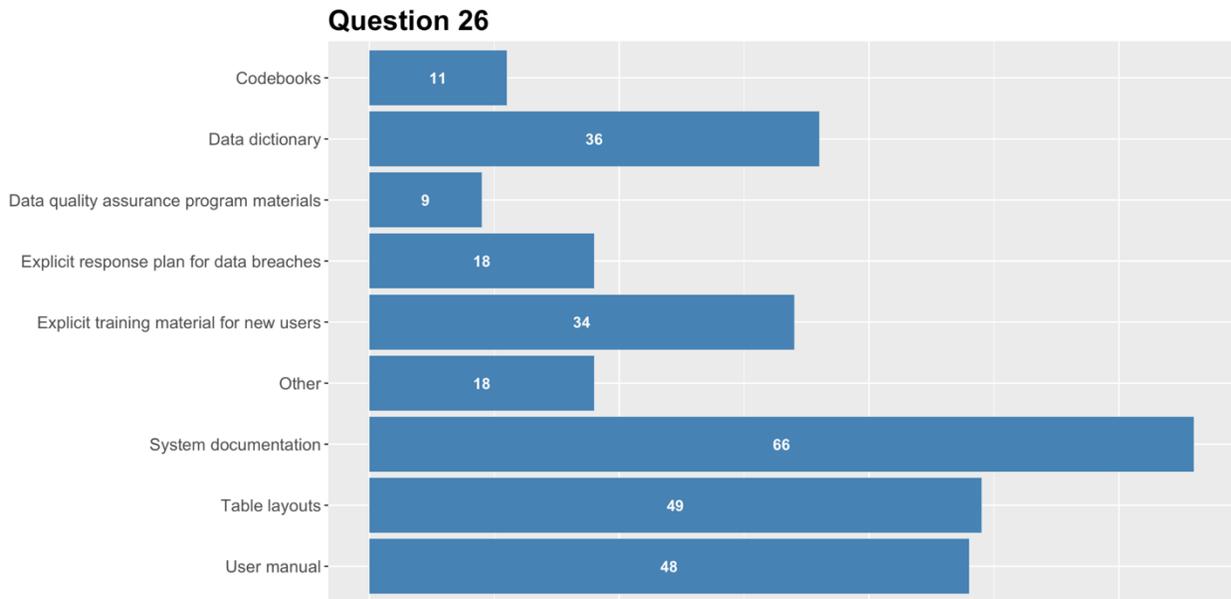
- (a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

This question was asked only of those 85 agencies who answered “yes” to question 24. The majority of the respondents to this question reported having a formal policy or procedure in place.

QUESTION 26

Which of the following documents does your agency maintain for each database? Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

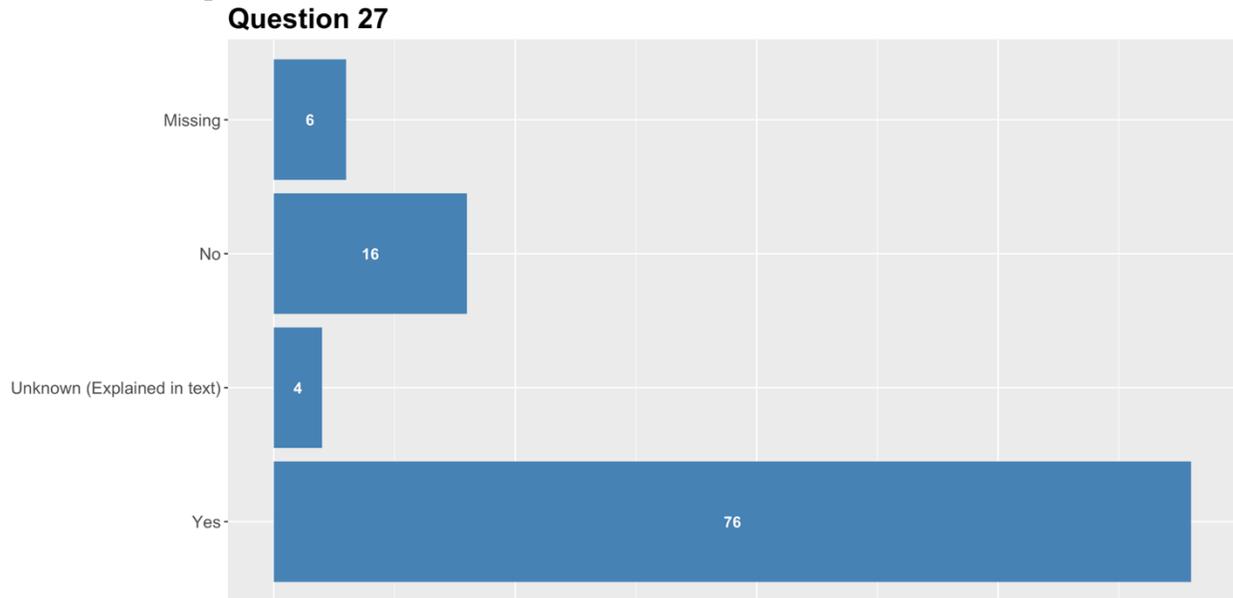
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (d) any standards for uniformity of database architecture
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (i) the existence of one or more data dictionaries for any and all databases

Analysis

The options in this question represent best practices in database documentation; without them, to varying degrees, it becomes more difficult to administer a database (especially in the face of personnel change), verify information obtained from the database, and use the database for inferences not specifically coded in. Only one of these options, “system documentation,” is maintained by a majority of the survey respondents, but this question was worded restrictively, such that only maintenance of the documentation for each database qualified an agency to make the selection. Future analysis could determine what proportion of databases—as opposed to agencies—maintains each form of documentation.

QUESTION 27

Do your agency databases contain audit trails of users creating and updating records with date/time stamps?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(j) the existence of any audit procedures implemented by such entities to ensure reliability of data

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

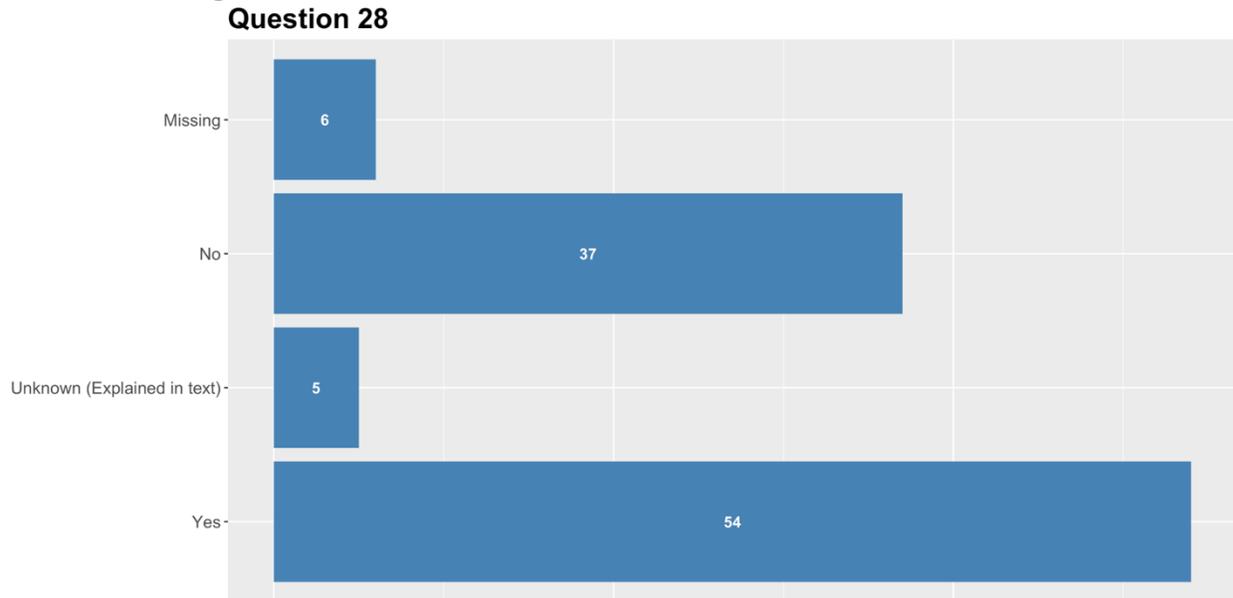
(a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

While the majority of survey respondents reported that their databases contain audit trails, the permissive wording of this question allowed an agency's maintenance of a single database with audit trails to qualify as a "yes" answer to this question. Future analysis could determine what proportion of databases—as opposed to agencies—include audit trails in their databases.

QUESTION 28

Do your agency databases have a formal change request process to evaluate, review, and document changes?



Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

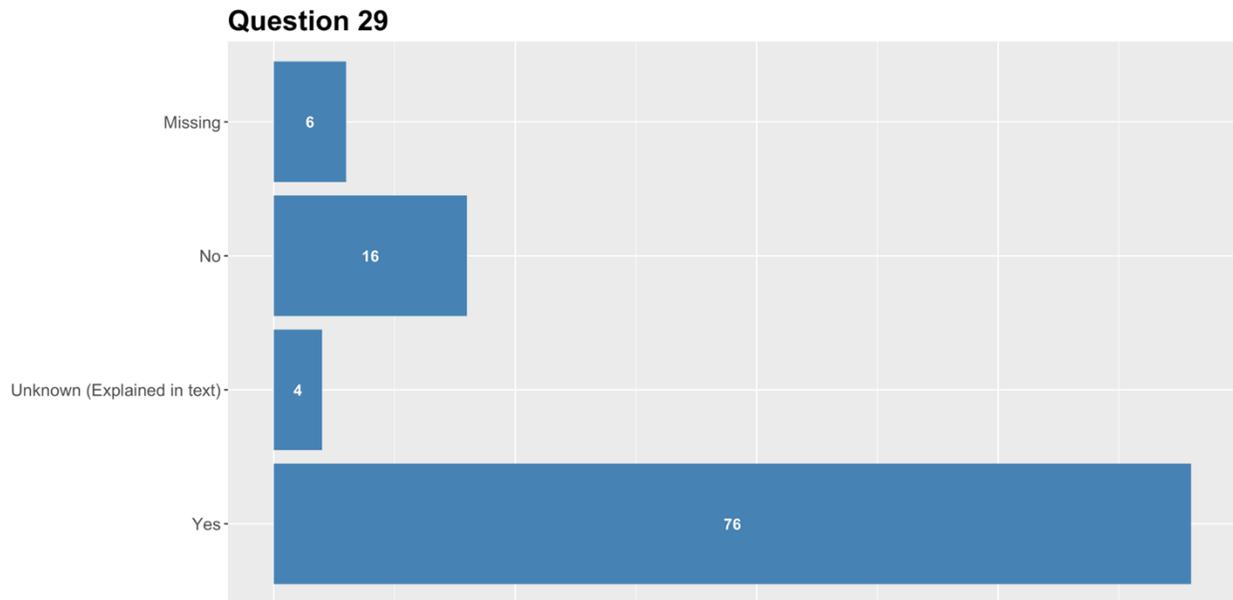
(a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

While more than half of survey respondents reported having a formal change request process, the permissive wording of this question allowed an agency with a single database having a formal change request process to answer “yes” to this question. Future analysis could determine what proportion of databases—as opposed to agencies—includes such a process.

QUESTION 29

Do your agency databases enforce data validation rules?



Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

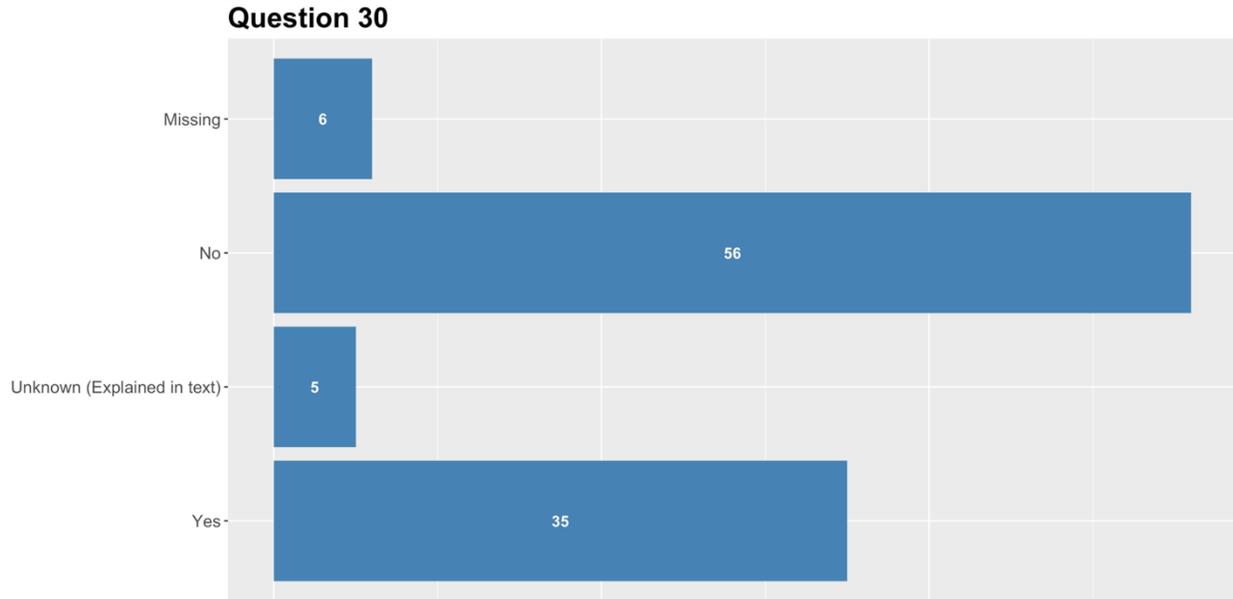
(a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

Data validation rules ensure that the data in a particular part of the database obey constraints appropriate to the thing they represent. For instance, a database field intended to represent height in inches should contain only numeric values within certain ranges (“60” or “72” would be appropriate; “6” or “720” would not) and not words or numeric values appropriate to height in feet. This question was worded permissively; an agency’s maintenance of a single database with a formal change review process qualifies that agency to answer “yes” to this question. Future analysis could determine what proportion of databases—as opposed to agencies—includes such a process.

QUESTION 30

Does your agency use any form of non-normalized data?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(j) the existence of any audit procedures implemented by such entities to ensure reliability of data

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

(a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

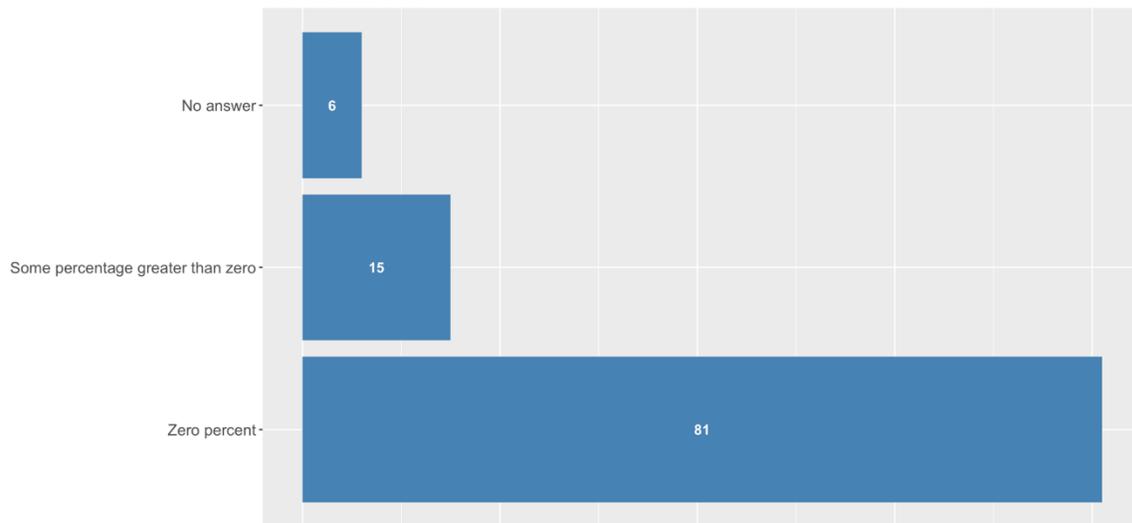
Analysis

Normalized data obey constraints of form that render them resistant to errors when data are inserted, deleted, or changed; the relations among normalized data also possess formal properties that make inferences on those data readily conceivable without reference to a specific programming language. More than half of the survey respondents reported using non-normalized data. Because this question was worded impermissively, an agency's maintenance of a single non-normalized database requires that agency to answer "yes" to this question. Future analysis could determine what proportion of databases—as opposed to agencies—employ normalized data.

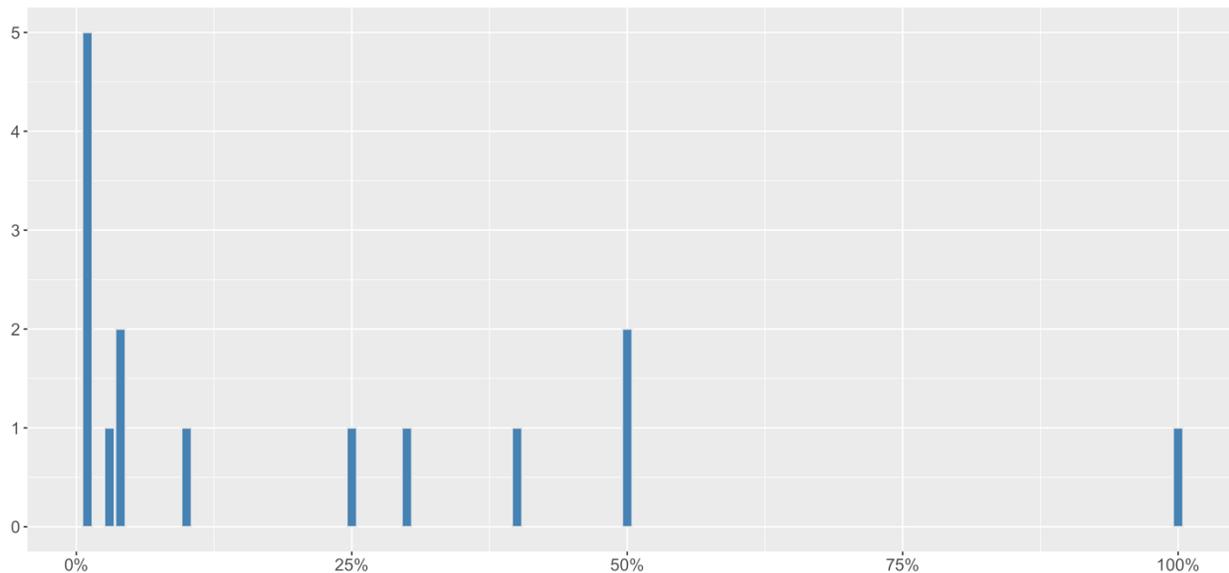
QUESTION 31

Please indicate the percentage of your agency's databases that have ever undergone a data reliability audit conforming to the guidelines contained in the United States Government Accountability Office publication GAO-09-680G Assessing Data Reliability.

Question 31a



Question 31b



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(j) The existence of any audit procedures implemented by such entities to ensure reliability of data

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

(a) Findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

Graph 31a shows that 15 survey respondents reported having databases that had undergone a data reliability audit conforming to GAO guidelines. Graph 31b shows the percentages of databases of these 15 entities that have undergone an audit conforming to GAO guidelines; each bar represents one of the 15 agencies who answered the question with some nonzero percentage. Only one of the 15 entities indicated that a majority of their databases (in this case 100%) had undergone such an audit.

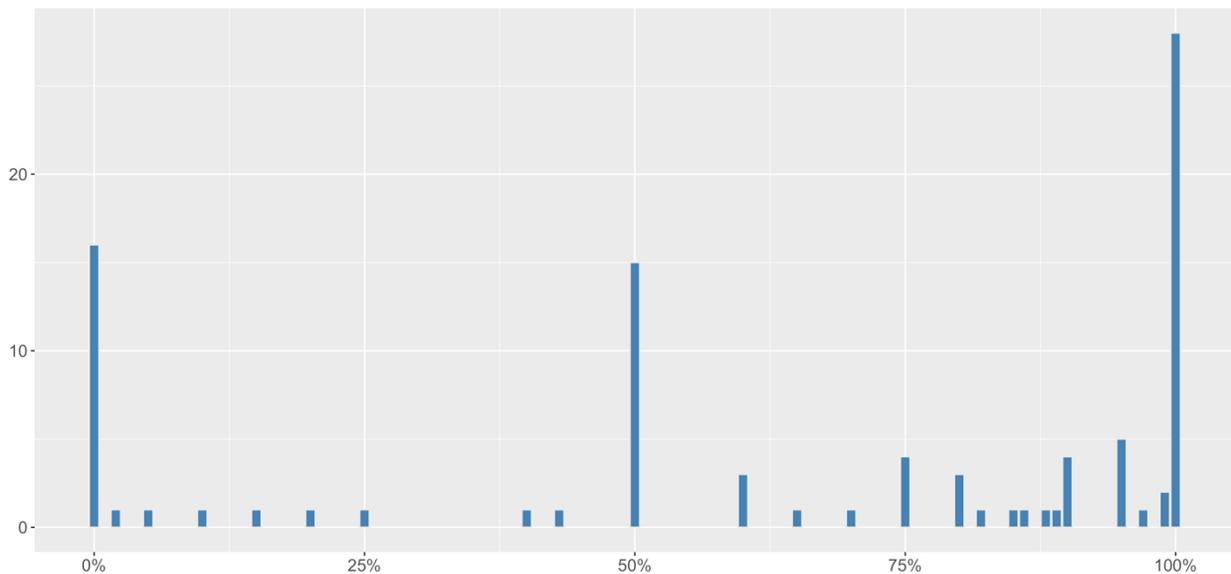
QUESTION 32_1

For the purposes of this survey, databases can be managed in two broad categories:

1. Directly Managed by Agency Staff — Agency has direct control of the database, including format, structure, audit, validation, normalization, and overall administration. This also includes vendor contracted management of agency controlled DBMS.
2. Vendor Managed Through Application Interface — The vendor provides an application to the agency, which typically includes a database. The application's database is directly managed by the application's interface. Agency staff only access the data in the application database through the vendor supplied application interface.

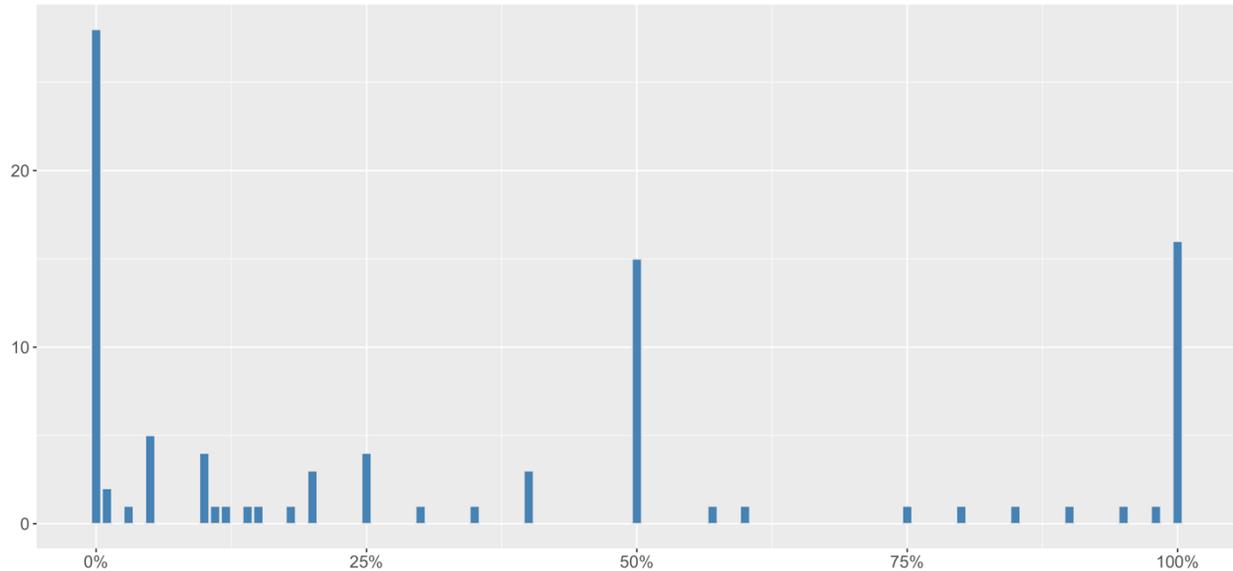
Percent of Databases Directly Managed by Agency Staff

Question 32a



QUESTION 32_2

Percent of Databases Vendor Managed through Application Interface Question 32b



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (d) any standards for uniformity of database architecture
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (i) the existence of one or more data dictionaries for any and all databases
- (j) the existence of any audit procedures implemented by such entities to ensure reliability of data
- (k) issues related to the public ownership of the databases of such entities
- (l) issues related to security of such databases
- (m) costs of maintaining databases

Question linked to Chapter 315, Laws of 2017, Section 4 Sub-Section 1 Paragraph(s):

- (a) findings or conclusions regarding the quality, accessibility, and utility of the databases of state government

Analysis

Many of the questions in this survey cannot be answered about a vendor-managed database if its structure is inaccessible to the agency. The graphic represents counts at various percentages of direct agency management.

QUESTION 33

Please provide any additional comments regarding your agency's architecture, data reliability, and standards.

Analysis

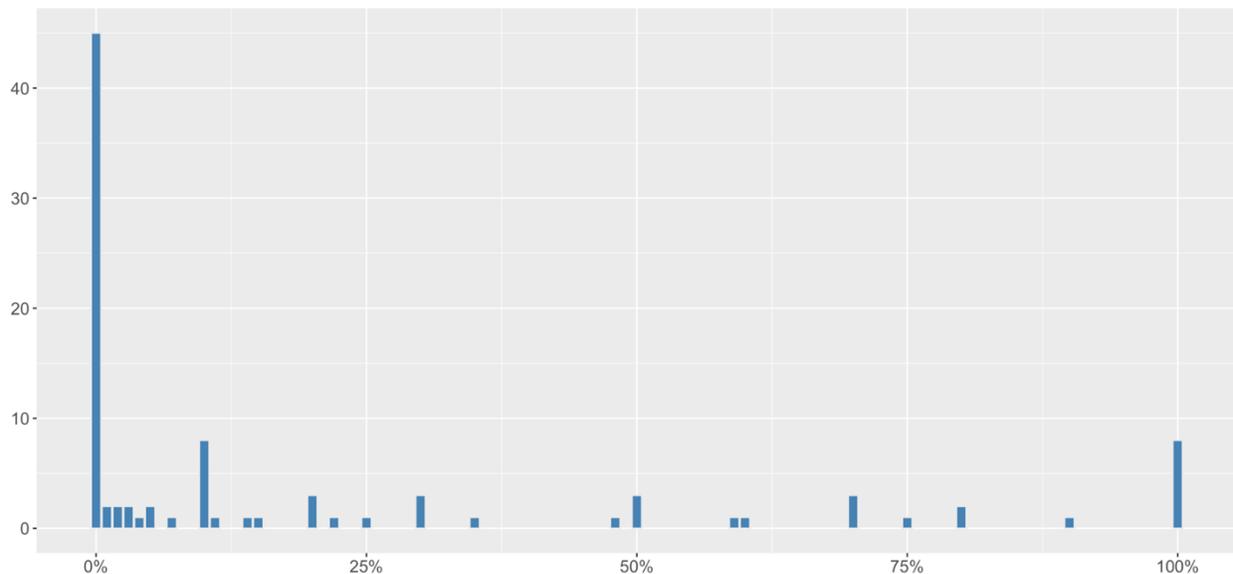
Eight survey respondents provided additional comments regarding their database architecture, data reliability, and standards. Most of these comments further explained the agency's answers to Questions 24 through 32. Some of the comments related to the need to differentiate among agency databases in order to provide more accurate answers to the questions.

TRANSPARENCY, INTERNET ACCESSIBILITY, AND PUBLIC OWNERSHIP OF DATA

QUESTION 34

What percentage of your agency's databases are accessed by the public through the Internet?

Question 34



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

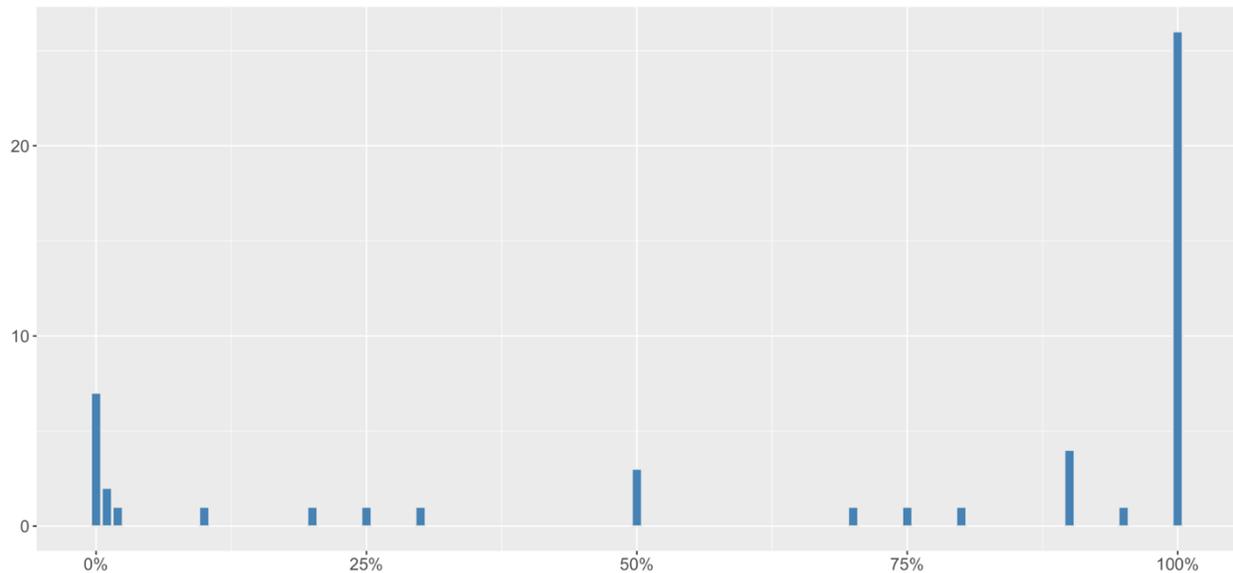
Analysis

A plurality of agencies indicated that none of its databases are accessed by the public.

QUESTION 35

You selected [answer to Question 34] % as the percentage of your agency's databases that are accessed by the public through the Internet. Of the databases that make up the [answer to Question 34] % indicated in the previous question, what percentage of your agency's databases require a user ID and password?

Question 35



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

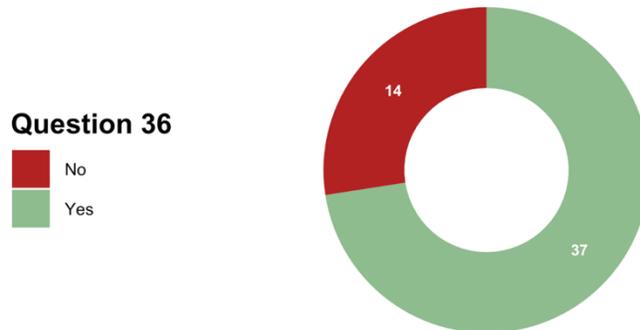
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

This question applies only to the 51 agencies that indicated a nonzero percentage of publicly accessible databases in question 35. Twenty-six survey respondents with publicly accessible databases reported that 100% of these databases require a user ID and password.

QUESTION 36

Is there a standard process for obtaining public access to databases that are accessible through the Internet?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

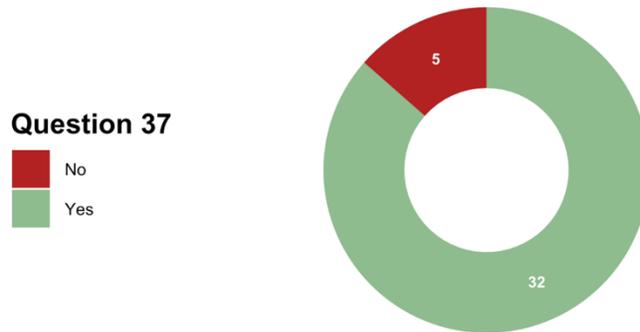
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

This question applies only to the 51 agencies that indicated a nonzero percentage of publicly accessible databases in Question 35. The majority of these agencies reported having a standard process for obtaining public access to databases through the Internet.

QUESTION 37

Is the process for obtaining access to the public databases through the Internet documented and readily available for users?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

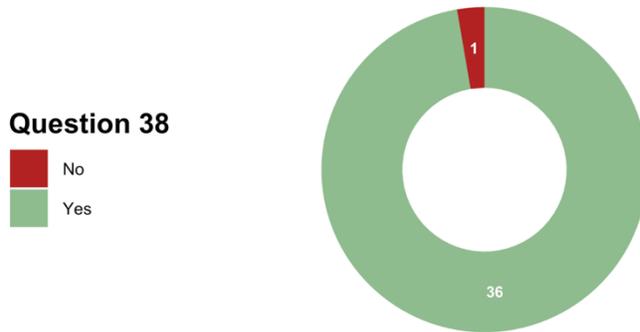
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

This question applies only to those 37 agencies that indicated in Question 36 that some process for obtaining access exists. For the majority of these agencies, the process for obtaining access to public databases through the Internet is documented and readily available for users.

QUESTION 38

Does your agency provide contact support for public users that have issues or questions pertaining to accessing databases that are accessible through the Internet?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

This question applies only to those agencies that indicated in Question 36 that some process for obtaining access exists. Only one of the 37 entities providing access to databases via the Internet reported not having contact support for public users with issues or questions.

QUESTION 39

Please provide any additional comments concerning public Internet access of your agency's data.

Analysis

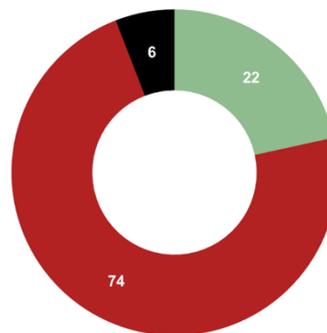
Thirty-three survey respondents provided additional comments concerning public Internet access of their agency's data. Some of these respondents expressed concern that public access could jeopardize their ability to protect sensitive and personal information maintained by the agency, such as Social Security numbers, tax returns, and bank account records.

REMOTE CONNECTIVITY FOR OTHER STATE GOVERNMENT ENTITY ACCESS

QUESTION 40

Does your agency provide remote access to your agency's databases for other agencies and/or committees charged with the responsibility of assessing agency and program effectiveness and efficiency?

Question 40



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

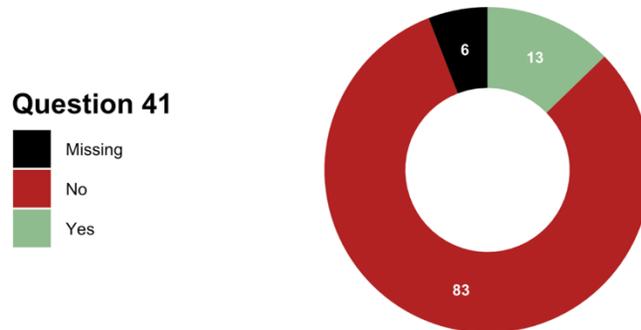
(f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

The majority of survey respondents do not provide remote access to their databases for other agencies and/or committees charged with oversight responsibilities.

QUESTION 41

Are there any federal or state statutes or regulations that prohibit remote access to your agency's databases for other agencies and/or committees charged with the responsibility of assessing agency and program effectiveness and efficiency?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

Analysis

For the majority of survey respondents, there are no federal or state statutes that prohibit remote access to their databases for entities charged with the responsibility of assessing agency and program effectiveness and efficiency.

QUESTION 42

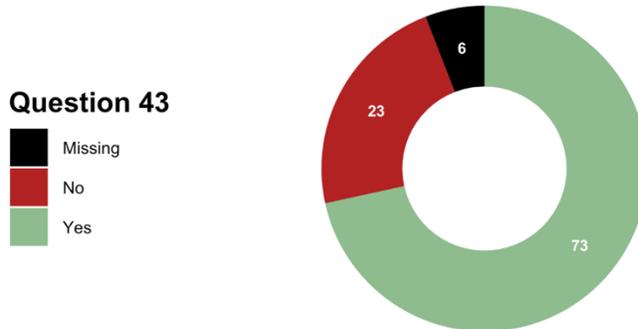
Please provide any additional comments concerning remote access of your agency's data by other agencies.

Analysis

Seventeen survey respondents provided additional comments concerning remote access of their agency's data by other agencies. Several agencies specified the external parties that have access to their data, including federal and state agencies and authorized service providers.

QUESTION 43

Does your agency have written agreements or contracts with any and all vendors that provide IT services for your agency wherein the vendor has access to or maintenance of your agency's data?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

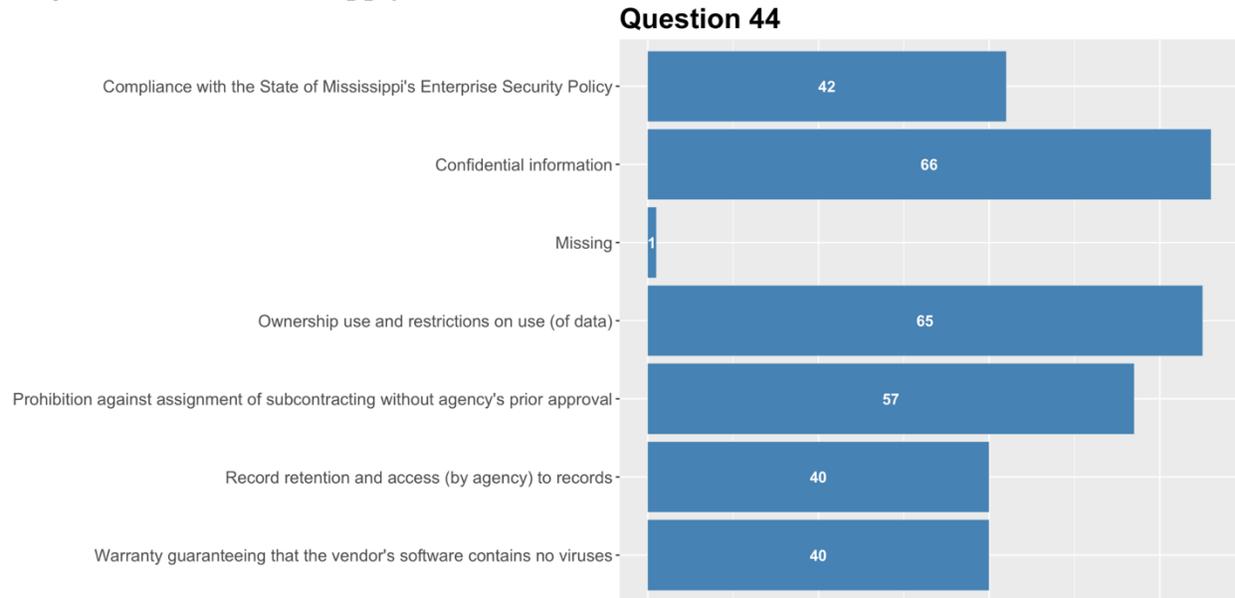
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information
- (l) issues related to security of such databases

Analysis

The majority of survey respondents report having written agreements or contracts with vendors that provide IT services wherein the vendor has access to or maintenance of the agency's data.

QUESTION 44

Do the written agreements or contracts contain provisions that address the following subjects? Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

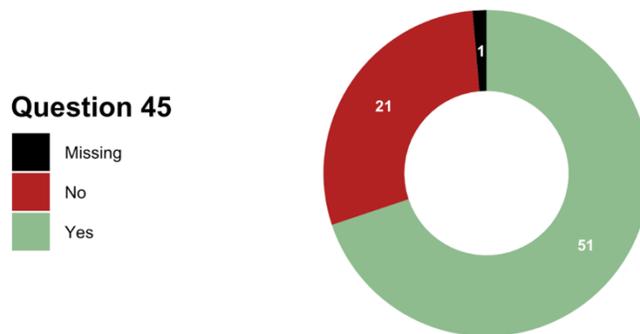
- (c) the existence of policies regarding the retention and archiving of past years' database files
- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information
- (l) issues related to security of such databases

Analysis

This question applies only to the 73 survey respondents that indicated in Question 43 that written agreements or contracts exist. Twenty-one of the entities reported that their written agreements or contracts include all of the provisions that are elements of best practice for IT service contracting.

QUESTION 45

Do the written agreements or contracts contain provisions addressing the duty of the vendor to destroy and verify the destruction of any personal identifiable information (PII) or personal health information (PHI) in the vendor’s possession upon conclusion of the contract?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

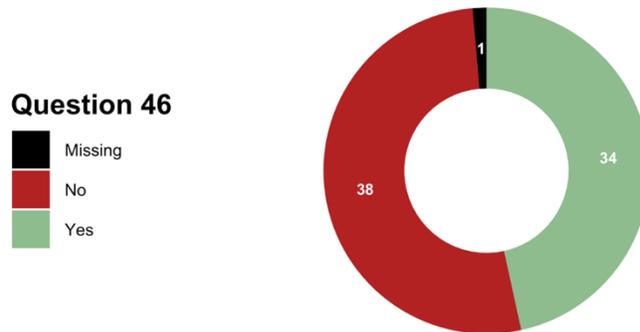
- (h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information
- (l) issues related to security of such databases

Analysis

This question applies only to the 73 survey respondents that indicated in Question 43 that written agreements or contracts exist. It is possible that some agencies that replied “no” to this question do not maintain PII or PHI data, although some do.

QUESTION 46

Do the written agreements or contracts contain provisions for agency audit of vendor’s security procedures?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

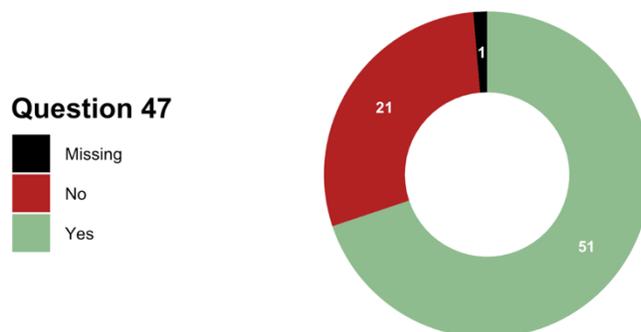
(l) issues related to security of such databases

Analysis

This question applies only to the 73 survey respondents that indicated in Question 43 that written agreements or contracts exist. Most of these entities do not provide for agency audit of vendor’s security procedures in their written contracts for IT services.

QUESTION 47

Do the written agreements or contracts contain language indemnifying the agency for any loss or damages resulting from the unauthorized release of PII/PHI?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information

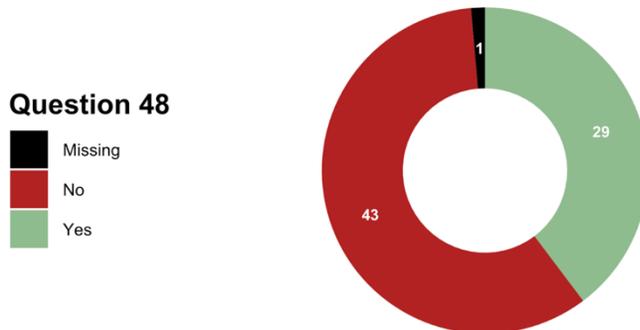
(l) issues related to security of such databases

Analysis

This question applies only to the 73 survey respondents that indicated in Question 43 that written agreements or contracts exist. It is possible that some agencies that replied “no” to this question do not maintain PII or PHI data, although some do.

QUESTION 48

Does your agency have written procedures to follow when auditors or other parties seek access to PII/PHI when conducting research on audit projects for research purposes?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency

(h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information

Analysis

This question applies only to the 73 survey respondents that indicated in Question 43 that written agreements or contracts exist. The majority of these agencies reported not having written procedures to follow when auditors or other parties seek access to PII or PHI when conducting research.

QUESTION 49

Please provide any additional comments concerning any legal issues with the data in your agency.

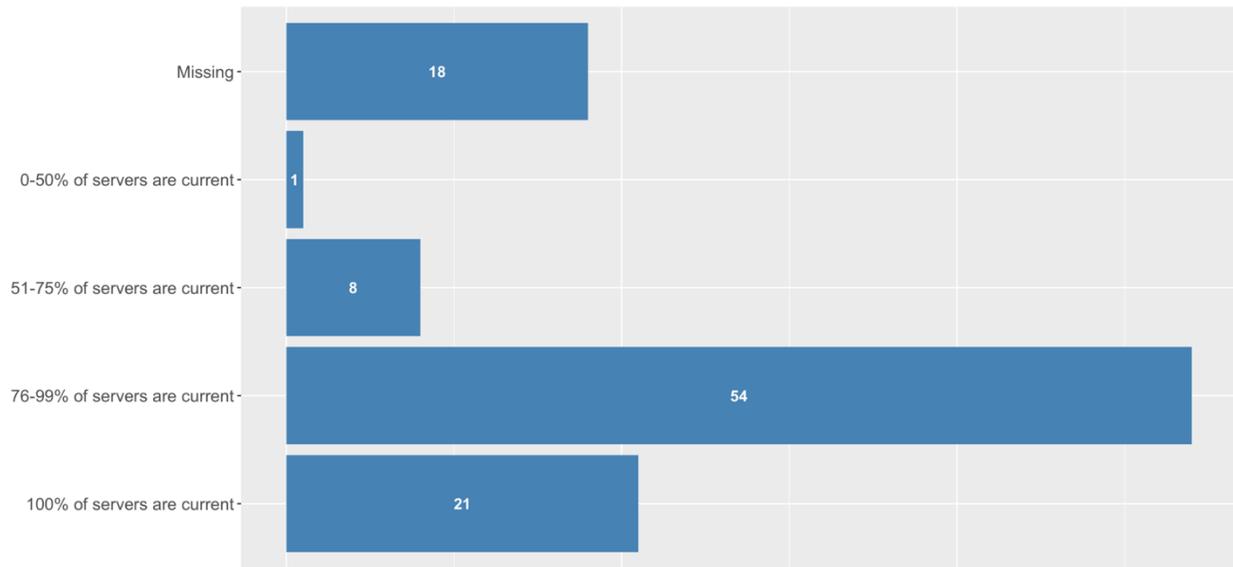
Analysis

Twenty-one survey respondents provided additional comments concerning legal issues with their agency's data. Several of the comments reiterated the confidential nature of records maintained by the agency while acknowledging secure data sharing provisions that allow for investigations of fraud, waste, and abuse.

QUESTION 50

How current is your agency with operating system versions, patches, and security standards for servers that provide agency-hosted website access?

Question 50



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(l) issues related to security of such databases

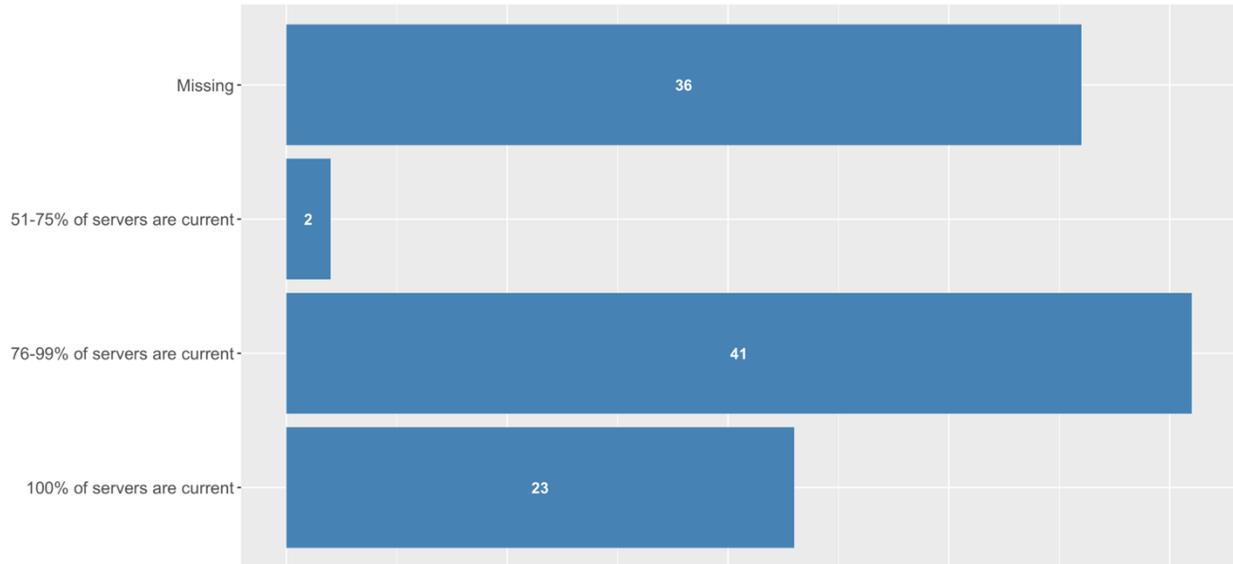
Analysis

The majority of survey responses indicated a range of 75%-99% currency.

QUESTION 51

How current are your agency's third-party-maintained servers with operating system versions, patches, and security standards?

Question 51



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(l) issues related to security of such databases

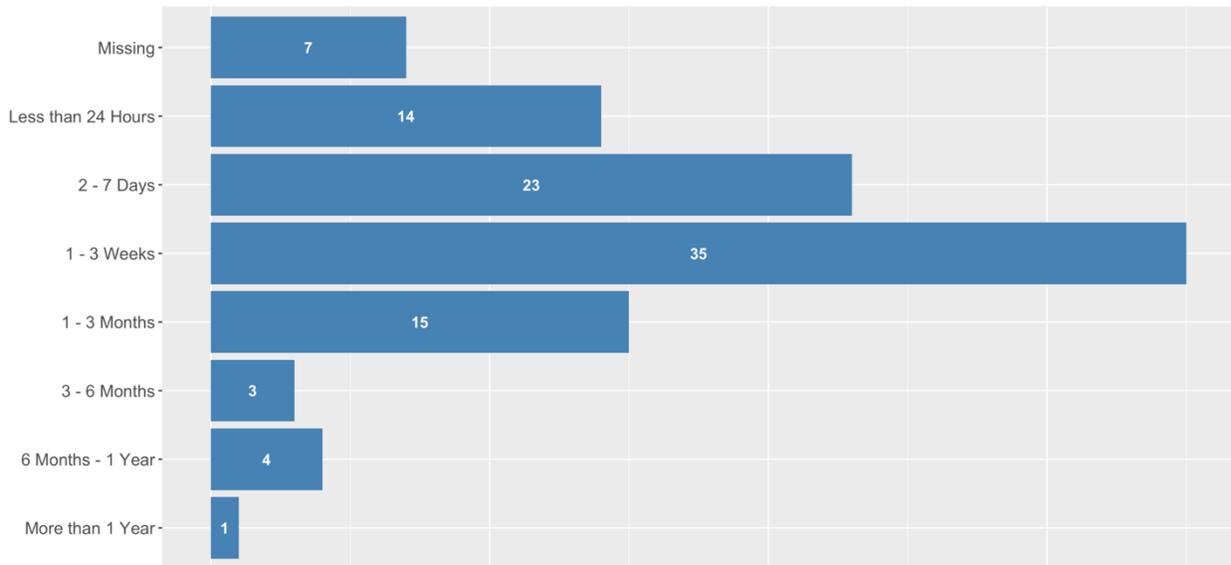
Analysis

The plurality of responses indicated 75-99% currency, but the large number of missing responses suggests that future analysis of this question is warranted.

QUESTION 52

Estimate the average time it takes your agency to bring systems and databases to the current patch level once a patch has been released by vendor.

Question 52



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

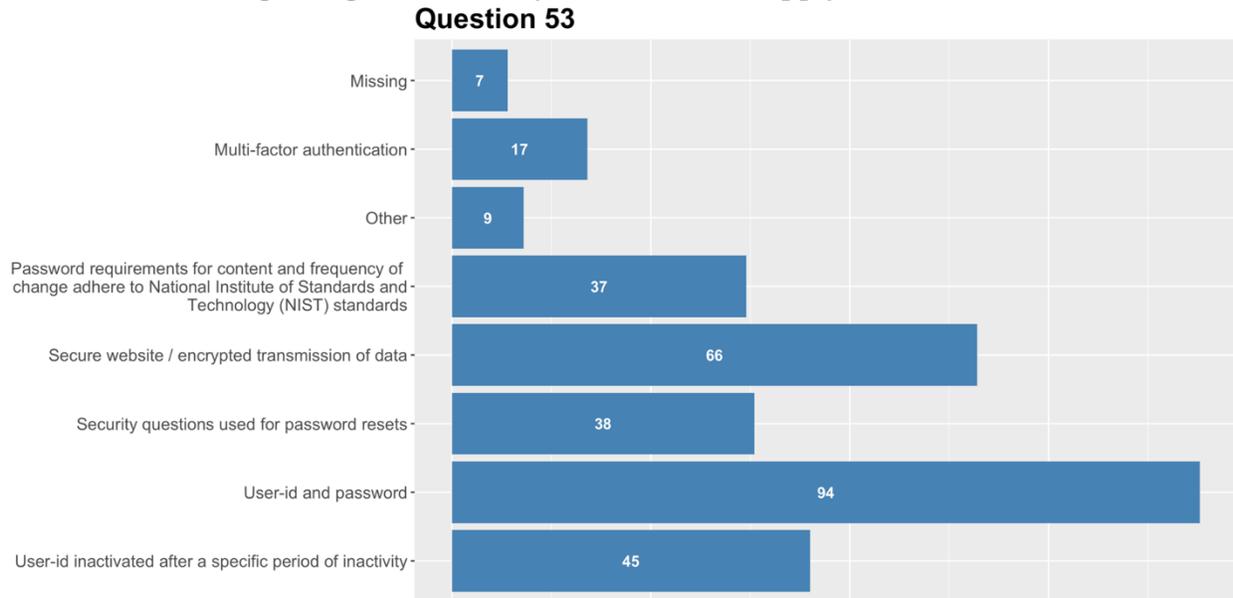
(l) issues related to security of such databases

Analysis

Thirty-seven survey respondents reported an average time of a week or less to bring systems and databases to the current patch level once a patch has been released by the vendor.

QUESTION 53

What security measures does your agency have in place to control access to databases identified at the beginning of this survey? Select all that apply.



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

- (e) the transparency and Internet accessibility of such databases that are established for public access and use
- (f) the degree of Internet accessibility and any hindrances to the accessibility of such databases by agencies and committees charged with the responsibility for assessing agency and program effectiveness and efficiency
- (l) issues related to security of such databases

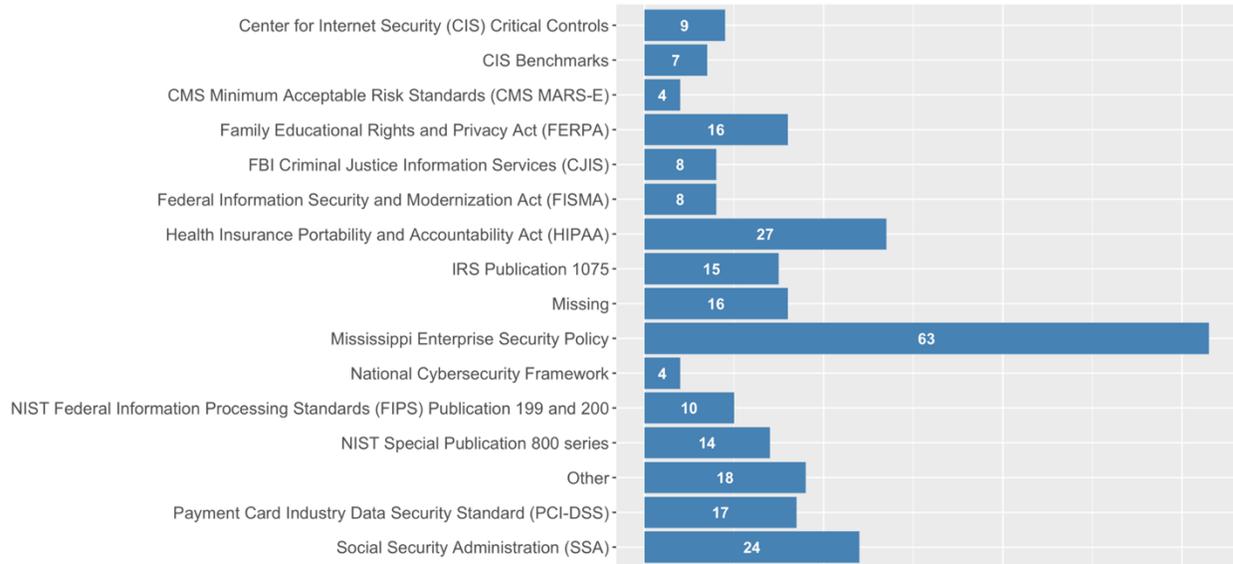
Analysis

A majority of survey respondents indicated use of both encryption and user ID/password-limited access.

QUESTION 54

What regulatory entities dictate the access to or restriction of confidential information contained in your agency’s database files? Select all that apply.

Question 54



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(h) any legal requirements under state and federal law that impact access and use of confidential or otherwise legally protected information

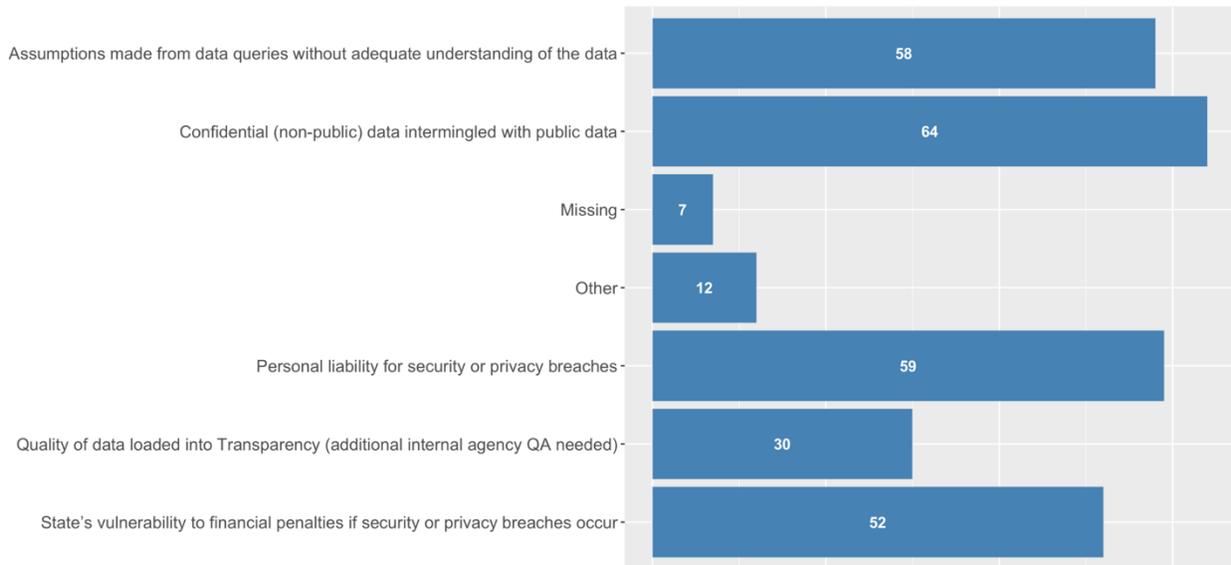
Analysis

State policy dictates the access to or restriction of confidential information contained in database files for a majority of agencies.

QUESTION 55

What concerns do you have about public ownership of database files and the challenges of securing or protecting data as required? Select all that apply.

Question 55



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(k) issues related to the public ownership of the databases of such entities

Analysis

Survey respondents agreed with most of the listed concerns over public ownership of database files and the challenges of securing or protecting data as required.

QUESTION 56

Please provide any additional comments concerning security issues or public ownership issues associated with your agency's data.

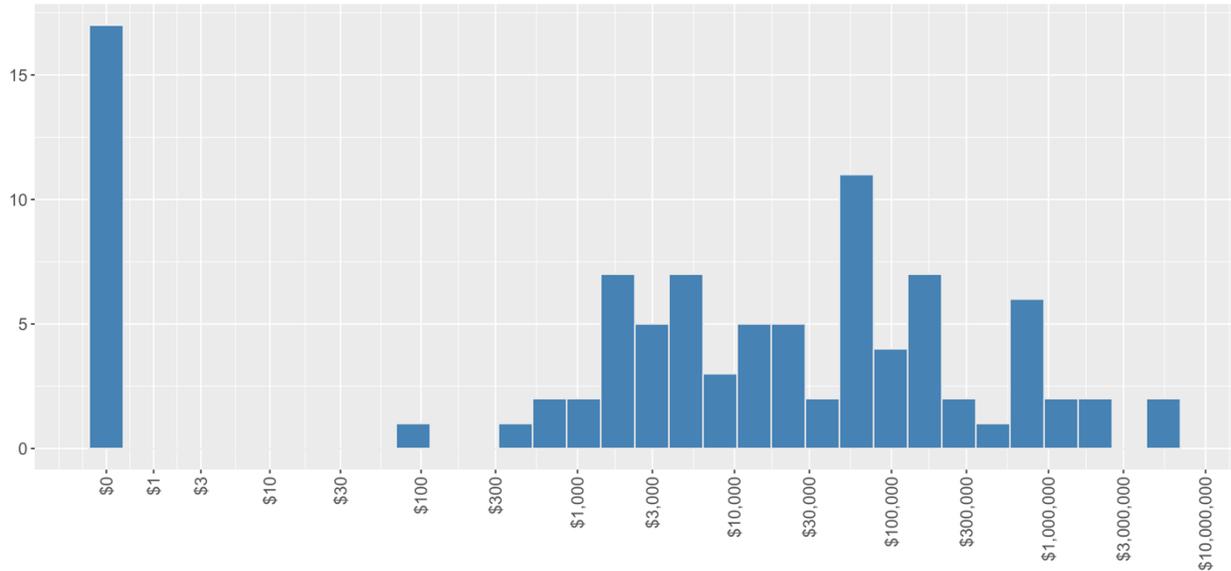
Analysis

Fifteen survey respondents provided additional comments concerning security or public ownership issues associated with their agency's data. Concerns were again expressed over information security.

QUESTION 57

What is the estimated hardware cost for all databases for FY 2015-FY 2019?

Question 57



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

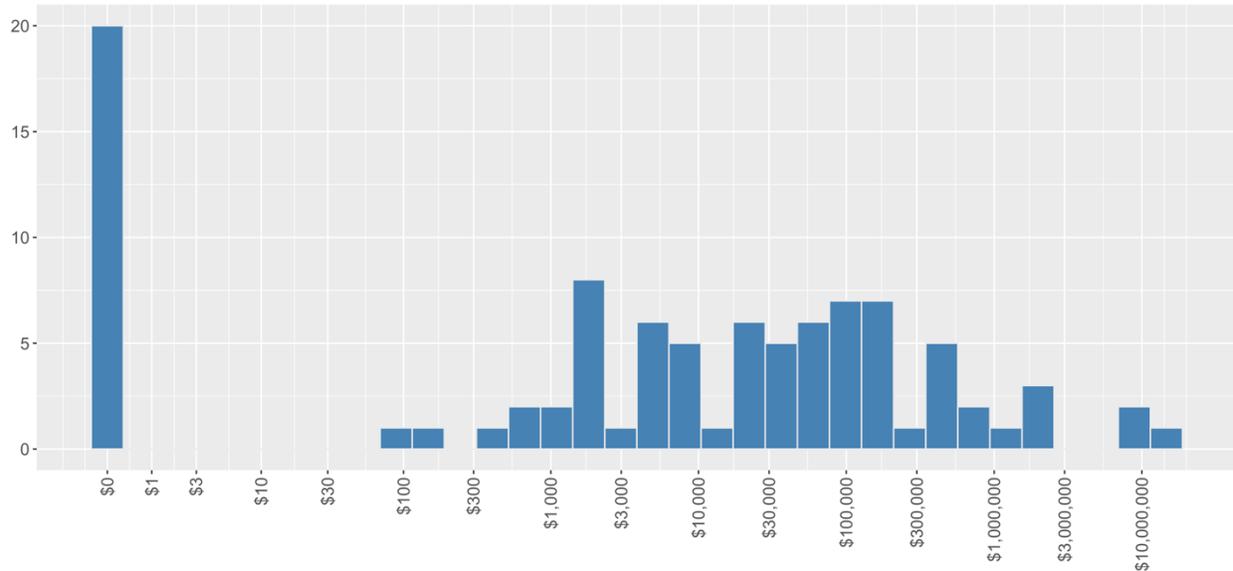
Analysis

The number of zero values reported by survey respondents is worth noting; more agencies claimed to have no hardware costs than claimed any other cost. Seven agencies did not answer this question.

QUESTION 58

What is the estimated software cost for all databases for FY 2015-FY 2019?

Question 58



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

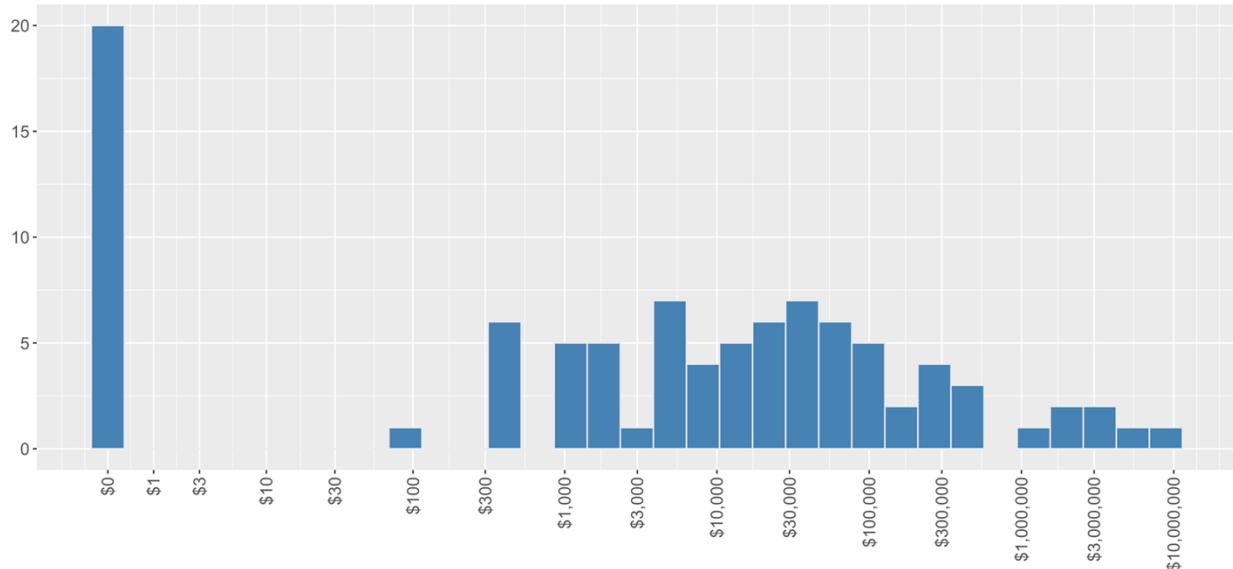
Analysis

The number of zero values reported by survey respondents is worth noting; more agencies claimed to have no software costs than claimed any other cost. Seven agencies did not answer this question.

QUESTION 59

What is the estimated hardware maintenance and support cost for all databases for FY 2015-FY 2019?

Question 59



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

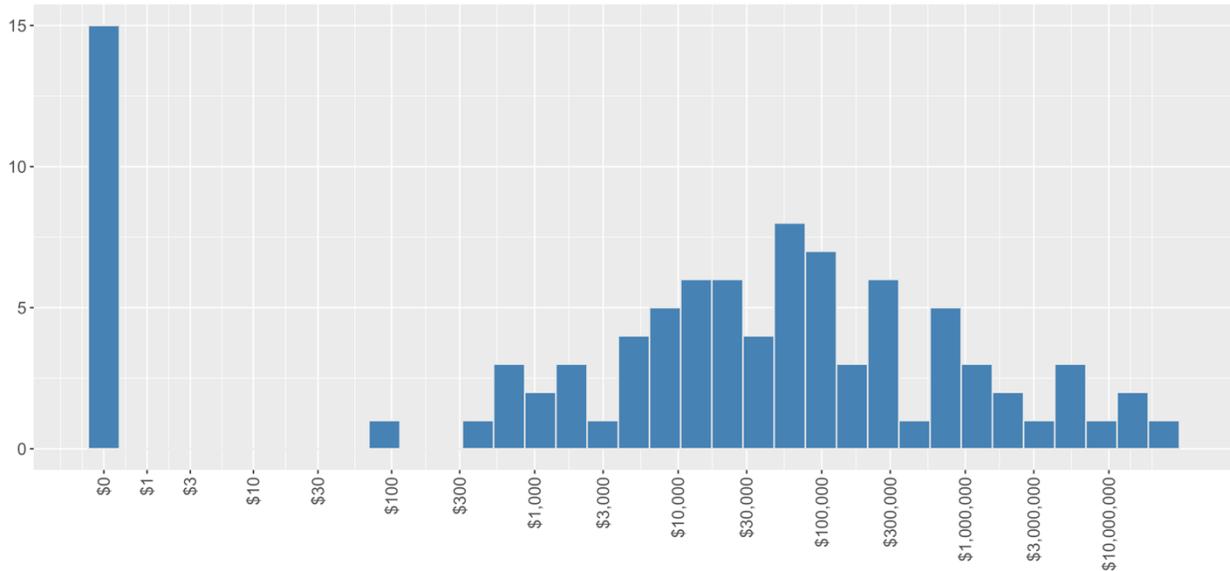
Analysis

The number of zero values reported by survey respondents is worth noting; more agencies claimed to have no hardware maintenance and support costs than claimed any other cost. Seven agencies did not answer this question.

QUESTION 60

What is the estimated software maintenance and support cost for all databases for FY 2015-FY 2019?

Question 60



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

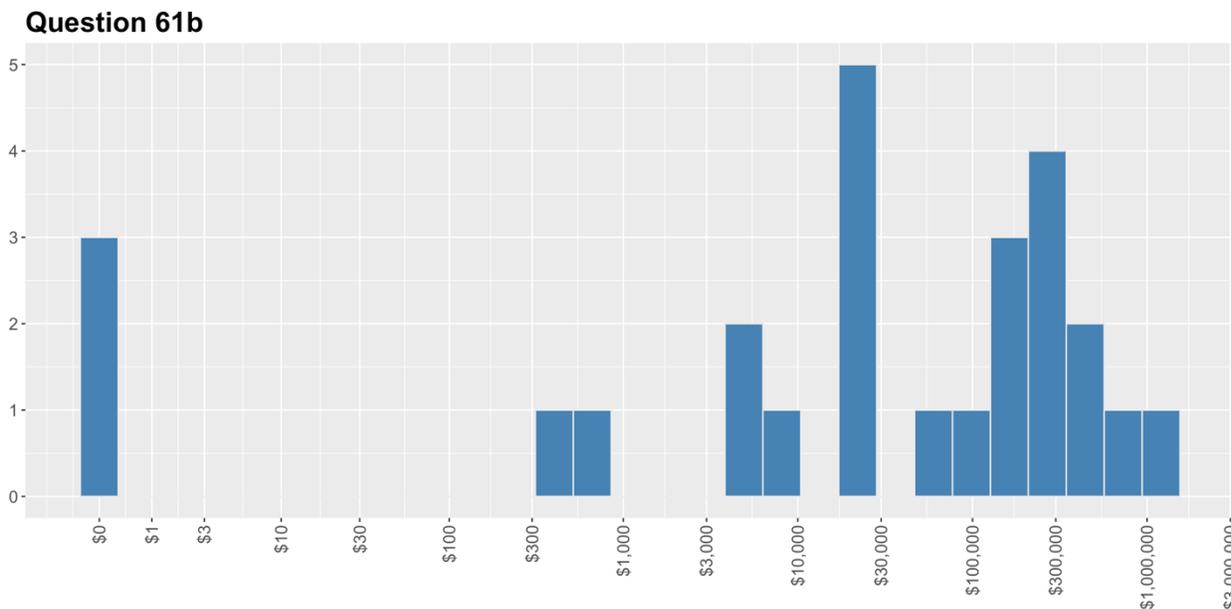
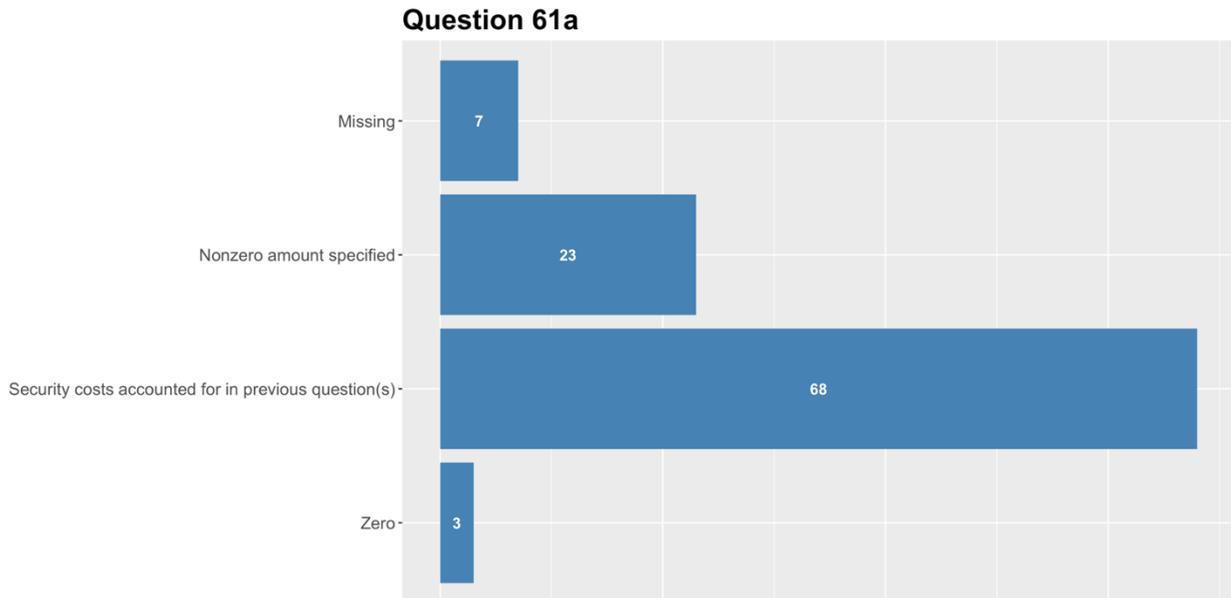
(m) costs of maintaining databases

Analysis

The number of zero values reported by survey respondents is worth noting; more agencies claimed to have no software maintenance and support costs than claimed any other cost. Seven agencies did not answer this question.

QUESTION 61

What is the estimated cost to provide security for all databases for FY 2015-FY 2019?



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

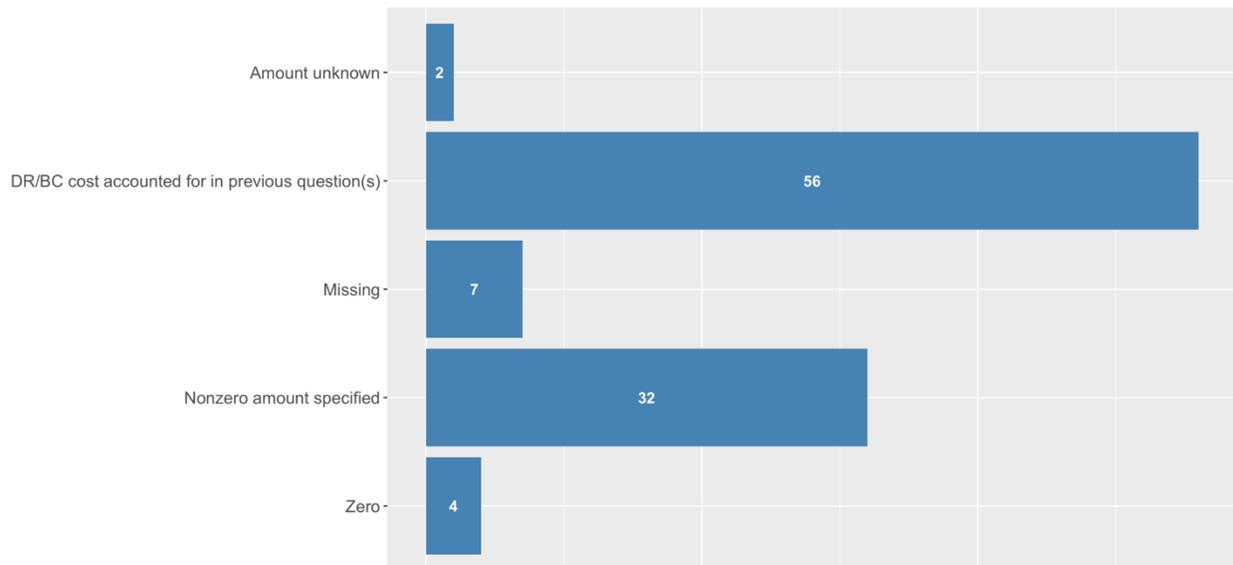
Analysis

The histogram presented in the second graph contains only those agencies that provided a numeric value for security costs. A majority of agencies did not separate out security costs. A future study could further examine the zero-cost responses. Seventy-five agencies either didn't answer this question or did not separate out security costs.

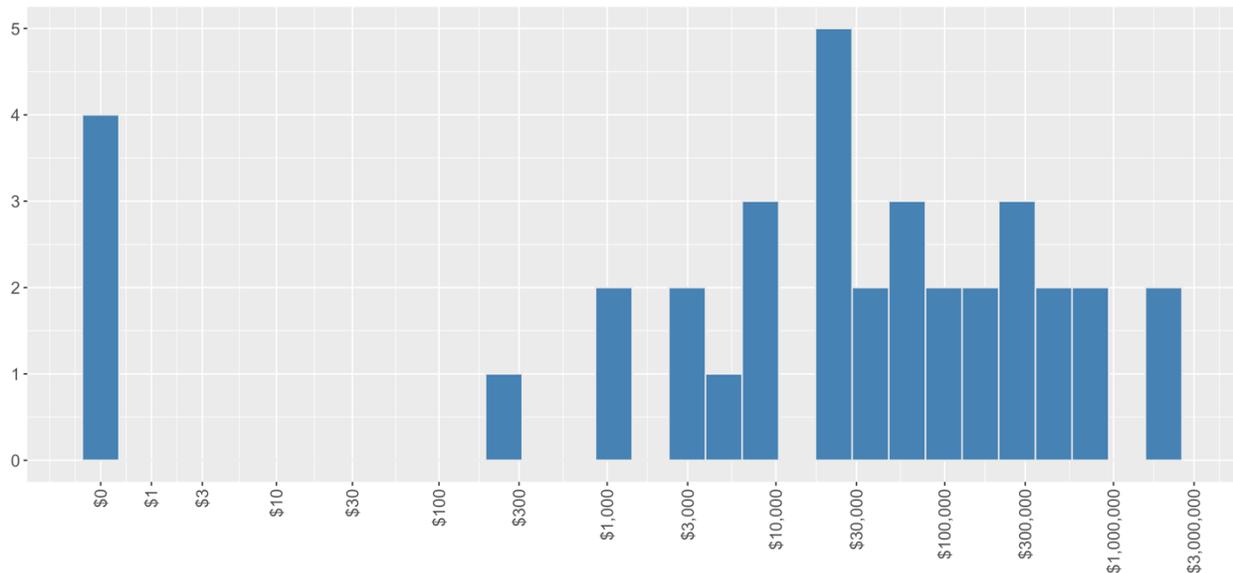
QUESTION 62

What is the estimated cost to provide disaster recovery/ business continuity for all databases for FY 2015-FY 2019?

Question 62a



Question 62b



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

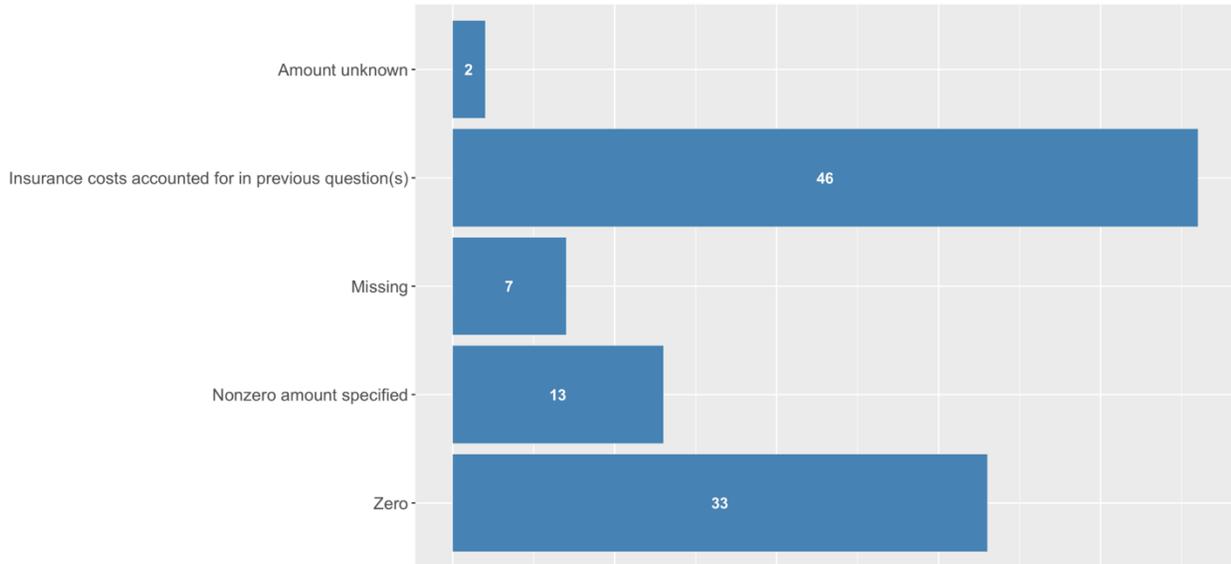
Analysis

The histogram presented in the second graph contains only those agencies that provided a numeric value for disaster recovery/business continuity costs. Some agencies claimed unknown costs; most agencies did not separate out these costs. Sixty-five agencies either didn't answer this question or did not separate out disaster recovery/business continuity costs. A future study could further examine the zero-cost responses.

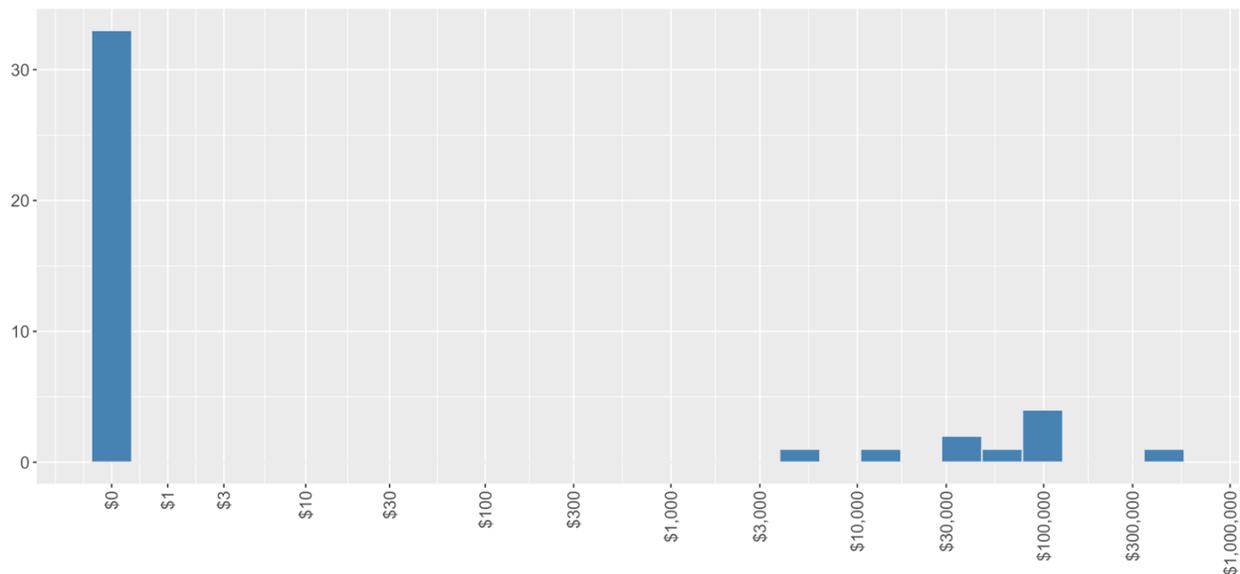
QUESTION 63

What is the estimated cost for liability insurance related to data loss or data breaches for all databases for FY 2015-FY 2019?

Question 63a



Question 63b



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

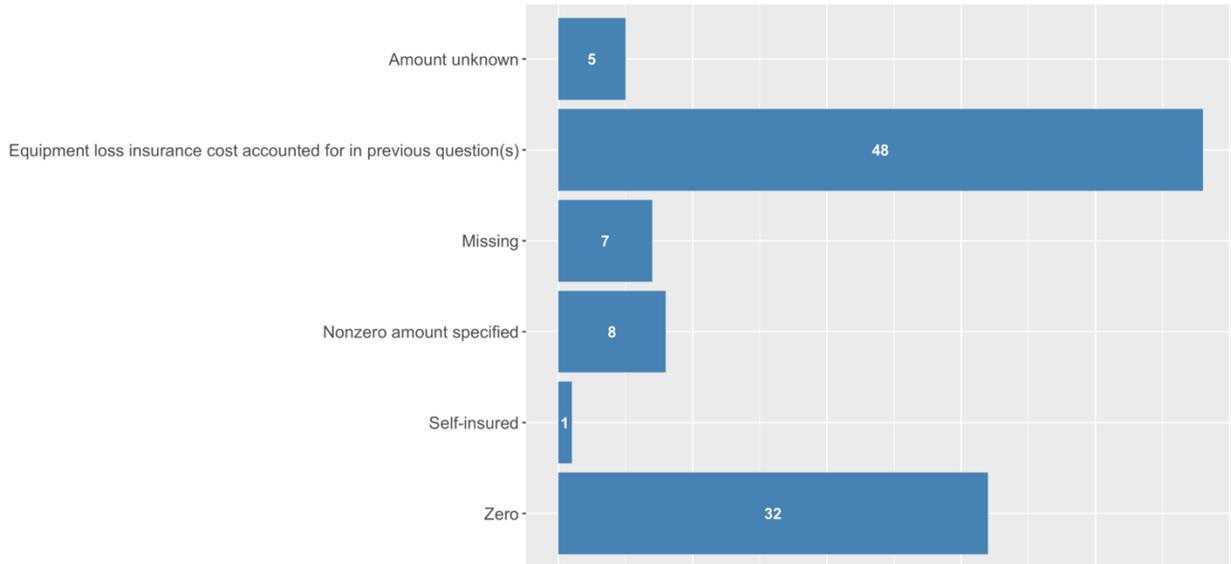
Analysis

The histogram presented in the second graph contains only those agencies that provided a numeric value for data liability insurance costs. Some agencies claimed unknown costs; many agencies did not separate out data liability insurance costs. Fifty-eight agencies either didn't answer this question or did not separate out data liability insurance costs. A future study could further examine the zero-cost responses.

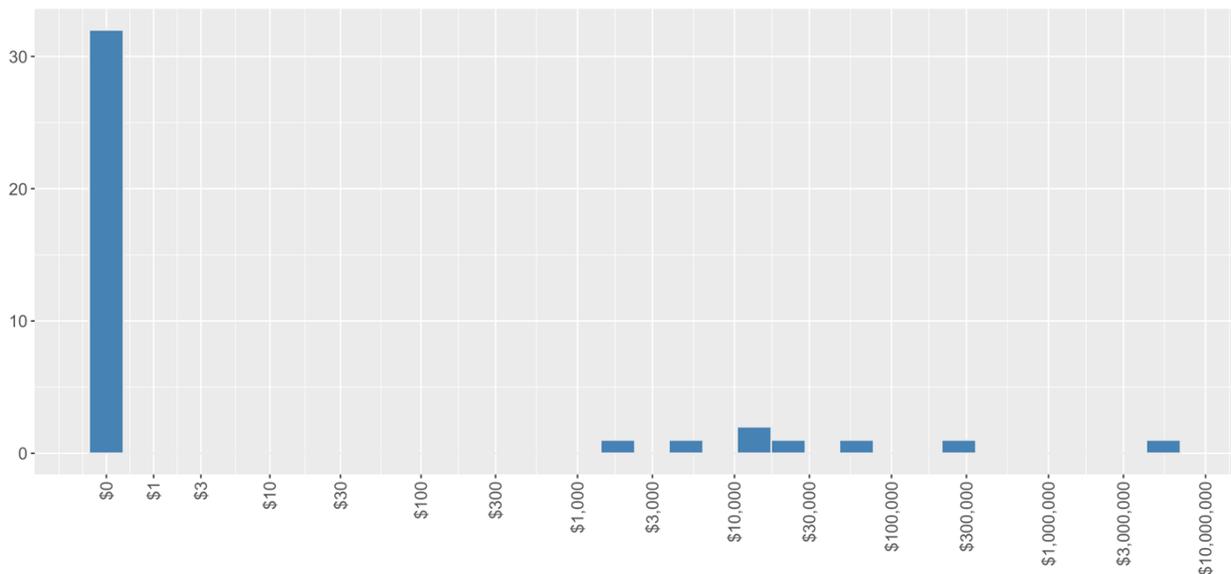
QUESTION 64

What is the estimated cost for liability insurance related to equipment loss in the event of a disaster for all databases for FY 2015-FY 2019?

Question 64a



Question 64b



Question linked to Chapter 315, Laws of 2017, Section 3 Sub-Section 1 Paragraph(s):

(m) costs of maintaining databases

Analysis

The histogram presented in the second graph contains only those agencies that provided a numeric value for equipment loss liability insurance costs. Some agencies claimed unknown costs; many agencies did not separate out equipment loss liability costs. Sixty-one agencies either didn't answer this question or did not separate out equipment loss liability insurance costs. A future study could further examine the zero-cost responses.

QUESTION 65

Please provide any additional comments concerning any financial cost associated with your agency's data.

Analysis

Twenty-five survey respondents provided additional comments concerning financial costs associated with their agency's data. Some of the comments reported costs that were not reported in response to the individual cost-related survey questions. Other respondents whose databases are hosted/maintained by the Department of Information Technology Services noted that since 2015 this is no longer a cost incurred by the agency because ITS no longer bills other state agencies for services. Some noted that they do not maintain liability insurance related to equipment loss because the loss is covered under a general liability insurance policy. Others noted that they do not maintain liability insurance related to equipment loss because the costs of this insurance can exceed the cost of replacing the equipment.

Appendix I: Managing Data as a Strategic Asset

What does it mean to manage data as a strategic asset and what benefits does it offer to state government?

According to the National Association of State Chief Information Officers (NASCIO)⁸,

“data that has intelligence or intellectual property applied to it becomes information and information is the fuel needed by the business of government to execute programs and make informed decisions. for data and information to be considered “strategic,” their generation and utilization must be in support of, and tied back to, specific business [in this case government] goals. ...Information that is not available, useful, and consumable cannot be used to make informed decisions. ... information must be reliable, based on data supported by standards, and validated by business rules. ...”

From these observations, NASCIO concludes that “managing data as a strategic business asset” means that “data must be managed to create reliable information that can be readily consumed by the business of government.”

Other proponents of the practice of managing data as a strategic asset note that it facilitates discoveries that go beyond the subject matter of an individual dataset, such as improved social policy and cost savings identified through the analysis of relationships between isolated datasets.

What are best practices for managing data as a strategic asset?

As discussed in this section, an important source of best practices for managing data as a strategic asset is the U.S. Office of Management and Budget’s (OMB) Open Data Policy for Managing Information as an Asset.

OMB’s Open Data Policy for Managing Information as an Asset

While OMB’s Open Data Policy was developed for the federal government, the best practices for data management contained therein are equally applicable to government at all levels.

The opening paragraph of OMB’s memorandum on open data policy declares:

“Information is a valuable national resource and a strategic asset to the Federal Government, its partners, and the public. In order to ensure that the Federal Government is taking full advantage of its information resources, executive departments and agencies (hereafter referred to as “agencies”) must manage information as an asset throughout its life cycle to promote openness and interoperability, and properly safeguard systems and information. Managing government information as an asset will increase operational efficiencies, reduce costs,

⁸ According to its website <https://www.nascio.org/AboutNASCIO> the National Association of State Chief Information Officers is “a non-profit 501(c)(3) association representing state chief information officers and information technology executives and managers from the states, territories, and the District of Columbia.”

improve services, support mission needs, safeguard personal information, and increase public access to valuable government information.”

As shown in the following exhibit, the federal government’s open data project adopted seven principles of open data. These principles align with the objectives of H.B. 649 (2017 Regular Session) by making government data accessible (subject to privacy, confidentiality, security, or other valid restrictions), usable, and descriptive of its quality.

Principles of Open Data

1. Public	
	<i>Consistent with OMB’s Open Government Directive, agencies must adopt a presumption in favor of openness to the extent permitted by law and subject to privacy, confidentiality, security, or other valid restrictions.</i>
2. Accessible	
	<i>Open data are made available in convenient, modifiable, and open formats that can be retrieved, downloaded, indexed, and searched. Formats should be <u>machine-readable</u> (i.e., <u>data</u> are reasonably structured to allow automated processing). Open data structures do not discriminate against any person or group of persons and should be made available to the widest range of users for the widest range of purposes, often by providing the data in multiple formats for consumption. To the extent permitted by law, these formats should be non-proprietary, publicly available, and no restrictions should be placed upon their use.</i>
3. Described	
	<i>Open data are described fully so that consumers of the data have sufficient information to understand their strengths, weaknesses, analytical limitations, security requirements, as well as how to process them. This involves the use of robust, granular metadata (i.e., fields or elements that describe data), thorough documentation of data elements, data dictionaries, and, if applicable, additional descriptions of the purpose of the collection, the population of interest, the characteristics of the sample, and the method of data collection.</i>
4. Reusable	
	<i>Open data are made available under an <u>open license</u> that places no restrictions on their use.</i>
5. Complete	
	<i>Open data are published in primary forms (i.e., as collected at the source), with the finest possible level of granularity that is practicable and permitted by law and other requirements. Derived or aggregate open data should also be published but must reference the primary data.</i>
6. Timely	
	<i>Open data are made available as quickly as necessary to preserve the value of the data. Frequency of release should account for key audiences and downstream needs.</i>
7. Managed Post-Release	
	<i>A point of contact must be designated to assist with data use and to respond to complaints about adherence to these open data requirements.</i>

SOURCE: Project Open Data, U.S. Office of Management and Budget.

What actions are recommended by NASCIO for moving the process of managing data as a strategic asset forward?

In considering options for Mississippi state government, it is helpful to consider recommendations made by the National Association of State Chief Information Officers (NASCIO). Recognizing the importance of promoting and advancing data management across the state government enterprise, including the need for more data sharing, NASCIO makes the following recommendations for advancing enterprise data management:

- *Assemble an early organizational structure, roles and responsibilities that will form the early governance and management of data management. Identify and recruit champions who will support a data management operating discipline with funding and authority.*
- *Develop a communications strategy for delivering a compelling message regarding data management and its value to government and citizens.*
- *Clearly articulate organizational strengths and weaknesses related to data management.*
- *Clearly describe the risks state government faces if “data management” is not properly managed.*
- *Describe the importance of data management in support of cybersecurity.*

