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Strategic Decision-Making Dashboard

June 2023

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Thesis Advisors: Dr. Nicholas Dew, Professor
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Department of Defense Management

Naval Postgraduate School

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ABSTRACT

Decision support is a vital process that equips decision-makers with the necessary insights to make informed choices, thereby enhancing mission readiness and optimizing resource allocation. To offer effective decision support, advisors and analysts must comprehend the decision-maker's priorities and employ decision support tools that deliver flexible and immediate visual representations of resources. In this study, I advocate for the implementation of data analytics tools specifically designed to aid management decisions through data analysis. My evaluation focuses on potential solutions for the future creation of a strategic decision-making dashboard. I assess data analytics tools for their capacity to furnish decision support capabilities that align with management decisions throughout the decision-making process. The research delves into the strengths and weaknesses of each data analytics tool examined. The ideal design should offer decision-makers data visualization techniques that empower them to make informed management decisions, ensuring resource efficiency and the advancement of organizational objectives. In conclusion, the research conducted supports the use of suitable data analytics tools and the future development of a strategic decision-making dashboard.

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LIST OF ACRONYMS AND ABBREVIATIONS

A2I	Airlift Integrated Interface
AHLTA	Armed Forces Health Longitudinal Technology Application
AI	Artificial Intelligence
AMHS	Automated Message Handling System
AMPS	Account Management and Provisioning System
A-PES	Automated Performance Evaluation System
ARC	Audit Response and Coordination
ARMS	Access Request Management Service
ATTLA	Air Transport Test Load Activity
BI	Business Intelligence
CAMPS	Consolidated Air Missions Planning System
CMOS	Cargo Management Operations System
CORIP	Commanding Officers Readiness Inspection Program
COTS	Commercial Off-The-Shelf
DAAS	Defense Automatic Addressing System
DAI	Defense Agencies Initiative
DCAS	Defense Cash Accountability System
DCBS	Distribution Component Billing System
DCOS	Defense Civilian Payroll System
DCPDS	Defense Civilian Personnel Data System
DCS	Defense Collaboration Services
DISA	Defense Information Systems Agency
DISS	Defense Information System for Security
DLA	Defense Logistics Agency
DLIFLC	Defense Language Institute Foreign Language Center
DOD	Department of Defense
DON	Department of the Navy

DRRS	Defense Readiness Reporting System
DSAID	Defense Sexual Assault Incident Database
DSS	Distribution Standard System
DTS	Defense Travel System
eDACM	Electronic DON Acquisition Career Management
EEBP	Enterprise External Business Portal
eMH	Enterprise Military Housing
ESAMS	Enterprise Safety Application Management System
ETA	Electronic Transportation Acquisition
FLTMPS	Fleet Training Management and Planning System
FMEA	Financial Management Evaluation and Assessment
GCSS	Global Combat Support System
GFM	Global Force Management
GIS	Geographic Information System
GOPAX	Group Operational Passenger System
GSA	General Services Administration
GSMA	Garrison Supply Management Application
GTN	Global Transportation Network
ICODES	Integrated Computerized Deployment System
IDE	Integrated Data Environment
ITPRAS	Information Technology Procurement Review and Approval System
JCM	Joint Container Management
JKO	Joint Knowledge Online
JSOU	Joint Special Operation University
JTIMS	Joint Training Information Management System
KM	Knowledge Management
LDG	Logistics Data Gateway
M&RA	Manpower and Reserve Affairs

MCEITS	Marine Corps Enterprise Information Technology System
MCFAD	Marine Corps Funding Authorization Document
MCFIAS	Marine Corps Financial Integrated Analysis System
MCTFS	Marine Corps Total Force System
MCTIMS	Marine Corps Training Information Management System
MICRR	Managers Internal Control Remediation and Reporting
MIS	Management Information System
MNP	My Navy Portal
MOL	Marine Online
MRRS	Medical Readiness Reporting System
ODSE	Operational Data Store Enterprise
OODA	Observe-Orient-Decide-Act
PBIS	Program Budget Information System
RF-ITV	Radio Frequency In-Transit Visibility
SAS	Statistical Analysis System
URL	Uniform Resource Locator
USMC	United States Marine Corps
USN	United States Navy

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I. INTRODUCTION

Over the last decade, sophisticated technology has evolved to provide tools that facilitate enhanced decision-making for simple and difficult problems. As we apply our experiences, decision support proves to be a critical element of the decision-making process. Decision support, typically provided by an analyst, is a trusted source of data analysis. In the ever-expanding arena of data analytics, both analysts and decision-makers benefit from the innovative solutions and processes offered by data analytics tools. Further, dashboards leverage data through data analytics and translate raw data into manageable information. When applied with knowledge and experience, data informs accelerated decision-making. Still, as useful as a dashboard can prove to be, it is incumbent that analysts and decision-makers interpret and use the data appropriately and consistently. Simply stated, the proper use of data helps make more informed decisions, which increases chances at successful actions. Nevertheless, the Commandant of the Marine Corps states,

> We do not currently collect the data we need systematically, we lack the processes and technology to make sense of the data we do collect, and we do not leverage the data we have to identify the decision space in manning, training, and equipping the force. (Berger, 2019, p. 14)

At most Department of Defense (DOD) organizations, presentation of data is heavily reliant upon Microsoft Office products such as PowerPoint, Excel, and SharePoint to produce presentations, graphs, and charts. These methods for using data to make decisions have repeatedly proven to be inefficient and time consuming while the use of data analytics tools may provide more timely, accurate, and relevant decision support. Predicated on using data in a way that provides data visualization methods to enable faster critical decision-making, the research presented in this report seeks viable data analytics tools for the development of a decision-making dashboard.

A. RESEARCH OBJECTIVE

This project intends to identify viable data analytics tools to aid in the future development of a dashboard that incorporates data analytics into everyday decision-

making. Future development of a viable decision support capability aligns planning and decision-making to strategy, capability development, and resourcing.

B.   RESEARCH APPROACH

This project identifies options that maximize the use of data to streamline decision-making and provides the reader with a recommended solution on the use of data relative to the decision-making process.

The core questions connected to this project are as follows:

- What data is used to guide decisions?

- What tools are used to inform decision-making?

- What category of tools are used to access the data (e.g., website, application, system)?

This project uses two methods of collecting and understanding data. The first method, via survey, is utilized to capture responses about organizational data requirements. The survey is designed to capture feedback that identifies the type of data that is used, how the data is accessed, and how the data flows from the accessed location to the user. The second method is based on market research for data analytics tools and an analysis of supportability and suitability. The market research focuses on available solutions provided by either DOD or commercial off the shelf (COTS).

The methodology used in this project entails the following steps:

- Conduct a literature review relevant to data analytics

- Interview subjects on current data requirements

- Conduct market research on data analytics tools that support user data requirements

- Synthesize results to develop a recommendation for data analytics tools to be used in a dashboard

C. CHAPTER SUMMARY

This project focuses on solutions that make better usage of organizational data that is applicable to the decision-making process. By examining existing methods used for compiling current data requirements, this project aims at identifying a solution that maximizes the use of data for streamlined decision-making. Through a literature review and market research, this project intends to identify viable data analytics tools that can aid in the development of a dashboard. Additionally, a survey presented to personnel about the use of data identifies user and organizational data requirements. Finally, I provide a recommendation of viable data analytics tools that inform decision-making.

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II.   LITERATURE REVIEW

The purpose of this chapter is to provide an understanding of data analytics and how it supports decision-making. The literature reviewed for this project focuses on articles that discuss data analytics and how it is used to gather information, make sense of the data, and communicate results to streamline decision-making. These reviews will aid in the understanding of data analytics and the suitability for aiding in streamlined decision-making.

A.   DECISION-MAKING

Reflection on countless decisions in both business and government has led to the assumption that most decision-making can be improved. According to the Industrial College of the Armed Forces (1997), critical decisions usually consist of considerable resources and can have long term consequences to an organization. Research suggests that decisions are frequently affected by the environment, which often has uncertainty (Industrial College of the Armed Forces, 1997).

1.   Making Better Decisions

Colonel John Boyd, a retired United States Air Force officer, developed a four-step process called the OODA (Observe-Orient-Decide-Act) loop, depicted in Figure 1 (Pearson, 2021). Colonel Boyd, a military strategist was likely influenced by the work of Sun Tzu, as this can be seen through the application of the OODA Loop. Widely used in military strategic and operational thinking, the OODA loop depicts a learning cycle of decision-making and enables decision-makers to adapt to change faster than the competitor. When used as a tool, Colonel Boyd's OODA loop helps sense and make sense of an ever-changing environment. Fundamental to sensing and making sense is to ensure that the decision-maker is oriented to the problem set as quickly as possible.

OODA LOOP
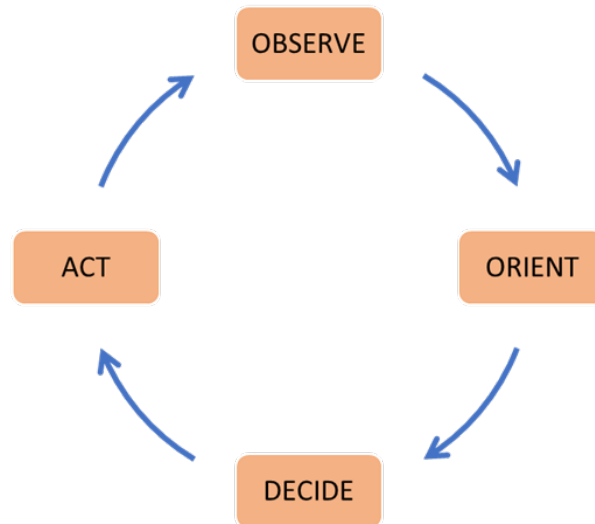
Figure 1.   John Boyd's OODA Loop. Adapted from Pearson (2021).

The observation phase focuses on external environments and allows one to maintain attention outwardly to receive information that can be used to orient onto the problem. In practice, while observing the environment the observer must choose the relevant information and ignore the noise or incomplete information.

The core concept of the OODA loop is orienting on the problem set before deciding. During the orientation phase the observer decides on the best course of action based on the information provided or decides to loop back to the observation phase to reassess the environment for additional information. Ultimately, the observer has enough information to make an informed decision.

Coming to a decision is the result of observing the environment while considering all the pertinent information to orient onto the problem. During this phase it is important to remain open to observational changes, so the preconceived biases do not interfere with decision-making. Once the observer feels a decision can be made based on the information, it is time to act.

Marking the final step is acting. Acting on a decision provides additional information and serves as a test to see if the correct decision was made. Because the OODA loop is a feedback loop each action taken is a new opportunity for the observer to receive additional information that will lead to refined decisions.

While addressing the 68th Current Strategy Fourm and referencing Colonel John Boyd's decision-making model, the OODA loop, Admiral Richardson stated that, "The U.S.'s advantage in observation is deteriorating" (Kalinyak, 2017). Admiral Richardson went on to say that "the advantage boils down to not who gets the information, but who can make the better sense of it" (Kalinyak, 2017).

2.   Providing Decision Support

A guiding principle is that decision support analysts are a trusted source of data. Ultimately, it is the decision-maker's trust of an analyst's observation of data that permits accelerated and informed decision-making. It is assumed that analysts already possess the skills, knowledge, and experience to provide decision support. Decision support includes an assessment or a basic understanding of the situation. Understanding the situation allows analysts to use data to predict probable outcomes. According to the Strategic Decisions Group, decision quality is about "how to frame strategic choices, generate alternatives, develop credible forecasts, quantify uncertainty, and judge the quality of a decision at the time it is made" (Strategic Decisions Group, 2023). If incomplete data is presented or the assessment is incorrect, then decision-making is likely to be flawed. Much like the decision-maker, it is important that a decision support analyst also follow a decision-making process such as Boyd's OODA loop. This process allows for an informed assessment to be completed as it allows the analyst to observe and orient to the situation.

While using Boyd's OODA loop process the context and tenets of analysis and decision-making can vary. However, some common principles or tenets that need to be considered include:

- Clearly defining the problem or decision to be made

- Gathering and analyzing relevant data and information

- Considering available options or alternatives

- Evaluating the potential outcomes and consequences of each option

- Identifying and evaluating potential risks and uncertainties

- Considering the ethical implications of each option

- Considering the preferences and values of stakeholders involved in the decision

- Making decisions based on a logical and systematic process

- Implementing and monitoring the decision to evaluate its effectiveness

- Being open to adjusting the decision based on new information or changing circumstances

Ultimately, the goal of analysis and decision-making is to choose the best option based on available information, while also considering potential risks and consequences, ethical considerations, and stakeholder preferences.

B. DATA STRATEGY

Business firms and government frequently use data analytics as a tool for decision-making: "Data analytics is a broad field in data science in which experts collect data from sources to be standardized, analyzed, and interpreted" (The Upwork Team, 2023). It is important to understand the key elements and methodology of using data. A systematic approach helps organizations make informed decisions and optimize their operations by leveraging the information obtained from their data. However, the sheer volume of data produced and gathered in today's environment has overwhelmed our capacity to comprehend and analyze it effectively. This makes data strategy imperative when using data to support strategic decision-making. Data, as a strategic asset, must be trustworthy, accurate, complete, timely, protected, and high quality.

The DOD Data Strategy framework governs how all organizations within the DOD will use data. In his vision statement, Deputy Secretary of Defense, David L. Norquist, states the "DOD is a data-centric organization that uses data at speed and scale for operational advantage and increased efficiency" (Department of Defense [DOD], 2020, p. 2). This vision statement, coupled with the goals of the DOD Data Strategy framework, provides all DOD users of data with a basic outline to follow while incorporating data into local modernization efforts. The DOD Data Strategy defines the framework goals shown in Figure 2 as:

- Visible – Consumers can locate the needed data.
- Accessible – Consumers can retrieve the data.
- Understandable – Consumers can find descriptions of data to recognize the content, context, and applicability.
- Linked – Consumers can exploit complementary data elements through innate relationships.
- Trustworthy – Consumers can be confident in all aspects of data for decision-making.
- Interoperable – Consumers and producers have a common representation and comprehension of data.
- Secure – Consumers know that data is protected from unauthorized use and manipulation. (DOD, 2020, p. 6)
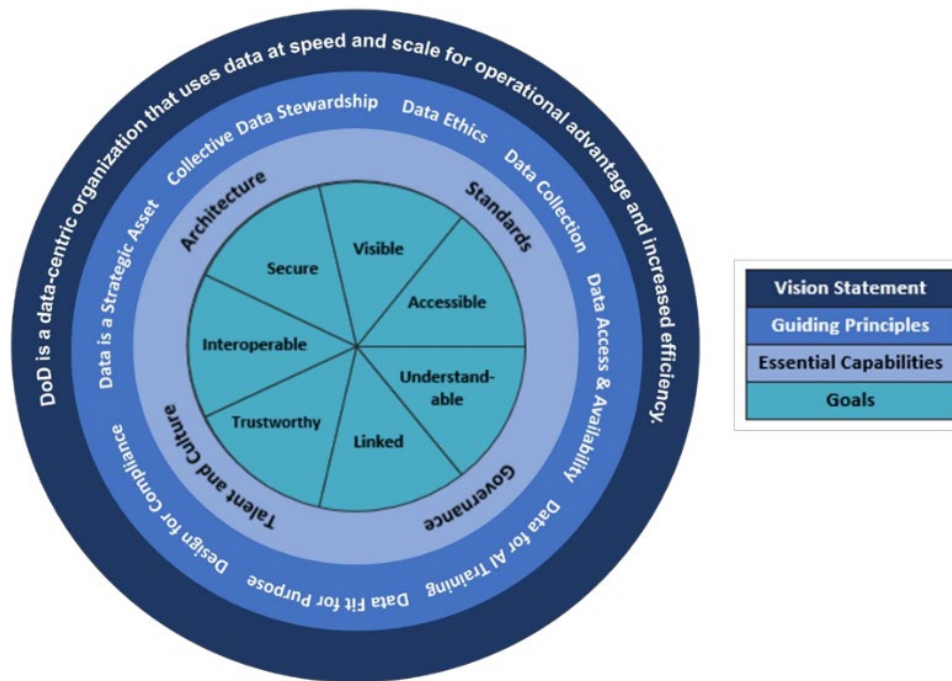
Figure 2.   DOD Data Strategy Framework. Source: DOD (2020, p. 1).

Data analytics is predicated on using sufficient data. To ensure that the data quality obtained is sufficient for use, a data management plan should be implemented. Philip Anton points out that "data management is necessary for doing data analytics" (Anton et al., 2019, p. xvi). When collecting data for analysis it will come as structured or unstructured. The data management plan ensures that a common set of business rules are followed so that data is collected, scrubbed, and made sufficient for use in data analysis. Managing data involves three main ideas: collect the data, analyze the data, identify the results.

a.   Data Collection

Taking into account that data can be generated internally or sourced from external locations, those who handle data may occasionally accumulate extraneous or unsuitable information. As stated by Li et al., "Lack of good data is the most common barrier to organizations seeking to employ predictive analytics" (2018, p. 39). The authors go on to say that because future data isn't available, past data must be used to predict the future.

Traditionally, data is stored in stovepiped information systems in a format that is not typically helpful for use in data analytics. However, the ongoing maturation in the field

of data analytics has increased data sharing amongst these stovepiped information systems allowing for data collection from numerous sources or tools. Data can be collected from various sources that provide necessary information for decision-making. The most common tools for data collection are applications, websites, and web applications or systems. A comparison review of data tool definitions shows that differences between tools can often be misinterpreted. Each tool type is defined as follows:

- Application: "a program (such as a word processor or a spreadsheet) that performs a particular task or set of tasks" (Merriam-Webster, n.d.a).

- Website: "a group of World Wide Web pages usually containing hyperlinks to each other and made available online by an individual, company, educational institution, government, or organization" (Merriam-Webster, n.d.b).

- System: "a group of devices or artificial objects or an organization forming a network especially for distributing something or serving a common purpose" (Merriam-Webster, n.d.c).

- Web application: "a computer program that utilizes web browsers and web technology to perform tasks over the Internet" (Stackpath, n.d.).

To provide a shared understanding amongst the survey respondents, Table 1 provides a definition for each data source category used by respondents for the research survey. Due to the abundance of DOD web applications that are named or use the word system, the survey uses the term "system" synonymously for web application.

Table 1.   Definition of Tool Types

Data Source (Tool Type)	Definition	Example
Application	Program or software that runs on an operating system. Can be networked or stand-alone.	Web Browser Calculator
Website	Online pages accessible through a web browser and provides read only information.	https://uscode.house.gov/
Web Application (System)	Any tool (application or website) that requires authentication for access to data.	Defense Travel System (DTS)

b.   *Data Analysis*

An equally important consideration is understanding the data that is selected for use: "Data analysis consists of all the processes required to clean and visualize data in order to draw conclusions from it" (The Upwork Team, 2023). Analysts that provide decision support using data need to be able to make assumptions about the application of the data that is collected and analyzed. These assumptions must take the data validity into consideration. Likewise, decision-makers should always understand what assumptions were used and what conditions cause the assumptions to no longer be valid (Davenport, 2018, pp. 84-85).

c.   *Data Visualization*

The process of presenting the analytical results is synonymous with telling a story. Results need to be clear, concise, and relevant to the problem or question that is being studied. According to *Smashing Magazine* writer Vitaly Friedman (2008):

> The main goal of data visualization is its ability to visualize data, communicating information clearly and effectively. It doesn't mean that data visualization needs to look boring to be functional or extremely sophisticated to look beautiful. To convey ideas effectively, both aesthetic form and functionality need to go hand in hand, providing insights into a

rather sparse and complex data set by communicating its key-aspects in a more intuitive way.

Data analysis requires a method to prepare and present information in a manner that organizes and communicates a story. Effective data visualizations are portrayed in many ways, including tables, charts, maps, graphs, and dashboards. These methods all provide information to the user and show the relationship in data.

C.   CHAPTER SUMMARY

The literature review explores how data analytics supports decision-making in organizations. The chapter reviews the OODA loop developed by Colonel John Boyd, which provides a learning cycle of decision-making to adapt to change faster than competitors. The chapter also discusses data strategy, including data collection, analysis, and visualization, and how these are important for successful data analytics. An example is provided, the DOD Data Strategy Framework, as a guide for organizations to manage data effectively. The literature review revealed the importance of data quality and data management input into data analytics tools to ensure accurate data analysis and informed decision-making.

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III. METHODOLOGY

For this project, data collection and analysis involved a dual-method approach to identify existing data needs and explore potential solutions for data analytics which is aimed at achieving the project's objectives. The first method used comprised of a survey from a sponsoring organization's Data Management Working Group (DMWG). This assessed respondents' current data requirements and use of data tools. The intent of the survey was to measure how many and what type of data systems are being utilized by the organization's personnel. The second method used was market research of available data tools and practical uses for the sponsoring organization's data requirements and the project's goal. The market research is further broken up into commercial non-DOD options that can be purchased as COTS or through contracted labor. Internal market research is comprised of DOD options that are provided through any of the DOD Agencies or Components and are generally available for use by personnel.

A.   SURVEY

The focus of this survey is to explore requirements for decision-making using data as it relates to the use of data tools and processes. The primary recipients of the data tool survey are all personnel who use programs to complete daily work with the organization. Due to the wide-ranging application of available data tool solutions, the survey questions were written to capture responses from a broad audience of individuals involved in any process. Distribution of this survey was coordinated through the organization's Knowledge Management (KM) team via email and conducted via SharePoint site for a 21-day period covering September 24, 2021, through October 15, 2021.

The survey comprised six questions relating to data and data tools used by respondents. Three questions consisted of drop-down options with the ability to specify a custom value, and the other three questions were formatted as open response. Three additional research questions were included to determine if there were any data correlations between the respondent's unit, employment, or branch of service. Respondents were given the ability to respond anonymously, and personal information was not obtained. Responses

were reviewed and cleaned prior to analysis to ensure consistency within responses. A review concluded that the survey did not have an indication of any respondent biases or research biases. The survey was directed and approved by a competent sponsoring authority to determine organization data requirements. The survey questions are included in Appendix A.

B.   MARKET RESEARCH

Market research was performed to gain awareness of the current availability and capabilities of commercial and government data analytics tools. This project examined published reviews, analyzed stated capabilities and solutions, and reviewed news articles relating to data tools. This research was conducted to identify available alternatives to the status quo and determine if the available alternatives merit consideration for use by the sponsoring organization. The organizations requirements aligned with the research objectives are discussed in Chapter I, Section A.

1.   Data Analysis Solutions

The identification of the need to share data to make data-driven decision-making has led to the creation of data management initiatives that, in the future, can provide the DOD with a repository of data analytics tools. Through appropriate level permissions, these DOD and COTS data analytics tools provide DOD data users with the opportunity to use available solutions in the analysis of their data. A review of available solutions will provide an understanding of the benefits, capabilities, and limitations of data analysis.

2.   Decision-Making Solutions

It is important that decision-makers and analysts have tools that allow them to follow a decision-making process. Research into available DOD and COTS solutions will provide the reader with a varied range of options to consider for data requirements. A review of available products provides an understanding of the benefits and capabilities of those solutions for decision-makers.

C.   CHAPTER SUMMARY

This chapter describes the two methods used to collect and analyze data for the project. The first method was a survey of personnel in the organization to discover their data requirements and usage of data tools. The survey was conducted via email and SharePoint for a three-week period. The second method was market research of available commercial (non-DOD) options and DOD options for data analytics tool solutions. The research aimed to identify alternatives to the status quo and determine if they are worth consideration for use in the organization's data analytics tool requirements. The market research also focused on data analysis and decision-making solutions and aimed to understand the benefits, capabilities, and limitations of data analytics tool options. The survey questions are included in Appendix A, and the results of the market research are discussed in Chapter IV, sections A and B.

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IV. SURVEY RESULTS

The survey in Appendix A was developed by the sponsoring organization's Knowledge Management branch and is used with permission by the organization's Chief Knowledge and Data Manager. The survey is cleared for public release via a security and legal review. Survey questions were presented to personnel via email invitation with a link to a SharePoint intranet site and all personnel at the organization were invited to voluntarily participate. Survey response data was reviewed and cleaned to ensure anonymity, consistency in responses, and applicability to this research. In total, this survey received 273 responses from 49 different respondents identifying 166 unique data tools. Survey results from the respondents are included in Appendix B. The following interpretations of the results are arranged in order of the questions.

A. SURVEY: DATA TOOL

This section analyzes survey respondent demographics and data tool use alignment to the organization's needs. I provide an analysis of the questions, which illustrates the survey respondents' demographics related to type of employment within the organization and illustrates the respondent data tool usage according to data tools currently required within the organization. Figure 3 depicts the data tool survey response results.
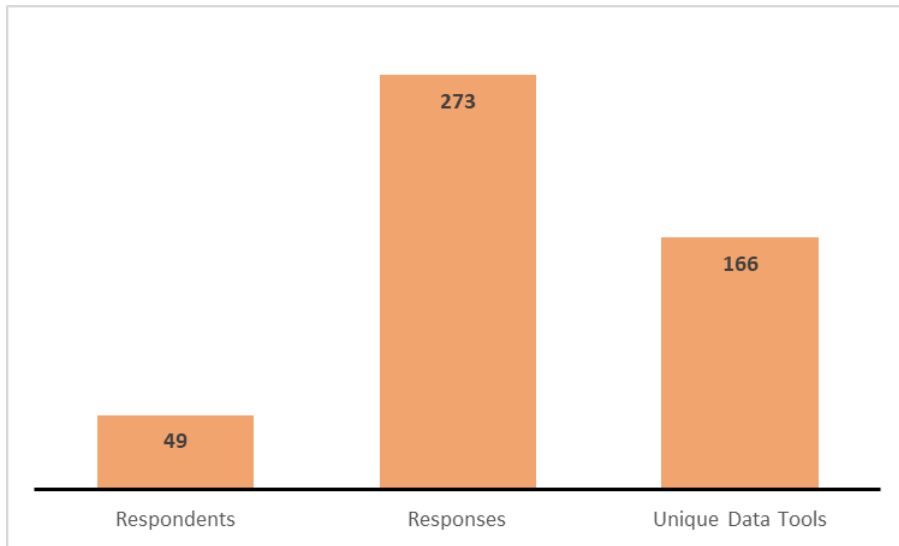
Figure 3.   Survey Response Results

1.   Demographic Questions

Question 1. What is your Unit/Section?

Survey results from 49 respondents consist of: 82% Component Staff Sections (40 respondents), and 18% Major Subordinate Elements (9 respondents). Responses indicate that data tools are being utilized across the entire organization. Figure 4 depicts the organizational distribution of survey respondents.
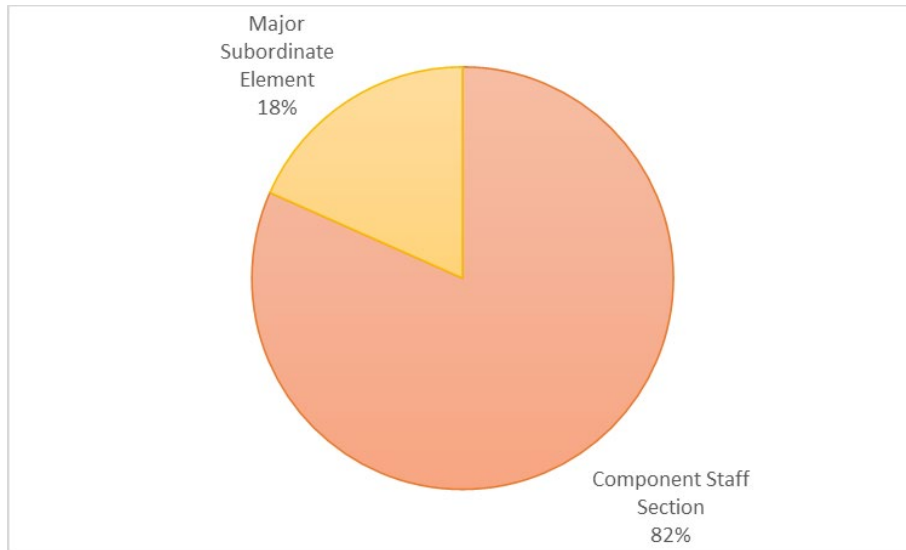
Figure 4.   Organizational Distribution of Survey Respondents

Question 2. What is your Employment Type?

Survey results from 49 respondents consist of: 37% Civilian (18 respondents), 33% Contractor (16 respondents), and 30% Military (15 respondents). The number of responses by employment type show an analogous representation within the organization. However, when compared to the 3,905 employees, the proportional representation of number of respondents by employment type comprised of 13.9% of the workforce: 8.7% Civilian, 4.8% Contractor, and 0.4% Military. Figure 5 depicts employment distribution of survey respondents and Figure 6 depicts the proportional representation of workforce survey respondents.
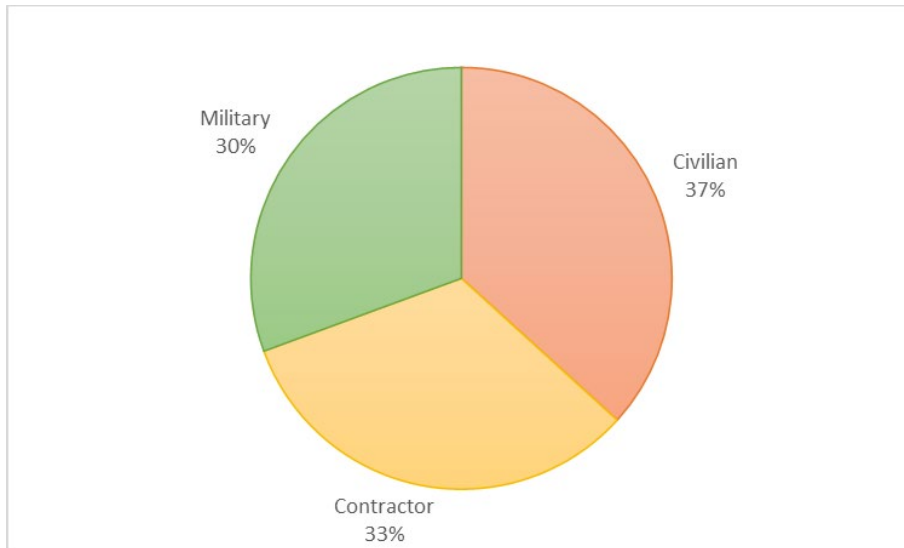
Figure 5.   Employment Distribution of Survey Respondents

Figure 6.   Proportional Representation of Workforce
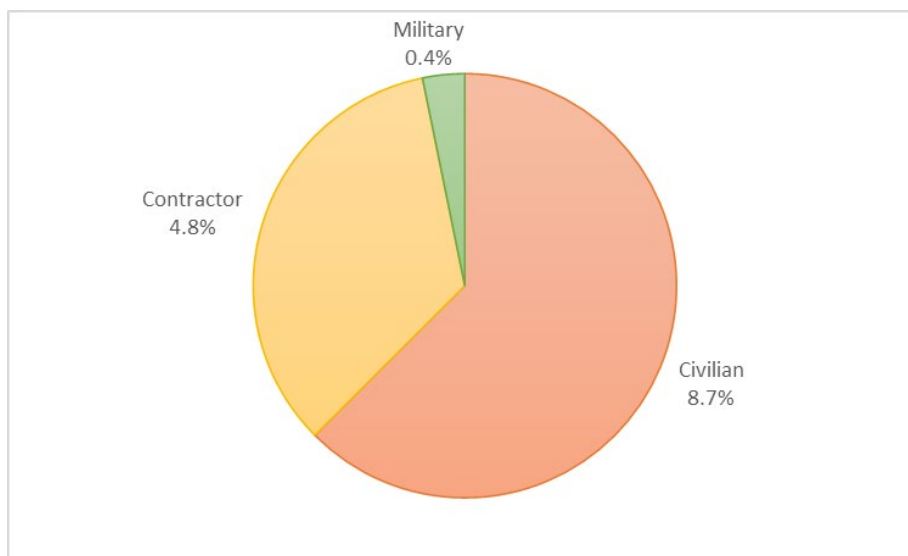
Question 3. What is your Branch of Service?

Survey results from 49 respondents consist of: 69% N/A (Civilian/Contractor) (34 respondents), 29% USMC (14 respondents), and 2% USN (1 respondent). This question was included to determine the distribution by branch of service within the organization. Figure 7 depicts branch of service distribution of survey respondents.
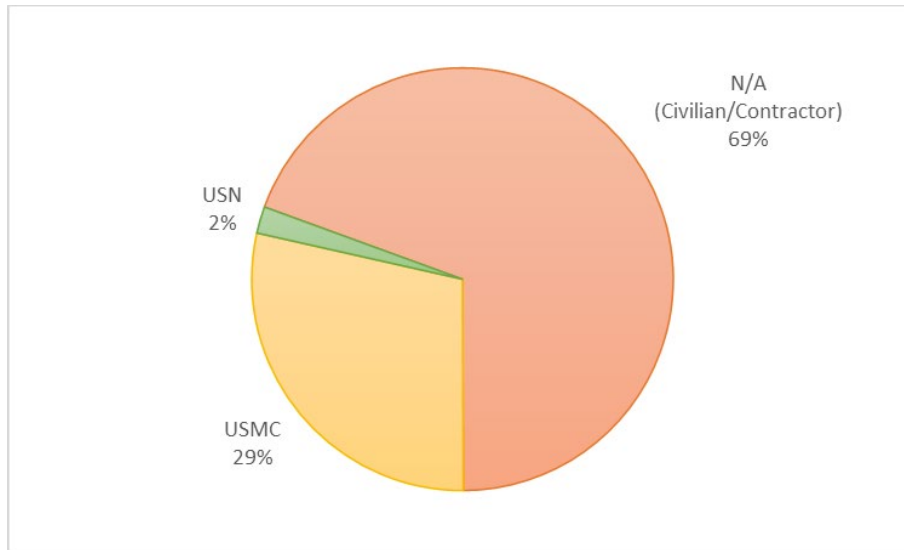
Figure 7.   Branch of Service Distribution of Survey Respondents

2.   Data Tool Questions

Question 1. What is the name of the tool?

Survey results from 273 responses identified 166 unique data tools. Figure 8, depicted below, is the top ten data tools reported by survey respondents. This question provides insight as to what data tools are being utilized within the organization. As reported by 27% (13) of respondents, Marine Online (MOL) is the most common data tool. This is consistent with 29% of the survey respondents coming from the USMC. Additionally, half of the top ten reported tools shown in Figure 8 support a procurement or resourcing function. For a complete list of reported data tools, see Appendix C.

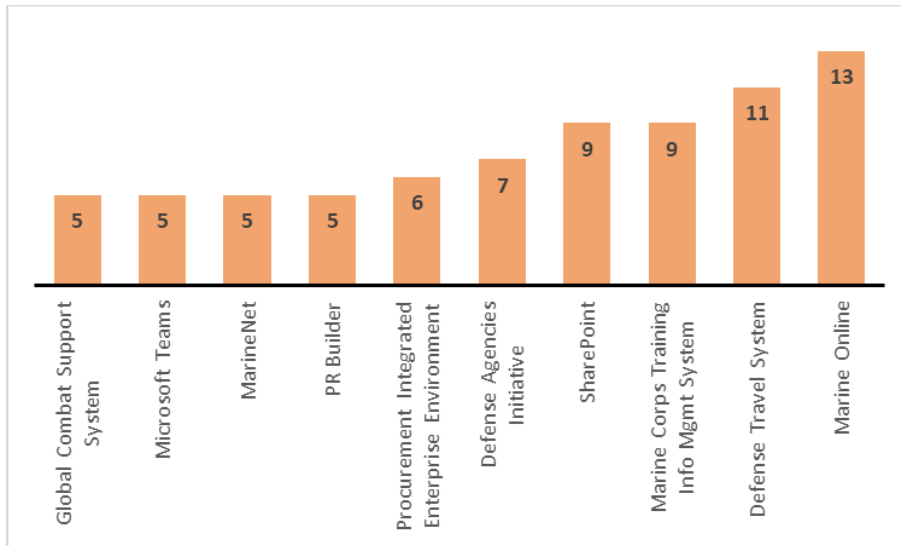Figure 8.   Top Ten Data Tools Reported by Survey Respondents

Question 2. For what do you use the tool?

Survey results from 273 responses categorized data tool usage in four areas that consisted of: 8% Research (22), 12% Operations (32), 38% Program Management (103), and 42% Administration (116). Figure 9 depicts survey respondent distribution by tool use.
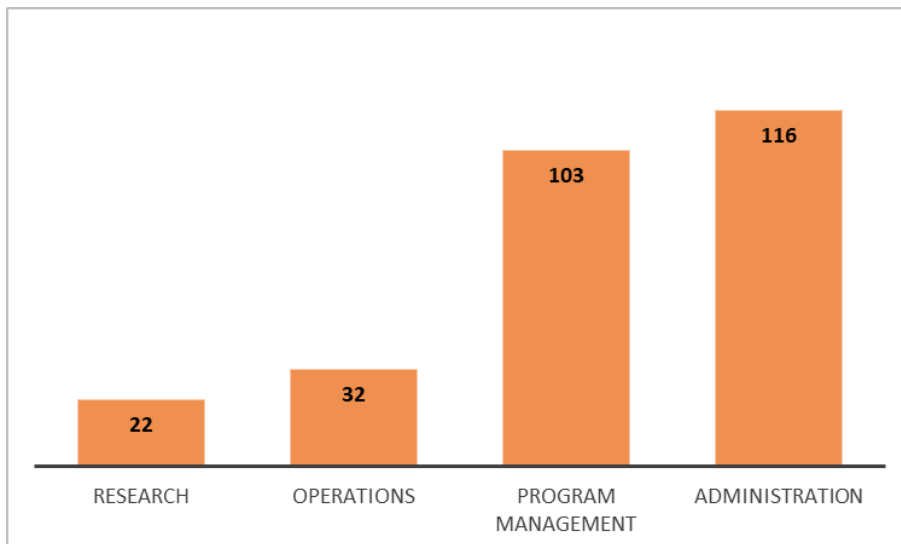
Figure 9.   Tool Use Distribution of Survey Respondents

Question 3. What type of tool is this?

Survey results from 273 responses categorized data tool type in three areas that consisted of: 26% Application (72), 34% System (92), and 40% Website (109). Figure 10 depicts survey respondent distribution by tool type.
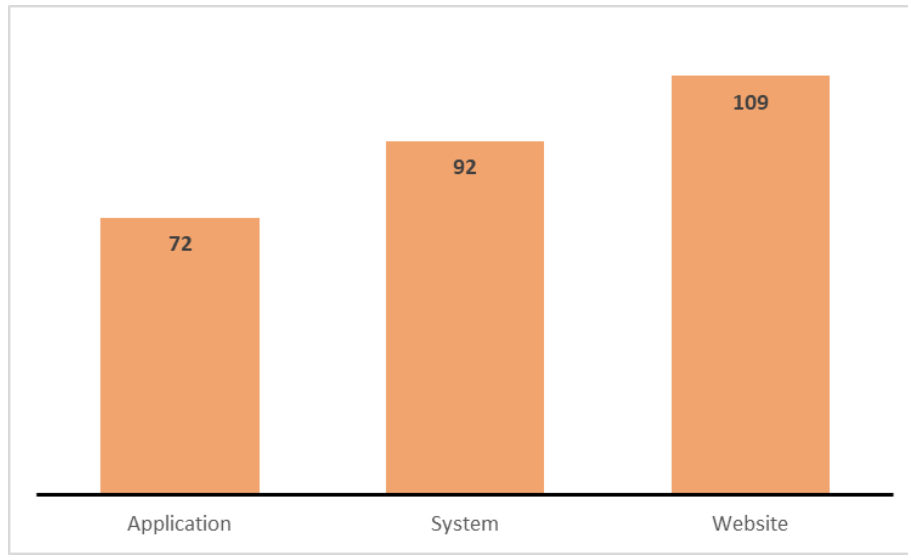
Figure 10.   Tool Type Distribution of Survey Respondents

Question 4. For this tool, do you push data to it, pull data from it, or both?

Survey results from 273 responses categorized data flow in one of three options that consisted of: 0% Push (0), 10% Pull (64), 90% Both (209). Figure 11 depicts survey respondent distribution by tool data flow.
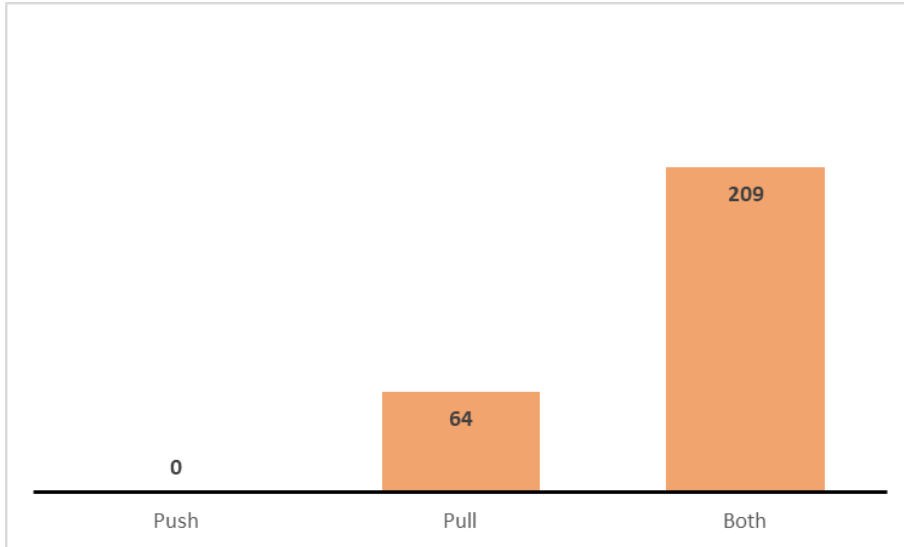
Figure 11.   Tool Data Flow Distribution Reported by Survey Respondents

Question 5. Who owns this tool?

Survey results from 273 responses reported ownership of the data tools as: consisting of: 36% Military Services (99), 35% Department of Defense (96), 23% Other (63), and 5% Combatant Command. Figure 12 depicts survey respondent distribution by tool ownership.

Figure 12.   Tool Ownership Distribution Reported by Survey Respondents

Question 6. Do you have additional comments for this tool?

Survey results from 49 respondents provided a web link (URL) for 73% (122) of the 166 unique data tools reported. Figure 13 depicts tools reported by survey respondents with a URL.
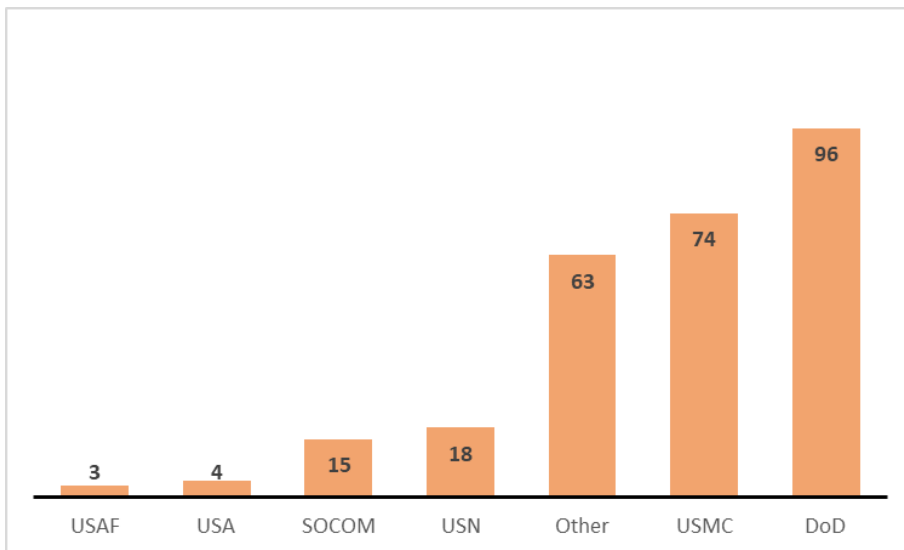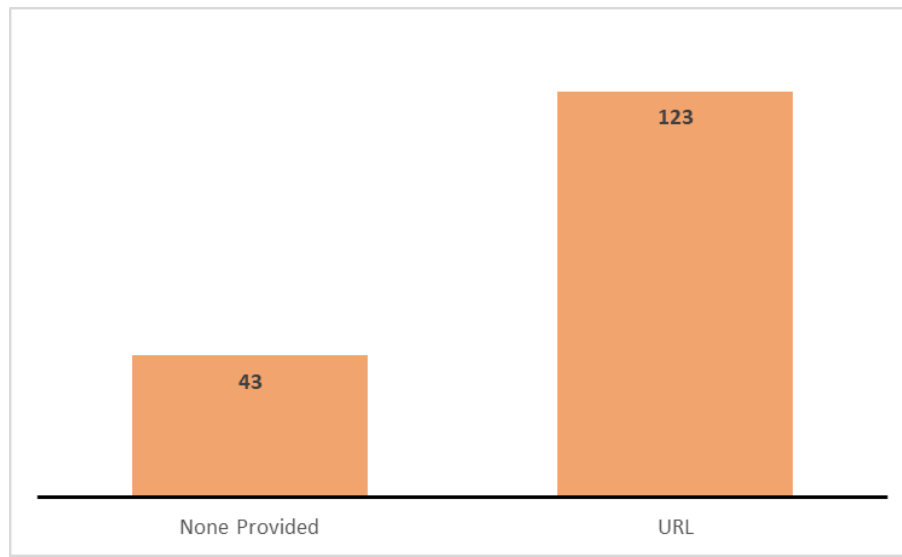

Figure 13.   Tools Reported with a URL

B.   CHAPTER SUMMARY

The survey results provide valuable insights into the usage of data tools within the organization and the demographics of the respondents. The data tool questions reveal that 166 unique data tools are being used, with Marine Online (MOL) being the most used tool. The distribution of tool usage by category shows that a significant portion of the tools are used for administration and program management, indicating a need for data analytics tools that can support these functions. The tool type distribution shows that website-based tools are the most used, followed by system-based and application-based tools. Most respondents (90%) use data tools for both pushing and pulling data.

The overall takeaway is that the survey results can inform the development of a data analytics dashboard that meets the needs of the organization. By understanding the types of data tools being used, their categories, and data flow, a dashboard can be designed

that incorporates the most used tools and provides functionality that supports administration and program management. The ownership distribution of data tools can also inform decisions regarding data sharing and collaboration. Furthermore, the results indicate a desire for collaboration and sharing, which can be supported by the development of a dashboard. Finally, the demographics of the respondents reveal that the usage of data tools is widespread across the organization, indicating a need for the development of a dashboard that is accessible to all.

V.   MARKET RESEARCH

As discussed in Chapter III, two categories of data tool solutions are explored. Research shows that widely available options exist which can be used to meet decision-making and data analysis requirements. Examination of the benefits, capabilities, and limitation tradeoffs between selected potential solutions aims at identifying an option that best meets the requirements. Each solution that is reviewed will have a varying degree of applicability when it comes to utilization based on the needs identified in Chapter IV. The purpose of this chapter is to identify solutions that support the decision-making and data analytic needs of the organization and can aid in the development of a dashboard.

Research conducted on seven popular data analytics platforms, found that organizations within the DOD already have access to one or more of the possible solutions. Specifically, Tableau, Qlik, and Microsoft Power BI are three solutions reviewed that are already available to users within the DOD. Further examination was conducted to determine how well the three available solutions meet the research objectives.

Popular data analytics solutions considered were:

1.   Tableau: "We make breakthrough products that change the way people use data" (Tableau, n.d.-b).

2.   Qlik: "Our vision is for a data-literate world. Where people, businesses, organizations, and governments tackle their most complex challenges with data. That's what excites us here at Qlik" (Capone, n.d.).

3.   Microsoft Power BI: "Do more with less using an end-to-end BI platform to create a single source of truth, uncover more powerful insights, and translate them into impact" (Microsoft, 2023a).

4.   SAS: A powerful data analytics platform that provides users with a range of data mining and machine learning tools to uncover insights and trends. SAS is widely used in industries such as healthcare, finance, and government, where data security and regulatory compliance are critical concerns (SAS, 2023).

5. IBM Cognos Analytics: A data analytics platform that provides users with a range of tools to explore and analyze data. IBM Cognos Analytics is known for its powerful analytics capabilities, integration with other IBM products, and collaboration features (IBM, n.d.).

6. Google Analytics: A web analytics platform that provides users with insights into website traffic and user behavior. Google Analytics is widely used by website owners and marketers to track website performance and make data-driven decisions (Google, n.d.).

7. Alteryx: A data analytics platform that provides users with a range of tools to prepare, blend, and analyze data from a variety of sources. Alteryx is designed to be user-friendly and enables users to automate data workflows to save time and increase efficiency (Alteryx, n.d.).

A. DATA ANALYSIS & ANALYTICS

The goal of analysis and decision-making is to choose the best option based on available information, while also considering potential risks and consequences, ethical considerations, and stakeholder preferences. Data analysts need access to data and as mentioned in Chapter II, data management allows analyst users to cleanse data and separate usable and unusable data. With authoring and collaboration tools, an analyst can analyze the data and create visualizations and dashboards that provide insights needed for decision-making.

1. Tableau

Tableau is a popular data visualization and analysis tool that enables users to analyze and present data in a visually appealing and understandable way. According to information on Tableau's website, the following data analysis capabilities are provided:

- Data visualization options, including charts, graphs, and maps, that enable users to present data in a visually compelling way.
- Data exploration tools, including filtering, sorting, and drill-down capabilities.

- Analytic and calculation tools, including forecasting, trend analysis, and statistical analysis.
- Collaboration tools that enable users to share data and insights. (Tableau, n.d.-c)
- "Data blending allows users to combine data sources by simply dragging them into a single view for fast visual analysis." (Morton, n.d.)

2.   Qlik

Qlik is a data analytics and visualization tool that helps use data in a visually compelling way. On their website, Qlik states that the following data analysis capabilities are provided:

- Associative analytics allows users to analyze data in a flexible and intuitive way.
- Data visualizations, including charts, graphs, and maps, that enable users to identify patterns and trends in data.
- Data exploration tools, including filtering, sorting, and drill-down capabilities.
- Collaboration tools that enable users to work together and share insights and knowledge. (Qlik, 2022, pp. 2–10)

3.   Microsoft Power BI

Microsoft Power BI is a "unified, scalable platform for self-service and enterprise business intelligence (BI). Connect to and visualize any data, and seamlessly infuse the visuals into the apps you use everyday" (Microsoft, 2023b). Power BI states that it provides the following data analysis capabilities:

- Data models that integrate and transform data from various sources enabling them to analyze and visualize it in a more efficient and effective way.
- Data analysis tools, including data exploration, filtering, and drill-down capabilities.
- Data visualization options, including charts, graphs, and maps, that allow users to present data in a visually appealing and understandable way.
- Natural language processing capabilities that allow users to ask questions in plain English and get answers in real-time. (Microsoft, 2023b)

B.   DECISION-MAKING

Recall from Chapter II that decision support includes an assessment or a basic understanding of the situation "to frame strategic choices, generate alternatives, develop credible forecasts, and quantify uncertainty" (Strategic Decisions Group, 2023). Analysts use data to predict probable outcomes and if incomplete data is presented the assessment may be incorrect leading to flawed decision-making. The following three commercial solutions were explored for feasibility in meeting the data requirements for decision-making.

1.   Tableau

Tableau is a data visualization and business intelligence tool that allows users to create interactive dashboards and reports from a variety of data sources. Tableau has a user-friendly interface to "help people see and understand data" (Tableau, n.d.-a) and supports a wide range of data sources. The capabilities provided by platform solutions are data driven that shape and clean data to provide insights and analytics. Tableau can support decision-making through the following capabilities:

- Create interactive and visually appealing dashboards and reports from a variety of data sources. The visual representations can help users identify trends and patterns in their data, which can inform decision-making.
- Connect to real-time data sources that decision-makers can access for the most up-to-date information.
- Collaborate and share dashboards and reports with others, which can support decision-making by bringing together multiple perspectives and expertise.
- Predictive analytics features that can help users forecast future trends and make data-driven decisions. (Tableau, n.d.-c)

2.   Qlik

Qlik is a business intelligence and data analytics platform that can support decision-making by providing users with data insights and analytics. As a government solution, the DOD uses Qlik services under the name Advana. The Advana service is available to members in the DOD through a request and approval process. Advana is a more prescriptive environment that provides already developed solutions that are not

customizable. The platform description provided is "Advana is the Department of Defense (DOD) multi-domain technology platform that provides military and business decision-makers, analysts, and users at all levels with unprecedented access to authoritative enterprise data and structured analytics—in a scalable, reliable, and secure environment" (Advana, 2022). As a COTS solution, Qlik supports decision-making through the following capabilities:

- Data visualization tools that allow users to create dashboards and reports that provide a clear and visual representation of data helping to inform data-driven decisions.
- Interactive analytics tools that allow users to explore data in real-time, which can support decision-making.
- Collaboration tools that allow users to share data and insights enabling more informed decisions.
- AI and machine learning capabilities that reduce human error and enhance the speed and accuracy of decision-making. (Qlik, n.d.)

3. Microsoft Power BI

Microsoft Power BI is a business intelligence tool that can support decision-making by providing users with data insights and analytics. Power BI is integrated with other Microsoft products such as Excel and SharePoint, making it a popular choice for organizations that use these tools. Power BI states that it supports decision-making through the following:

- Data visualization tools that help decision-makers to quickly identify patterns and trends in data and make data-driven decisions.
- Interactive analytics tools that allow users to explore data in real-time.
- Collaboration tools that allow users to share data and insights that supports decision-making.
- Natural language processing capabilities to support decision-making by enabling users to quickly get answers without the need for advanced technical skills. (Microsoft, 2023b)

C. DASHBOARD EXAMPLES

Data analytics tools previously discussed provide data visualization methods that can enable faster critical decision-making. The below examples of decision-making dashboards illustrate the capabilities that enables decision-making.

1. Tableau

The U.S. Air Force created a dashboard using Tableau that assesses infrastructure health. As illustrated in Figure 14, the dashboard informs strategic decision-making through various criteria such as time and allocated resources.

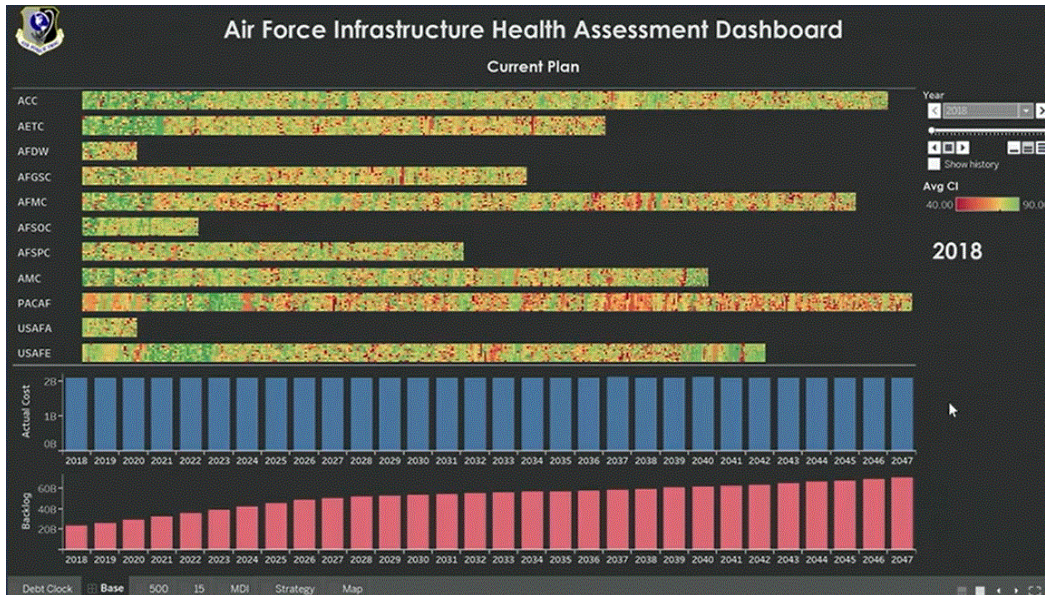Figure 14.   Air Force Infrastructure Health Assessment. Source:
Tableau (2018).

2. Qlik

The Texas Comptroller created a dashboard using Qlik. Depicted in Figure 15, users can track revenue, expenditures, payments, and economic development.
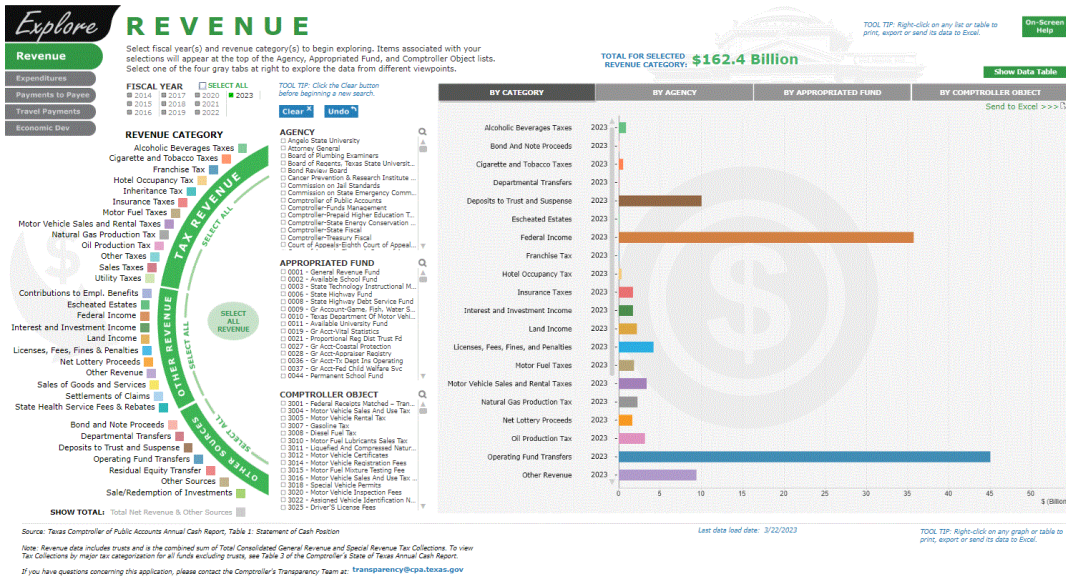
Figure 15. Texas Comptroller Revenue. Source: State of Texas (2023).

3. Microsoft Power BI

Power BI integrates seamlessly with other Microsoft products as shown in Figure 16.
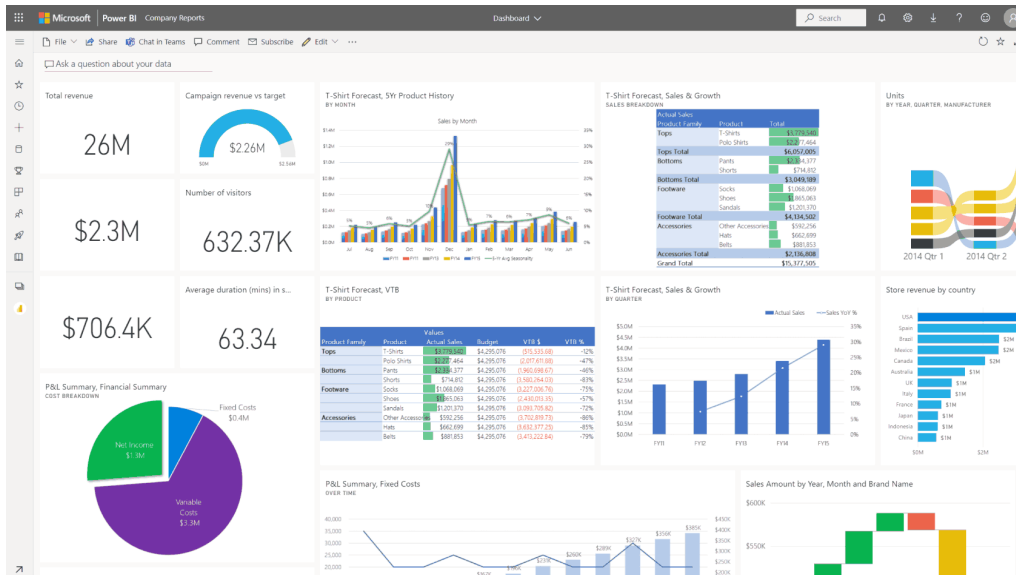

Figure 16. Power BI Interoperability with Other Microsoft Products. Source: Microsoft (2023).

D. CHAPTER SUMMARY

This chapter discusses the results of market research on various data analytics tools to identify which options best meet the organization's decision-making and data analytic needs. The research reviewed seven popular data analytics platforms, which included Tableau, Qlik, and Microsoft Power BI. The latter three options are already available to some users within the DOD. Analysis of the benefits, capabilities, and limitations of each platform and how well they meet the research objectives is conducted.

Research points out the data analysis capabilities of each platform, including data blending, data visualization options, data exploration tools, analytic and calculation tools, and collaboration tools. The research also reveals how each platform supports decision-making, including the ability to create interactive dashboards and reports. Collaboration tools are also available to share data and insights among decision-makers. The market research shows that Tableau, Qlik, and Microsoft Power BI are all feasible solutions for meeting the organization's decision-making and data analytic needs. Ultimately, the choice of platform largely depends on the specific needs of the user and the availability of the platform.

VI. CONCLUSIONS AND RECOMMENDATIONS

The use of data analytics tools in decision-making processes can provide significant advantages for organizations. This project aimed to identify viable data analytics tool solutions that maximize the use of data for streamlined decision-making. Through a literature review and market research, this project identified several viable data analytics platforms, including Tableau, Qlik, and Microsoft Power BI.

The survey of personnel in the organization provided valuable insights into the types of data tools being used, their categories, and data flow. This information can inform the development of a data analytics dashboard that meets the needs of the organization, incorporates the most used tools, and provides functionality that supports administration and program management.

The market research analyzed the benefits, capabilities, and limitations of each platform and how well they meet the research objectives. The research highlighted the data analysis capabilities of each platform, including data blending, data visualization options, data exploration tools, analytic and calculation tools, and collaboration tools. The research also revealed how each platform supports decision-making, including the ability to create interactive dashboards and reports.

In today's competitive environment, the organization must leverage every advantage to stay ahead, and one of the most powerful tools at their disposal is data analytics. Data analytics has the power to transform raw data into actionable insights, enabling organizations to make well-informed, evidence-based decisions that drive growth, increase efficiency, and minimize risks.

A centralized decision-making dashboard can be a game-changer by addressing challenges such as stove-piped data and promoting collaboration. In the event of unforeseen circumstances, such as a natural disaster or a cyberattack, stove-piped data can jeopardize an organization's ability to maintain business continuity. By consolidating data into a single, easily accessible location, the organization can ensure that critical information

is organized and secure, reducing the risk of data loss and allowing for a quick recovery and continuity of operations.

Moreover, a decision-making dashboard fosters collaboration by bringing together multiple perspectives and expertise. By providing a unified platform for sharing data and insights, decision-makers can engage in real-time discussions, gain valuable feedback, and arrive at well-rounded decisions that consider diverse viewpoints. This collaborative approach is crucial in driving innovation.

Efficiency is also significantly improved through the use of a strategic decision-making dashboard. The organization can streamline decision-making processes by reducing the time spent searching for relevant information, compiling data from disparate sources, and manually creating visualizations. This improved efficiency translates into faster, more effective decision-making and a more agile organization that can rapidly respond to evolving conditions and environments.

Data analytics can also help the organization identify inefficiencies, redundancies, and cost-saving opportunities. By understanding the relationships between choices, decision-makers can optimize resource allocation, reduce waste, and ultimately increase profitability. This competitive edge can make the difference between thriving and merely surviving in today's dynamic environment.

In conclusion, adopting the development of a strategic decision-making dashboard is an essential investment for the sponsoring organization to remain competitive, agile, and innovative. By centralizing data, enhancing collaboration, and ensuring business continuity, the organization can unlock the full potential of data and drive meaningful, data-driven decisions that lead to more informed decision-making.

APPENDIX A. SURVEY

Request all personnel who utilize tools to complete daily work within your department complete the data tool survey. Personnel, regardless of unit, employment, or branch, are critical to providing insight on websites, applications, and systems that are being leveraged within the organization. The survey objective is to gain insight on tools that are being utilize outside of current understanding or control. The survey is voluntary; however, maximum participation of personnel is desired.

A.   INSTRUCTIONS

Follow the provided survey link and utilize the "add another tool" button within the survey to address each program that you or your department employs. The link provided to the Department of Defense Data Strategy 2020 will aid in understanding enterprise goals. The glossary link below serves as a reference to address any questions you may have during the survey and to identify examples of tools typically used. The survey is open for 21 days. The first day to take the survey is Friday, September 24, 2021. The last day to take the survey is Friday, October 15, 2021.

1.   Websites

Websites are accessed via web browsers and are utilized to retrieve various types of information. Websites are categorized by domain. Some examples include government agency websites (.gov), educational institutions' websites (.edu), nonprofit organizations' websites (.org), and commercial websites (.com).

2.   Applications

Applications can be self-contained or a group of programs. The program is a set of operations that runs the application for the user. Examples of applications include word processors, database programs, web browsers, development tools, image editors and communication platforms.

3.   Systems (Web Applications)

Systems are organized collections that integrate inputs and outputs to accomplish an overall goal. Web applications are applications that require access to the internet. This survey categorizes systems and web applications as the same tool type. For this survey if you must authenticate or login to the application or website via the internet to gain access to data it should be considered a system. Examples of systems include the Global Combat

Support System (GCSS), Programming Budget Information System (PBIS), and Management Information System (MIS).

B.   SURVEY

Figure 17.   Data Tool Survey

APPENDIX B. SURVEY RESULTS

a) Identify your "Unit / Section."

b) Identify your "Employment Type."
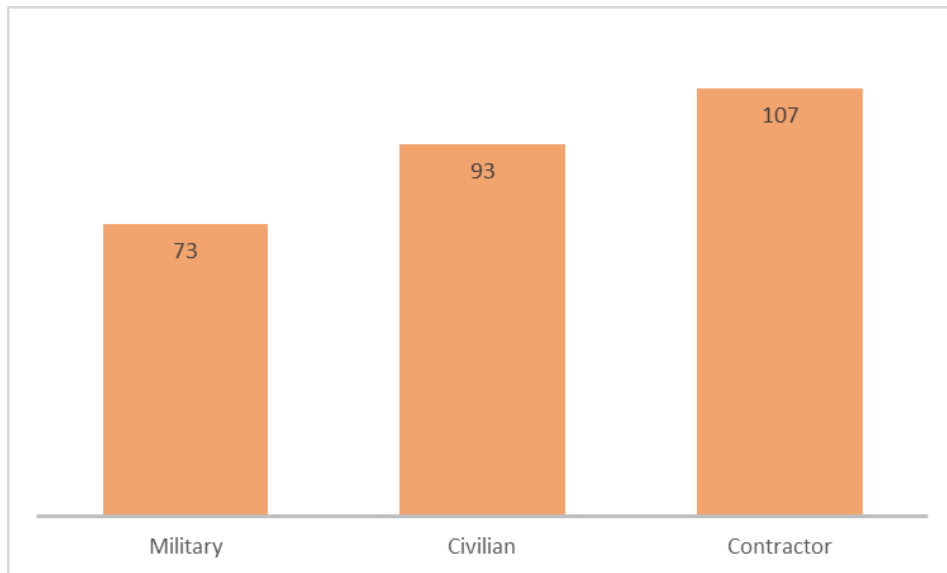
c) Identify your "Branch of Service."
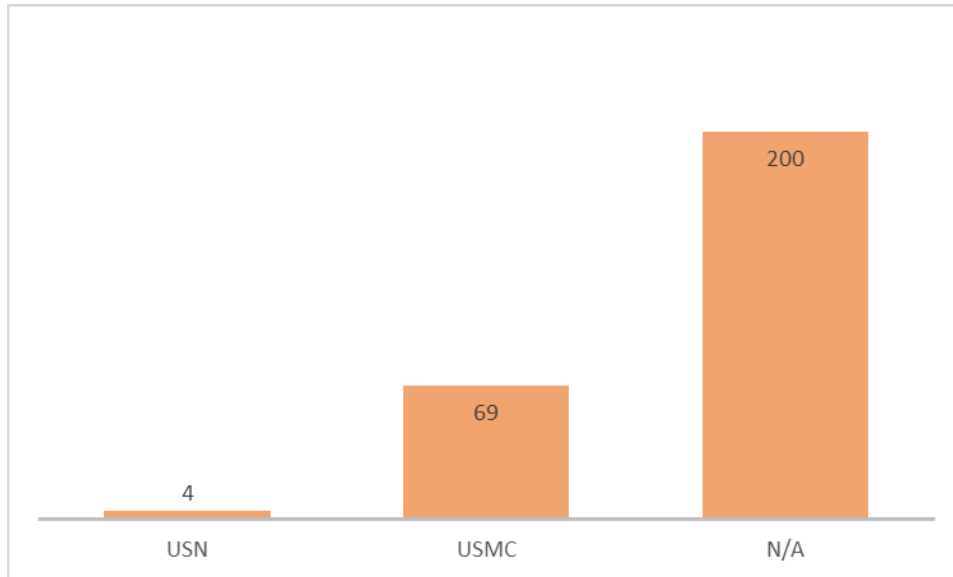
1) What is the name of the tool?
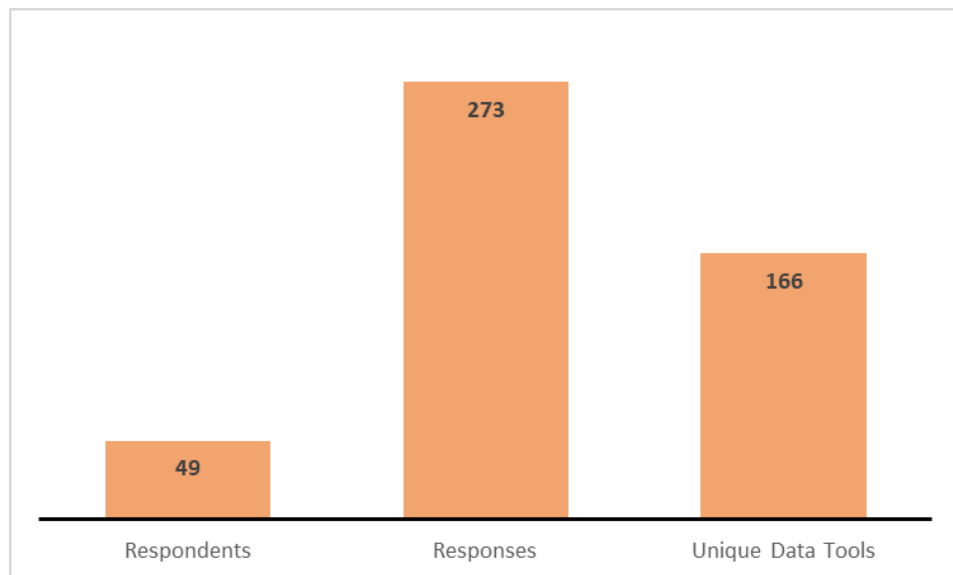
2) For what do you use the tool?

3) What type of tool is this?

4) For this tool, do you push data to it, pull data from it, or both?

5) Who owns this tool?
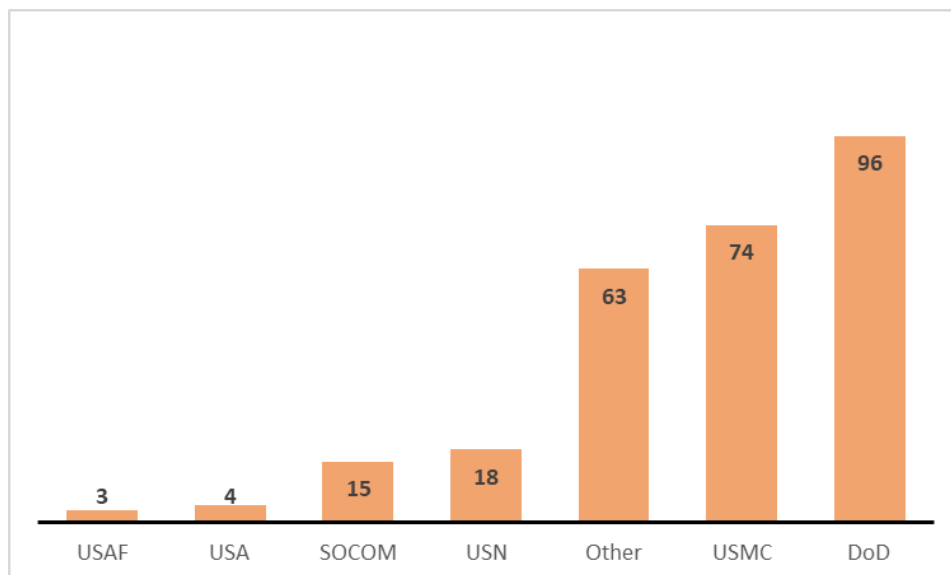
6) Additional comments for this tool. For example, a URL for the tool, where do you work in your unit/section (S-1, G-63, etc.).
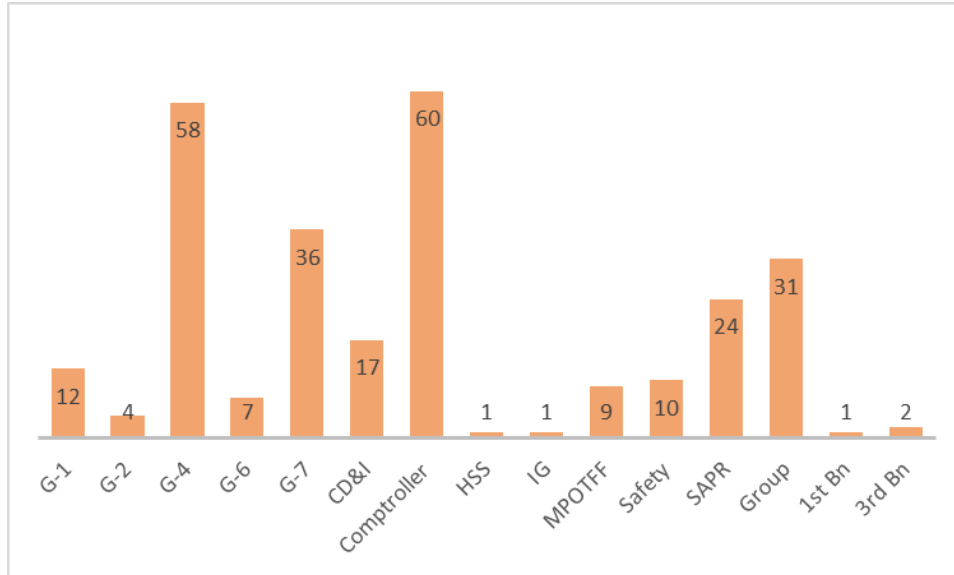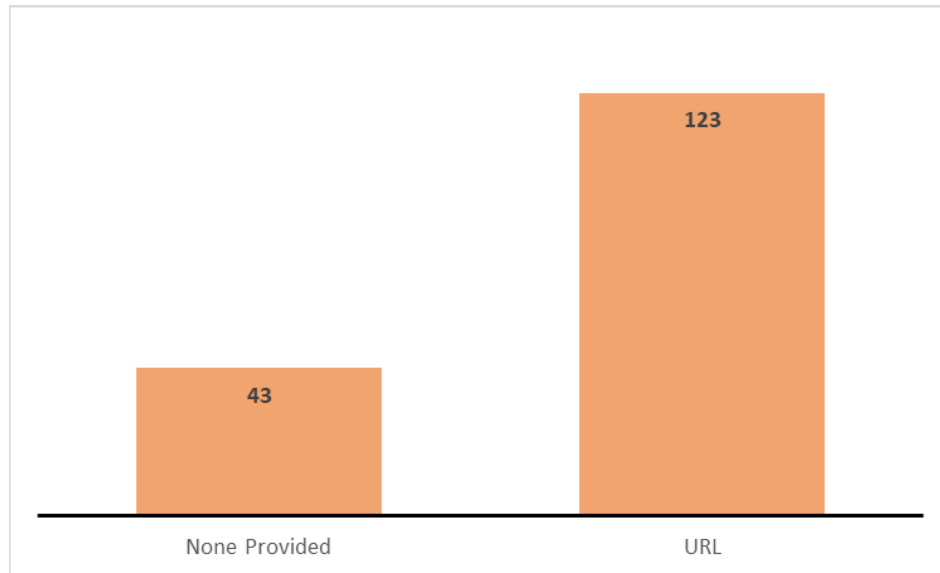
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APPENDIX C. DATA TOOLS LIST

Table 2.   List of Respondent Data Tools and URLs

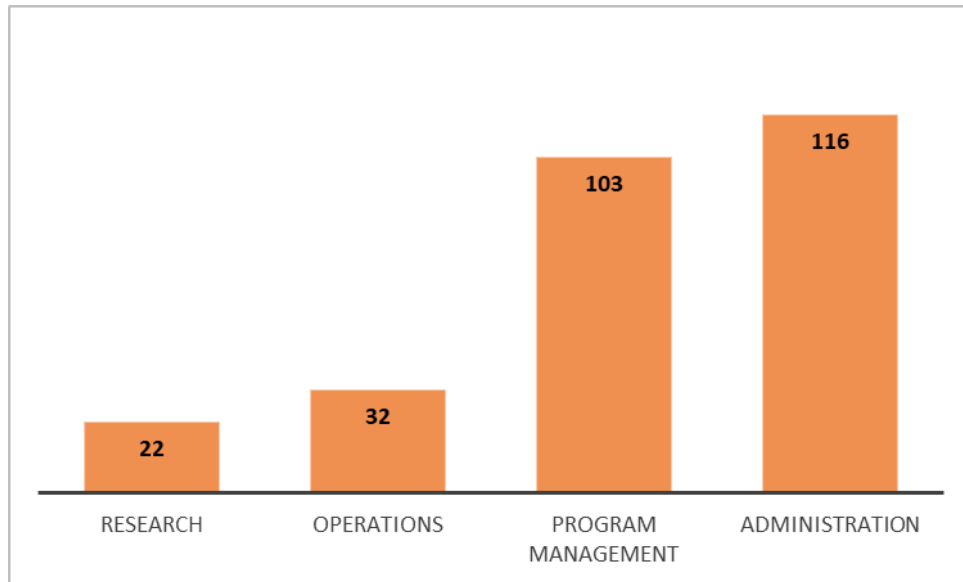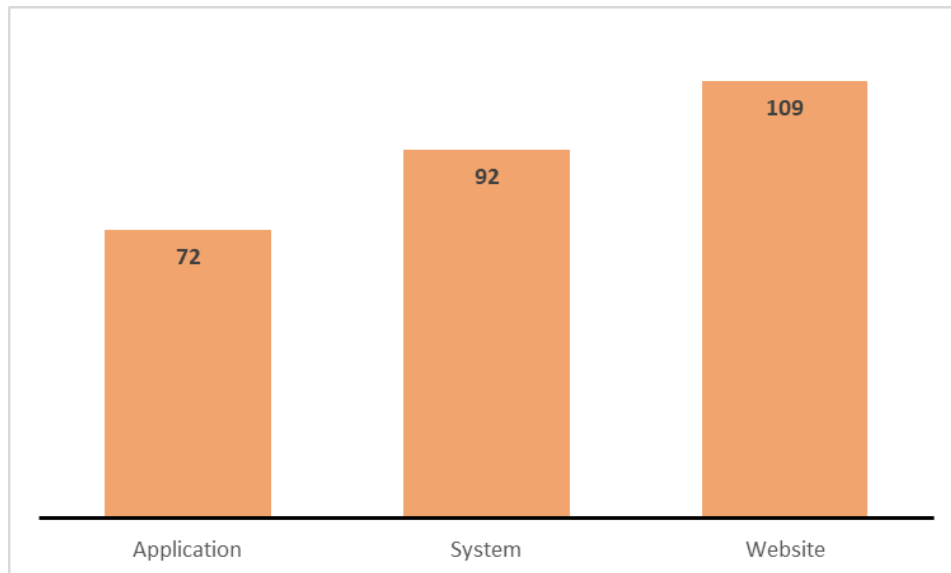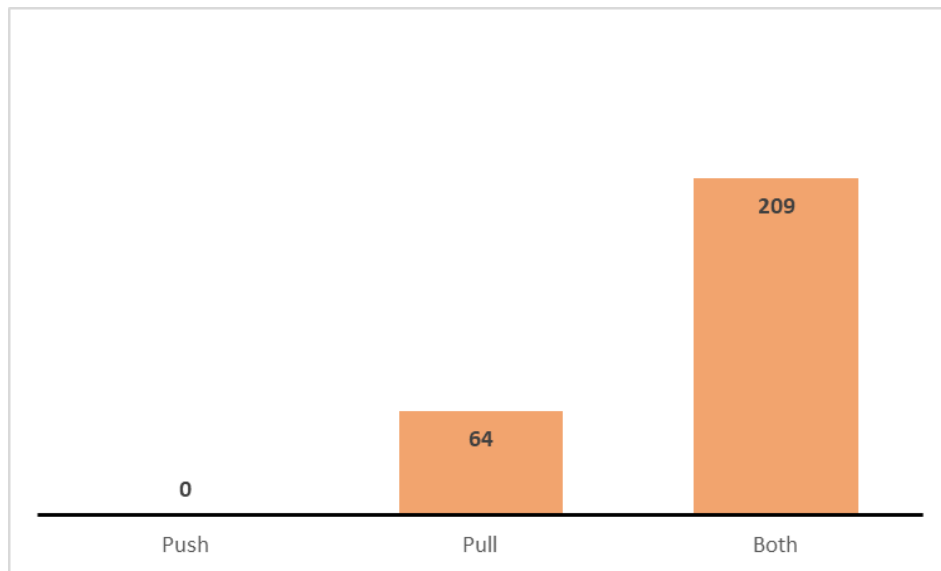| Data Tool Name	Data Tool URL
Access Request Management Service (ARMS)	https://odsf.mcw.usmc.mil/arms2/
Account Management and Provisioning System (AMPS)	https://amps.dla.mil
Acquisition Management System	None Provided
ADVANA	https://advana.data.mil/#/
Air Transport Test Load Activity (ATTLA)	https://trdmws.maf.ustranscom.mil/
Airlift Integrated Interface (A2I)	https://tacc.us.af.mil/Home
Armed Forces Health Longitudinal Technology Application (AHLTA)	https://health.mil/
askDFAS	https://corpweb1.dfas.mil/askDFAS/welcome.action
askGSA	https://ask.gsa.gov/eresolveLogin
Audit Response and Coordination (ARC) Tool	None Provided
Auto CAD	https://mcicomportal.usmc.mil/Home/UserProfile
Automated Message Handling System (AMHS)	https://amhs.usmc.mil/
Automated Performance Evaluation System (A-PES)	https://a-pes.mmrp.usmc.mil/
Cargo Management Operations System (CMOS)	https://www.cmos.csd.disa.mil/index.html
CATCH	https://www.sapr.mil/catch
CGRI CHECKLIST	https://hqmc.marines.mil/IGMC
Citi Commercial Cards	https://home.cards.citidirect.com/CommercialCard/login?locale=en
Commanding Officers Readiness Inspection Program (CORIP)	None Provided
Consolidated Air Missions Planning System (CAMPS)	None Provided
Corrosion Prevention and Control	https://www.marcorsyscom.marines.mil/Portfolios/
Dataminr	https://app.dataminr.com/app/dashboard.html
Defense Civilian Payroll System (DCOS)	https://wypc.csd.disa.mil/wypc/
Defense Agencies Initiative (DAI)	https://ebs.dai.csd.disa.mil

Data Tool Name	Data Tool URL
Defense Automatic Addressing System (DAAS)	https://home.daas.dla.mil/
Defense Cash Accountability System (DCAS)	https://dcasw.csd.disa.mil/dcasweb/dm/infoquery/linkToTransDetail.action?index=0
Defense Civilian Personnel Data System (DCPDS)	https://compo.dcpds.cpms.osd.mil/
Defense Collaboration Services (DCS)	https://conference.apps.mil/dashboard
Defense Information System for Security (DISS)	https://dissportal.nbis.mil/diss-jvs-ui/faces/consent.jsp
Defense Information Systems Agency (DISA)	https://disa-storefront.disa.mil/dsf/home
Defense Language Institute Foreign Language Center (DLIFLC)	https://www.dliflc.edu/
Defense Logistics Agency (DLA)	http://www.dla.mil
Defense Readiness Reporting System (DRRS)	https://drrs-tb16-app.innovasi.com/drrs/login
Defense Sexual Assault Incident Database (DSAID)	https://sapr.mil/dsaid-overview
Defense Travel System (DTS)	https://dtsproweb.defensetravel.osd.mil/dts-app/pubsite/all/view
DELTEK	https://www.costpointfoundations.com/VATCINC/portal.html
Distribution Component Billing System (DCBS)	https://dcbs.transport.mil/
Distribution Standard System (DSS) - Material Tracking	https://dssweb.dla.mil/materialtracker/
Distribution Standard System (DSS) - MRO Tracking	https://wegal.disa.mil/mrostatus/index2.html
DOD Directives	https://www.esd.whs.mil/DD/
DOD SAFE	https://safe.apps.mil/
DoN Audit Response and Coordination (ARC) Tool	https://arc.navy.deps.mil/
DoN Tracker	None Provided
DOTS Web Transfer Portal	https://dots.dodiis.mil/webtransfer/#/
eBenefits	https://www.ebenefits.va.gov/ebenefits/homepage
electronic DoN Acquisition Career Management (eDACM)	https://www.atrrs.army.mil/channels/navyedacm/
Electronic Transportation Acquisition (ETA)	https://eta-teams.transport.mil/teams/login
Enterprise External Business Portal (EEBP)	https://businessportal.dla.mil/saml2/idp/sso?RelayState=%2Firj%2Fportal

Data Tool Name	Data Tool URL
enterprise Military Housing (eMH)	https://home.army.mil/imcom/index.php/download_file/view/228/301
Enterprise Safety Application Management System (ESAMS)	https://esams.cnic.navy.mil/ESAMS_GEN_2/login
ETHOS	https://usmc-mccs.csod.com/client/usmc-mccs/default.aspx
Financial Management Evaluation and Assessment (FMEA)	https://apps.mcboss.usmc.mil
FireFox	None Provided
Fleet Training Management and Planning System (FLTMPS)	https://ntmpsweb.nwptf.nuwc.navy.mil/fltmps/
FM Online	https://fmonline.ousdc.osd.mil/
Garrison Supply Management Application (GSMA)	https://webapps.mcieast.usmc.mil/GSMA/Home/Index
Gearlocker	None Provided
General Services Administration (GSA)	https://www.gsa.gov/
Geographic Information System (GIS)	None Provided
Gideon software program	None Provided
Global Combat Support System (GCSS)	https://gcssmc-trng.gcds.disa.mil/index.htm
Global Force Management (GFM)	https://gfm.transport.mil/
Google Chrome	None Provided
Google Earth	None Provided
Google Maps	None Provided
Grammarly	https://www.grammarly.com/
GraphPad Prism	None Provided
Group Operational Passenger System (GOPAX)	https://gopax.transport.mil
IFTDTL PORTAL	None Provided
IGCAM	https://eris.mceits.usmc.mil/arsys/forms/ars9.mceits.mcw.ad.usmc.mil/SHR%3ALandingConsole/Default+Administrator+View/?cacheid=2bf79f7f
Information Technology Procurement Review and Approval System (ITPRAS)	https://eris.mceits.usmc.mil/arsys/forms/ars9.mceits.mcw.ad.usmc.mil/SHR%3ALandingConsole/Default+Administrator+View/?cacheid=2bf79f7f
INMARSAT Usage COMSAT	https://iris.comsat.com/
Integrated Computerized Deployment System (ICODES)	https://www.sddc.army.mil/icodes/Pages/icodes.aspx

Data Tool Name	Data Tool URL
Integrated Data Environment (IDE) / Global Transportation Network (GTN) Convergence (IGC)	https://www.igc.ustranscom.mil/igc/
Intelilink Visa Business Solutions	https://commercial.visaonline.com/
Intelink	https://www.intelink.gov/#intelink-front-page
Jacobs Technology	None Provided
Joint Container Management (JCM)	https://bscm.transport.mil/global_v2/BSCMGlobal
Joint Knowledge Online (JKO)	https://www.jcs.mil/JKO/
Joint Special Operation University (JSOU)	https://jsou.edu/
Joint Training Information Management System (JTIMS)	https://jtims.jten.mil/jtims/welcome.do
LimDu SMART	https://edq.med.navy.mil/main.aspx
Logistics Data Gateway (LDG)	https://ldg.transactionservices.dla.mil/ldg/login.shtml
LOGTOOL	https://navylogistics.com
Management Information System (MIS)	None Provided
Managers Internal Control Remediation and Reporting (MICRR)	https://apps.mcboss.usmc.mil
Manpower & Reserve Affairs (M&RA)	https://www.manpower.usmc.mil/webcenter/portal/MRAHome
Map Of The World	https://map.nga.mil/
Marine Corps Enterprise Information Technology System (MCEITS)	https://eis.usmc.mil/sites/spservices/helpdesk/adlist/Pages/default.aspx
Marine Corps Financial Integrated Analysis System (MCFIAS)	https://odsf.mcw.usmc.mil/odsf/
Marine Corps Funding Authorization Document (MCFAD)	None Provided
Marine Corps Small Arms Registry	https://msada.dc3n.navy.mil/MSADAWeb/Links.aspx
Marine Corps Total Force System (MCTFS)	None Provided
Marine Corps Training Information Management System (MCTIMS)	https://mctims.usmc.mil/
Marine Online (MOL)	https://mol.tfs.usmc.mil/mol/UserHomeEntry.do
MarineNet	https://www.marinenet.usmc.mil/
Marines.mil	https://www.marines.mil/
Matters Most	https://chat.il4.dso.mil
MAXIMO	https://mcicomportal.usmc.mil/

Data Tool Name	Data Tool URL
MCI-EAST Environmental Website	https://www.mcieast.marines.mil/
Medical Readiness Reporting System (MRRS)	https://mrrs.dc3n.navy.mil/mrrs/secure/welcome.m
Microsoft Edge	None Provided
Microsoft Explorer	None Provided
Microsoft Office	None Provided
Microsoft Power BI	None Provided
Microsoft Teams	None Provided
Milconnect	https://milconnect.dmdc.osd.mil/milconnect/
MILSINQ	https://home.daas.dla.mil/
MyBiz DPMAP	https://compo.dcpds.cpms.osd.mil/
MYNAVYPORTAL (MNP)	https://my.navy.mil/
MyPay	https://mypay.dfas.mil/
NC Courts	https://www.nccourts.gov/
NEPA PAMS	https://nepapams.usmc.mil/
NIPR laptop	None Provided
NSOPW.gov	https://www.nsopw.gov/
NXPowerLite	None Provided
One identity/ Active Roles	None Provided
Operational Data Store Enterprise (ODSE)	https://odsf.mcw.usmc.mil/
Oracle Self Service Human Resource Management Software	None Provided
PDREP	https://www.pdrep.csd.disa.mil/
PeopleSoft	None Provided
Photoshop	None Provided
PR Builder	https://www.prbuilder.usmc.mil
Procurement Integrated Enterprise Environment (PIEE)	https://piee.eb.mil/
Program Budget Information System (PBIS)	https://pbis.nmci.navy.mil/
Radio Frequency In-Transit Visability (RF-ITV)	https://national.rfitv.army.mil/login/Login.do
Remedy ITSRM	None Provided
Risk Management Information - Streamlined Incident Reporting	https://afsas.safety.af.mil
RSAT	None Provided
R-Studio	None Provided
R-Studio Desktop	None Provided

Data Tool Name	Data Tool URL
R-Studio Server	None Provided
R-Studio Shiny	None Provided
Safe Helpline	None Provided
SECNAV.NAVY.MIL	https://www.secnav.navy.mil/Pages/default.aspx
Servemart	https://www.usmcservmart.gsa.gov/advantage/ws/main/home?store=USMC
Sharedrive	None Provided
SharePoint	None Provided
Single Mobility System (SMS)	https://sms.transport.mil/sms-open/smswebstart.pl
SMARTS	https://odsf.mcw.usmc.mil/odsf/
SOFLO Language Database	None Provided
SOLMAN	https://solman.sofsa.mil/Home/Home/UserAgreementMemorandum
SPAWAR HELPDESK	https://gdscnola.sscno.nmci.navy.mil
Standard Accounting and Budget Reporting System (SABRS)	https://miap.csd.disa.mil/portal.html
SUASMAN	https://cac.suasman.sofapps.net/
SYNCADA	https://portal.syncada.com/USBank/Login.aspx
TALON POINT	https://www.talonpoint.net/
Task Management Tool (TMT)	None Provided
TDM Publications	https://app.mcboss.usmc.mil/suite/sites/support/
Total Ammunition Management Information System (TAMIS)	https://tamis.army.mil/#/default
Total Force Data Warehouse (TFDW)	https://tfdw-web.mceits.usmc.mil/index.aspx
Total Force Structure Management System (TFSMS)	https://tfdw-web.mceits.usmc.mil/index.aspx
Total Lifecycle Modeling System (TLCM)	https://lcmi.logcom.usmc.mil/portal/dispatch/show.home
Total Workforce Management Services (TWMS)	https://twms.dc3n.navy.mil
TRANSCOM Reference Data Management (TRDM)	https://trdmws.maf.ustranscom.mil/trdm/#/TRDM/home
Transportation Capacity Planning Tool (TCPT)	https://www.tcpt1.usmc.mil/tcpt
Twitter	https://twitter.com/
Unit Travel Card Citi Manager	https://home.cards.citidirect.com/CommercialCard/login

Data Tool Name	Data Tool URL
US BANK GCPC	https://www.access.usbank.com/cpsApp1/AxolPreAuthServlet?requestCmdId=login
USMC HQMC Doctrine and MCWL	https://usmc.sharepoint-mil.us/_forms/default.aspx
Veterans Affairs (VA)	https://www.va.gov/
Virtual Private Network (VPN)	None Provided
Voyager Fleet Cards	https://www.voyagerfleetpartners.com/app/auth/userLogin.do
WEBVLIPS	https://www2.transactionservices.dla.mil/webvlips/docnum.asp
YouTube	https://www.youtube.com/
Zoom	https://zoomgov.com/

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