State of Montana Data Strategy

Office of the Chief Data Officer (CDO)

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Introduction

The purpose of this document is to be a high-level strategy, not a step-by-step guide. It is intended to provide guiding principles that can be used by departments and agencies to design data strategies that align with business specific needs.

Data Mission and Vision

The government of the state of Montana is working to become more proactive, improve customer service, reduce waste, and improve its ability to serve the citizens of Montana. With the incredible breadth of data the state government collects as a part of our normal operations, it is imperative that the state has access to accurate and up-to-date information so that it can respond in a timely and appropriate manner to any issues that arise. The state will use high quality data and analytics to provide a thorough understanding of what we are doing, how much we are spending to do it, and that the outcomes for the citizens of Montana are among the best in the nation.

In the modern world, data is an asset like any other, and the state of Montana owes it to the citizens to maximize the value of that data. The office of the Chief Data Officer will work across the enterprise to ensure that the data is secure, well governed, and easily accessible while also partnering with agencies to provide guidance on the staff and resources they need to properly utilize the assets.

Goals

Improve Customer Service

The state of Montana interacts with citizens through every facet of their daily lives. When the state serves its citizens better, it has a very real and measurable effect on outcomes. When it takes less time to deliver a service to a citizen, not only do they have a better experience, but the increased efficiency means the state spends less to deliver the service.

The same is true for private industry. If Montana takes six months to deliver a permit while Wyoming or North Dakota deliver the same permit in 30 days, a percentage of private organizations are going to build their operations elsewhere. Organizations, like people, tend to take the path of least resistance.

Increase Efficiency

Efficiency goes hand in hand with customer service. When the state cannot serve a customer quickly and for minimal cost, the customer experience suffers. Every time the state has to collect a customer's information again, process a request on paper, or maintain another piece of software to do the same job, the state not only wastes taxpayer money, but does a poor job serving them for the extra expense.

Without proper data management, it is overly burdensome to measure how successful the outcomes are for citizens. It is even more difficult to measure where or how much money is wasted with redundant or outdated processes. Taking the data maturity journey will enable the government of Montana to reduce costs while doing more for its citizens and private businesses.

Enable Transparency

In the effort to prioritize customer service and increase accountability among state agencies, we must improve our ability to be transparent. Letting the public understand how the state is trying to spend resources wisely, eliminate waste, and improve our ability to serve the citizens of Montana. Using the data we have at hand to make this clear to the citizens of Montana will help to increase trust in state government.

Empower Agencies

The state of Montana puts ownership and responsibility for safeguarding data squarely on the shoulders of the agency director/commissioner. Any attempt to centralize data in the Montana State government needs to ensure that agency

heads maintain this data ownership. An approval process will be implemented that will require the data owner to approve before anyone is allowed access to data. By doing this, the agency head always has the last call on whether someone can see the data in question.

Insight Driven Decision Making

The state is already data driven, but becoming *insight* driven is key to aligning work with the mission. As an organization matures its data practice by centralizing and applying governance, it becomes exponentially easier to produce meaningful insights from the data. Spreadsheets get replaced with dashboards, manual processes get automated, and predictions move from gut instinct to algorithmic.

Strategic Objectives

Governance

Objective 1: Establish Data Governance Advisory Council

Centralizing and planning data governance is one thing, but without a data governance board, it lacks the collaborative direction from the top that is needed to break down silo walls. The data governance board is made up of the primary decision makers in state agencies along with experts around security, technology, and statute. The board exists to make decisions about where improvement efforts should be focused, how data should be used, and give advice on when resources need to be expended to change or improve the data landscape.

Objective 2: Establish Data Governance

Data governance is the management of data from 'cradle to grave' and establishes policies for how data is acquired, how data should be used, and how long data and metadata should be kept. Of course, the state has a great deal of governance in place regarding record retention and data protection, but up to this point the effort has been scattered across numerous organizations. With centralized and collaborative data governance in place, the state can begin identifying authoritative and longitudinal datasets leading to increases in accuracy, transparency, and customer service.

Objective 3: Create Data Security Guidance for Cloud Storage and Transfer

The state has an enormous responsibility to safeguard the data it holds in trust for the citizens. As data is moved to the cloud the ability to keep it safe actually increases, but only if we design a strong set of guidelines for how to keep data safe in this new paradigm. The state will use its resources to design a cloud data strategy that emphasizes security and privacy.

Objective 4: Improve Master Data Management

Longitudinal datasets are datasets that span multiple agencies or organizations. A basic citizen record is the easiest example. When a citizen contacts the state government, each agency should know who that citizen is, and any updates that are made to that record should be reflected in every agency. From the perspective of the citizen, the government of Montana should seem like one cohesive unit. It should not be up to them to navigate interagency silos to get service.

Collaboration and Skills

Objective 5: Foster Data Communities

Saying that the barriers to data sharing have been removed does not fully address the issue. Members of one agency have little idea for what data exists in other agencies. In order to encourage collaboration between agencies, the state needs to foster working groups and data communities. A monthly meet up of analysts, or a quarterly demo of dashboards and other analytical products offers a starting point for further collaboration while also reducing duplicate effort across agencies.

Objective 6: Grow Data & Analytics Skillsets

To maximize the productive use of data, the state of Montana needs to increase the level of data literacy across agencies. Agencies need resources with the skillsets that can perform data prioritization, collection, and analytics.

Having strong analytics skills in each agency allows analytics to stay close to the source. This ensures that subject matter experts and analysts work closely together, and the analytics they produce are meaningful.

Objective 7: Found Data Center of Excellence

The office of the Chief Data Officer will also need to establish a Center of Excellence in order to provide a support structure for data professionals in the state. The data COE will provide guidance, statistical and machine learning expertise, and best practices to the rest of state government. Having a Center of Excellence allows analytics professionals in any agency to double check their work and ensure what they are doing is in line with the state's analytical standards.

Objective 8: Create Cross Functional Teams for the 9 Areas of Data Governance

A cross functional team is not a formal council like the Data Governance Advisory Council. Instead, these teams are made up of subject matter experts and stakeholders for each area of practice under the umbrella of data governance (see fig. 1). In many cases, these teams are already in place and operating without the help of an overarching governance board. By combining guidance from the board, and practical expertise from the cross functional teams, the state can begin developing and codifying best practices throughout the organization.
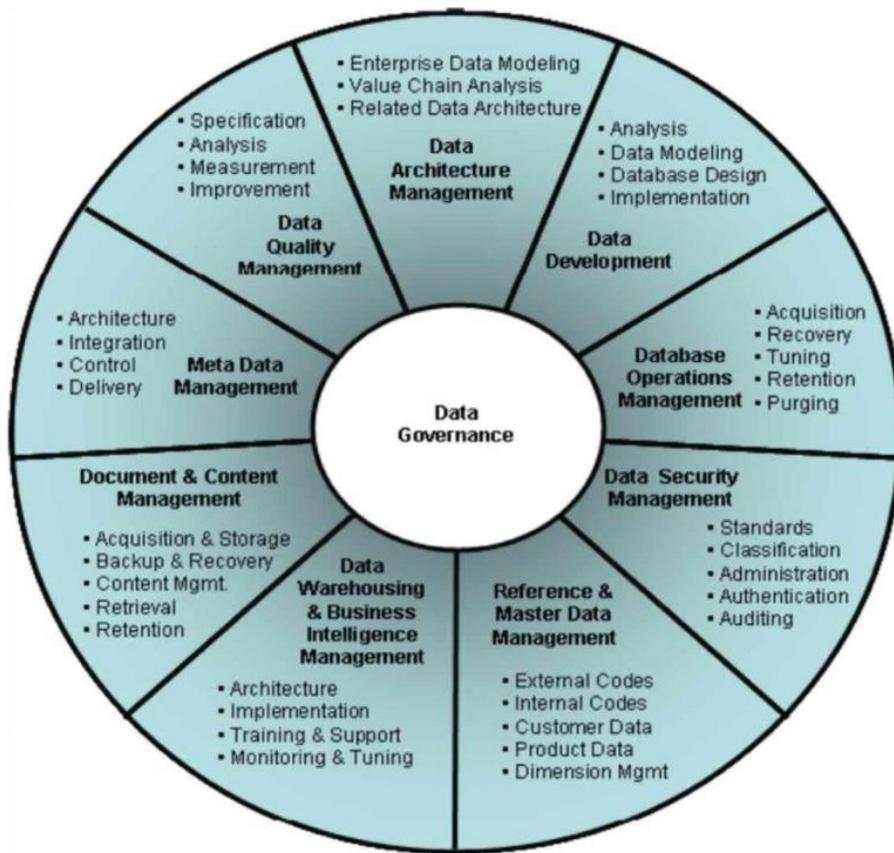
Figure 1: DAMA-DMBOK2 Data Management Framework (The DAMA Wheel)

Objective 9: Data Access Approval Process

To make data sharing easier, the state must move on from relying on manually created Memorandums of Understanding to using an automated approval process. Not only will this reduce the barriers to sharing by automating the process once approval is granted, it will also provide a more manageable environment. In the current process, it is difficult for a director to know what data sharing agreements already exist and they are forced to lean on one or two subject matter

experts to keep them informed. By switching to an approval process in ServiceNow, the director not only gets a say in each approval by default, but they can easily see the history of what has and has not been approved.

The idea here is that we create a process in ServiceNow. If a user wants access to a set of data, they put in a request. The request is routed to the data owner, which in Montana is the agency director, and they or their delegate must approve or deny the request. An approval should automatically grant the privileges within Snowflake, removing the chance for human error during provisioning. This process can then be audited on a cadence to ensure the list of who has access matches the list of who should have access.

Assessments

Objective 10: Current State Assessment

In order to ensure taxpayer dollars are spent in the most effective way, each agency should perform an inventory of its data assets. This need not be fully exhaustive, instead employing the Pareto Principle (80/20 rule). Once this has been done, the state can prioritize what projects will have the greatest return on investment, either by improving outcomes or saving money through improved efficiency. A current state assessment is the first step in a data maturity analysis.

Objective 11: Capability Maturity Assessment

For the state of Montana to be successful in this transformation, it needs to first establish a starting point. Developed by the United States Department of Defense in the mid 1980's to evaluate software contractors, the Capability Maturity Assessment concept was further developed by Carnegie-Mellon to apply to a broad range of fields. (1)

There are six levels of maturity, and progression through the levels happens in order: (2)

- Level 0: Absence of capability
- Level 1: Initial or Ad-hoc: Success depends on the competence of individuals
- Level 2: Repeatable: Minimum process discipline is in place
- Level 3: Defined: Standards are set and used
- Level 4: Managed: Processes are quantified and controlled
- Level 5: Optimized: Process improvement goals are quantified

In more practical terms, this is intended to reveal the things an agency can improve to get the most out of their effort. By showing common patterns seen in other organizations as they work to improve their capability, the maturity model provides a business-oriented reference point to measure against and help understand where our organization falls in the greater scheme of data maturity. An example of these models is shown in figure 2.

However, these maturity levels can be applied to each aspect of data governance, and they do not all have to be completed at once. The office of the CDO will guide departments and agencies though doing a self-assessment of their capability across the different facets of data governance. This process will help agencies prioritize their efforts to ensure the greatest impact.

2021 Data Maturity Model — SAFEGRAPH

	Explorer	User	Leader	Innovator
Business Strategy	Data is used solely for reporting purposes	Data insights are used to inform business decisions	Competitive business strategy is built off of data	Data informs a continuous evolution of business strategy
Data	The organization solely uses its own internal data	The organization uses data providers to enrich & supplement its own data	Third party data is used as a differentiator	The organization is constantly looking to leverage new datasets from non-obvious sources
Culture	The use of data and analysis is left up to the individual	Data is a part of measuring results but not planning	Decision makers are enabled with the results of data analysis to maximize business outcomes	The organization has built true AI/ML algorithms that adapt and improve business objectives
Architecture	The business lacks a cohesive and coherent data architecture	Some architecture exists to automate and analyze data flow	The architecture enables all members of the organization to be data driven	The architecture is built for speed, market distribution and large volumes of data
Data Governance	Governance is largely manual and lacks consistency	Process is in place to protect data quality across the organization	There's universal confidence in the data and resulting insights	Data governance is integrated into all business processes
Procurement & Onboarding	No datasets have been onboarded to the organization	Individual teams are responsible for procuring and onboarding their own data	There's a streamlined process for data procurement, but onboarding isn't universal	The organization has a data procurement team that sources and onboards new data

Figure 2: Safegraph Data Maturity Model

Explore Future Capabilities

Objective 12: Explore Machine Learning and Robotic Process Automation

The power of predictive analytics is becoming well known across the public and private sector. While many predictive problems cannot be approached until the state is further along in its data maturity journey, many questions can be approached right away. Some example use cases the state could start with are: predicting housing demand, economic predictions, or efficient resource allocation across a number of domains.

As valuable as predictive analytics can be, robotic process automation may be an even more powerful tool for the state. Many processes in the state currently require a large manual effort. Processing permit applications, issuing licenses, and hundreds of other touchpoints with customers can be automated using RPA. Automation can handle the majority of these cases and alert staff when manual intervention is needed. This improves speed and accuracy of course, but it also means that employees previously bogged down with repetitive processing can focus on more valuable and impactful activities that help agencies achieve their strategic goals and objectives.