

STRATEGIC PERSPECTIVES SERIES

How to Succeed with Self-Service Analytics

Balancing Empowerment and Governance

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Research Sponsored by DataClarity



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Eckerson Group helps organizations get more value from their data through research, consulting, and education. Our experts each have more than 25+ years of experience in the field, specializing in business intelligence, data architecture, data governance, analytics, and data management. We provide organizations with expert guidance during every step of their data and analytics journey. Get more value from your data. Put an expert on your side. **Learn what Eckerson Group can do for you!**

About This Report

To conduct research for this report, Eckerson Group interviewed numerous industry experts and viewed numerous product demos. This research was sponsored by DataClarity. Eckerson Group does not endorse any specific vendor offerings

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Introduction

Self-service analytics is the holy grail for organizations. It promises to empower business users to generate their own data and insights and liberate the information technology (IT) department to focus on more value-added activities than generating custom reports. But this win-win strategy often goes haywire immediately upon deployment.

Self-service analytics fails when empowered users create hundreds or even thousands of reports, most of which are variations on the same theme but contain conflicting metrics and data. This creates a proverbial Tower of Babel, where everyone talks, but no one communicates. The result is greater confusion and distrust of data than before.

This report describes why self-service analytics seems so easy in theory but is challenging in practice. More importantly, it provides several frameworks to guide organizations in rolling out a self-service analytics strategy that works. The key is to apply the right amount of governance to balance empowerment with control.

- **Chapter One**—Pitfalls and Paradoxes. Self-service analytics seems like a win-win proposition for business and IT, but it can quickly go awry without sufficient governance. This chapter exposes the landmines that can explode a well-meaning self-service strategy.
- **Chapter Two**—Know Thy Customer. Data leaders who launch self-service analytics programs without knowing their business users risk unleashing chaos. This chapter provides a simple framework for classifying business users, which can be used to guide self-service strategies.
- **Chapter Three**—The Key to Self-Service: Trust But Verify. Self-service analytics goes awry when business users publish and distribute reports broadly without submitting changes through an agile review process. This chapter shows how to create a governance process to manage standard reports.
- **Chapter Four**: Teams, Roles, and Pushdown Development. Self-service analytics requires

the right people in the right roles doing the right things. But that requires a carefully crafted organizational model. This chapter shows how to coordinate corporate and distributed resources to support business users and ensure the data needs are met.

- **Chapter Five**: Tools and Technologies. Technology plays a critical role in making self-service a reality. The advent of AI-infused products has changed the equation for self-service analytics.

Our hope at Eckerson Group is that you use our frameworks to build a better self-service program that achieves the right balance between user empowerment and corporate governance.



Chapter 1: The Pitfalls and Paradoxes of Self-Service Analytics

Self-service analytics is harder than it seems. There are many unseen landmines and pitfalls, as well as paradoxes worth understanding. This chapter exposes issues that can undermine a well-meaning self-service strategy.

Self-Service Pitfalls

Self-service analytics seems like a win-win proposition for business and IT, but it can quickly go awry without sufficient governance.

Here's what happens: Newly empowered data analysts create a multitude of conflicting reports and dashboards with unique business logic and data. The data doesn't add up when shared, and business users no longer know which report to use. Executives get frustrated when they receive conflicting answers to simple questions like, "How many customers do we have?"

At organizations awash in conflicting reports, data analysts refuse to trust any except those they create themselves. Also, business users revert to requesting custom reports from IT, or worse, they stop using data altogether to make decisions. Instead of liberating business users, ungoverned self-service analytics creates data chaos—a proverbial Tower of Babel where people talk but few communicate.

Rather than use the term "self-service analytics," we need to start talking about "governed self-service." Proper governance balances user empowerment with standards to ensure data and business alignment—something every organization (and ultimately every individual) wants and needs.

Self-Service Paradoxes

Governed self-service analytics reconciles the polar forces pitting freedom against control. This dynamic plays out in many areas of business and technology: speed versus standards; innovation versus operations; agility versus architecture; and departmental needs versus corporate interests.

Organizations need to balance these dueling forces to deliver an optimal self-service environment for user empowerment (self-service) and business controls (governance). You can't have one side of the equation without the other; you need both to counterbalance the

excesses of each. Just as self-service without governance creates data chaos, governance without self-service creates a bureaucratic and oppressive operating environment.

This tension between freedom and control creates interesting paradoxes that companies experience when trying to implement self-service analytics:

Paradox 1: Self-Service Requires Standards

At first glance, self-service allows users to fulfill their own data analytics needs any way they want. But the opposite is true. Without standards, business users have to work harder and longer to get what they want with greater risk of failure.

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For example, we all take for granted that we can hop in our cars, drive to the grocery store, and return safely, taking the most direct and

efficient route possible. We think we have autonomy and total freedom, but we don't. The illusion of freedom is created by our conscious (or unconscious) adherence to a multitude of rules, regulations, and standards that govern such a trip: We drive on the right side of the double yellow lines; we stop at red lights and slow down at yellow ones; we obey the speed limit (mostly); we get a driver's license, and we register the car. Without these and hundreds of other rules and regulations, the roads would be chaotic and dangerous, and we'd risk our lives during every trip to the grocery store.

In the same way, self-service analytics requires a multitude of standards or it devolves into data chaos. These standards include how to define and calculate metrics, how to store and access data, how to query and publish reports, and how to govern individual privacy and security. Standards are the foundation upon which self-service analytics is built.

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Paradox 2: Self-Service Requires Tailoring

Self-service means different things to different people. An old school executive thinks self-service involves viewing a report online rather than on paper; a business manager believes it is drilling into a dashboard and saving the view as a "report" that they can view next time with fresh data; a data analyst thinks it's the ability to find, combine, analyze, and visualize data from any source. And each is right.

For business intelligence (BI) teams, this places a premium on classifying business users by their information appetites and then providing relevant business views, analytic functionality, training, support, and facilitation. It also means tailoring permissions so users only see the data, metrics, and analytic functionality relevant to their jobs. Permissions maintain the visual and analytical palette by giving users only what they need to do their jobs quickly and effectively.

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Paradox 3: Self-Service Requires Hand Holding

Self-service implies that a task is easy enough for almost anyone to do without assistance, like pumping your gas at the service station. But becoming self-sufficient takes time, even with easy things. This is especially true for complex tasks, such as creating custom dashboards and analytic views.

Most BI leaders schedule one-on-one meetings to help business executives become proficient with analytic tools and applications. This is expected for top executives, but it's equally true for hard-core data analysts. Just because someone has a "data analyst" title doesn't mean they know how to use a self-service tool to explore the organization's data and generate insights that matter. Most business people, data analysts included, need a little help to understand the nuances of the company's data, its visual design standards, and how to use a new tool.

Since a BI leader can't provide one-on-one assistance to everyone in the organization, other BI team members need to chip in. BI "relationship managers" need to schedule one-on-one time with business unit leaders

and managers to get them comfortable with analytic tools and output. BI developers, if not embedded in the business, should make themselves available to data analysts and data scientists via office hours or data labs, where analysts can work through problems with specific tools and data sets.

Paradox 4: Self-Service Requires More Collaboration with IT, Not Less

Business people love the idea of self-service analytics because it promises to liberate them from the shackles of the IT department and its perpetual backlog. With self-service, business users can create their reports and dashboards without having to wait for the IT department. But the reality is that self-service requires the business to spend more time with IT, not less.

Self-service analytics doesn't work unless the business steps up and owns the data analytics program.

Self-service analytics doesn't work unless the business steps up and owns the data analytics program. Ownership takes many forms: a data

analytics council that reviews and approves strategy and tactics; a data governance process that defines, documents, and manages key data elements; a data quality process that monitors core data elements for defects; a report governance process that certifies reports and the analysts who create them; a permission structure that defines who can access which data; and an agile process that prioritizes projects and capabilities for BI developers.

In essence, the business sets the rules and standards that the IT team implements. If the business doesn't assume ownership and responsibility for data analytics resources, processes, and strategies, then it will never enjoy a robust data analytics infrastructure with easy access to clean, integrated, timely, and relevant data. The business needs to work hand-in-hand with the IT department to make self-service analytics work.

Paradox 5: The Need for Self-Service is Inversely Proportional to the Quality of Core Business Dashboards

Although businesspeople clamor for self-service analytics, most don't really want

it. How can that be? Data is so locked up in many organizations that business people spend nights and weekends finding data and stitching it together using Excel or Tableau to create required quarterly or annual reports for business leaders.

Not surprisingly, these individuals are desperate for self-service tools that can streamline this process. Yet, if they didn't have to create the reports at all, they would be ecstatic. They have better things to do than spend their precious free time creating business views of data. Their job is to lead and make decisions, not slice, dice, and prepare data like a data analyst.

What business managers want is a well-designed, interactive report or dashboard that generates the views they want and can be easily modified. They don't want to create reports from scratch; they simply want the BI team to understand their needs and create pre-ordained business views that largely align with their needs. Ideally, these dashboards are predictive, showing business people performance to plan and forecast and suggesting next steps.

As a rule of thumb, each business function needs one or more well-designed, interactive

dashboards that address 80% of managers' and workers' typical questions. Since these dashboards can be complex, the IT department often creates them, but skilled departmental analysts and report developers can design and build these dashboards as well. If the IT department has limited resources, a self-service initiative might be the only way these standard dashboards get created.

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The point is that organizations should spend more time implementing robust departmental dashboards instead of pursuing a self-service strategy for its own sake. A well-designed departmental dashboard will obviate much of the demand for self-service.

Summary

Self-service analytics seems like a win-win. The business gets what it wants, how and when it wants it, and the IT department gets to focus on value-added tasks. The reality

is that self-service analytics can go awry quickly, creating data chaos with hundreds of conflicting reports and dashboards.

To avoid data chaos, organizations need to implement "governed self-service" where business and IT collaborate to establish standards that define data elements and the proper use of reports and dashboards, establish processes for ensuring data quality, and develop controls for accessing and safeguarding data, among other things.

The next chapter discusses how to classify business users so you can apply the right level of self-service access and functionality to meet their needs.

Chapter 2: The Key to Self-Service Analytics: Know Thy Customer

Data leaders who launch self-service analytics programs without knowing their business users risk unleashing chaos. This chapter provides a simple framework for classifying business users, which can be used to guide self-service strategies.

Executives might think the primary way to implement self-service analytics is to purchase a visualization tool for every knowledge worker in the organization. After all, some software vendors have equated self-service analytics with their products. Granted, software tools can empower business users, but they only produce positive results if they are tailored to each individual's role and preferences.

The dirty little secret of self-service analytics is that one size doesn't fit all.

The dirty little secret of self-service analytics is that one size doesn't fit all. There are as many types of self-service as there are individuals in an organization. An old-school executive who reads printouts of Excel reports might think self-service is viewing an online dashboard; a business manager might think it's the ability to

modify a report or dashboard with a point-and-click interface; a data analyst might think it's the ability to create data sets and dashboards without IT assistance.

Classification. To succeed with self-service analytics, it's imperative to create an inventory of business users and classify them. This classification scheme becomes the basis for how you configure data sets, analytical tools, and data access permissions. It also informs how you organize your data analytics team and design your data architecture. Knowing and classifying your users is a critical first step toward self-service success.

Where to Start

When we begin a consulting engagement, we ask clients for three things: a current schematic of the data architecture; an organization chart that identifies data analysts and their managers in each division and department; and a user

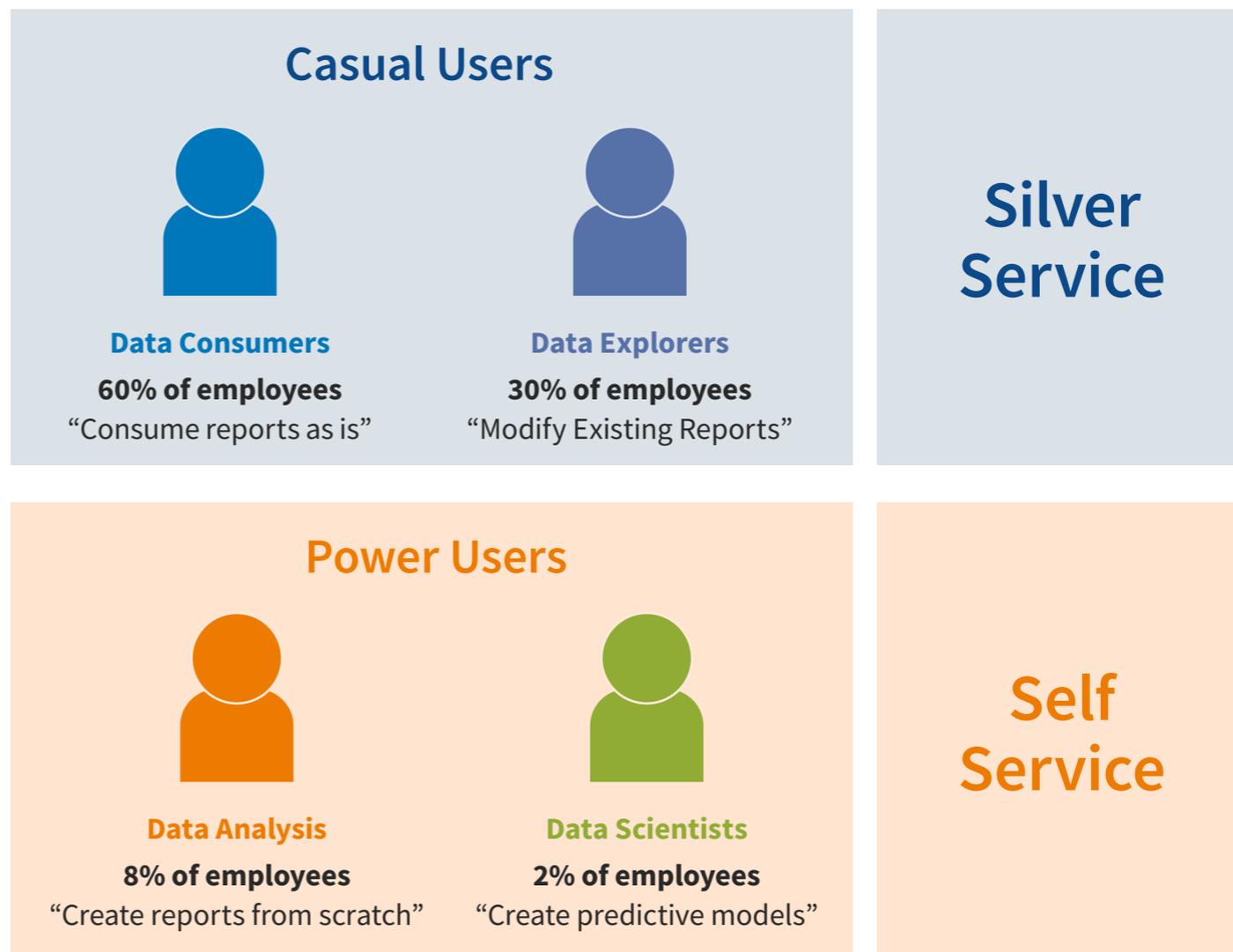
classification scheme. If we're lucky, we might get a printout of current data architecture and perhaps a corporate organization chart, but we rarely get a user classification scheme.

How can you serve people if you don't know who they are or even that they exist?

How can you serve people if you don't know who they are or even that they exist? We often spend an entire day with clients mapping out who produces insights and reports in every department, and we rarely finish. We urge clients to "get out there and meet these people!" The data analysts and their managers are your most loyal advocates or zealous critics—they can make or break your data analytics program.

Classifying Users. As a shortcut, Eckerson Group offers a classification scheme that has proven to reflect user demographics at most organizations. It classifies business users as either casual or power users, based on whether they consume or produce information. It then divides each of those two groups into two sub-categories. Casual users consist of data consumers and data explorers, while power users consist of data analysts and data scientists. (See figure 2-1.)

Figure 2-1. Eckerson Group's User Classification Scheme



Casual Users. Data consumers are casual users who consume reports and dashboards without modification. They generally represent about 60% of all data users. Data explorers, on the other hand, are casual users who occasionally want to modify reports or dashboards to create

a new view of existing data. Data explorers represent about 30% of all data users.

Casual users don't want self-service in the true sense—the ability to create data sets and reports from scratch without IT assistance.

They do not perform lots of analysis or create reports and dashboards; their job is to make decisions. What casual users want is “silver service”—the ability to consume content that is highly tailored and pre-digested to meet their decision-making needs. That means either the corporate data analyst team or a local data analyst needs to create a custom data set (i.e., data mart), a business model, and a report geared to the casual users in the department.

What casual users want is “silver service”—the ability to consume content that is highly tailored and pre-digested to meet their decision-making needs.

Power Users. Unlike casual users, power users desperately desire true self-service. For decades, they have had to beg, borrow, and steal data from the IT department and manipulate the assembled data crumbs using Excel or Access. Lacking true self-service, they can spend upwards of 80% of their time finding, cleaning, and integrating data rather than analyzing it. Self-service reporting, analysis, data integration, and analytics tools are a huge boon to the power user community.

Because of their voracious appetite for data, power users exert an outsized influence on corporate data strategies even though they only represent 10% of data users in an organization. Most are data analysts who create budgets, analyze pricing, design incentive metrics, evaluate campaigns, and generally exist to answer ad hoc questions from business leaders. Their counterparts are data scientists who, combining strong data skills with statistics and computer programming, create powerful descriptive and predictive models from large volumes of historical data. As experts in artificial intelligence, they are currently in high demand even though they only make up about 2% of data users today.

The Dilemma of Data Explorers

Of the four personas, data explorers are the hardest to support. Most of the time (80%), data explorers consume reports and dashboards just like data consumers, but occasionally (20% of the time) they want to act like power users and generate ad hoc queries and create reports from scratch. Unfortunately, most data explorers don’t have power user skills and can’t remember how to use the self-service features of a BI tool.

Fortunately, new AI-infused BI tools are tailor-made for data explorers: the tools let them submit queries using keywords and natural language instead of SQL or more complex query generation tools. They also automatically surface insights from algorithms that run against queried data in the background.

Over time, we expect the percentage of data explorers to grow significantly as more computer- and data-literate individuals enter the workforce and companies become more data-driven. We expect more casual users will dive into data to explore root causes and remediation strategies. As AI becomes the new BI (see our report by this name), data explorers won’t have to work as hard to create ad hoc views of data.

Applying User Classifications

With a user classification scheme in hand, data analytics leaders can more easily select analytical tools, define permissions, create data architecture, establish training and support services, and establish a business engagement strategy.

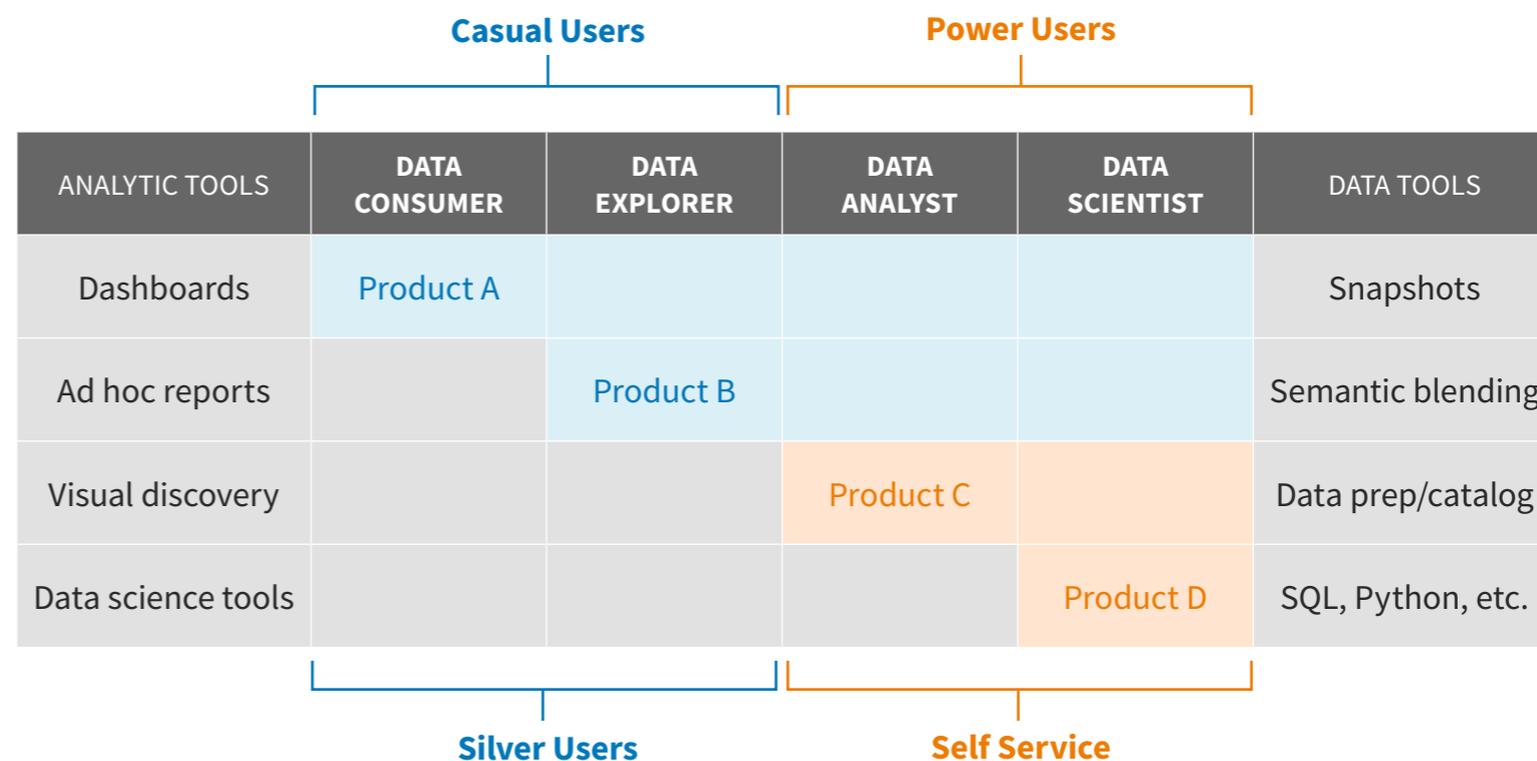
Tools. Eckerson Group often uses the matrix in figure 2-2 to help data leaders evaluate

their data and analytics tools portfolio. A decade ago or more, a company might need to purchase a different product from a different vendor for each type of user. Today, it's possible (but not necessarily prudent) to purchase a data analytics platform from a single vendor to support most, if not all, user requirements.

Permissions. It's critical to purchase tools with granular permissions. Because tools today supply a broad range of functionality and provide access to large and diverse sets of data, it's important to configure a tool environment so it's tailored to user needs by role and sometimes by an individual. It's important to "dumb down" the tool for casual users to keep from overwhelming them with features and functions they don't need, which is a surefire way to undermine adoption.

Permissions help avoid the proliferation of conflicting reports and dashboards. By default, permissions should prevent business users from publishing reports and dashboards until they gain proper authorization. Usually, this happens when they achieve a certification that demonstrates they understand the company's data, its standards, and self-service policies.

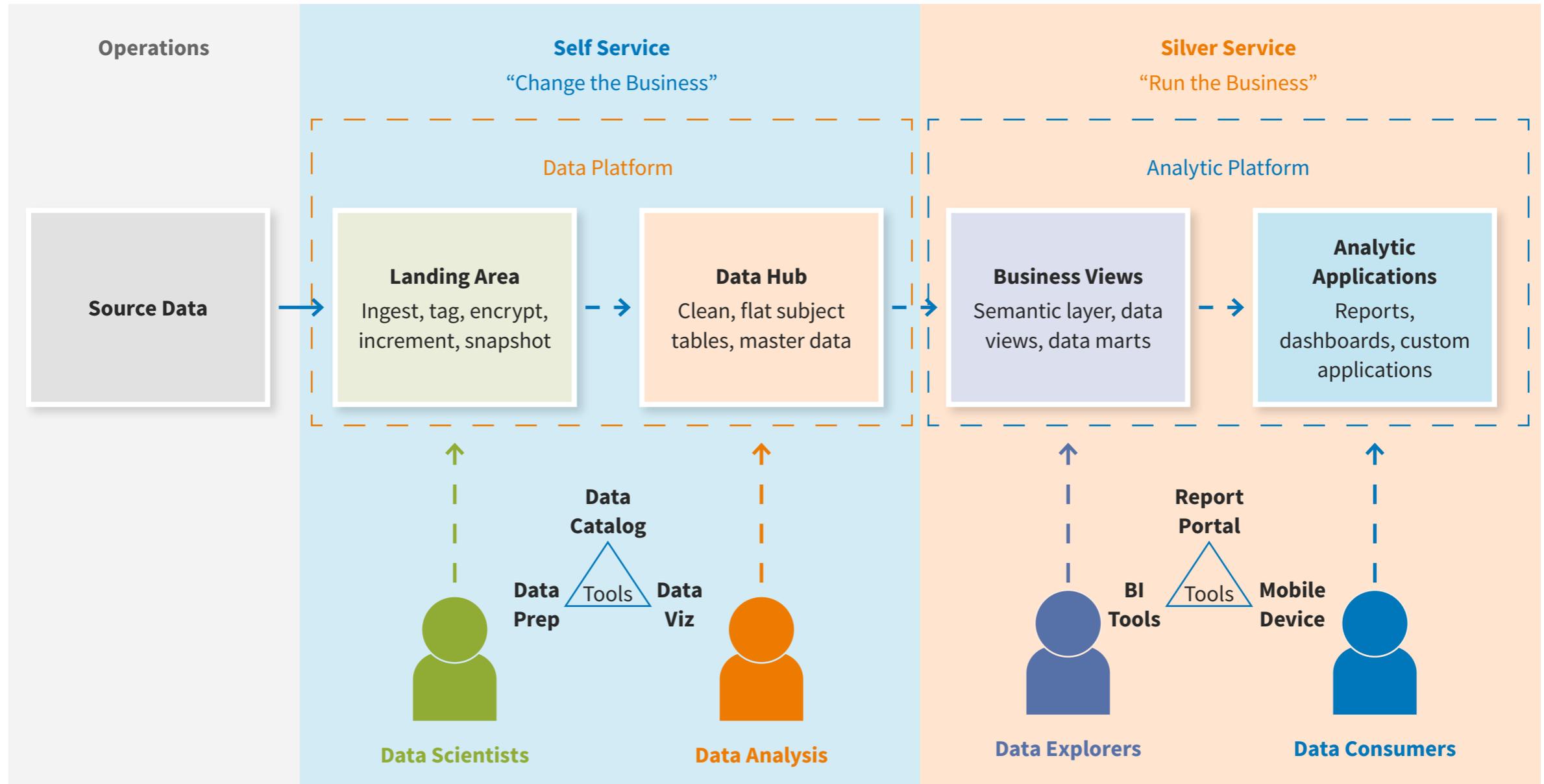
Figure 2-2. Tools Portfolio by User Type



Data Architecture. Permissions also extend to the data architecture, where each class of business user gains access to a different layer. The conceptual data architecture in figure 2-3 shows that data consumers access applications (i.e., reports, dashboards, and custom applications), while data explorers

access a domain-specific business model of data (i.e., semantic layer). They use the semantic layer to modify or extend existing applications. Data consumers and explorers use BI tools, plus a reporting portal to find relevant reports and mobile applications that display analytics.

Figure 2-3. Mapping User Types to Data Architecture



Similarly, data analysts query data from subject-oriented tables in a data hub (i.e., data lake, data warehouse, data fabric). Data analysts use the flattened subject-oriented data to craft custom data sets for analysis. To create data pipelines and analytic models, data scientists extract raw data from a landing area. Both data analysts and data scientists use a triumvirate of self-service analytic tools: a data catalog to find data, a data prep tool to combine data, and a visualization tool to analyze and share data.

In reality, all four types of users access more than just one component in the architecture. The 80/20 rule applies if the data is well organized. Data explorers will access analytic applications more than business views; data

analysts will access business views more than data hubs, and data scientists will query data hubs more than landing areas. Business users follow the path of least resistance: They query data at the highest level of abstraction and cleanliness possible that contains the data they need.

Other Considerations. A user classification scheme is also critical for creating suitable training and support programs that foster adoption. And for creating a data analytics center of excellence in which power users are the eyes and ears of a corporate data analytics team in the business units. Likewise, their managers generally form the working committee of a data analytics council and run the community of practice that gathers power

users from across the organization for regular meetups and other activities.

Conclusion

Data leaders who launch self-service analytics programs without knowing their business users risk unleashing chaos. Data leaders need to canvas the organization and understand who produces what information for whom and where. They then need to classify business users based on their information needs. Finally, they need to use that scheme to drive tooling, architecture, governance, training, support, and organizational decisions.

The next chapter explains how to regulate the creation of reports by data analysts empowered with self-service tools.

Chapter 3: The Key to Self-Service: Trust but Verify

Self-service analytics goes awry when business users publish and distribute reports broadly without submitting to an agile review process. This chapter shows how to create a governance process to manage standard reports.

Most business users reflexively dislike governance of any kind. Governance processes slow them down, undermine their effectiveness, and make it more difficult to achieve business goals, they say. Yet, without governance, self-service goes awry quickly.

For governance to work, business users must embrace it. They must see it as an incentive, not an obstacle or punishment. When that happens, report authors gain both empowerment and influence, and the business avoids data chaos. There are several ways to create governance incentives, as we'll see. Besides, governance must be lightweight and efficient: Service level agreements (SLAs) should be associated with each step in the governance process so business users know they won't be caught in a permanent IT backlog.

Without proper governance, the promised land of self-service empowerment quickly descends into hellish data chaos. The goal is to implement lightweight controls that channel

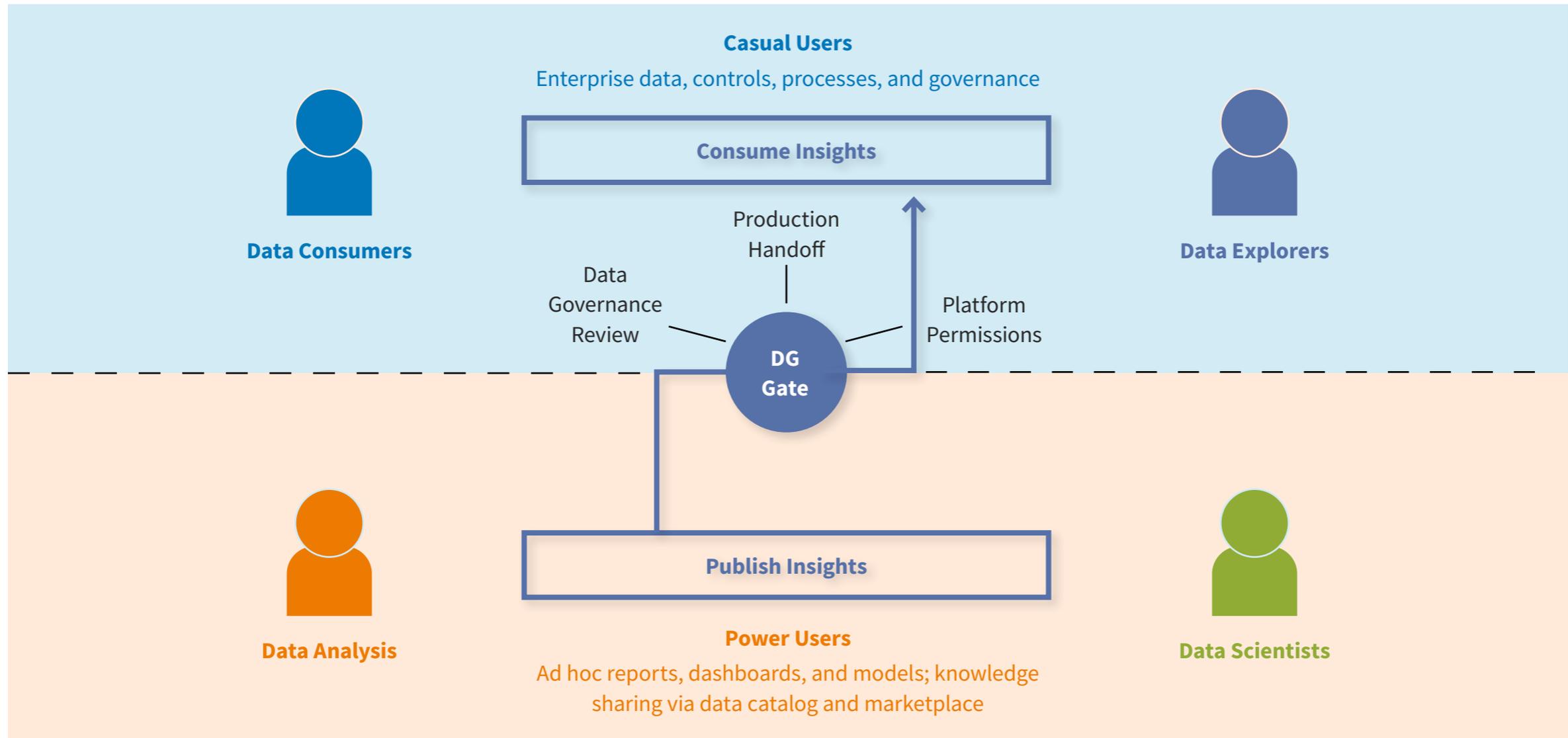
user empowerment without creating confusion and misalignment.

Report Governance

Gateway. The first step in governing self-service analytics is to establish a report governance gateway for the publication of approved standard reports for decision making. Most companies start by standardizing a dozen or so enterprise reports that executives use. Some departments also create standard reports for local consumption.

An enterprise report gateway governs the distribution of dashboards and reports created by power users for the broader community of casual users. If power users (and IT developers) want their reports consumed by the enterprise, they must submit their report (or a change to an approved report) through the gateway. Business units and departments can also establish report governance gateways for their standard reports. The gateway consists of three components: 1) a report governance

Figure 3-1. Power Users Submit Reports to Governance Review



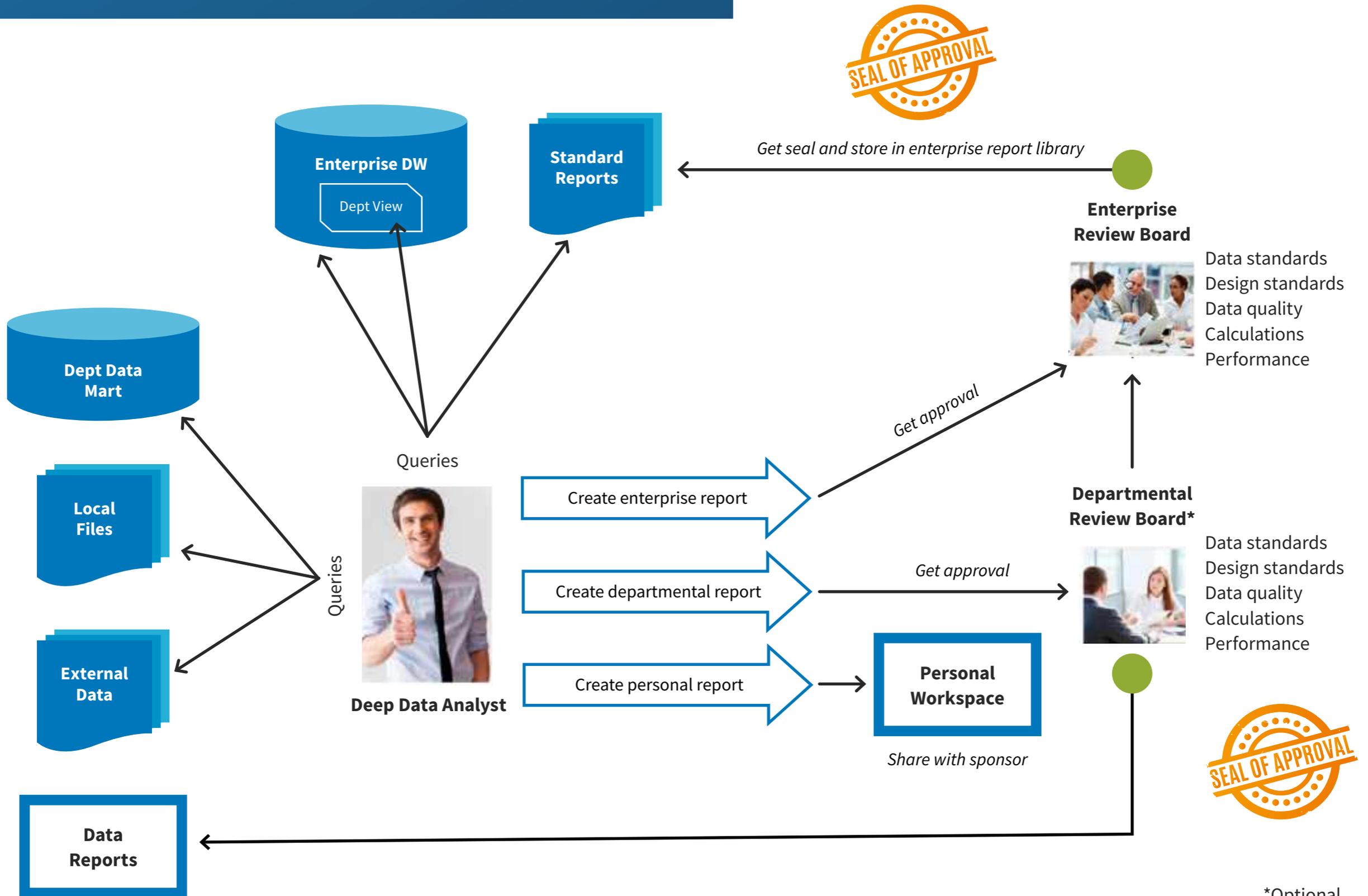
review, 2) an optional production handoff, and 3) platform permissions. (See figure 3-1.)

Report Governance Review. Power users kick off the report governance process by submitting a form that describes the new report

or requested changes to an existing standard report. Typically, the analytics director or a triage committee review the form for completeness and clarity and then passes it to a review board. With a typical SLA of 2 to 6 days, the board reviews the proposed changes for conformance

with corporate data and design standards, then passes the request to a technical sub-committee for review of the SQL code, APIs, and query performance. Once approved, the report receives a watermark or seal of approval with a time-stamp. (See figure 3-2.)

Figure 3-2. Report Governance Process



The diagram shows a generic process for governing enterprise and departmental reports. Reports that aren't governed are stored in a personal workspace and shared according to platform permissions.

Watermark. The seal of approval is the incentive that drives power users to embrace the governance process because it increases the demand for their reports. The seal is a powerful change agent that gives business users the confidence to trust the figures in the report. As one data analytics leader said, “Our watermark has changed behavior in our organization. When executives open a [self-service] report, they first look for the watermark in the bottom right corner. If it's not there, they ask why not and question the data.”

“When executives open a [self-service] report, they first look for the watermark in the bottom right corner. If it's not there, they ask why not and question the data.”

This doesn't mean that every report needs a watermark. Far from it. “Non-certified” reports serve to answer point-in-time questions or are

used by a department or workgroup outside of the governance domain. One data analytics leader described following the 80/20 rule: 80% of reports should be standard reports created or certified by the corporate BI team (or departmental teams), while 20% are non-standard reports created for ad hoc analysis.

Production Handoff. In the case that a power user submits a report in a non-standard format such as Excel, the review board decides whether the report should be rewritten in a standard format. If the new report contains data, not in the existing data warehouse or data lake, the review board again must decide whether to extend the data warehouse with new data before approving the report.

Some companies support an array of “enterprise standard” reports written in different tools and formats, while others do not. Often, the deciding factor is query performance and data security. Users won't use a standard enterprise report if it is too slow, and the IT team won't release a report if it can't protect against unauthorized data access.

Platform Permissions. The best way to govern self-service activity is to set the default mode for publishing reports to “Self Only.” This means

that business users can create or modify a report or dashboard but they can't share it with others. The creator can store the report in a personal workspace for future reference, or they can print the report and show it to colleagues. But they cannot electronically send the report to someone else until they have the authorization to do so, either permanently or on a case-by-case basis.

The best way to govern self-service activity is to set the default mode for publishing reports to “Self Only.”

Controlling permissions to hit the “send” button on a report is a key to governance, but few companies consider this until it's too late. Also, some BI tools don't support personal workspaces, which makes it impossible to shut down the report floodgates in time.

Analyst Certification

Another way to incent business users to embrace governance is to require them to demonstrate their knowledge of corporate data, standards, and tooling before receiving permission to distribute reports, a license to a self-service tool, or access to corporate data

repositories. This can be done through training courses or certification tests, or a combination. The data analytics leader quoted earlier also said, “We require our data analysts to pass two tests to get a license [to a self-service tool.]” With rights come responsibilities!

“We require our data analysts to pass two tests to get a license [to a self-service tool.]” With rights come responsibilities!

To get certified, business users should demonstrate knowledge of the company’s key metrics, filters, and hierarchies, and how they are defined and calculated, logically and in SQL. They should also be familiar with the company’s visual design standards and templates and know how to use them correctly. They should also know how to navigate the data warehouse or local data mart and use the self-service tool.

Some companies also require users to know basic SQL and statistical and numeracy concepts.

Some power users might object to certification—putting their “rights” ahead of any responsibilities—but over time the majority will see certification as a badge of honor. They will aspire to move through multiple tiers of certification to gain status, advance their careers, and perform rewarding work. This quickly becomes a self-reinforcing cycle as business users who have achieved “status” motivate others to do likewise.

Over time the majority will see certification as a badge of honor.

Self-service analytics without governance is a disaster in the making. But governance without empowerment is a bureaucratic nightmare. To balance the two, companies

need to turn governance into an incentive that business users embrace because they get something they want—a seal of approval or access to a self-service tool or data.

Summary

Companies that want to succeed with self-service analytics need to abide by two mantras:

- 1. Trust but verify.** To get a seal of approval, go through the report governance gateway.
- 2. With rights come responsibilities.** To get a self-service license and access to data, demonstrate knowledge of corporate data and visualization standards.

Report governance won’t work without supporting teams and technology. The next chapter reviews the types of committees, teams, technology, and tools required to support self-service analytics.

Chapter 4: The Federated Organization and Push-Down Development

Self-service analytics requires the right people in the right roles doing the right things. But that requires a carefully crafted organizational model. This chapter shows how to coordinate corporate and distributed resources to support business users and ensure the data needs are met.

Having the right standards and governance processes is critical to self-service analytics, as we discovered in the prior chapter. But just as important are the teams and people who execute those processes. Self-service analytics requires a carefully crafted federated organizational model with strong oversight and distributed development.

Having the right people in the right roles doing the right things throughout an organization enables organizations to “push down” development and support from the corporate team to embedded local developers and business users. But this push-down strategy only works if there is also a well-planned and highly choreographed process at the corporate level for promoting and prioritizing requests that are either too small or too big for local resources to handle.

It also requires cross-functional oversight of the enterprise program to ensure that all voices

are recognized and heard, all needs are scoped and prioritized, and everyone uses the same standards and governance processes. As you can see, self-service analytics has a lot of moving parts—it requires a leader with the skills of a circus juggler to keep all the plates spinning without any crashing to the ground.

Oversight Committees

At many companies, each business unit or department acts as its own arbiter of data and technology standards and is responsible for communicating those standards, approaches, and practices to workers and educating them. Not surprisingly, this decentralized approach creates data chaos and silos that undermine data consistency and process effectiveness at the enterprise level. Once disconnected teams experience enough data pain, they recognize the need for centralized governance.

Table 4-1. Governance Processes Required to Support Self-Service Analytics

Once disconnected teams experience enough data pain, they recognize the need for centralized governance.

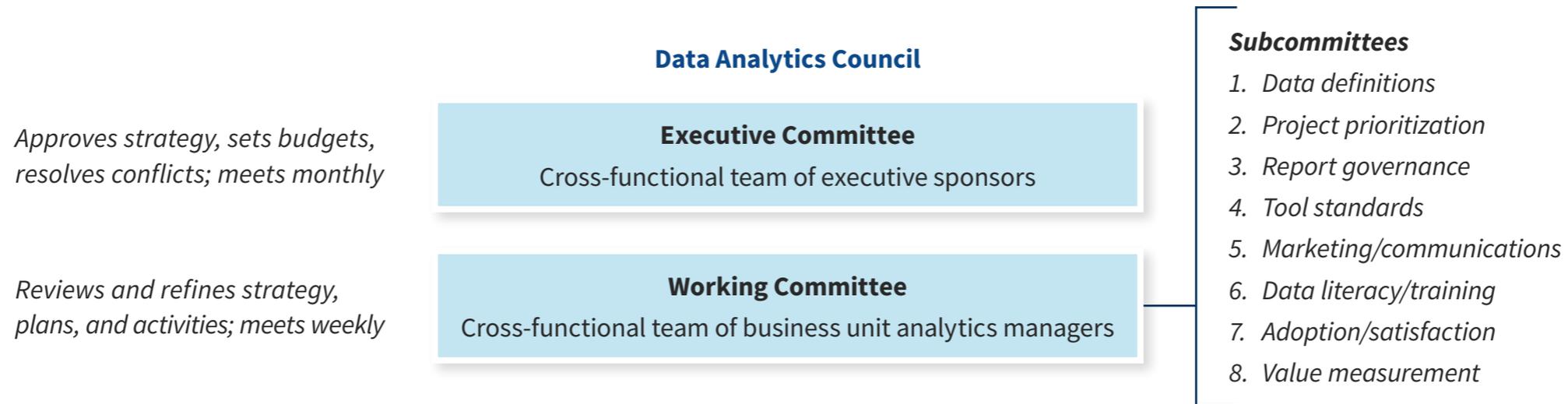
FORMAL PROCESSES	DESCRIPTION
Standardize data definitions	Define, document, and manage the definition of key data elements.
Govern reports	Review and certify new enterprise reports and changes to existing certified reports.
Govern algorithms	Review and certify new algorithms, monitor the accuracy of production algorithms, and certify changes to existing algorithms.
Manage data security	Define, document, manage, and enforce data privacy and security policies.
Prioritize projects	Prioritize business requests for new applications, features, and functions as well as changes to existing solutions. (See “Project Management” in this chapter.)
Standardize tools	Establish tool standards that the corporate team will use to develop enterprise applications and administer.
Foster data literacy	Create training and support programs designed to improve data literacy among rank-and-file employees.
Increase awareness	Develop marketing and communications campaigns to raise awareness of data and analytics and drive the adoption of new capabilities.

Data Analytics Council. To tame the chaos, representatives from each department join forces—often at the request of the head of the corporate data analytics (CDA) team. This grassroots group forms the core of a Data Analytics Council—an enterprise oversight committee that serves as a board of directors for data analytics. It manages one or more of the formal processes listed in table 4-1, with direction and support from a chief data officer or VP of data analytics.

The Data Analytics Council usually consists of a working committee composed of analytics managers from each business unit and an executive committee consisting of business sponsors. The working committee is the workhorse of the council since it’s comprised of analytics managers who experience the “pain of bad data” every day. (See figure 4-1.)

A working committee may have subcommittees that tackle various governance processes, such as reviewing and approving data definitions, prioritizing projects, governing reports,

Figure 4-1. Data Analytics Council Composition and Responsibilities



governing analytics, setting tools standards, and creating a data literacy or training program, among other things. Sometimes, independent groups manage these processes, such as a data governance committee or prioritization board. For example, the Data Analytics Council may define terms critical for analytical processes and pass them to the enterprise Data Governance Committee for consideration.

Informal Processes

To take root and flourish, self-service analytics also requires informal processes. Here,

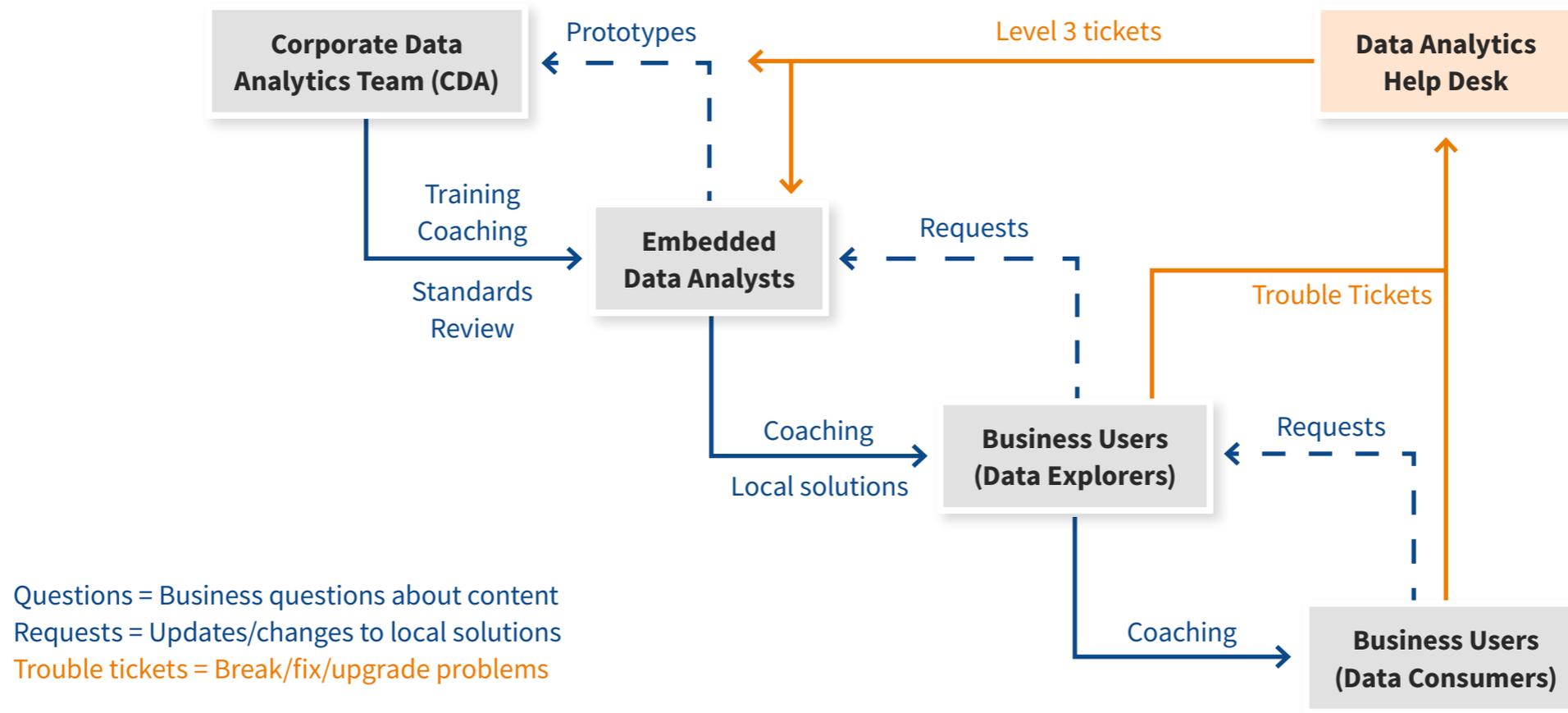
knowledge trickles down, while requests trickle up.

Trickle Down. The CDA team trains and coaches embedded data analysts residing in business units. (In the ideal scenario, it also hires and evaluates the performance of those data analysts even though they report to a business unit head. See **“The Modern Data Analytics Organization: Federating the Center of Excellence.”**) To support the embedded analysts, the corporate team may hold office hours for one-on-one meetings. The corporate

team may also run data labs where analysts can work on their code with the help of a corporate specialist. The corporate team may also help organize a community of practice for embedded data analysts to network regularly.

From there, knowledge continues to trickle down in a step-ladder manner. Embedded data analysts build local solutions (i.e., dashboards) for their department and coach data-savvy business users to customize existing reports (i.e., data explorers). In turn, data explorers coach data consumers on how to use their data

Figure 4-2. In a Federated Organization, Support Trickles Down and Requests Trickle Up



analytics tools and gain more value. (See figure 4-2.)

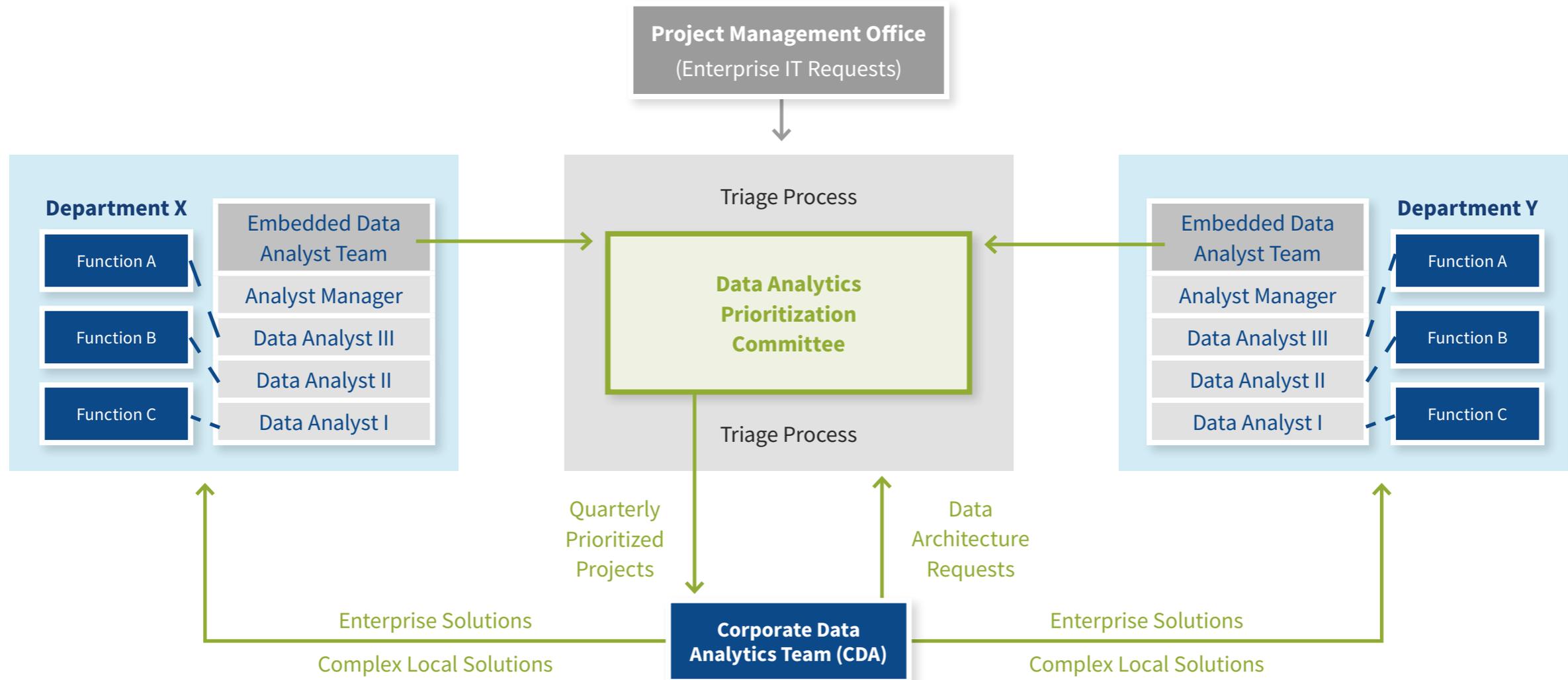
Trickle Up. While coaching and support trickle-down, requests trickle up. Data consumers send their questions about the data or requests for new features to data explorers, who address them if possible. In turn, the data explorers

relay their questions and requests to data analysts—their local data experts—who may build a quick solution, or prototype a more complex one and show it to specialists on the CDA team. (See figure 4-2.)

At the same time, business users submit trouble tickets to a data analytics help desk

using a form that triages the request. The help desk is designed to handle break-fix issues and small or simple requests. It is staffed by entry-level managers or support specialists. Larger requests or enhancements are forwarded to the corporate prioritization committee via a formal submission process. (See below.)

Figure 4-3. Project Request Pathways



Project Management

A data analytics prioritization committee is the focal point for handling larger requests that exceed a certain threshold, say projects exceeding \$100,000 or three months in length. The committee scopes, triages, and ranks

requests, and maps them to the available development capacity of the corporate development team. Typically, a project manager works with business leads to triage requests, estimating complexity, duration, and skill requirements. A robust triage process enables the prioritization committee to know

exactly how many requests it can fulfill in the quarterly development cycle.

Request Pathways

Project requests may come from departments, the corporate PMO, and the CDA team itself.

The Help Desk may also forward requests that are beyond its ken to handle.

Departmental Requests. Within each department, an analytics manager coordinates a team of data analysts. The manager scopes, consolidates, and prioritizes requests from business unit leaders, managers, and staff and assigns them to the appropriate analyst. However, if the request is too large or complex for the local data analyst team, the manager submits the request to the data analytics prioritization committee. (See figure 4-3.)

Each departmental analyst is aligned with a specific function or team but may also work on requests in other functions, depending on availability, skill level, and domain knowledge. Data analysts are divided into job classification tiers based on their ability, experience, and domain knowledge. Departments will have a different mix of analysts based on their data analytics maturity.

Corporate PMO Requests. The prioritization committee also fields requests from the enterprise PMO and the CDA team. The PMO specifies data analytics work in large enterprise IT projects, such as the implementation of a new enterprise resource planning application

or a cloud migration project. This work might entail building event streaming pipelines or moving a data warehouse to a public cloud platform.

CDA Requests. The CDA team submits projects that involve enhancing the data infrastructure, whether adding new sources to the data warehouse, automating data pipelines or building subject-area models to support specific departments or corporate processes. Often these “internal” requests get crowded out by urgent corporate PMO and departmental requests, sacrificing the long-term health of the organization’s data infrastructure. To avoid this problem, CDA organizations may dedicate a team to handle this work.

Resource Allocation

To make this top-down request model work, it’s critical that the CDA team and embedded data analyst teams—allocate a specific percentage of their time to each request pathway. (See tables 4-2 and 4-3.)

This manner of allocating resources requires that each team to accurately estimates its development capacity. Teams that apply DataOps practices know how to do this. (See “Best Practices in DataOps: How to Create

[Robust Data Pipelines.](#)”) Without an accurate estimate, teams fall behind schedule and create a perpetual backlog.

Developer Allocation. It is also helpful if individual developers—both corporate and embedded—allocate a fixed percentage of their time to various request pathways, depending on their skills and assignments.

For example, at the departmental level, embedded analysts might reserve 60% of their time to work on departmental projects, 10% for help desk tickets, and 10% for corporate data infrastructure projects that affect the department. Also, to encourage innovation, many companies allow developers—both corporate and embedded—to spend one day a week (20%) working on self-directed projects that will benefit the company and advance their skills.

At the corporate level, developers are more likely to be assigned to teams dedicated to different request pathways, with the option to rotate teams after one or two years. For instance, the CDA might create a dedicated help desk to address small requests, an operational reporting team to handle operational requests, a cross-functional “SWAT” team to build departmental solutions quickly, and an architecture team to extend the data infrastructure.

Table 4-2. Embedded Analyst Team

REQUEST PATHWAYS	ALLOCATION
Departmental Requests	60%
CDA Help Desk	10%
CDA Enterprise Projects	10%
Self-Directed	20%
TOTAL	100%

Table 4-3. CDA Team

REQUEST PATHWAYS	ALLOCATION
Departmental Requests	30%
Project Management Office	20%
CDA Help Desk	10%
CDA Enterprise Projects	20%
Self-Directed	20%
TOTAL	100%

Summary

Self-service analytics requires a federated, business-driven organization led by strong and enlightened leaders who excel at communicating across departmental and corporate boundaries. Ultimately, it’s an exercise in push-down development that offloads a significant degree of analytics and support work from a corporate team to local data analysts.

But a federated model requires significant coordination, cooperation, and planning among corporate and departmental teams. The CDA team needs a robust team of data and analytics specialists to assist local teams, build enterprise applications and data infrastructure, and maintain a help desk. It also requires strong oversight committees, including a prioritization process for managing top-down project requests.



Chapter 5: Tools and Technologies

Technology plays a critical role in making self-service a reality. The advent of AI-infused products have changed the equation for self-service analytics.

So far in this series, we’ve focused on the importance of governance processes and organizational models to achieve success with self-service analytics. But tools and technologies also play an important role.

For decades, software vendors proclaimed the dawning of the era of self-service analytics. The reality has rarely matched the hype. Data analytics products have always been harder to configure and use than most users anticipate. But now that’s changed.

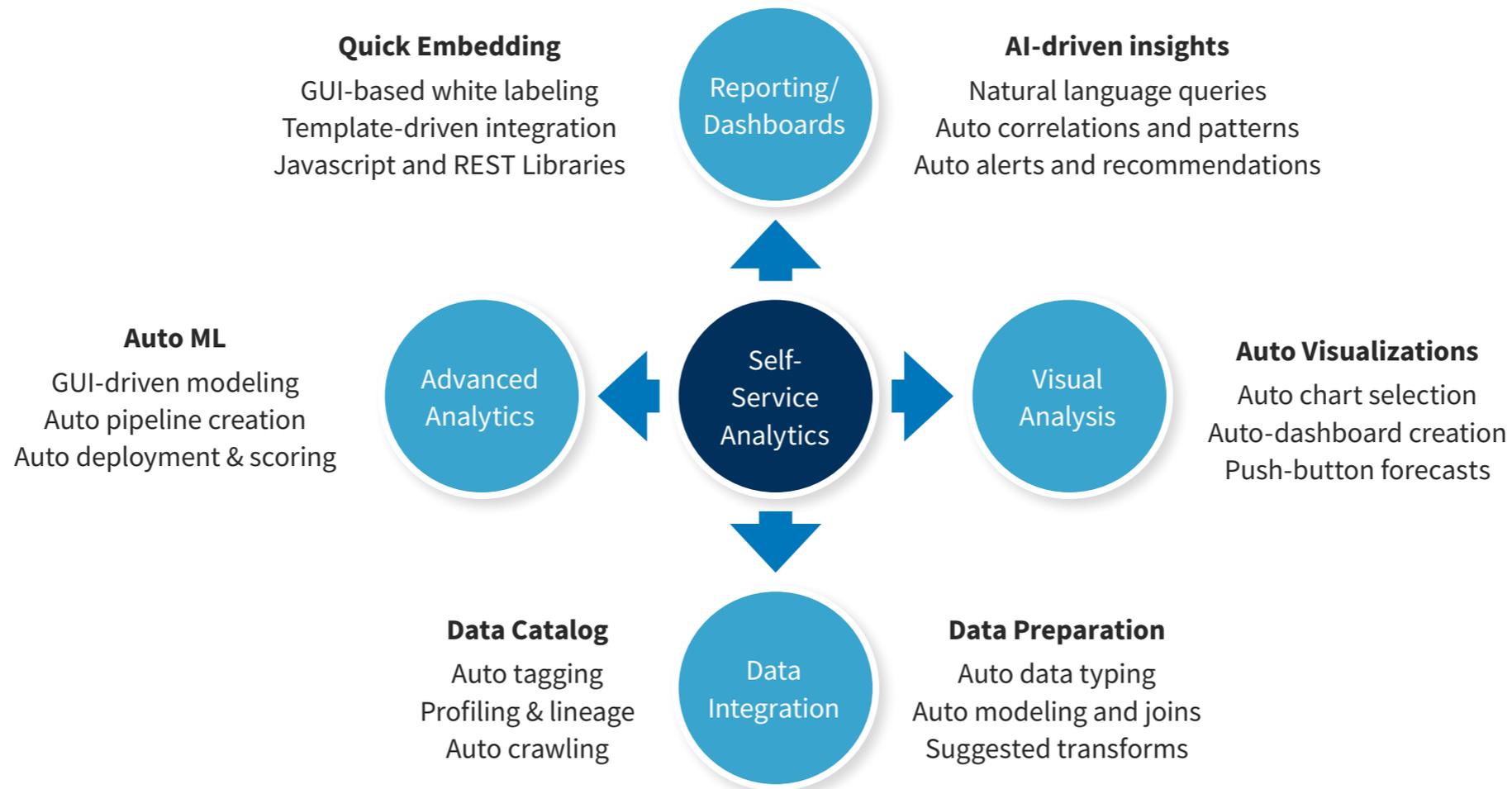
The advent of machine learning (ML) has dramatically changed the equation for self-service analytics. ML has made data and analytics tools both more powerful and easier to use for a wide spectrum of users, automating tasks that once took one or more experts to accomplish. These tools turn business users into citizen data analysts, and data analysts into citizen data scientists and data engineers.

The advent of machine learning has dramatically changed the equation for self-service analytics.

Self-service tools have permeated every aspect of data analytics. Both casual and power users have benefitted. (See figure 1.)

Casual User Tools. Data consumers now have AI-powered reporting and dashboard tools that automatically generate analyses in the background, displaying the most relevant relationships, including correlations, anomalies, and trends detected in a selected chart, dashboard, or data set. Data explorers can now generate natural language queries by speaking or writing words into a search box as a way to kickstart an analysis. They also can create dashboards by pinning the results to a display. (For more information about these types of tools, see “AI is the New BI: How Algorithms are Transforming Business Intelligence and Analytics”.)

Figure 5-1. The Spectrum of AI-Powered Data Analytics Tools



For casual users, these AI-infused tools are like having a personal data analyst in their pocket.

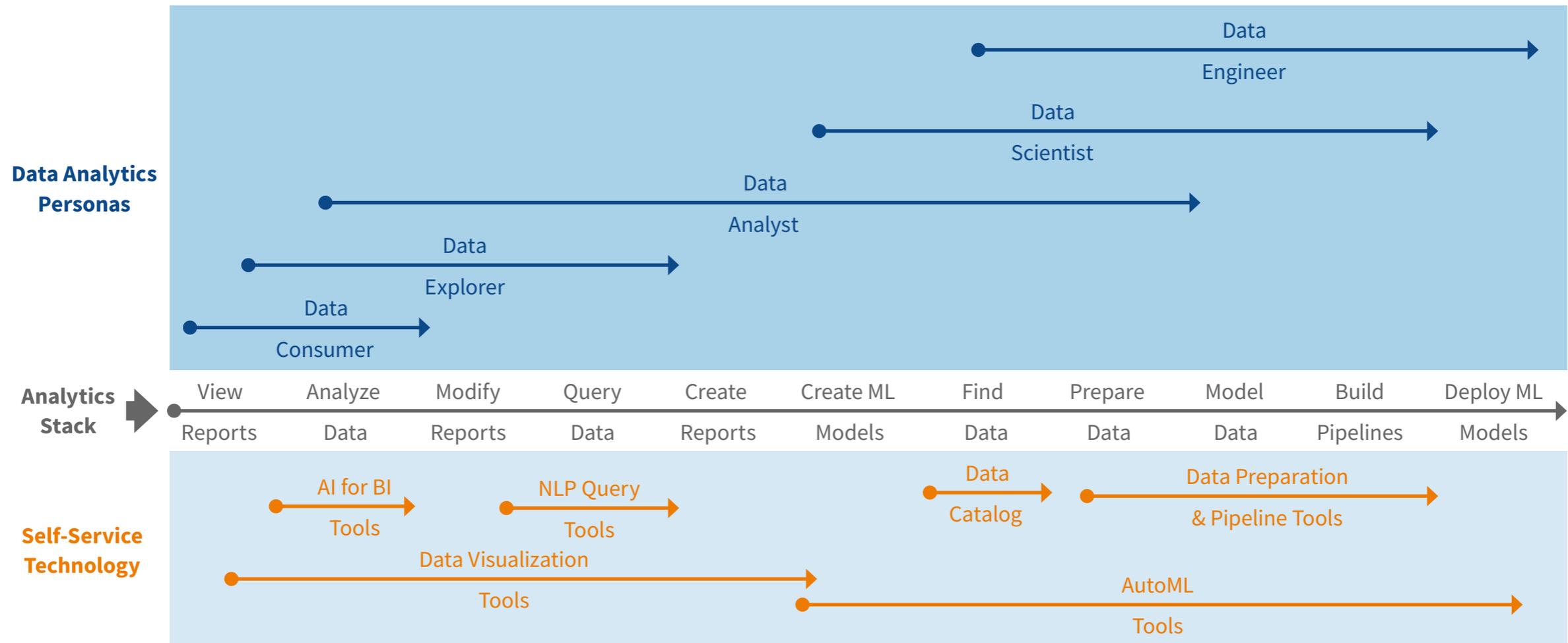
They enable casual users to take on some of the functions of a data analyst, allowing data analysts to focus on more complex business problems.

Power User Tools. Power users are perhaps the biggest beneficiaries of the self-service movement. In the past, power users relied on the IT department for data, and when that took too long, they used Excel and Access to query databases and stitch together the information into a report. The process was cumbersome

and time-consuming and left little time for analysis.

Today, self-service tools empower data analysts to do the work formerly done by BI developers, data engineers, data scientists and application developers. For instance, data catalogs enable

Figure 5-2. AI Technology Expands the Range of Self-Service Capabilities



data analysts to find, profile and annotate relevant data sets. New data preparation tools make it easy to combine data sources, clean and transform data, and share these workflows with others. And new visual analysis tools make it easy for data analysts to query data, visualize and analyze the results, compile into a dashboard, and publish for others to consume.

(See “[Self-Service Triumvirate: The New Data Analyst Workbench](#).”)

Data analysts who aspire to become data scientists now have self-service tools that make it easy to build predictive and prescriptive models. These so-called AutoML tools provide a cloud-based, graphical environment for

building and deploying machine learning models, including automated data prep, feature generation, and model-build selection. The tools profile a data set, automatically select algorithms to test and apply the appropriate data preparation routines for each selected algorithm. Most come with built-in APIs to

score the models against production data and monitor the results over time.

Finally, data analysts can embed charts, tables, and an entire self-service environment into other applications (e.g., portals, cloud applications, custom or mobile applications) with new “low-code” or “no code” tools. They can also white-label a data analytics tool using a point-and-click interface or by configuring cascading style sheets.

Self-Service Shifts

The advent of powerful new self-service tools is shifting what business and technical users can do with data. Soon, this shift will turn into an expectation written into job descriptions and performance reviews. (See figure 2.)

For example, data consumers will be expected to query and analyze data and modify dashboards thanks to new AI-enabled BI tools. Data explorers will be expected to create new dashboards or modify analytics applications with new queries. Data analysts will reallocate time currently spent finding and preparing data to more value-added activities, such as analyzing data and creating lightweight ML models, thanks to a host of tools mentioned above. Data scientists will create their own data

pipelines and deploy models into production thanks to codeless data pipelining tools. And data engineers will focus more time building a robust, self-service oriented enterprise data platform rather than creating data pipelines for data analysts and data scientists.

The Impact of a Self-Service Data Platform

The most impactful way organizations can facilitate self-service analytics is to build a robust data platform that provides domain-specific data sets and is geared to empower

business and technical users. As a data platform becomes more robust, business users and technical developers become more self-sufficient. They do more work themselves without the help from an upstream specialist. This frees up resources to focus on more value-added activities. (See figure 3.)

As a data platform supports more shared metrics and domain models, the more self-sufficient business and technical users become.

Data Refinery. A self-service platform provides appropriate access points for each type of

Figure 5-3. Self-Service Increases as a Data Platform Matures

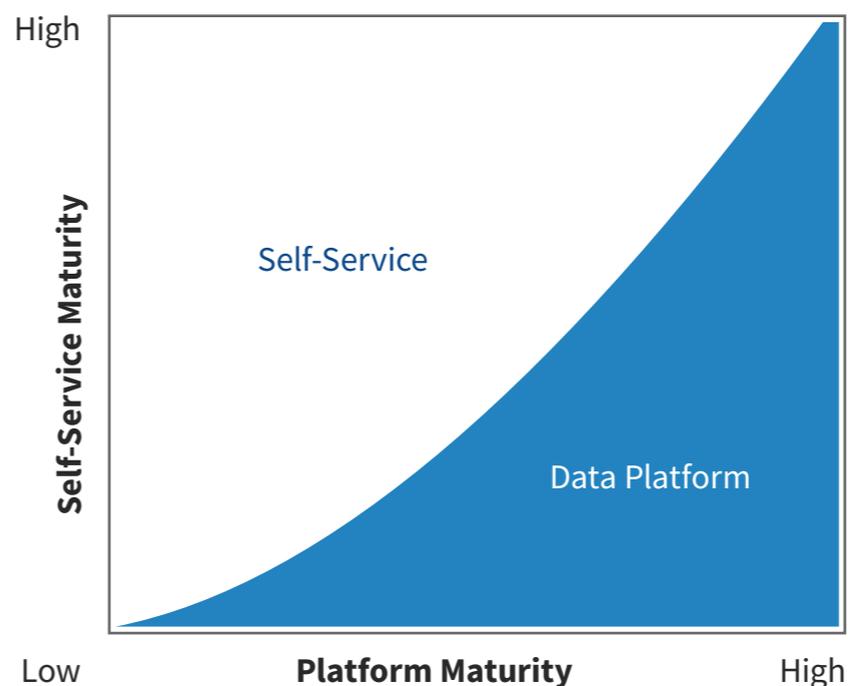
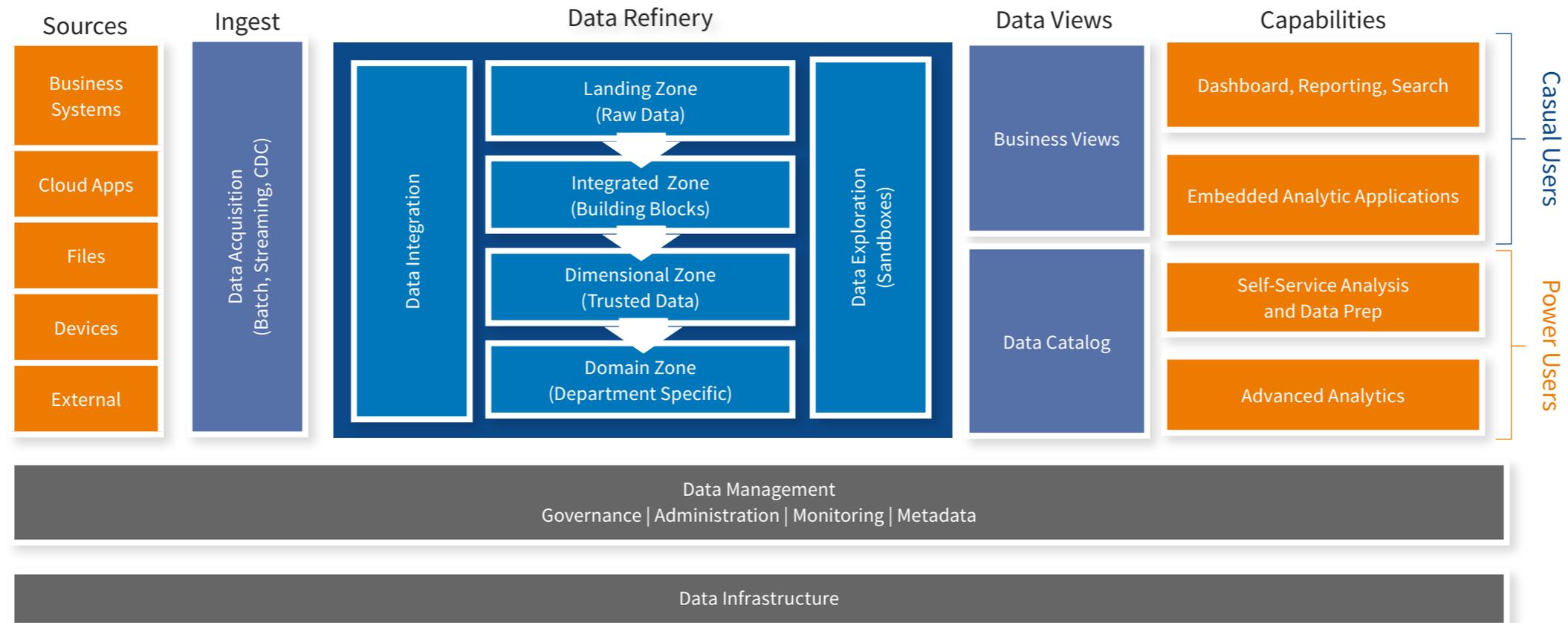


Figure 4. Modern Data Architecture with a Data Refinery



business and technical user. To do this, the data team creates a “data refinery” that transforms raw data into various types of assets. The landing zone contains raw data extracted from a host of sources; the integrated zone combines data into flat, subject-area

building blocks; a dimensional zone converts that data into a dimensional model with conformed dimensions and trusted data; and a domain zone creates a department-specific view of data pulled from the other three zones. (See figure 4.)

Business users armed with dashboards, reports, analytic applications, and AI-based search tools access data through specially crafted business views that run against data in the refinery. Power users equipped with a bevy of self-service tools and appropriate

permissions use a data catalog to find appropriate data in the refinery, a sandbox to explore that data, and data prep tools to extract and transform the data into custom data sets for analysis. A well-designed data platform makes self-service tools more powerful and users more productive.

Summary

Technology plays a critical role in making self-service a reality. The advent of AI-infused products has changed the equation for self-service analytics. As powerful as new products are, organizations need to first implement governance processes and appropriate

organizational models before turning to technology. Then, they can reap huge benefits from tailored deployment of self-service tools, technology, and data platforms.



Conclusion: Self-Service Success

Self-service analytics requires an intricate dance that blends user empowerment and corporate governance. Balancing these dueling forces requires a business-driven, federated organization, a refined user classification model, agile governance processes, and enlightened leadership.

On one hand, organizations need to push down as much development and support as possible to empower business users to meet

their data and analytics needs. On the other, they need to create top-down governance and prioritization processes to ensure business and data alignment.

Establishing a federated organization that balances empowerment and governance is not easy, but the upshot is powerful: Organizations can turbo-charge their productivity while better aligning with corporate and business unit strategies and goals.

About the Author



Wayne W. Eckerson has been a thought leader in the data and analytics field since the early 1990s. He is a sought-after consultant, noted speaker, and expert educator who thinks critically, writes clearly and presents persuasively about complex topics. Eckerson has conducted many groundbreaking research studies, chaired numerous conferences, written two widely read books on performance dashboards and analytics, and consulted on BI, analytics, and data management topics for numerous organizations. Eckerson is the founder and principal consultant of Eckerson Group.



About Eckerson Group



Wayne Eckerson, a globally-known author, speaker, and advisor, formed **Eckerson Group** to help organizations get more value from data and analytics. His goal is to provide organizations with expert guidance during every step of their data journey.

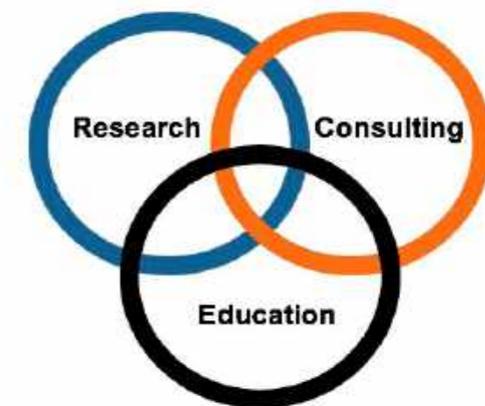
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