

2022 Analytics Maturity Assessment

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OVERVIEW

Analytics maturity is a journey toward using analytics in the decision-making processes throughout an organization to validate business decisions and outcomes with data. As an industry, utilities are steadily traveling forward on that road. Some utilities are forging their way ahead to blaze a trail, but they continue to harvest insights being collected by member utilities that are progressing at a slower pace.

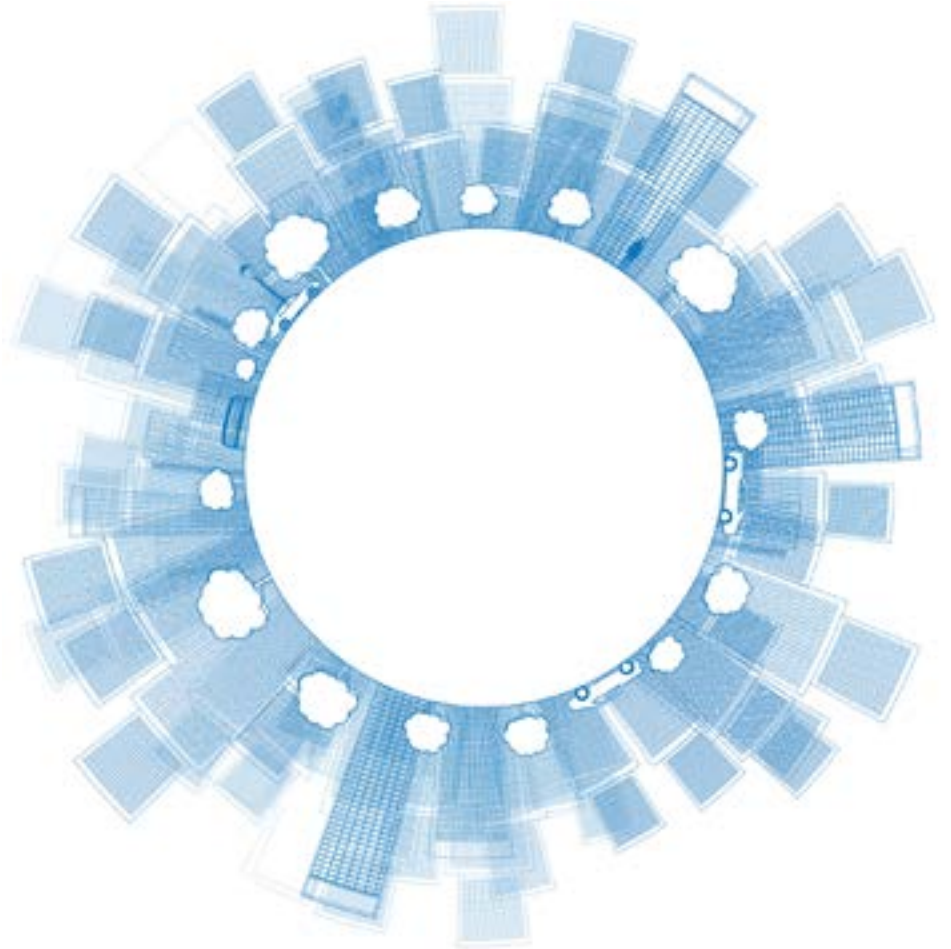
UAI partners with the UAI Executive Advisory Council (EAC) and UAI staff to develop and conduct an Analytics Maturity Assessment (AMA) biennially for member utilities to track their progress along the path to analytics maturity. In total, 36 UAI members participated in the 2022 assessment, with 18 returning respondents. Data was gathered and analyzed between Q1 2022 and Q1 2023.

CONFIDENTIALITY

All survey information is confidential and will be shared only with the explicit permission of each utility's EAC representative(s) on a case-by-case basis. All other shared information is aggregated, and the identity of individual utilities will remain anonymous.

ABOUT UAI

Utility Analytics Institute (UAI) is a utility-led membership organization that provides support to the industry to advance the analytics profession and utility organizations of all types, sizes, and analytics maturity levels, as well as analytics professionals throughout every phase of their career. UAI membership includes over 100 utilities and utility agencies across North America and influential market leaders in the utility analytics industry. This community of analysts shares experiences and insights to learn from each other as well as other industries.



METHODOLOGY

The AMA is a self-assessment tool. As with any self-assessment, the results reflect the judgment and opinions of the individuals completing the survey. UAI analyzes, assembles, and publishes the findings for its members. This self-assessment enables each participating utility to compare its current level on the analytics maturity curve overall and across seven dimensions (Strategy, People, Analytics Governance, Data Governance, Business Process Integration, Analytics Capabilities, and Technology & Tools) to that of other participating members.



A set of questions was developed for each dimension, with points weighted based on response options. The minimum, maximum, and average scores are shown for each domain (Leadership and Technical Competency) as well as the total score. A four-quadrant model depicts the AMA scores of participating utilities across the two domains (see the Q-chart below).

Each dimension has a maximum of 1,000 points except for People, which has a maximum of 1,500 points. A total of 7,500 points are available in the assessment, with Leadership having a maximum of 4,500 points and Technical Competency a maximum of 3,000 points.

Leadership



Strategy – the degree to which a utility has defined, developed, and implemented an enterprise analytics strategy.



People – the development and success of the organizational model that supports enterprise analytics.



Analytics Governance – the capability of a utility to create and manage analytics processes, policies, and information.



Data Governance – the overall management of the availability, usability, integrity, and security of data used in an enterprise, including metadata management.

Technical Competency



Business Process Integration – the degree to which data and analytics drive business processes and inform key performance indicators (KPIs).



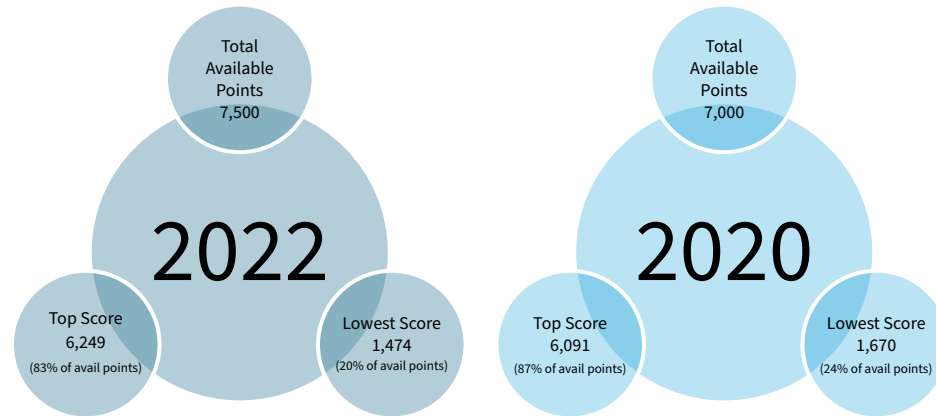
Analytics Capabilities – the current and anticipated capabilities of different business groups to apply basic-to-advanced analytics.



Technology & Tools – the ability to procure the appropriate tools and technologies, and the management of analytics technology adoption across different business groups.

RESULTS

The overall scores from the 2022 AMA are lower than scores from the 2020 AMA. It might appear we have taken a step backward, but a deeper dive brings clarity. Though a good representation of the member population, the year-over-year comparison is not exact because some of the survey respondents differed, with 50% of the 2020 AMA survey participants returning to complete the 2022 survey.



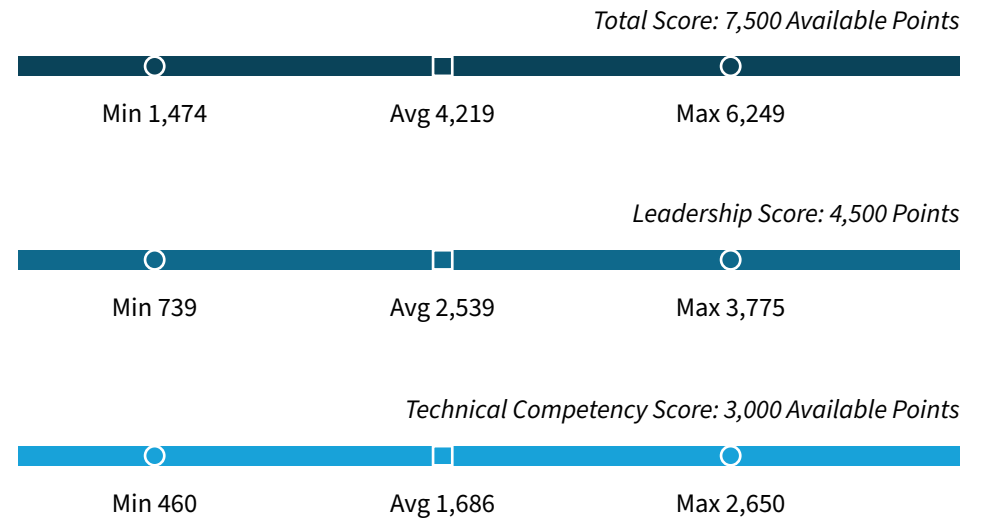
Though it appears the top and lowest scores decreased year over year in the overall grade, keep two things in mind: 1) the total available points increased from 7,000 in 2020 to 7,500 in 2022, and 2) half of the participants in 2022 changed. Taking the change in total available points into consideration, on average, members who completed the survey both years increased their total score by 10% in 2022. One utility increased its total score 53%, while multiple other utilities increased either their Leadership or Technical Competency score over 60% from the prior survey. The percentage increase or decrease was calculated as:

$$\frac{(2022 \text{ Total Points} \div 2022 \text{ Total Available Points}) - (2020 \text{ Total Points} \div 2020 \text{ Total Available Points})}{(2020 \text{ Total Points} \div 2020 \text{ Total Available Points})}$$

An examination of the results for each dimension is outlined in the following sections. Comments are paraphrased where appropriate.

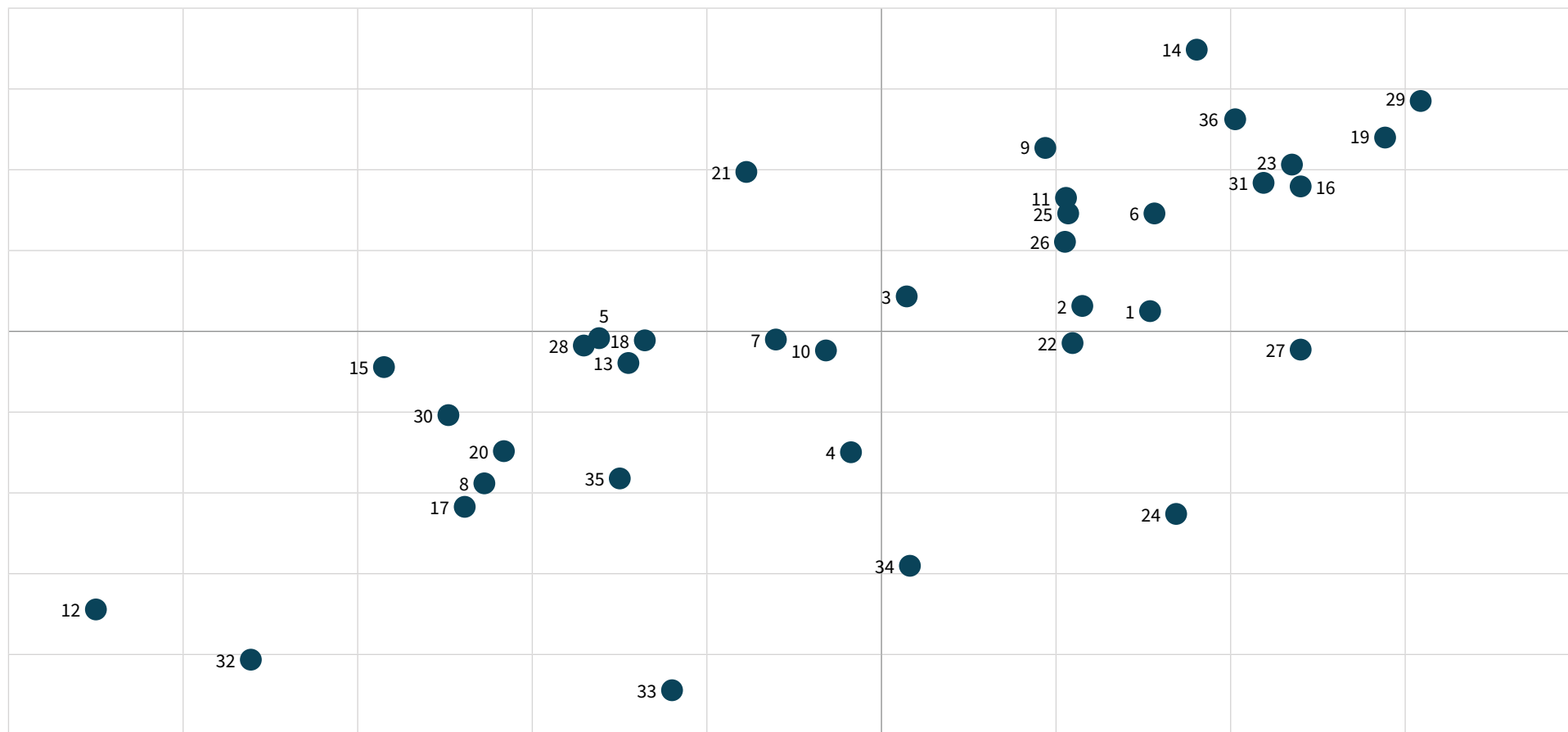
2022 Analytics Maturity Assessment

Range of Scores



Quadrant 3

Quadrant 4



Quadrant 2

Quadrant 1

2022 Analytics Maturity Assessment by Quadrant

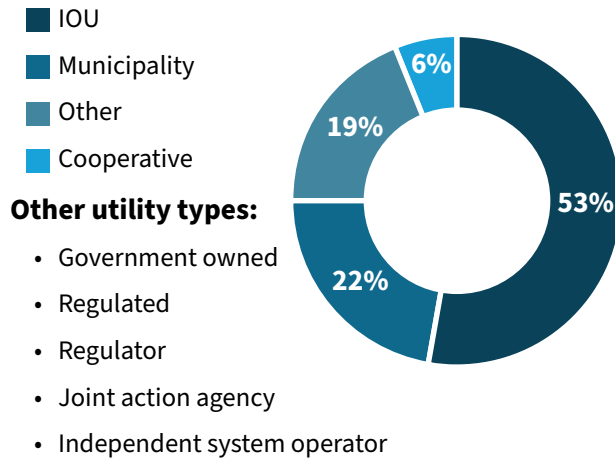
Though individual scores remain anonymous, each participating utility was assigned a number and can rank their scores against their peers using the Q-chart. The number beside each marker represents an individual utility. Participants whose combination of

Technical Competency and Leadership scores lands within Quadrant 4 are invited into the AMA Top Quadrant Community, which meets quarterly to share information, exchange knowledge, and help each other continue to move up the analytics value curve.

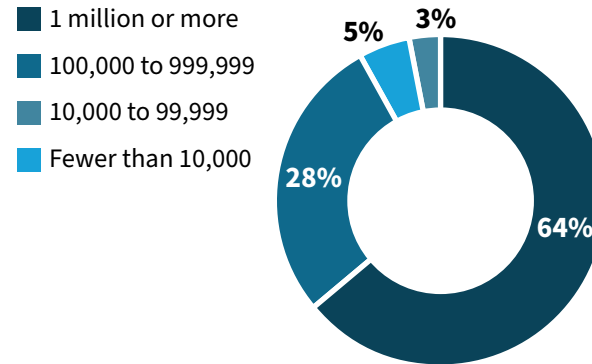
DEMOGRAPHICS

(Questions 1 - 7)

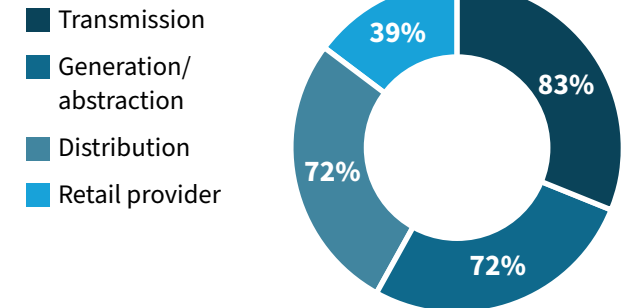
What type of utility do you work for?



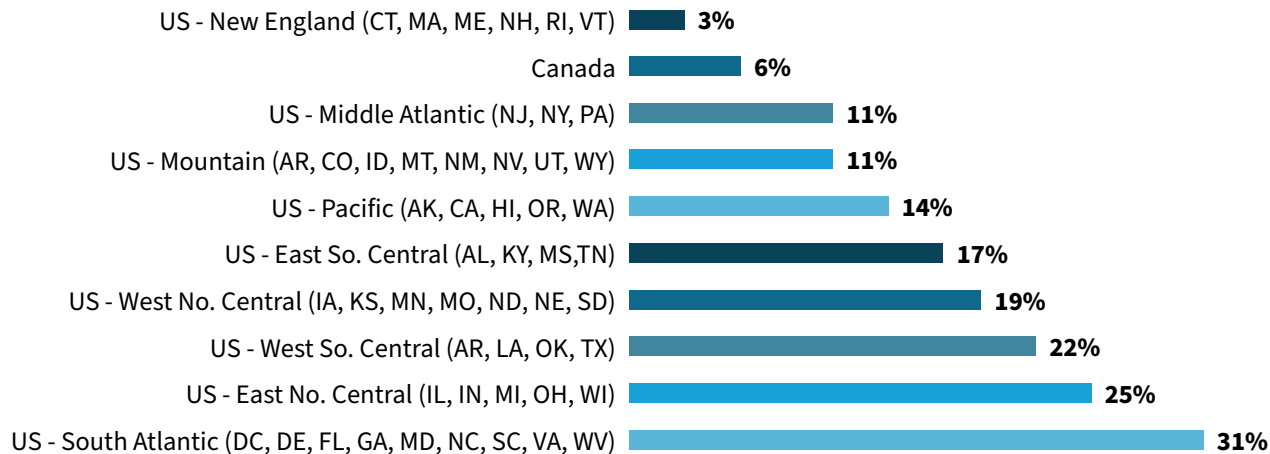
Number of Customers



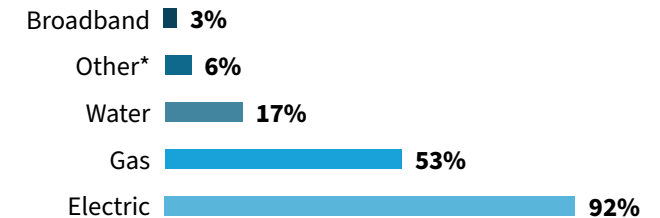
What electric services does your utility offer?



Which region(s) does your utility serve?* All participants are in North America



What services does your utility offer?



*Other services:

- System balancing operations
- Transit
- Regulator

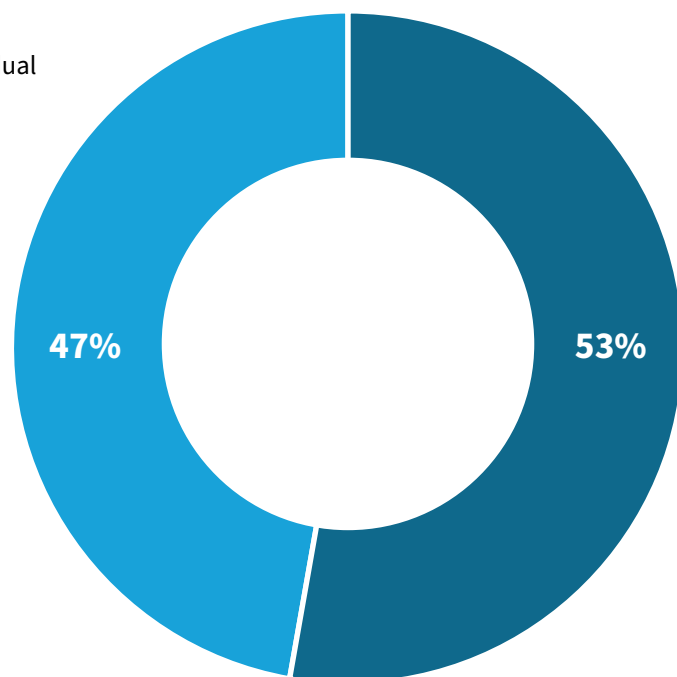
PARTICIPANT INFORMATION

(Question 58)

A team approach to the AMA survey can deliver a more accurate assessment of the analytics maturity of an organization than an individual response can produce. While the analytics team is a major contributor to the responses, a team with a representative from each functional group can provide a 360-degree view of the data and analytics roles across the organization and generate an opportunity for discussion, adoption, and cross-functional collaboration on data-driven decision-making across the utility, manifesting in increased analytics maturity.

Please tell us how this survey was completed.

- Team
- Individual



Please type the role(s) of the individual(s) who worked on this survey.



STRATEGY

Analytics maturity is a journey. We would be unlikely to start off on a journey without a purpose and destination, or at least a direction, in mind. Otherwise, we would deplete resources and risk losing the confidence and ability to continue the journey. We would determine our route ahead of time, estimate arrival time, identify potential delays, and use modern tools to stay on course. If we had travel partners, we would confer with them about details to ensure we agree. We refer to that purpose and direction as a plan, or strategy.

Data strategy starts with recognizing and treating data as an asset in much the same way we would tangible or financial assets:

- We acquire assets to provide an economic benefit.
- We purchase inventory, real estate, stocks, and bonds with the expectation they will increase in value.
- Tools and equipment are bought with the expectation of reducing the time needed to complete a job, increasing accuracy, maintaining safe conditions and providing new capabilities.

We gather data to measure the output from tangible assets, apply the associated costs, calculate profits, and invoice to recover those costs and profits.



Data is utilized to meet regulatory or customer requirements, inform investors, inspire trust, and promote products and services.



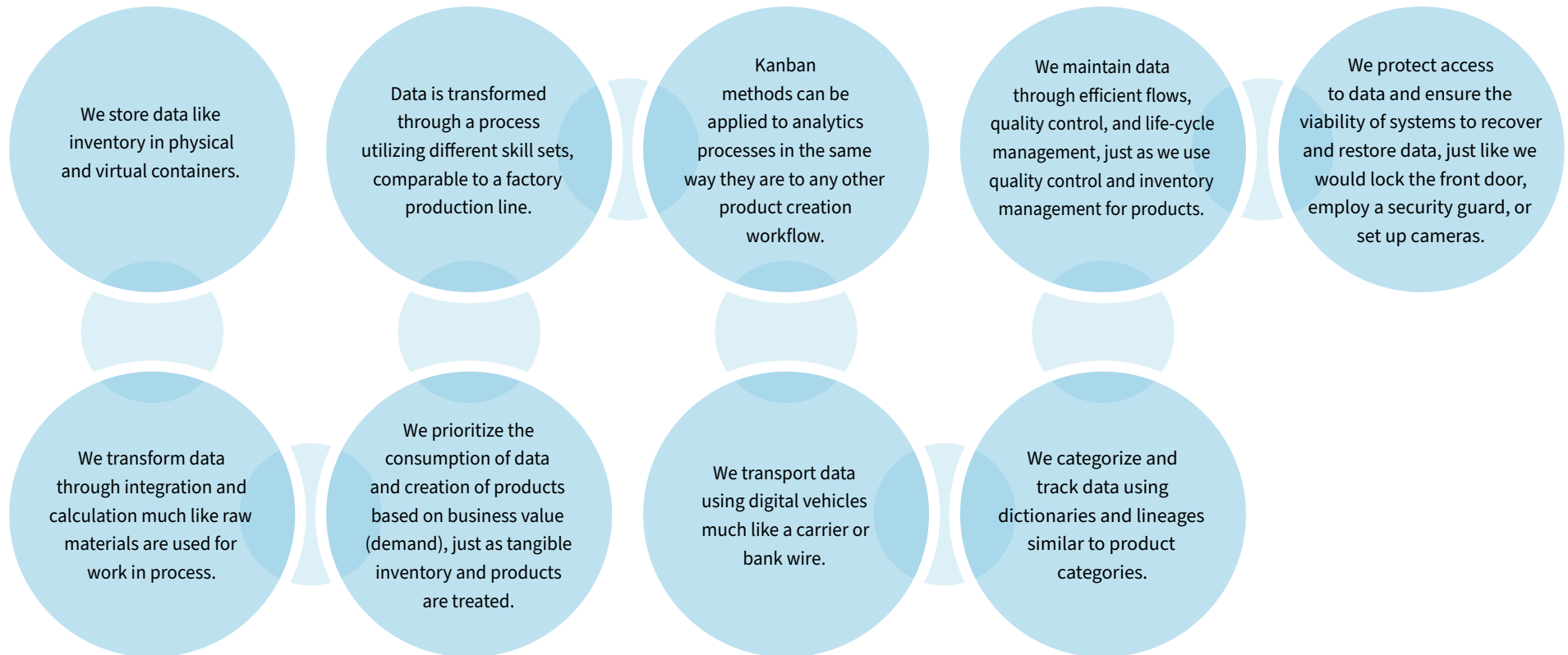
Data is transported, much like inventory or equipment, to assist with or complete a task or project.

The value of physical assets is realized through the data created when being used. Analytics extends the value of the tangible assets we employ by using the data generated by its usage to identify opportunities and risks, enhance problem-solving capabilities,

and accelerate process improvements. Data that is gathered, manipulated, and applied creates business value, also known as economic benefit, and we can draw a parallel between how we treat data and tangible and financial assets.



Commonalities between physical assets and data assets



Observations: Questions 8-13

- There was a dramatic increase from 27% of respondents in 2020 to 67% in 2022 who indicated their analytics strategy has a substantial and direct linkage to their organization's overall vision and mission.
- Utilities indicating a formalized practice to treat data as an asset scored 25% higher on average than those utilities that did not.
- While 20% of utilities have a robust analytics strategy defined, another 47% have development well underway. However, implementation of the strategy highlights an anomaly between the 2020 and 2022 survey responses. In 2020, 100% of utilities indicated the implementation of their strategy was well underway. Since 18 of those utilities took the current survey, we would expect at least 50% of the utilities to either have implementation still well underway or fully implemented in 2022. Instead, only 44% indicated they meet that status.

Recommendations



PRIORITIZE

- Start small and build a data platform one use case at a time.
- Prioritize projects that increase data and make automation of data flow a requirement of the projects.
- Keep room on the road map for small projects across different business units to provide quick wins and awareness.



INTEGRATE

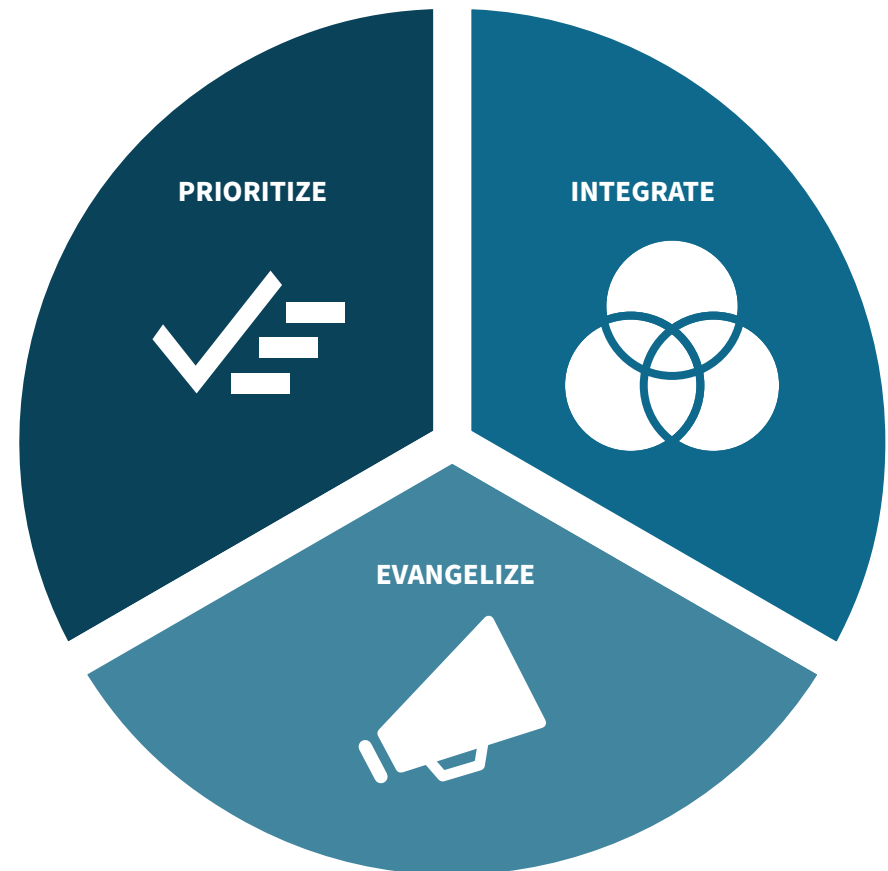
- Include stakeholders from multiple functional units and at various levels. These subject matter experts (SMEs) will become analytics champions as they become involved in the process, trust it, and rely on it.
- Create a rolling road map prioritized with the organizational mission and vision.
- Establish projects as tactical actions on the scoreboard across business units to provide opportunities for:
 - Cross-functional partnership.
 - Increased knowledge and visibility.
 - Executive awareness.
 - Visible project approval.



EVANGELIZE

- Have an elevator speech ready and use it often.
- Keep a record of your wins and assign a value to them (bragging board). Select a method and be consistent with estimates and updates (dashboard).
- Create a visible project intake process for analytics projects (road map).
- Roll up project plans to a dashboard at the executive level.

PIE: Prioritize, Integrate, and Evangelize



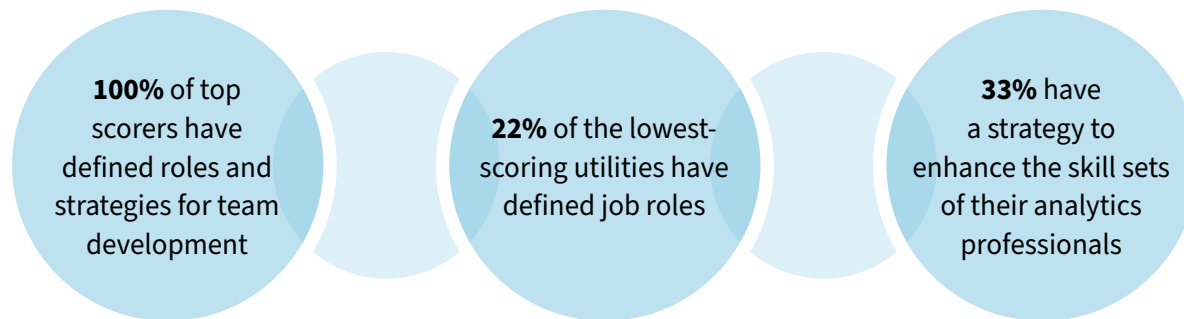
PEOPLE

We discussed previously how consumption of assets does not realize a gain until we use data to measure the derived output, calculate costs, and recover profits. Regardless of what you have heard about artificial intelligence (AI), data does not accomplish these tasks without people.

Without people to create, store, manage, manipulate, extrapolate, and interpret it, data is nothing more than electronic matter stored on a physical medium and moved

via electronic or optical technology. To remain competitive, analytics professionals must train and practice just like athletes and musicians.

A successful team of analytics professionals requires a combination of business and technical skill sets from business analysis and project management to platform management, data engineering, code development, and statistical analysis. Your staff is an investment who requires development to maintain and increase productivity.



Observations: Questions 14-28

- The current use of analytics by the utilities surveyed primarily is focused on building reports and creating dashboards, with 85% using data to establish KPIs, 74% using models to summarize data, and 79% using models to study historical trends. However, only 56% of the utilities are using models to optimize business processes.
- Looking to the future, over 90% of the utilities expect to expand their use of models for predictive, prescriptive, and process automation over the next three years.
- Other future uses will include virtual simulation and modeling, self-service, cognition, robotics, augmented reality/virtual reality (AR/VR), edge analytics, automation, and AI and machine learning (ML). These percentages for future uses are high considering 31% of the utilities surveyed have no plan to develop their staff.

Executive sentiment regarding the value of data and analytics across the business units provides insights into where analytics evangelism can occur:

- According to the survey, 58% of executives find little to no value in data for legal and regulatory problem solving, yet every business unit has regulatory requirements, vendor contracts, retention requirements for system data, and employee-related resolutions.
- Forecasting is identified as extremely reliant on data, yet only 17% of executives find data-driven decisions extremely valuable for Finance/Accounting, which sets budgets based on forecasted revenues and expenses, establishes rate structure, determines customer risk management, and establishes daily cash flow and reserve requirements.

Recommendations



PRIORITIZE

- Continue working within the UAI community to define and standardize job roles.
- Deliberately plan and budget to increase the skill set of your analytics team. Keep them educated and interested.
- Consider including consultants and software vendors on analytics project teams to both augment existing employees and train them.
- Include knowledge transfer in your strategic use of consultants and vendors. These partnerships are on-the-job training for your in-house analytics team and will broaden their perspectives as well as prepare them to maintain the products created.



INTEGRATE

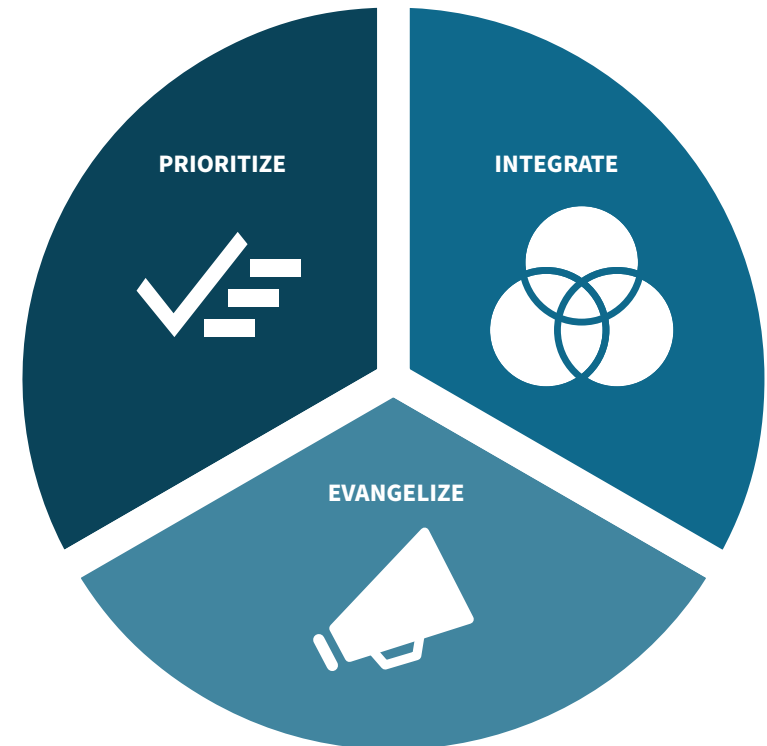
- Bring representatives from the business units into the analytics and data governance teams. Their exposure to projects will provide insights into how they can use data for their own decision-making processes.
- Seek their input on subjects such as data retention, data security, return on investment, and model traceability for auditors.
- Ask them what problems they are trying to solve and offer to help resolve them. Start small and gain their trust in the analytics process and acceptance of its business value. These are the projects to leave room for in your schedule.



EVANGELIZE

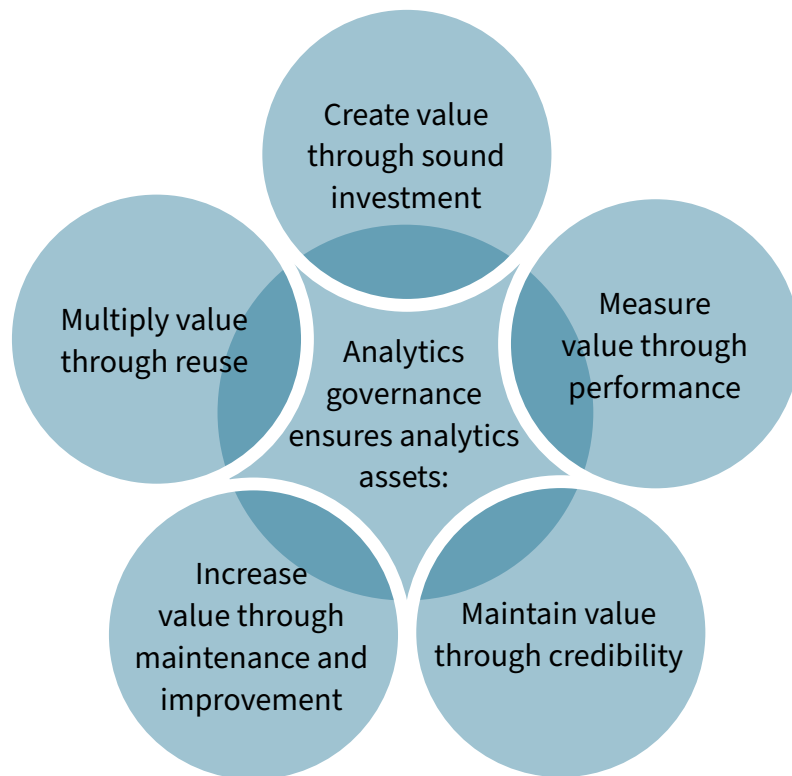
- Know the market value of your analytics professionals. Recognition through leadership roles, certifications, and awards from recognized professional organizations provides evidence to substantiate requests for salary increases.
- Demonstrate analytics projects to departmental and senior leadership.
- Take advantage of UAI for the opportunity to promote your team through community leadership, presentations, published articles, certified training, and nomination for excellence in analytics awards.

PIE: Prioritize, Integrate, and Evangelize



ANALYTICS GOVERNANCE

Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 350-40¹ identifies internal-use software as an intangible asset and outlines the circumstances where costs can be capitalized. We know analytics models and automated processes are considered software, based on the definition of software. Encyclopedia Britannica states: “A set of instructions that directs a computer’s hardware to perform a task is called a program, or software program.”² As discussed in the Strategy section, intangible assets have value when they provide an economic benefit. Analytics governance helps to ensure analytics assets are valued accurately.



¹<https://asc.fasb.org/350-40/tableOfContent>

²<https://www.britannica.com/technology/software>



Observations:

Questions 29-31

- Less than 50% of the utilities responding to the survey have implemented an analytics governance program. However, another 34% are in the planning process.
- Although over 80% of utilities are using models in some capacity, only 50% have ensured there is accountability and traceability of analytics assets. Only 57% measure the performance of these assets to validate their accuracy.

Recommendations



PRIORITIZE

- Prioritize analytics projects based on business value.
- Put the accountability and traceability of analytics assets at the forefront of a project by including auditors in your stakeholder list.
- Create an ongoing schedule for periodic measurement, maintenance, and improvement of each model, which requires an inventory of the models along with documentation.



INTEGRATE

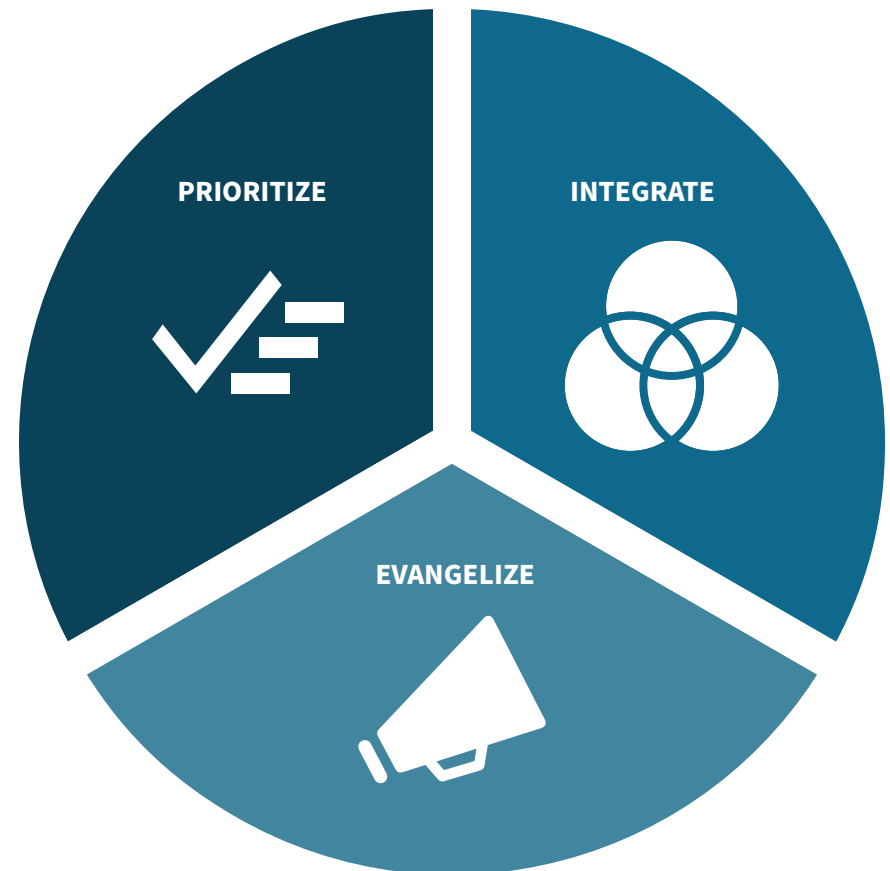
- Include a “to-be” business process model, the calculation methodology, and audit tables for calculation results in business requirements for each project to increase product documentation.
- Budget for external data sources as part of your data and analytics strategy. Note and adapt data retention requirements in contracts as needed.
- Add the model to the feature store as part of closing projects.



EVANGELIZE

- Include actual vs. forecasted results within the model itself (as well as alerts for poor performance) to maintain constant visibility of model accuracy.
- Acknowledge efficiencies and governance achieved with reused and repurposed models.
- Share documentation standards and audit table methodology within the UAI community.

PIE: Prioritize, Integrate, and Evangelize



DATA GOVERNANCE

Merriam-Webster Dictionary defines “governance” as the act or process of governing or overseeing the control and direction of something (such as a country or an organization)³.

If you were opening a business, you would write out a business and operating plan, detailing the vision and mission of your business and how you were going to oversee the direction of the business. Would your customers care if you did not have a business strategy and the means to implement it? Maybe not actively, but if the lack of it had a negative effect on your business product, customers would lose confidence in your business and take their business elsewhere.

Data governance is a business strategy for data. Data governance is strategic planning for how you are going to obtain, store, maintain, move, codify, present, or dispose of data in a manner that is legal, secure, timely, efficient, accurate, and appropriate. Data governance also includes the tools needed to carry out these plans, policies, and processes.

Failure to plan and execute data governance poses the risks of poor decision-making based on inaccurate or untimely data, sensitive data exposure, consequences of non-compliance, inefficiency due to re-works and corrections, and ultimately, loss of confidence in the data, the analytics products, and the analytics team. Just like a business and operating plan are essential to business growth, the data indicates data governance is essential to analytics maturity.

Observations:

Questions 32-39

- Utilities with an enterprise data governance program had a 19% higher total average score.
- Utilities with a robust analytics platform had a 28% higher total score.
- Utilities with both an enterprise data governance plan and a robust analytics platform had a 32% higher total average score.
- Most utilities answered all data governance categories with either “No, but planning, developing, or implementing” or “In place but limited or needs improvement.”
- Most Data Management Body of Knowledge (DMBOK) components are in process for completion over the next 1 year to 5 years with these exceptions: 65% of utilities have current capabilities for data security management and 57% have capabilities for database operations management.

³<https://www.merriam-webster.com/dictionary/governance>



Recommendations



PRIORITIZE

- Consider an enterprise analytics platform sooner rather than later. This platform provides the tools to put data governance into place and forces the thought process for implementation.
- If you must choose one over the other, buy the data management tool first and build processes to move data. Free visualization software is available, though it will not allow you to publish organizationally. Building data visualizations that crisscross among transactional systems will quickly become confusing and burdensome.
- Before you add purchased or created data assets to your inventory, identify how it will be handled from inception to disposition.



INTEGRATE

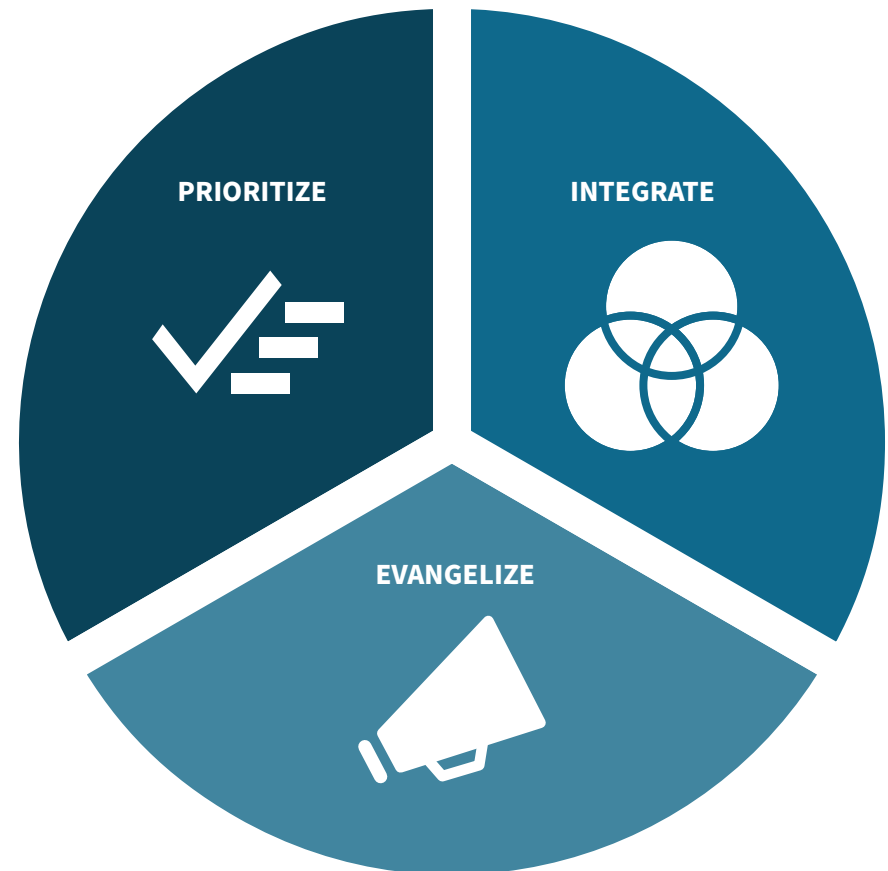
- Automate all data flows. Data loses integrity any time it is manually manipulated. Every time you build a process, it will need to be managed, so build in alerts and notifications.
- Tie data access to roles as opposed to individuals.



EVANGELIZE

- Place line items in project templates for data governance tasks necessary for each project to make sure the work efforts associated with getting the data, storing, moving, visualizing, and disposing of the data is understood and accounted for.

PIE: Prioritize, Integrate, and Evangelize



BUSINESS PROCESS INTEGRATION

Business process integration starts small with descriptive analytics and builds across the organization. Every functional group has manual tasks being created every month that can be automated and dynamic. Reducing efforts needed for time-consuming tasks improves the work environment and opens up availability for innovation and creative collaboration.

The survey indicates data and analytics are used more routinely within Forecasting/Market Operations and Customer Operations, with Operations/Workforce and IT making strong headway.

For some people, the idea of analytics is a black box. Bringing the data into the forefront of their decision-making process builds confidence, especially when subject matter experts on the business side — the stakeholders — are part of the project, verifying data along the way. Descriptive analytics are useful in bringing disparate data together to provide additional insights. What data from other departments or external resources might be helpful to business groups during their workday?



Observations:

Questions 40-42

- There's room for improvement to bring analytic awareness across the organization.
- About 75% of all utilities surveyed use data and analytics to inform the development and measurement of KPIs in some way across all functional groups.
- However, only 17% of these utilities use data and analytics to greatly inform or completely inform across all functional units.

Recommendations



PRIORITIZE

- Don't forget the "data" in data and analytics. The low-hanging fruit is with the business units that don't use analytics at all or only somewhat to inform business processes (for example, Legal, Infrastructure, Corporate, and Construction).



INTEGRATE

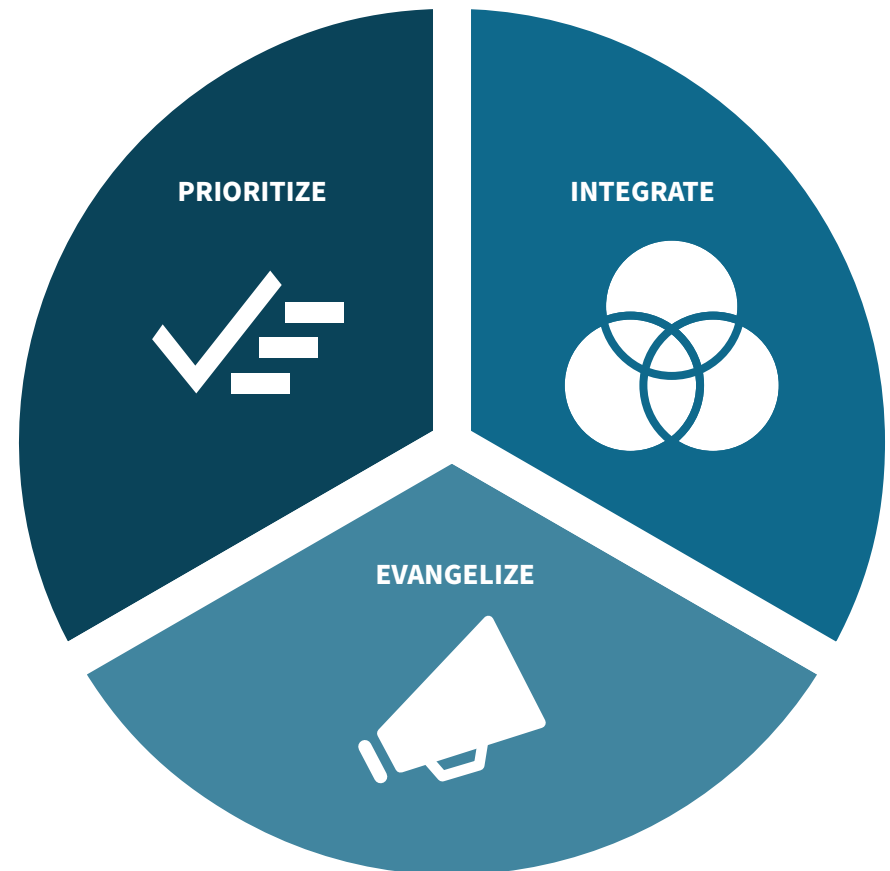
- Help the business units see the value of data and analytics. Begin by automating mundane processes.
- Bring in stakeholders from other functional groups as part of a project to gather multiple points of view.



EVANGELIZE

- These teams will begin relying more on data as they become part of the process and trust the outcome. Automation is not a selfless endeavor; it is building mutually beneficial relationships. Through these efforts, the organization gains benefits such as these:
 - Efficiencies in operations (measure it for them).
 - Access to data (established data pipelines).
 - Acceptance and support of analytics (cheerleaders).
 - Strengthened relationships (future project teams).

PIE: Prioritize, Integrate, and Evangelize



ANALYTICS CAPABILITIES

Analytics capabilities seem like a double-edged sword. On one hand, it is hard to build the skills without an advanced tool set; on the other hand, it is hard to gain a budget for the tools before you have demonstrated the capability and expected return on investment. There is a solution to this issue. Analytics capabilities refer to the current and anticipated capabilities of different business groups to apply basic-to-advanced analytics. They do not refer to the existing internal skill set and tool set.

Analytics maturity increases as data and analytics are accepted and incorporated across the entire organization. The key to increasing the ability to apply analytics is to find out what problems people are trying to solve and putting the right people in the room to talk about it. We often hoard our challenges within functional groups. An outside observation from a person within another department can prompt the right question or pose a new option that moves the needle of progress forward.

Consultants are a fantastic resource for problem solving and applying analytics. They bring a new perspective with a wider lens. Their exploration, observation, and analysis of challenges and opportunities within the utility industry and often outside the utility industry changes the paradigm for any individual organization. You can rely completely on consultants, or they can transfer knowledge to the internal team. Either way, bringing in consultants as part of organizational data strategy increases analytics capabilities.

Observations: Questions 43-51

- Responses indicate analytics capabilities start to deteriorate at predictive modeling, where the highest capabilities are at 69% for Forecasting/Market Operations.
- Statistical analysis, forecasting, and extrapolation are only prominent (greater than 80% capabilities) for forecasting and finance.
- Legal/Regulatory seems to be the last to apply analytics at all levels of capability, yet as discussed earlier, this functional group ties to every other one in some way.



Recommendations



PRIORITIZE

- Include the business value of gaining data as part of your project prioritization, then lay out the project road map to incorporate new data sources gained from completed projects.



INTEGRATE

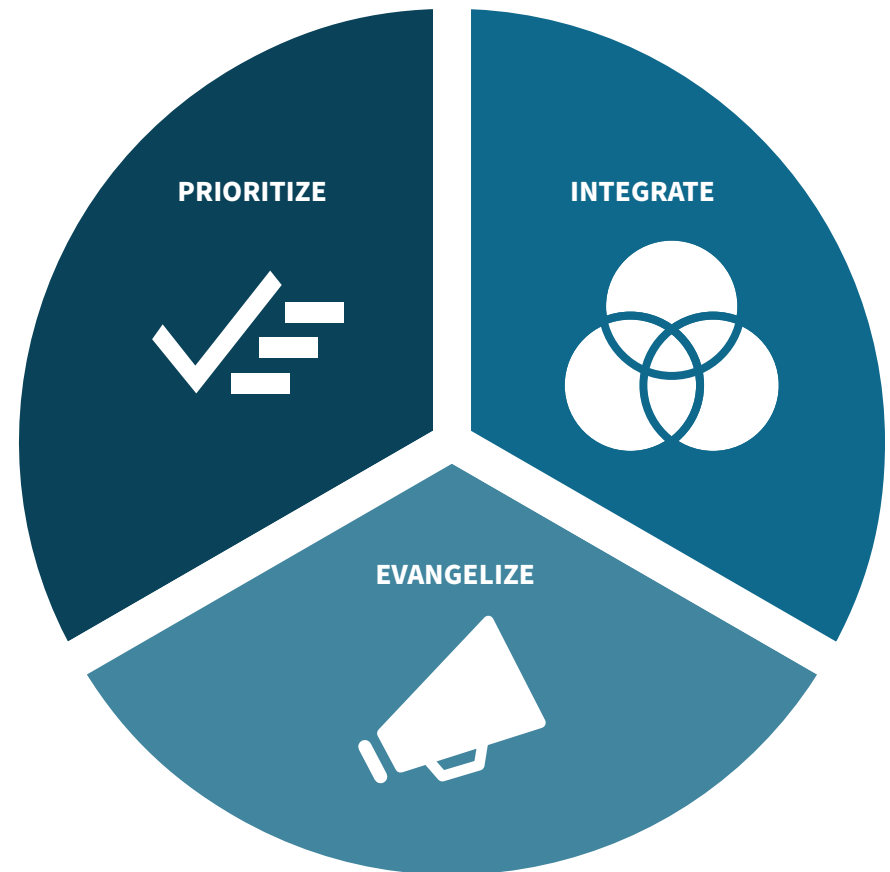
- Identify how you can reuse models, or at least the basis of the models, across business units. For example, can you recycle a demand forecast into customer operations or supply chain?
- Learn from others through UAI analytics courses, community discussions with peers, and knowledge transfer from vendors.



EVANGELIZE

- Reach out to the functional groups that are not making significant use of data and analytics. Ask them what problems they are trying to solve and include them on your road map.
- Introduce analytics to other functional groups through UAI community discussions, so they can experience how other utilities are utilizing analytics.

PIE: Prioritize, Integrate, and Evangelize



TECHNOLOGY & TOOLS

Most of the utilities surveyed are planning or implementing an enterprise analytics architecture with a robust tool set. However, it is worth noting baseline tools are increasing their features and offer substantial capabilities, particularly for utilities early in their analytics journey.

Utilities with no analytics architecture or specific tool sets, and no current plan to implement them, can still increase their analytics maturity. Remember, your analytics team extends beyond your doors. Consultants will help you to get where you want to be without the investment in tools. Don't forget to contractually maintain rights to the analytics products created for you.

Start with the tool sets you have and use them until they slow you down. Manually touching data will cause problems constantly, due to errors, inefficiency, or both; therefore, making data management your first set of purchased tools will move you up the analytics curve faster than buying visualization tools and trying to connect data across the organization.

Following Stephen Covey's advice to "Begin with the End in Mind"⁴ will create a more efficient analytics journey. Every time you build a product where data has to be updated manually will take time away from other opportunities. Building data pipelines and curating the data while using free software for visualization will prepare the way for the eventual transition to an enterprise analytics platform with a robust tool set.

For organizations with a robust tool set, is cloud an option as you move forward? Analytics platforms require administration, upgrades, and database tuning. Managed cloud platforms are effectively staff augmentation for those job duties.

Questions 52-57

- 13% of the utilities have no plans to put an analytics architecture in place, but 54% either have one in place or are in implementation.
- 3% of the utilities have no plans to purchase a robust analytics tool set, but 73% either have one in place or are in implementation.



- A majority (71%) of the utilities are taking advantage of third-party data and public datasets.

⁴Covey, S.R. (2013). Habit 2 Begin with the End in Mind. In *The 7 habits of highly effective people: Powerful lessons in personal change*. (25th Anniversary Edition). (pp. 144-163). Simon & Schuster.

Recommendations



PRIORITIZE

- Prioritize the purchase of data management over visualization tools.
- Consider drag-and-drop tool options to increase analytics capabilities through standardization, reduce the need for code, and improve efficiency when using consultants for staff augmentation.



INTEGRATE

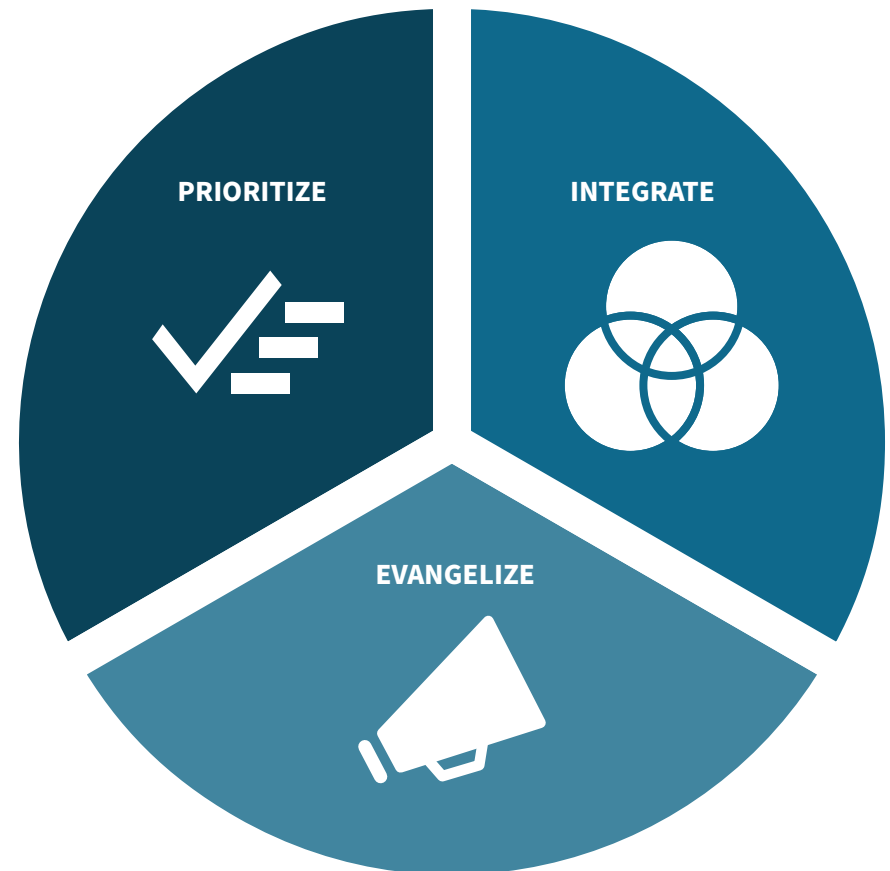
- Extend your team by bringing in consultants.
- Extend your team through a managed cloud platform.



EVANGELIZE

- Partner with vendors and consultants to speed up the implementation process and provide on-the-job training and guidance. Allowing a vendor to guide your customer success journey can move your utility up the analytics curve faster and provide a success story for both sides of the deal.
- Publish your success stories through UAI with articles, whitepapers, community discussions, and event presentations.

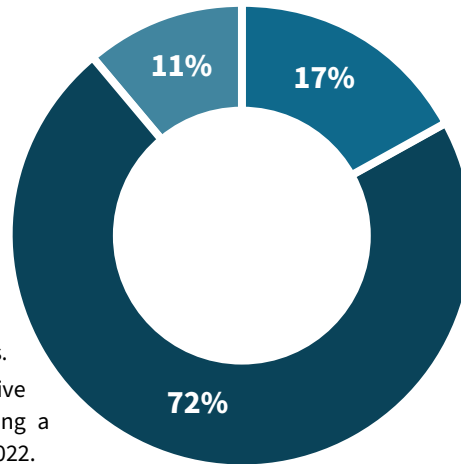
PIE: Prioritize, Integrate, and Evangelize



Appendix

Q8 - TO WHAT DEGREE DOES YOUR UTILITY TREAT, MANAGE AND VALUE DATA AS A STRATEGIC CORPORATE ASSET?

- **72%** Growing and expanding approach
- **17%** Limited, isolated examples
- **11%** Formalized practice
- **0%** Very little or not at all

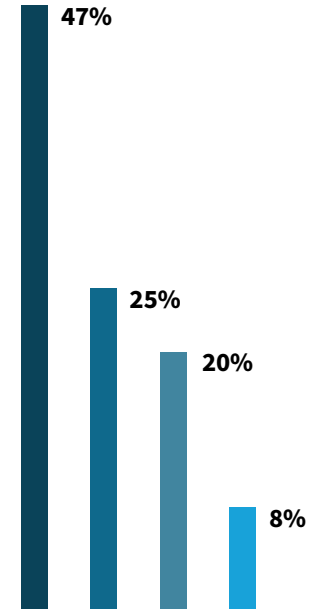


Comments:

- Some assets are managed better than others.
- We have had a corporate strategic initiative focused on developing and implementing a data management program in 2021 and 2022.
- Event management system (EMS) and advanced metering infrastructure (AMI) data are treated as assets.
- We consider data as a renewable asset. Data can be used beyond its original intent and reused an unlimited number of times.

Q9 - TO WHAT DEGREE HAS YOUR UTILITY DEVELOPED/DEFINED AN ENTERPRISE-WIDE DATA AND ANALYTICS STRATEGY?

- **47%** Development underway
- **25%** In the planning phases
- **20%** Robust enterprise-wide data and analytics strategy developed
- **8%** Does not exist



Comments:

- Strategy is probably not “robust,” but we do have one and are implementing it.
- Development will always be underway as we continuously improve.
- Strategy has a limited scope; it’s not enterprise wide.
- Strategy has been in place since 2014.
- Strategy is documented, but adoption of it is the biggest challenge (change management).

Q10 - TO WHAT DEGREE HAS YOUR UTILITY IMPLEMENTED AN ENTERPRISE-WIDE DATA AND ANALYTICS STRATEGY?



Comments:

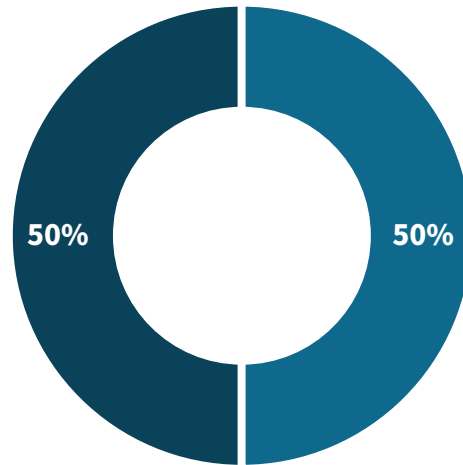
- Our operating model is still going through refresh and revisions.

Q11 - TO WHAT DEGREE IS YOUR ANALYTICS STRATEGY ALIGNED WITH THE OVERALL VISION AND MISSION OF THE ORGANIZATION?

- **50%** Substantial, direct and consistent linkage
- **50%** Linkage exists though inconsistent or indirect
- **0%** Little to no linkage exists

Comments:

- Our analytics focus areas align with strategic focus and operational areas to drive operation efficiencies.
- It aligns in specific departments.

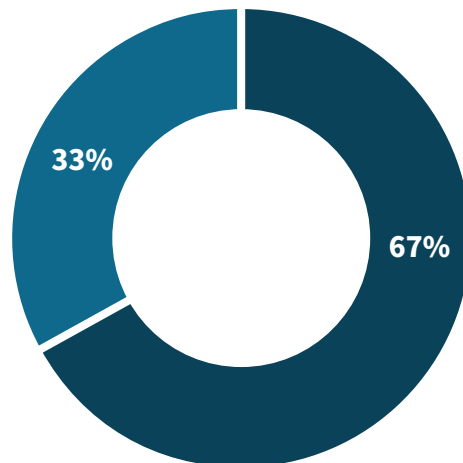


Q12 - DOES YOUR STRATEGY IDENTIFY LONG-TERM ANALYTICS DIRECTIONS AND GOALS?

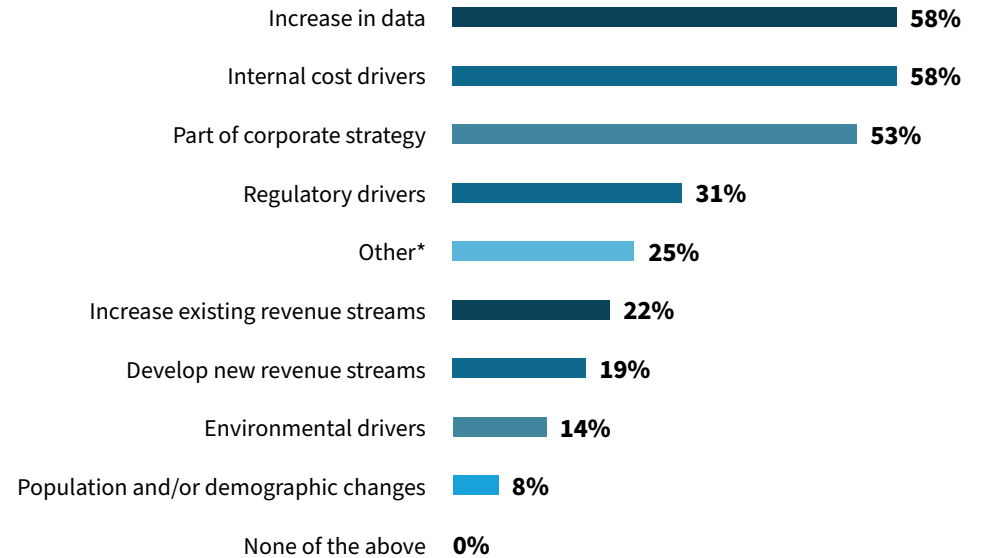
- **67%** Yes
- **33%** No

Comments:

- Long-term analytics directions and goals have not been set yet.
- We are in the planning stages and will include long-term goals when the strategy is developed.
- Linkage is not consistent; it depends on who you ask.
- A technical road map is being developed but has not been adopted.
- We are moving purposefully toward AI and digital transformation.
- We have a short-term direction in place for now but are working on long-term plans.
- Our long-term plans include Center of Excellence, self-service, and certified datasets.



Q13 - WHAT ARE THE TOP THREE DRIVERS OF YOUR ANALYTICS INITIATIVES?

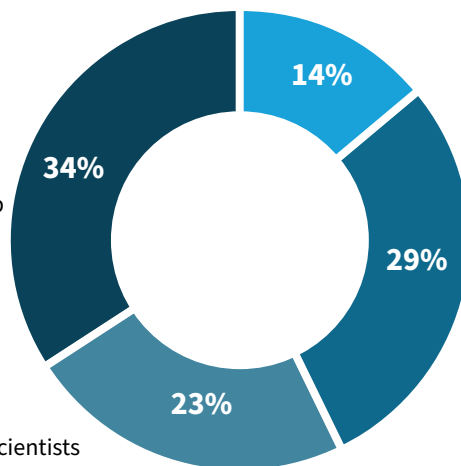


*Other drivers of analytics initiatives:

- Risk mitigation, asset management, customer experience, and a modern tool set.
- Develop new services for our member utilities and add more value.
- Proliferation of renewable generation and fossil fuel generation retirement.
- Siloed utilization and governance.
- Staffing projects and reliability-centered maintenance.
- Enterprise risk management. We recognized through our risk management process that incorrect data and analysis could significantly impact our ability to achieve our mission.
- Asset management.

Q14 - DO YOU HAVE AN ENTERPRISE ANALYTICS ORGANIZATIONAL MODEL?

- **34%** Yes, in place
- **29%** No, but in planning stages
- **23%** Yes, in implementation stage
- **14%** No, no immediate plans to develop



Comments:

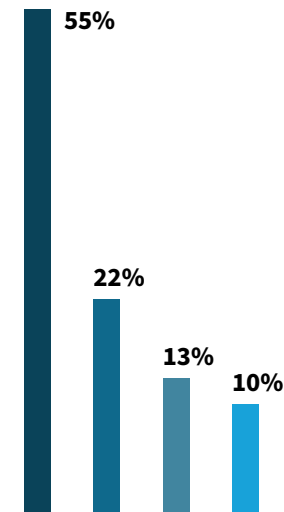
- The organizational model will continue to evolve.
- Center of Analytics Excellence (COAE), reporting to the chief analytics officer.
- We are migrating data analysts and data scientists to Finance while keeping data engineering in IT. Our strategy is to gain more acceptance by being external to IT.

Q15 - YOUR ORGANIZATION'S CURRENT OR PROPOSED MODEL IS BEST DEFINED AS:

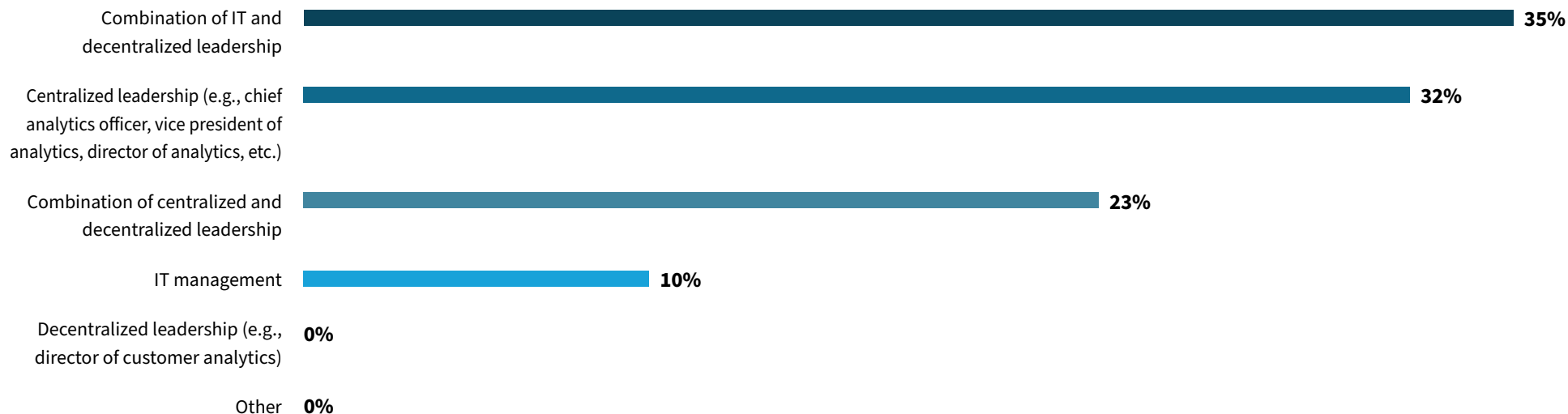
- **55%** Federated (decentralized with common enterprise procedures and/or infrastructure)
- **22%** Decentralized (no common organizational structure across groups)
- **13%** Centralized (centralized organization; consulting model)
- **10%** Other*

*Other organizational enterprise analytics models:

- Hybrid, center of excellence, or hub and spoke.
- Hybrid between centralized and decentralized.
- Centralized organization plus localized organizations.



Q16 - WHO IS RESPONSIBLE FOR YOUR ANALYTICS ORGANIZATION?

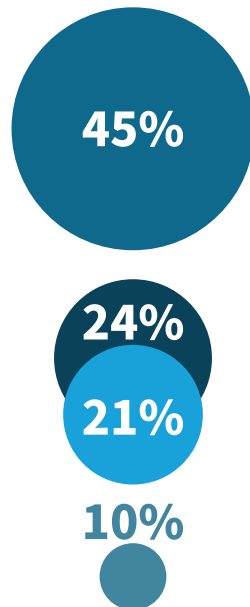


Q17 - TO WHAT DEGREE DOES YOUR UTILITY HAVE A DEFINED PROCESS FOR IDENTIFYING NECESSARY ROLES FOR EACH ANALYTICS PROJECT (E.G. SOLUTION ARCHITECTS, DATA LIBRARIAN, PROJECT MANAGEMENT, ETC.)?

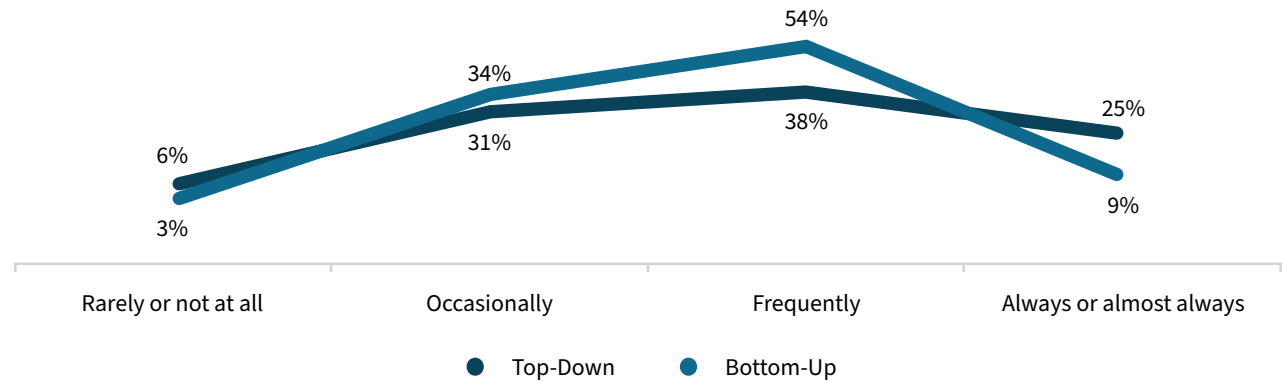
- **24%** No formal process
- **45%** Determined at the departmental level
- **10%** Enterprise process to determine project roles in development
- **21%** Enterprise process used to determine project roles in place

Comments:

- Some projects and proofs of concept (POCs) have less rigorous requirements due to speed and scale.



Q18 - TO WHAT DEGREE DO YOUR UTILITY'S ANALYTICS INITIATIVES OBTAIN EXECUTIVE SPONSORSHIP? (TOP-DOWN)
Q19 - TO WHAT DEGREE DO YOUR UTILITY'S ANALYTICS INITIATIVES SECURE ORGANIZATIONAL BUY-IN? (BOTTOM-UP)



Comments about top-down:

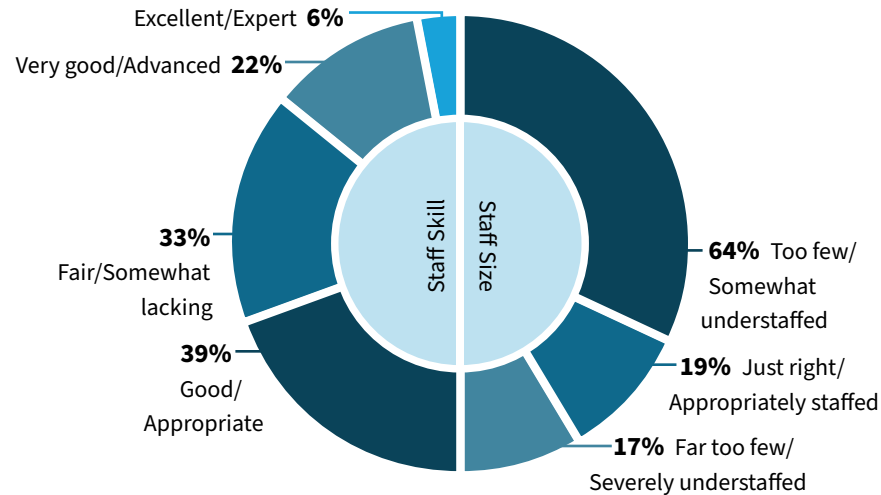
- Larger projects have executive sponsorship, but it is not required for ad-hoc projects.
- Our funding, focus, and outcomes all rely on senior executive approval and socialization.
- Sponsorship is always obtained but not always at the executive level.

Comments about bottom-up:

- This issue has become more of a focus in 2021 and moving into 2022. This is being achieved by our communities of practice, peer groups, and analytics academy.
- We attempt to communicate through company-wide updates and try to involve SMEs in the process.

Q20 - HOW WOULD YOU CHARACTERIZE THE NUMBER OF ANALYTICS PROFESSIONALS EMPLOYED BY YOUR UTILITY?

Q21 - HOW WOULD YOU CHARACTERIZE THE SKILL LEVEL OF YOUR UTILITY'S ANALYTICS STAFF/TEAM?



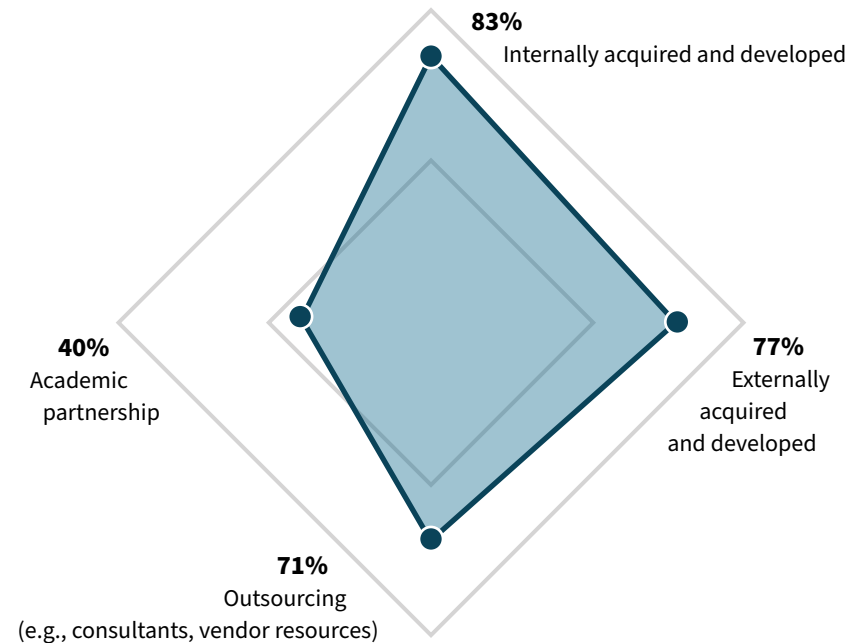
Comments about staff size:

- We are potentially close to the right total number in the aggregate, but terribly disproportionate in skill sets and very silo driven.
- We are heavily leveraging a staff augmentation model.
- Staffing is not aligned across the organization.
- We could always use more resources to grow capabilities, but we are currently staffed to handle current workload with a bit of space for growth.
- We have the correct size of staff for the current need; however, more staff would provide more value.
- We could do more with additional analytics resources.
- We are currently hiring our first two data analysts since this is a new program.

Comments about staff skill level:

- We rely on consultants for more advanced/nontraditional analytics.
- We have had success with developing the skill level of analytics staff internally with training and certification programs.
- The team is passionate but self taught. We are participating in UAI 101 training in the upcoming year.

Q22 - WHAT IS THE PROCESS OF ACQUIRING ANALYTICS TALENT

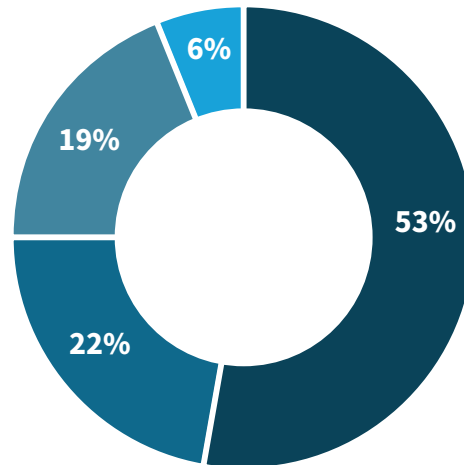


Comments:

- Instead of outsourcing, we leverage staff augmentation firms for diverse resources and the ability to hire once we get a chance to try them out and see if they and we are a good fit for each other.

Q23 - HAVE ANALYTICS-SPECIFIC JOB ROLES & RESPONSIBILITIES BEEN DEFINED AT YOUR UTILITY?

- **53%** Yes, but not at a comprehensive level
- **22%** Yes, defined across enterprise
- **19%** No, but in the process of developing/defining
- **6%** No, no plans to define



Comments:

- We continue to define this area around job descriptions, so data science hires are consistent with the operating companies in terms of skill, qualifications, abilities, etc.
- There is inconsistency across departments for the same job title.
- We just created a data analyst job description.

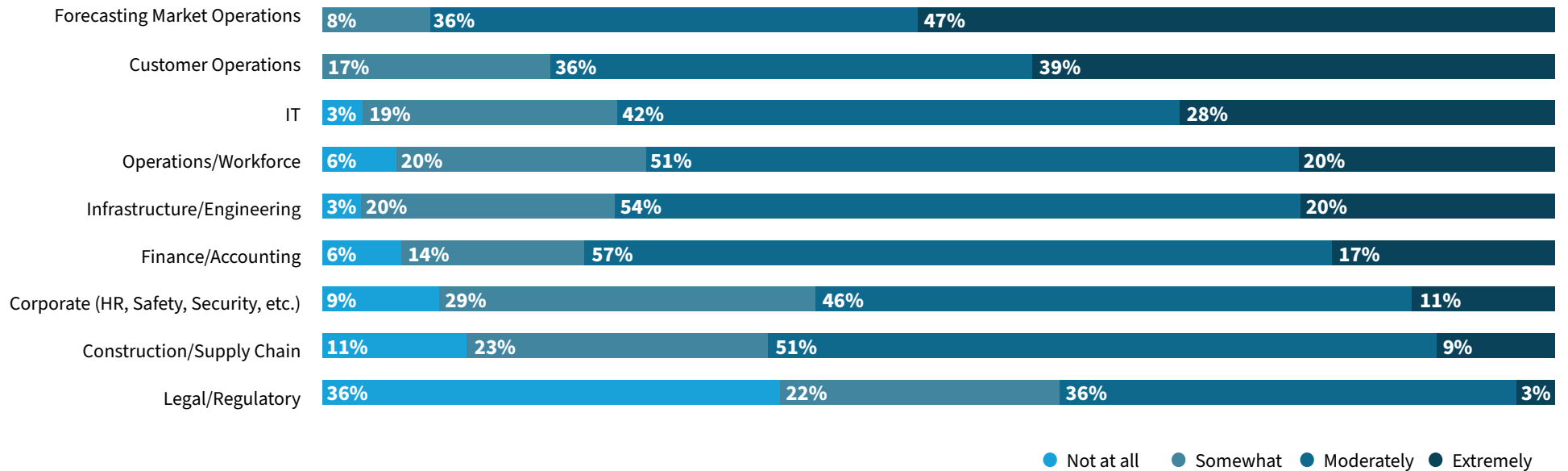
Q24 - HOW WOULD YOU CHARACTERIZE YOUR UTILITY'S STRATEGY WITH REGARDS TO DEVELOPING/ENHANCING THE SKILLSETS OF ITS ANALYTICS PROFESSIONALS?



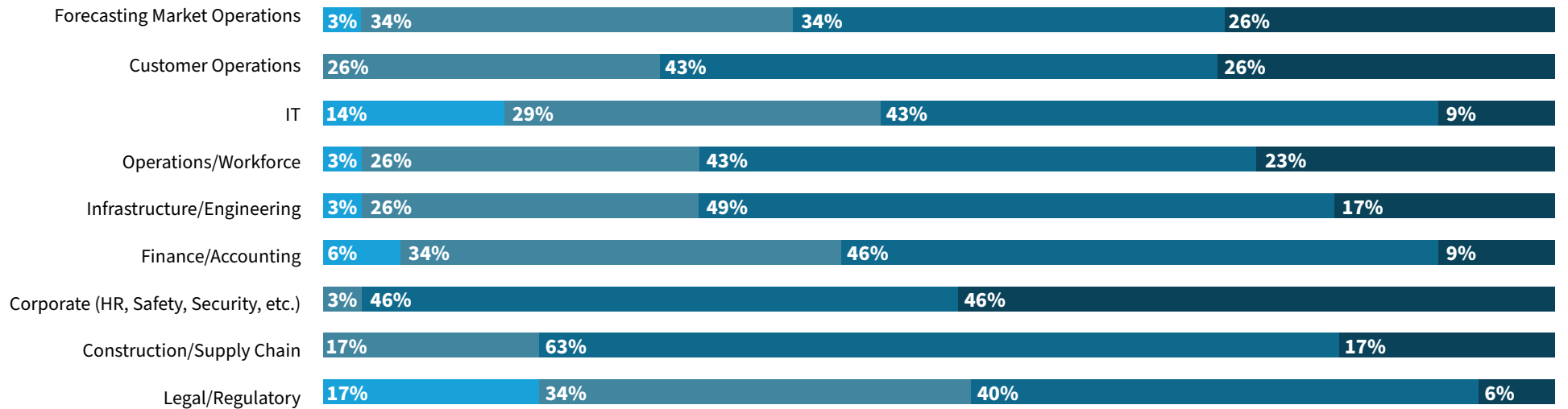
Comments:

- The strategy is in place but is not consistent across the enterprise. We implemented the Data Analytics Center of Excellence to help align it.
- We allow analysts to develop their own skills, based on their development goals as well as the needs of their team.
- There are a lot of opportunities but not a specific strategy.

Q25 - TO WHAT DEGREE DO YOUR ORGANIZATION'S EXECUTIVES VALUE A CULTURE OF DATA-DRIVEN AND ANALYTICS-BASED DECISION-MAKING WITHIN THE FOLLOWING FUNCTIONAL AREAS?

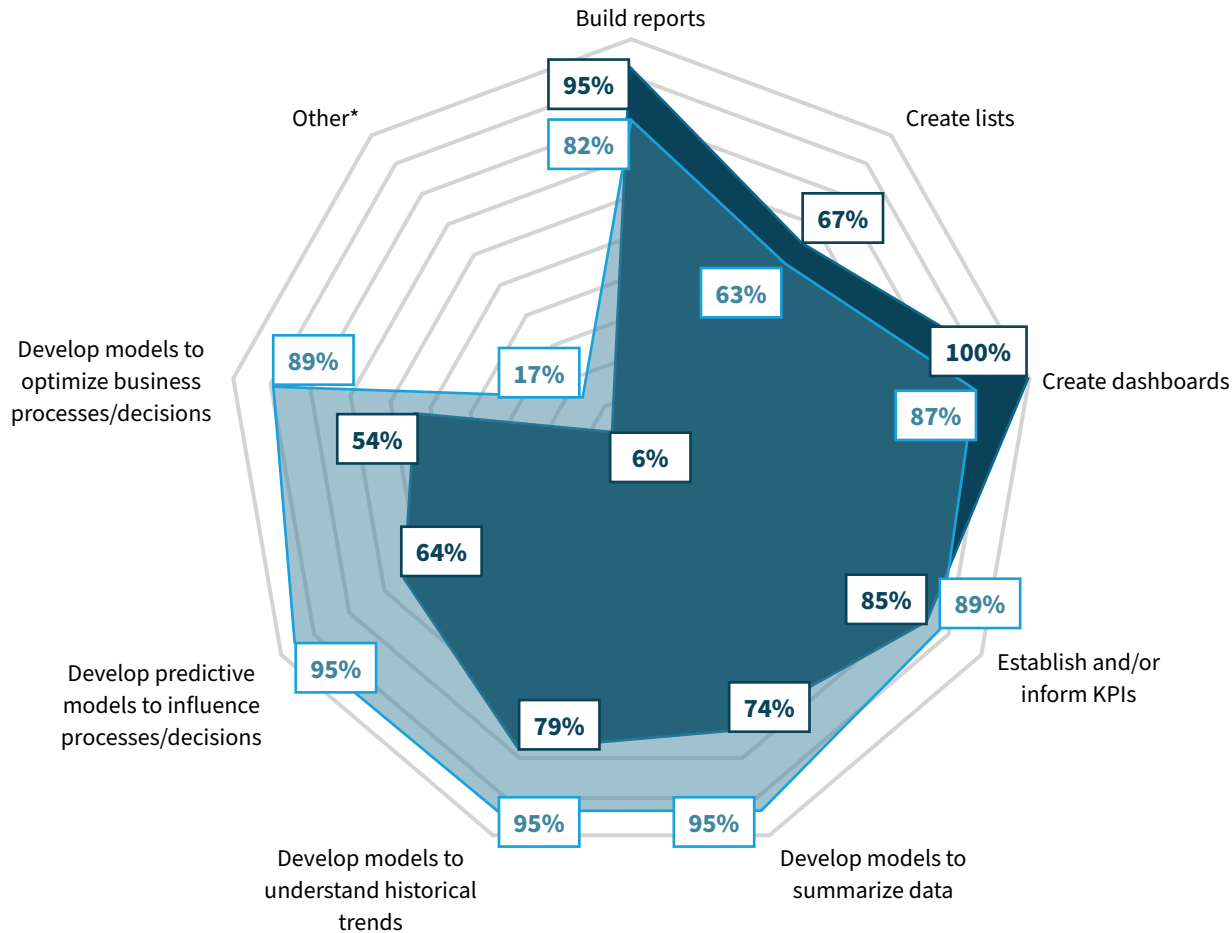


Q26 - TO WHAT DEGREE DO YOUR ORGANIZATION'S EMPLOYEES VALUE A CULTURE OF DATA-DRIVEN AND ANALYTICS-BASED DECISION-MAKING WITHIN THE FOLLOWING FUNCTIONAL AREAS?



Q27 - HOW DOES YOUR ORGANIZATION PRIMARILY USE DATA?

Q28 - HOW DO YOU EXPECT YOUR UTILITY WILL USE ITS ANALYTICS DATA 3 YEARS FROM NOW?



*Other current primary uses of data:

- We are just starting to lean more heavily in the predictive space in multiple areas across the organization.
- Our dashboards are very basic.

*Other future primary uses of data:

- Streamline/automate customer experience (self service).
- Cognition, robotics, AR/VR, edge analytics.
- We will continue to mature across all these areas, and I fully expect building reports, lists, and dashboards to be further automated in the future.
- Automation, advanced analytics, and AI/ML.
- Prescriptive models.
- Virtual simulation and modeling.

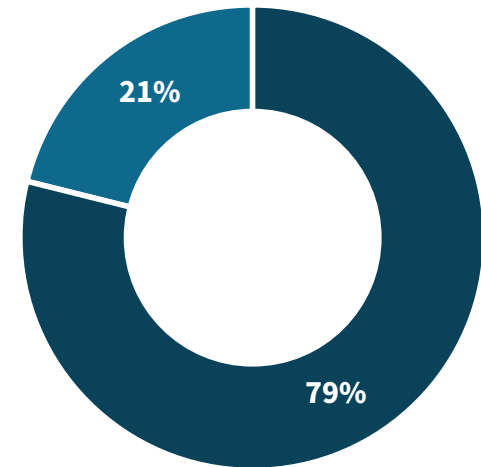
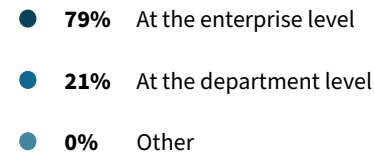
Q29 - DOES YOUR ORGANIZATION HAVE A DESIGNATED ANALYTICS GOVERNANCE PROGRAM?



Comments:

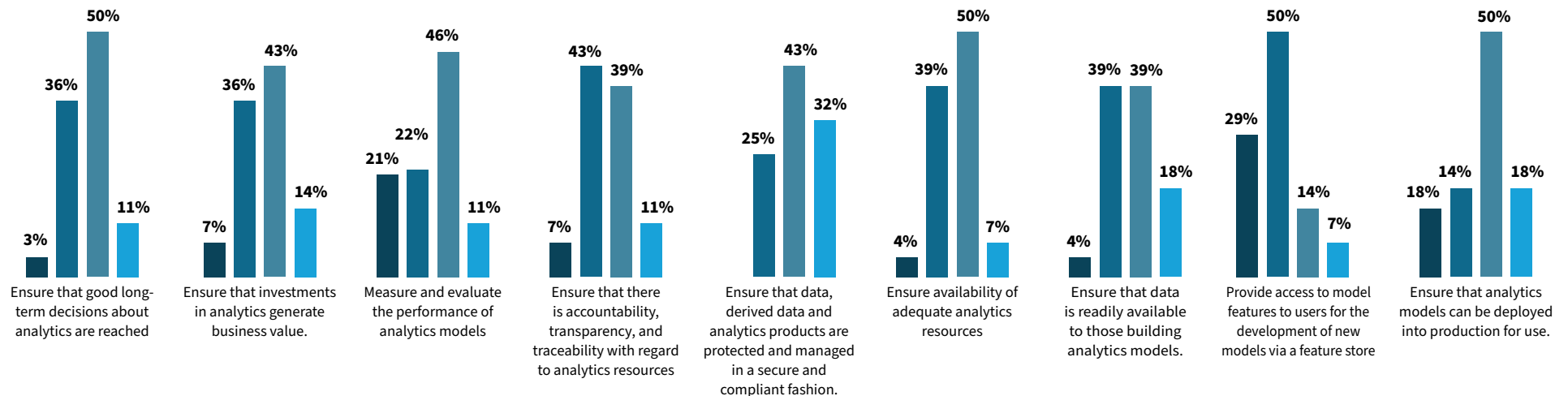
- We recently launched an analytics review board for enterprise-wide modeling and analytics oversight and governance.
- We leverage a governance, oversight, support, and perform (GOSP) model to define the roles of the center for excellence and operating companies.
- We are implementing governance for advanced analytics.
- Strong data access and computer controls are in place. A data governance council is in place but is used to inform vs. make decisions.

Q30 - IS YOUR ANALYTICS GOVERNANCE PROGRAM IMPLEMENTED OR INTENDED TO BE IMPLEMENTED?

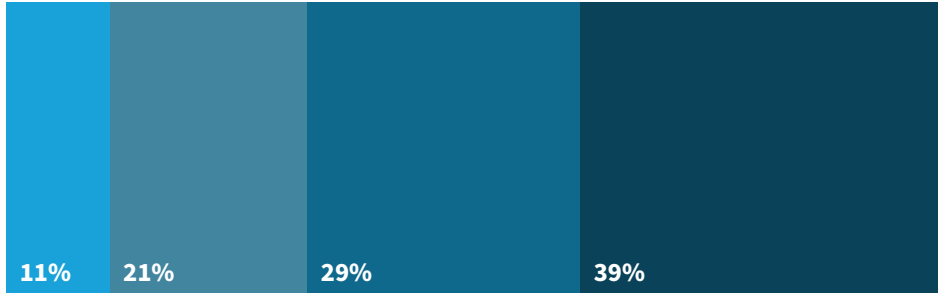


Q31 - PLEASE RANK YOUR UTILITY'S ANALYTICS GOVERNANCE PROGRAM'S ABILITY TO DO THE FOLLOWING:

● Not applying resources at this time
 ● Working towards developing capability/characteristic
 ● Current capability/characteristic - needs improvement
 ● Current capability/characteristic - doing well

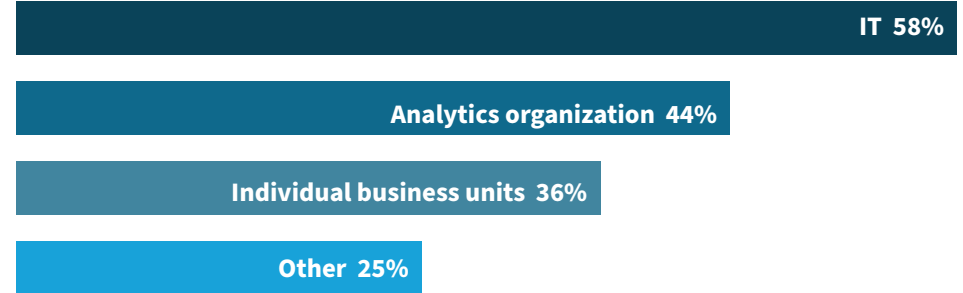


Q32 - DOES YOUR UTILITY CURRENTLY HAVE A DATA GOVERNANCE PROGRAM THAT MANAGES AT LEAST ONE OF THE FOLLOWING: AVAILABILITY, USABILITY, INTEGRITY AND SECURITY OF DATA?



- **11%** No formal program in place
- **21%** Enterprise program in place
- **29%** Limited or in place within select business groups
- **39%** Enterprise program currently being developed or implementation underway

Q33 - WHAT GROUP/BUSINESS UNIT IS RESPONSIBLE FOR DATA GOVERNANCE?

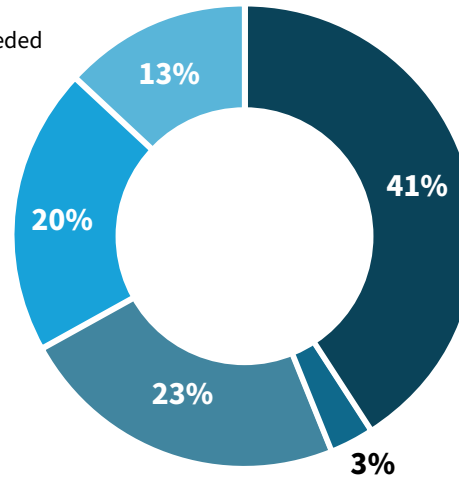


Other groups responsible for data governance:

- Data governance is a team sport.
- Data Governance and Insights department sits in the IT org, within Enterprise Analytics and Productivity, to support the individual business units with their data governance implementation and responsibilities.
- Information Management.
- We are piloting an approach for an enterprise wide program this year and anticipate that all the groups/business units mentioned will each play a role in data governance.
- Federated model.
- Our analytics organization falls under IT.
- No current data governance program in place.
- In process of formalizing data governance policies company wide.
- Legal.

Q34 - DOES YOUR UTILITY HAVE A DATA DICTIONARY IN PLACE?

- **41%** Data dictionary in place, not comprehensive and/or improvements needed
- **3%** Robust and comprehensive data dictionary in place
- **23%** Development in progress
- **20%** No, but considering developing one within the next 18 months
- **13%** No, and not considering developing one at this time

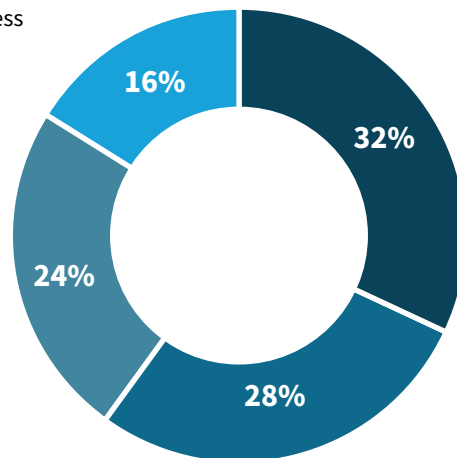


Comments:

- Customer data only but scaling out, with new data catalog implementation pending.
- We will be sending out a request for proposal (RFP) this year for the purchase of a data catalog system.
- As part of our development and implementation of a data management program last year, we developed a business glossary. We are in the process of documenting all our data sets there. Additionally, continuing the implementation of our data management program this year, we are developing and documenting metadata and data requirements. When complete, these three processes will provide us a complete picture of our data for business, technical, and operational uses.
- Approximately 80% of structured data is cataloged and curated. Unstructured data is not in the data dictionary.

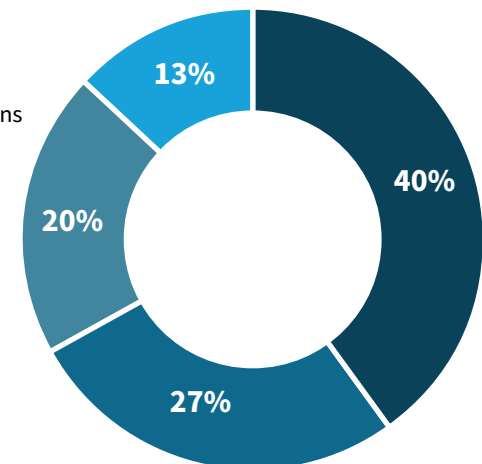
Q35 - DOES YOUR UTILITY HAVE A PROCESS FOR KEEPING THE DATA DICTIONARY CURRENT?

- **32%** Implementing formal process
- **28%** No formalized process
- **24%** Developing formal process
- **16%** Formal process in place

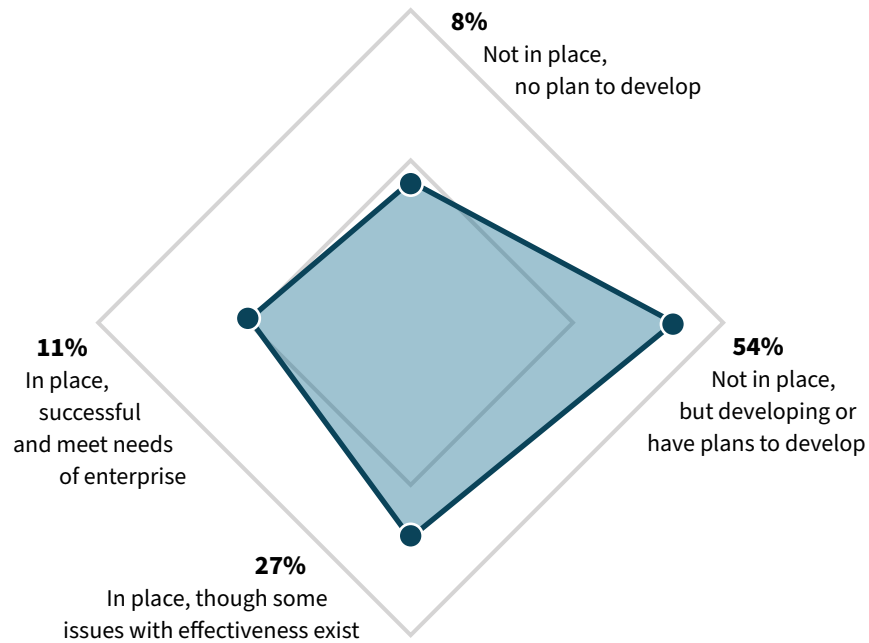


Q36 - DOES YOUR UTILITY HAVE AN INVENTORY OF ALL DATA SOURCES AND DATA QUALITY/DATA INTEGRATION/DATA ANALYTICS TOOLS?

- **40%** Good inventory though some information gaps exist
- **27%** Not in place, but have plans to develop
- **20%** Incomplete inventory
- **13%** Not in place, no plan to develop
- **0%** Thorough and accurate inventory



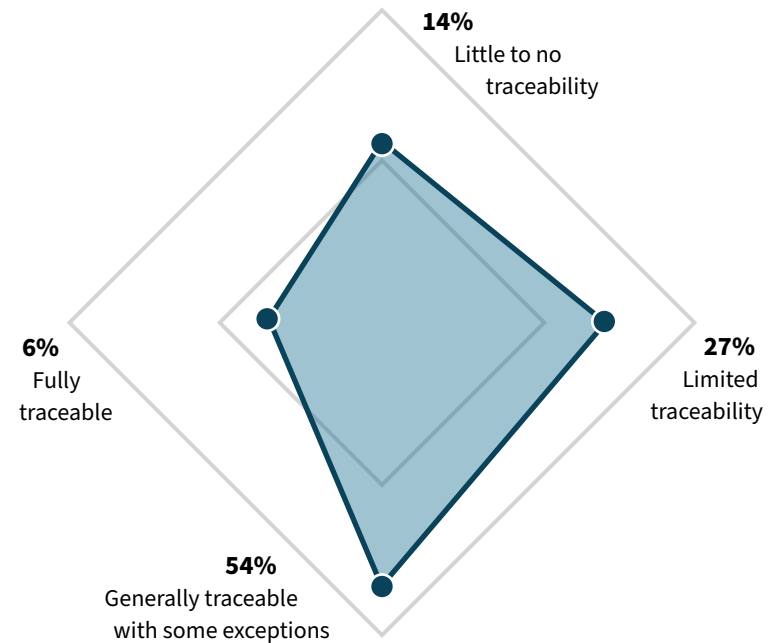
Q37 - HAS YOUR UTILITY ADOPTED DATA MANAGEMENT STANDARDS?



Comments:

- While some data management standards have been developed, the expectation is this will be an ever evolving catalog.

Q38 - IS YOUR UTILITY ABLE TO TRACE THE DATA RELIED UPON FOR DECISION MAKING OR DRIVING BUSINESS PROCESSES BACK TO ITS ORIGINAL SOURCE?



Comments:

- Full traceability for Financials and HR; generally traceable for other data.
- Varies between limited traceability and generally traceable, depending on the business unit.
- We are sending out a request for proposal (RFP) this year for a data lineage tool set.

Q39 - FOR EACH OF THE FOLLOWING TEN MAJOR COMPONENTS OF DATA MANAGEMENT IDENTIFIED BY THE DATA MANAGEMENT ASSOCIATION'S DATA MANAGEMENT BODY OF KNOWLEDGE (DAMA-DMBOK)⁵ PLEASE INDICATE THE STATUS AT YOUR UTILITY.

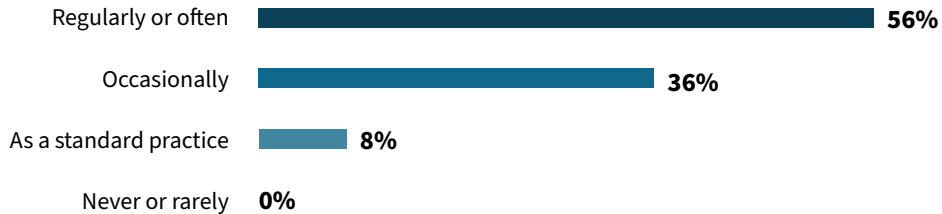
DMBOK	ENTERPRISE-WIDE CAPABILITIES NOT PLANNED	ENTERPRISE-WIDE CAPABILITIES EXPECTED WITHIN 5 YEARS	ENTERPRISE-WIDE CAPABILITIES EXPECTED WITHIN 1-2 YEARS	ENTERPRISE-WIDE CAPABILITIES IN PLACE NOW
OVERALL DATA GOVERNANCE	9%	34%	43%	14%
DATA ARCHITECTURE MANAGEMENT	3%	31%	43%	23%
DATA QUALITY MANAGEMENT	6%	40%	46%	8%
META DATA MANAGEMENT	11%	26%	52%	11%
DOCUMENT & CONTENT MANAGEMENT	6%	17%	34%	43%
DATA WAREHOUSING & BI MANAGEMENT	0%	26%	23%	51%
REFERENCE & MASTER DATA MANAGEMENT	11%	32%	37%	20%
DATA SECURITY MANAGEMENT	3%	11%	21%	65%
DATABASE OPERATIONS MANAGEMENT	6%	11%	26%	57%
DATA DEVELOPMENT	9%	27%	32%	32%

Comments:

- Assuming “data development” refers to our enterprise data strategy, we are currently partnering with AFS to define.
- No formal plan yet, but I’d expect that we’d have one in place within the next five years.
- As part of a data management project, we developed a multiyear project plan. The project plan was based on an assessment using Capability Maturity Model Integration-Data Management Maturity (CMMI-DMM) to gauge our current capabilities and maturity. Our aim is to reach a level 3 maturity in each domain as defined by the DMM.
- Data security policy is in place, but enforcement is user dependent.

⁵<http://www.dama.org/content/body-knowledge>.

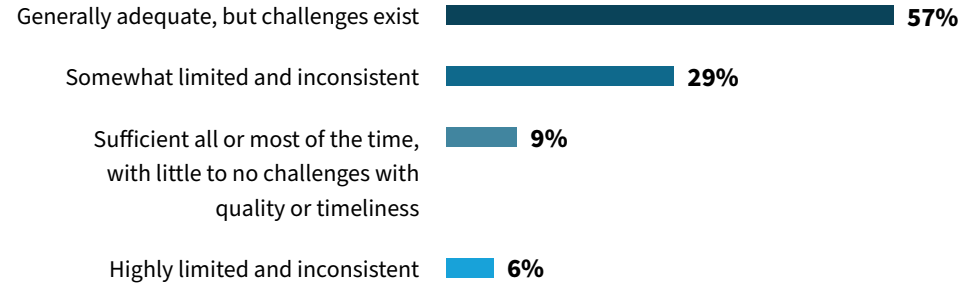
Q40 - HOW OFTEN DOES YOUR UTILITY USE DATA AND ANALYTICS TO DRIVE ITS BUSINESS PROCESSES?



Comments:

- I indicated as a standard practice based on our identification, intake, and approval process for use cases. For example, this year we are rolling out our first contact resolution metric and supporting dashboards. This is directly linked to our operations and will become a Tier 1 metric in 2023 and be tied to annual incentive plan bonus metrics. This is also new and innovative to the utility industry and requires extensive effort to combine cross channel data (for example interactive voice response , web, customer service records, telephony, and email) to tell the entire story on customer interaction completion. This is just one example.

Q42 - ACCESS TO DATA AND ANALYTICS TOOLS BY BUSINESS USERS AND PROCESS OWNERS IS:



Comments:

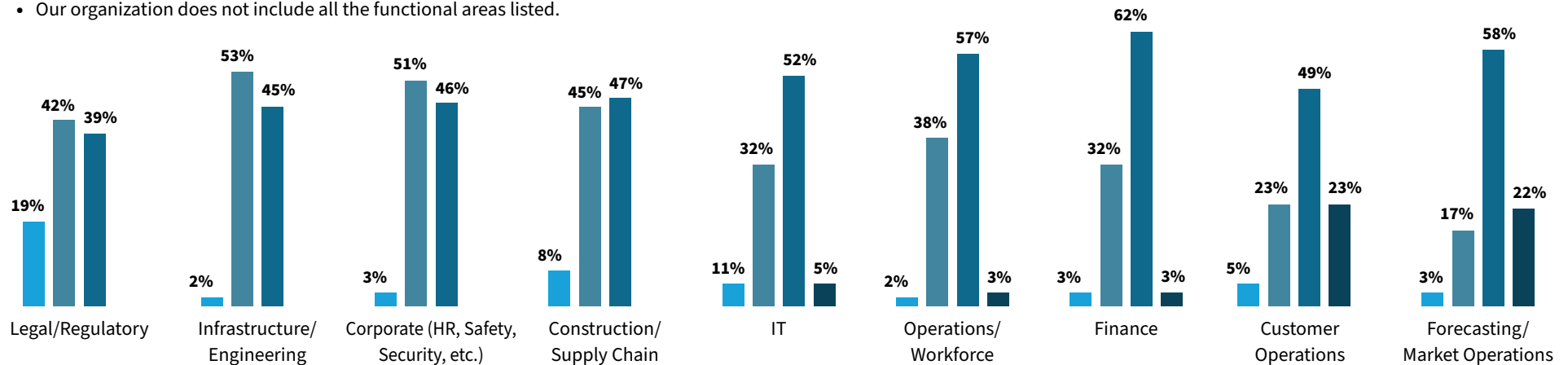
- Access is tedious and siloed, but we're improving.
- Our biggest issue is getting higher adoption of the data analytics platform. Visualization tools are generally consistent.

Q41 - TO WHAT DEGREE DO DATA AND ANALYTICS INFORM THE DEVELOPMENT AND MEASUREMENT OF RELEVANT BUSINESS PROCESS KPIS FOR THE FOLLOWING GROUPS?

● Don't at all inform ● Somewhat inform ● Greatly inform ● Completely inform

Comments:

- Corporate (Safety) has been a big focus in 2022 for our team. We are creating specific safety recommendations to assess the risk of a job before any work begins.
- Our organization does not include all the functional areas listed.



Q43-51: WHICH OF THE FOLLOWING BEST DESCRIBES YOUR ORGANIZATION'S BUSINESS UNIT(S) CURRENT ANALYTICS CAPABILITIES?

ANALYTICS CAPABILITIES	Forecasting/ Market Operations	Finance/ Accounting	Infrastructure/ Engineering	Customer Operations	IT	Corporate (HR, Safety, Security, etc.)	Operations/ Workforce	Construction /Supply Chain	Legal/ Regulatory
Gathering and managing data	91%	97%	91%	80%	97%	97%	94%	74%	74%
Adoption of analytics applications	91%	86%	86%	63%	94%	86%	75%	66%	57%
Basic reporting	94%	100%	97%	89%	97%	100%	100%	91%	83%
Business intelligence & dashboards	86%	91%	91%	80%	94%	91%	86%	86%	60%
Statistical analysis & forecasting/extrapolation	83%	82%	71%	63%	60%	60%	53%	51%	34%
Development of predictive models	69%	44%	49%	46%	34%	31%	44%	34%	18%
Development of prescriptive models	46%	29%	24%	31%	31%	29%	25%	17%	12%
Development of optimization models	57%	29%	26%	31%	29%	26%	22%	23%	12%
Development of machine learning and artificial intelligence	31%	23%	29%	31%	34%	26%	25%	14%	12%

Q52 - DOES YOUR UTILITY HAVE AN ENTERPRISE ANALYTICS ARCHITECTURE IN PLACE?

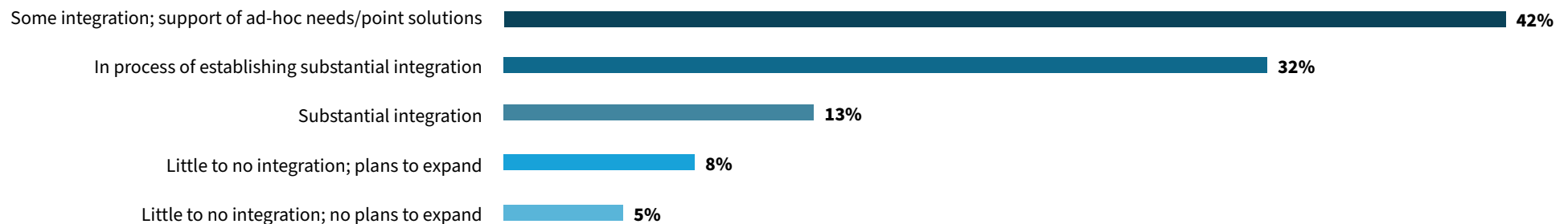


- **13%** Not currently in place, and no currently plan to implement
- **26%** Comprehensive architecture in place
- **26%** Analytics architecture in implementation phases
- **34%** In the planning and early development phases

Comments:

- Some tools but not all are at the enterprise level. Data architecture is primarily at the business unit level.
- We are now migrating our data analytics platform to the cloud.
- We are researching architecture and applications to use.

Q53 - TO WHAT EXTENT IS YOUR UTILITY INTEGRATING INFORMATION FROM DISPARATE SOURCES AND/OR ACROSS ORGANIZATIONAL AND/OR SYSTEM SILOS?



Comments:

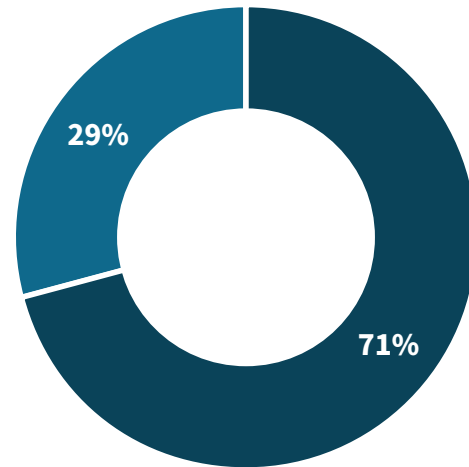
- Significant integration at the business unit level but not across business units.

Q54 - DOES YOUR UTILITY HAVE A PROCESS TO ACQUIRE AND MAKE AVAILABLE THIRD-PARTY AND PUBLIC DATASETS?

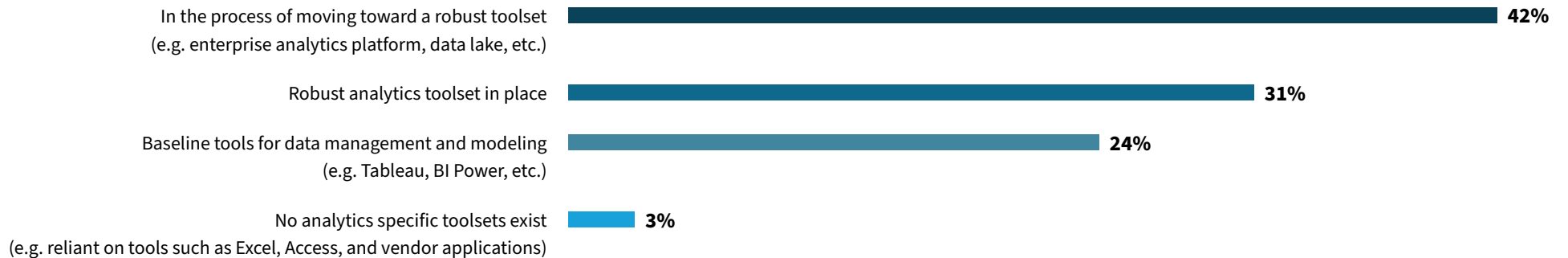
- 71% Yes
- 29% No

Comments:

- We do it, but it is ad hoc, not structured.
- We incorporate a variety of third party sources including customer segmentation, other vendors' transformed data, etc.
- In progress.



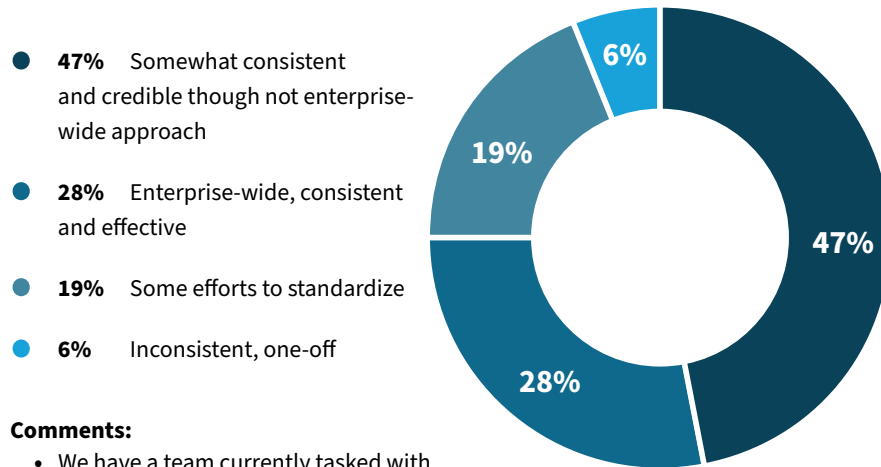
Q55 - HOW WOULD YOU RATE YOUR UTILITY'S ANALYTICS TECHNOLOGIES & TOOL SET?



Comments:

- We are shifting to the cloud.
- Limited use of Tableau, Power BI, and starting to consider moving to a data lake.

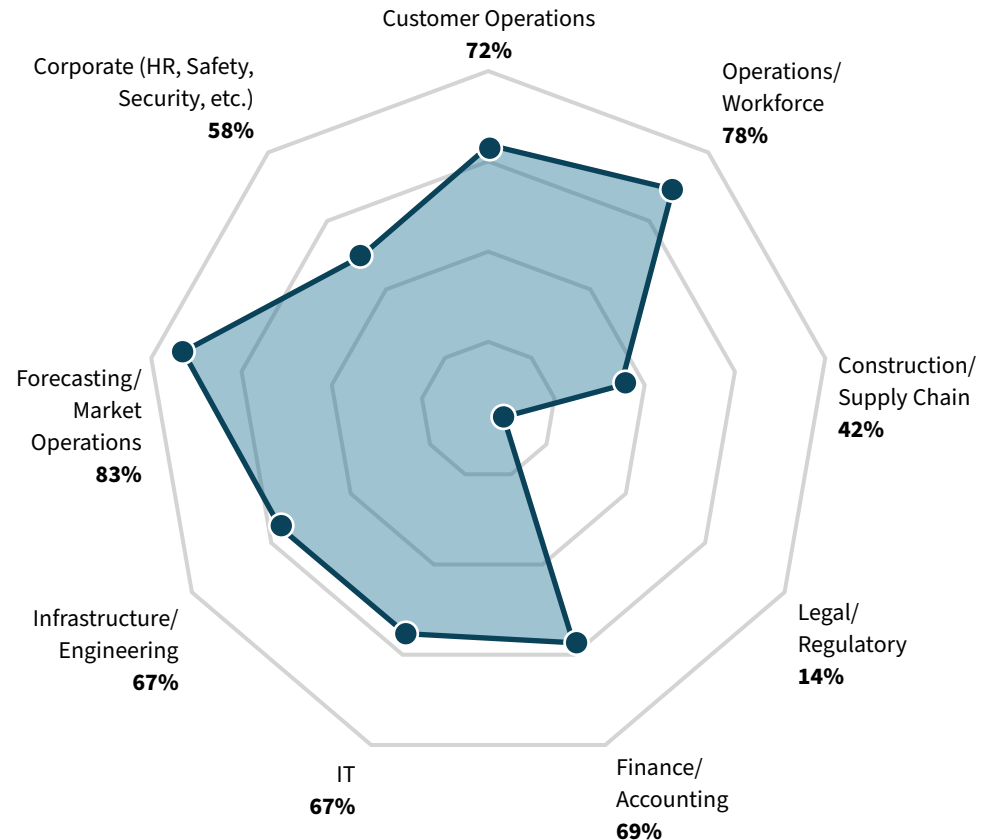
Q56 - YOUR UTILITY'S APPROACH TO EVALUATION AND SELECTION OF ANALYTICS TECHNOLOGIES AND TOOLS IS BEST DESCRIBED AS:



Comments:

- We have a team currently tasked with selecting the right analytics and reporting tools for each application.

Q57 - WHAT BUSINESS SEGMENTS MAKE SIGNIFICANT USE OF ANALYTICS TECHNOLOGIES AND TOOLSETS WITHIN YOUR UTILITY?



Comments:

- I'm not sure about Legal.
- Excluding Finance, the areas not selected are not a function of our organization.

