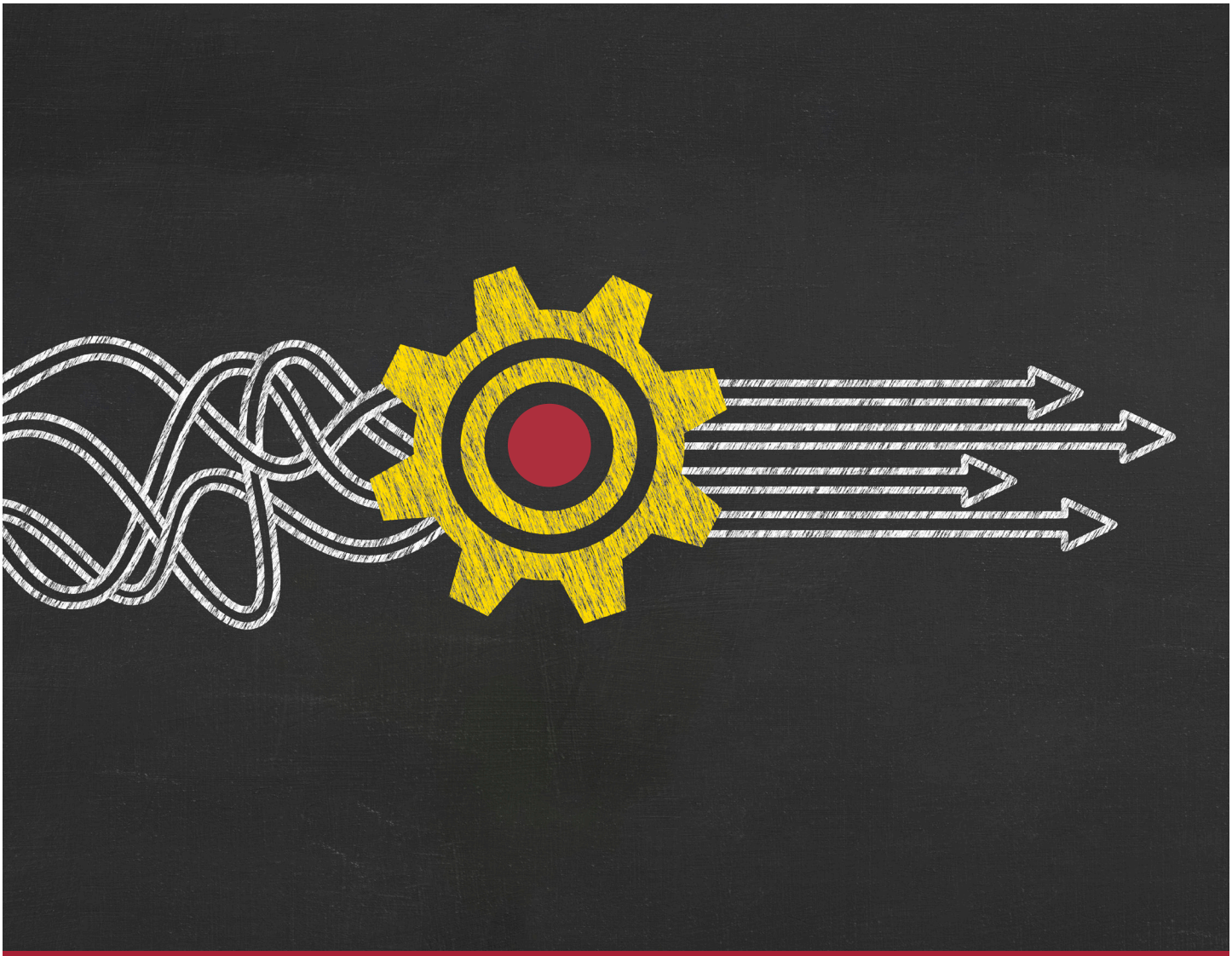

TBM Maturity Model for Federal Agencies

Focus Area: Technology

TCG
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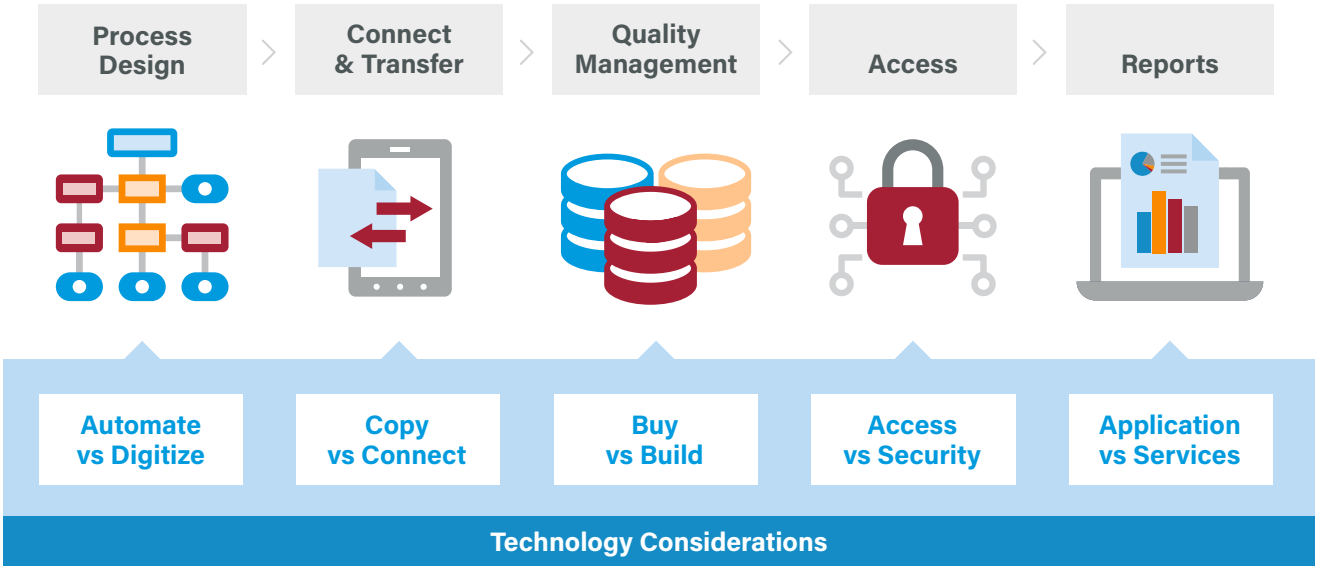
November 2019

Introduction

The TBM Maturity Model designed by TCG helps organizations establish and follow a pathway to mature their TBM program and provide a granular view of all organizational investments. In this paper, we build on the supporting resources for the TBM Maturity Model for Federal Agencies to discuss the complexity of TBM technology maturation, emphasizing key technical considerations and the need to incorporate technical staff into decision making around these considerations.

Figure 1

Technology Considerations in the TBM Process

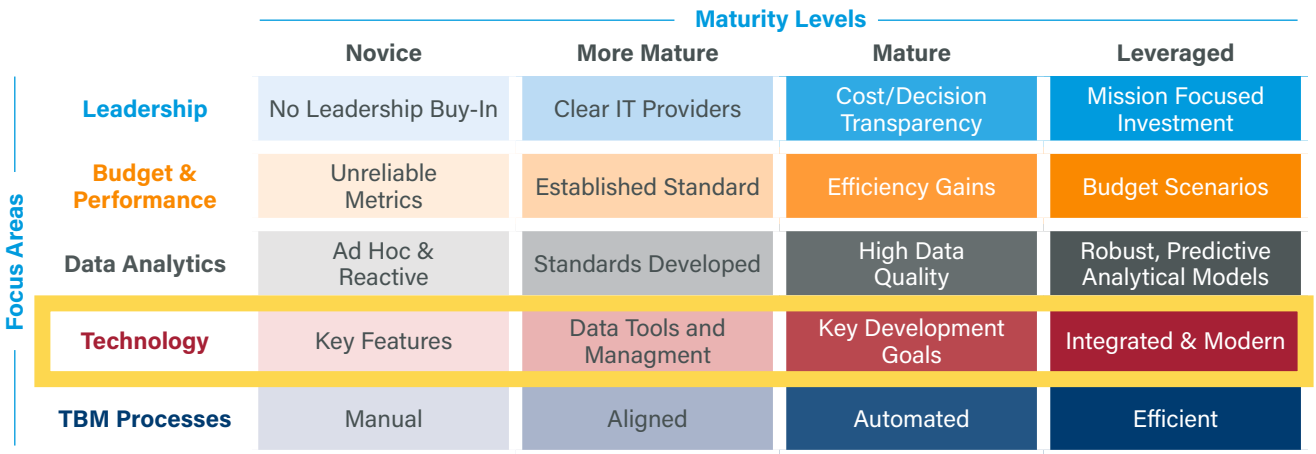


For the purposes of this paper, "technology" refers to all the technology involved in the process of achieving TBM analytics from the source data onwards. In other words, technology here is not limited to the suite of TBM-specific tools that are on the market. Thinking of TBM technology in these broader terms means understanding how to interface with current systems to collect/store data as well as automate and standardize TBM processes across departments. This perspective also requires agencies to assess how well technology presents the data back to stakeholders in the form of high quality reports and visualizations.

The Technology focus area overlaps with the Processes and Data Analytics areas of the maturity model, but this paper focuses on designing the technology decisions that were mentioned only briefly in those white papers. Figure 1 offers a high-level representation of the TBM process that we discussed in the **Processes white paper**. Each component of the process is aligned with a key technology consideration.

Figure 2

TBM Maturity Model - Technology



Maturity Stages

We highly recommend that agencies follow the Agile development paradigm, and maturity in this focus area is defined in terms of Agile's iterative approach. Each agency is different, but technology will play similar roles in maturing their TBM practice. Milestones for maturing technology will need to be pinned to the technology solution for each of the five key considerations that we describe in the next section. Below we offer a high level view of each stage of maturity.

Key Features (Novice Level)

At the Novice level, most agencies have taken tentative steps toward TBM adoption. Some may have purchased a TBM system and are getting their feet wet by applying the methodology to their IT practice. Agencies should have identified the key features of their minimum viable product (MVP) as it relates to each technology implementation. As part of this MVP, the technical team will need to identify and prioritize key application's features and/or services. In general, the novice level implies a completed plan for basic functionality around the TBM practice and some progress toward the goals in that plan.

What is a Minimum Viable Product (MVP)?

The idea of a **minimum viable product** is taken from Lean/Six Sigma and used in the Agile development methodology, so it may be familiar to many readers. An MVP consists of a technology deliverable with a base set of features that provide value to users. An MVP offers the flexibility to continually build the product with enhancements and new features as new needs are identified. This allows an agency to deliver value quickly while continuously improving the product.

Data Tools and Management (More Mature Level)

The MVP makes the rich granular data set available for analysis and reporting. At this maturity level agencies will need to identify the base set of services and/or application features that will be delivered to end users. This means identifying the core set of consumer facing data products—reports, visualization, etc—that can begin facilitating transparency around IT cost/performance and collaboration throughout the agency.

Key Development Goals (Mature Level)

At this stage of maturity, agencies build on the MVP by identifying key features needed to address their advanced organizational TBM needs. Agencies clarify what a mature TBM practice will look like from a technology perspective. This not only includes systems interfaces on the back end but also key user features and services for end-users.

Integrated and Modern (Leveraged Level)

The last step toward Leveraged Maturity is helping agencies follow their technology plans and supporting their efforts to achieving a robust TBM process that is delivering on its value proposition to its stakeholder groups. Technology at the Leveraged level is integrated and modern, meaning that the back-end processes have been fully automated across organizational departments. At this stage, the TBM practice is a core element in creating and justifying an agency's budget request. At the leveraged state, the technology that supports the TBM practice:

- **Supports development** of an annual budget
- **Drives conversations** around IT value
- **Provides real-time data** to stakeholders
- **Enables agency** representatives to derive further insights through advanced analytics
- **Ensures data quality** at all points within the TBM practice

In the next section we will discuss some of the key technical considerations needed to achieve these goals.

Key Technology Considerations

Technologists at agencies will play a key role in TBM maturation, providing important resources for decisions around solutions that drive efficiency and effectiveness in the TBM practice. Listed below are several considerations that every agency will need to address in making decisions around the technology that supports their TBM practice. While we have presented these considerations in a binary form and listed pros and cons for each, it's important to remember that in practice agencies may find hybrid solutions to be the most effective path to follow. It's also important to note that short-term choices about technology will often be determined by an agency's current maturity level, but developing a highly leveraged TBM practice means not sacrificing long term growth for short term gains. Finally, these considerations are interconnected, so technology decisions should be made looking at the entire end-to-end solution rather than taking these considerations on an individual basis.

Automate vs Digitize[1]

These two terms indicate different perspectives in how technology relates to existing processes. Automation indicates using technology to make existing processes more efficient without changing the underlying process—using a nail gun instead of hammer for roofing. Digitization denotes a more transformational perspective in which leveraging tools and technology changes the process itself. Similar to the example above, digitization would be analogous to using prefabricated roofing panels created in an automated factory.

> *"Automation is using a computer to do exactly the same things you did manually before. We take a paper form, convert that thing in its same image, same workflow process and just put it up on a computer. But we know by other experiences when we go shopping on the Web or do other things there are a lot of things the computer can do for us. It can know who you are ahead of time…It can save your preferences and it can expose to you other things you might be interested in. In essence, it's a customer-centric experience that uses the power of information technology to augment the things you want to do online. Automation doesn't typically do that."*
>
> *- former Federal CIO Tony Scott*

[1] Digitize," "digital transformation," and "digitalization" have been used in very different ways over the last five years. For a discussion around the confusing nature of this terminology see Jason Bloomberg's 2018 article in Forbes, **"Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril."**

Approaching TBM technology in terms of automation requires less effort and provides more immediate benefits. Using technology to augment existing processes means that no parallel period is needed to ensure that new processes and tech can replace existing systems. However, this also may mean that new technologies are not being fully leveraged, and processes will likely have many of the same limitations as before. Getting the most out of TBM processes means fully leveraging new technologies. This requires shifting how processes are structured, and requires a larger effort. In addition, the transition between new processes and technology can be difficult.

Unlike the other considerations in this section, automation and digitization map onto maturity levels in a fairly straightforward manner. At novice levels, agencies may simply need to find tools that make existing processes more efficient. This will allow them to get their TBM practice off the ground. As they increase their maturity and begin to collect and analyze data, they will be able to leverage technologies in more transformational ways.

TBM in the federal sector can be considered through this perspective as well. **CPIC has been the standard budgeting exercise for quite some time. TBM can be viewed as simply the latest tool for meeting budgeting requirements. Alternatively, it might be viewed as means to transform the way agencies gather and analyze IT data and make decisions about how IT is managed.**

Will TBM be a way of simply staying compliant with existing requirements or will it create greater transparency around IT spending, enabling zero-based budgeting and other innovations? At a leveraged state, TBM takes organizations beyond compliance, transforming the way IT is managed.

Copy vs Connect

As we discussed in the white paper on **TBM Data Analytics**, TBM implementation requires sourcing data from different areas of an organization including invoices, human resources, mission areas, project management offices, and other areas that are the authoritative source for given data sets.

As the term denotes, copying data involves duplicating data sets and placing them in a centralized TBM data store. On one hand, this allows the TBM project team to manipulate data without adverse effects on the source and mitigate data anomalies without external dependencies. However, this strategy contains serious logistical challenges including security, maintenance, hardware, and cloud purchase/storage capacity. In addition, copying large amounts of data into a central store also decouples that data from the authoritative source creating the potential for inconsistencies.

Alternatively, agencies might consider establishing a process that connects external data sets to a TBM user interface. Using APIs to connect to different source systems is the most obvious approach. This avoids the logistical concerns around the duplication of data and ensures that data sets remain tethered to the authoritative source.

On the downside, this also means relying on staff or contractors outside the TBM team's purview, creating obstacles to resolving data issues and ensuring a high level of system performance. This dispersed configuration creates questions around ownership and cost, making it possible that budget overruns will halt TBM projects because disparate systems owners will be unlikely and unable to pick up the slack for TBM projects.

Buy vs Build

Buy vs. build is a common dynamic for many software development projects, and industry and government have established best practices for identifying cost-effective actions and mitigating risks. **Decision Analysis Resolution (DAR)** is an industry-standard framework that uses tools like **Alternative Analysis** to identify, address, and document both business and technical concerns within an agency.

Purchasing a commercial-off-the-shelf tool (COTS) cuts down the time it takes to stand up the project, and it has been tested by users to assure that all features work and provide value.

However, out of the box tools can be difficult to modify, so agencies may find that features do not align neatly with their needs. This may be particularly true for TBM tools because they were developed for private industry, not government use. The data schemas may be fixed, making it time consuming and costly to add other organizational data for further analysis.

Custom development of TBM tools will generate a product defined by an agency's unique needs, and ongoing maintenance costs are generally less expensive than license fees. Moreover, there is built-in and dedicated support. In an ideal world it might be nice to always have a custom-made product ensuring an exact fit, but there are always drawbacks including development wait time and high costs. In addition, there is the danger of reinventing the wheel, so using a clear framework for assessing this decision is crucial.

Access vs Security

The question of how to balance access and security is not unique to TBM, but it is particularly relevant because TBM incorporates data from multiple sources and stakeholders need access to gain vital insights. For the purposes of this paper, "access" will refer to making data available to a larger number of stakeholders, and, in general, making the resources easier to connect to and ingest. Likewise, "security" will be used as a catch-all for the mechanisms designed to restrict availability of data resources, such as firewalls, access keys, encryption, and others.

Increased access often translates into increased value provided by the resource (e.g. used to make better decisions by more groups) as well as increasing transparency around government spending. On the downside, increased access can also increase the risk of exposure of sensitive data and/or personally identifiable information (PII). Similarly, there are pros and cons to increasing the security around TBM data resources. Increased security reduces the risk of exposure of restricted information as well as the downstream consequences of such a data breach. For TBM, much of the data should be considered procurement sensitive at the very least, since knowledge of past IT spending can give a contractor an unfair advantage on future RFPs.

Proper control of data resources will be a balance of access and security that maximizes the value of the resources, while limiting its misuse.

Since there is an obvious trade-off between access and security, it is important to note that the question of access vs. security is not binary. Rather, it is a question of identifying the needs of stakeholders and providing them the correct resources in a secure manner. As such, there are a some key technical considerations that IT experts need to assess in order to strike the proper balance:

1. **Is there Personally Identifiable Information (PII)** in the data?
2. **What is the appropriate security level** given the content of the data?
3. **How can proper security be maintained** given emerging exploits and other security concerns?
4. **What connection method** makes sense given the audience?
5. **Does the data need to be filtered** (masking fields or rows) based off of the recipient (e.g. should users only be able to access data for the systems they own)?
6. **Will these resources be shared outside of the organization?** (e.g. shared with other agencies for benchmarking purposes)

It is also worth noting that there are existing security requirements and best practices in the federal government that should be observed. For more information on the federal laws that govern data in the federal government, **visit ICLG.com**.

Application vs Services

The TBM process ultimately creates value for the agency once resources are shared with stakeholders and used to make better decisions around IT budgeting and management. The question remains, what should be the product that is delivered to stakeholders? In general, there are two primary ways of making TBM data actionable by stakeholders: applications and services.

To be clear, by "application" we are referring to the development or purchase of a technical solution—including a user interface for TBM stakeholders—that provides a base set of features that allow users to get relevant information and analysis from a single, centralized location. Alternatively, "services" refer to a reusable set of data and analysis access points that can be reused and reconfigured to answer numerous questions and support custom research and analysis of TBM data.

Each approach has its pros and cons. Applications are good at providing a core set of functionalities of data in real-time to establish a centralized, single source of the truth for IT spending and management data. However, due to the centralized nature, all new feature development and enhancements are owned by one group, which can slow down the release of updates significantly. Conversely, services allow each business unit to immediately create datasets and analyses that are relevant to their current business. This arrangement also implies that each business unit maintain personnel that are capable of accessing these services, which often requires more technical knowledge than an average user has.

When deciding what the correct solution for an agency looks like, technical staff can use tried and true best practices like **Joint Application Design (JAD).** These sessions can be used to discuss and review agency-specific, technical and business challenges that the solution needs to address as well as defining details of a solution.

Conclusion

Technology will be key to deriving the most value out of the TBM practice through aggregating data, analyzing data, and sharing insights throughout the organization. The goals that we discussed in the **Processes** and **Data Analytics** papers are advanced by technical team members through addressing the key considerations above. The key considerations should be reviewed in light of an end to end solution, because addressing any consideration will have downstream effects for other areas. Use Appendix I to begin assessing your current technology maturity level.

If you have questions about the maturity model or would like more information on how to use it, please contact **tbm@tcg.com**.

Other Resources

Visit **https://www.tcg.com/tbm-resources/** for additional information on implementing TBM at your federal agency.

- **Six Steps to Implementing Technology Business Management at Your Agency.**
- **TBM Maturity Model for Federal Agencies — Overview.**
- **TBM Maturity Model for Federal Agencies — TBM Processes.**
- **TBM Maturity Model for Federal Agencies — Data Analytics.**
- **Ready or Not, Here it Comes: Prepare for Technology Business Management.**
- For assistance or questions about implementing TBM at your agency, contact **tbm@tcg.com.**

About TCG, Inc.

TCG aims to improve the world around us, in big and little ways, every day, for our staff, clients, and community. TCG provides the federal government with positively distinct IT and management advisory services in Agile development, Technology Business Management, federal shared services, budget formulation and execution, and health science analytics that help government programs and America succeed.

TCG played a central role in supporting the roll-out of TBM across the Federal government. Our consultants helped create and distribute the policies agencies are now using to improve their management of IT investments, and our insights into IT spend data underpinned government's evolution towards TBM. As early members of the TBM Council, TCG was at the forefront of understanding and interpreting TBM principles for the federal government context.

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Appendix I: Agency Self Assessment

The questions below are for self-assessment, so that agencies can begin to evaluate the maturity level of their TBM practice in the Technology focus area. Questions are organized according to the key technical considerations discussed in this paper and include both yes/no and short answer. Answers to the yes/no questions highlight agency specific factors that will impact decisions for the five technical considerations. Teams should compare short answers to create consensus and a common understanding of the current maturity level of the agency's TBM practice. Distribute these worksheets to your team to fill out.

Automate vs Digitize

1. Is your TBM process an update to or extension of the existing CPIC process that has been in place for some time?

   ☐ Yes ☐ No

2. Is your agency looking to optimize existing processes as part of this TBM implementation/improvement?

   ☐ Yes ☐ No

3. What percentage of the budget data is pulled from outside business partners on an ad hoc basis?

   ☐ Yes ☐ No

Copy vs. Connect

1. If you are buying a TBM commercial-off-the-shelf tool (COTS), does the tool allow for ingestion of external data sources?

   ☐ Yes ☐ No

2. Which source systems have existing development resources to create needed data interfaces?

3. Which source systems (Finance, HR, EA, etc.) have current API endpoints or other methods of sharing relevant data for use by other business units?

Buy vs. Build

1. Does your agency currently have a TBM application?

   ☐ Yes ☐ No

2. If not, do you plan to purchase a COTS tool?

   ☐ Yes ☐ No

3. How do you currently view IT spending data in the TBM taxonomy?

4. How much flexibility do you require in terms of features that are not readily available in existing tools?

5. Have you done a comparison using your own labor rates of the buy vs. build alternatives, including licensing and O&M costs?

Access vs. Security

1. Has a review been performed on TBM data to assess the potential security and privacy concerns?

   ☐ Yes ☐ No

2. Are there existing user groups and permissions that can be leveraged when determining access to TBM data?

   ☐ Yes ☐ No

3. What are the users roles that need access to TBM data and what restrictions need to be applied for each role?

4. How important to the kinds of analysis you wish to do is the ability to drill down to the most granular source data? Are there only certain individuals/roles that need that ability?

Application vs. Services

1. Do key business partners have complete access to their TBM data for use in their internal management and ongoing operations?

   ☐ Yes ☐ No

2. Can you see a basic breakdown of your current IT spending across multiple organizational categories (i.e. Financial, IT, Business Services, etc)?

   ☐ Yes ☐ No

3. Are visualizations and reports sophisticated and targeted enough that you can quickly use them as the basis for evaluation of progress and to support decision-making?

   ☐ Yes ☐ No

4. Are the users equipped with the skills and tools to leverage services if they are provided?

   ☐ Yes ☐ No

5. How informed are stakeholders about their costing options and the impact different options have on their business?