

The Application Rationalization **PLAYBOOK**

An Agency Guide to Portfolio Management



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Introduction to Version 1.1

The Application Rationalization Playbook is designed to be an iterative document that evolves over time to reflect agency learning and a changing federal information technology (IT) landscape. Since the Playbook's original release, many agencies have kicked-off their own application rationalization efforts, stress-tested the plays at their agencies, and provided ample feedback and suggestions to improve the Playbook. This updated version incorporates feedback and input based on agency experience, sharpens and clarifies concepts, and removes redundant or unnecessary language. Specifically, there is added focus on the principles of Organizational Change Management (OCM), new agency case studies and lessons learned, and updates based on new Office of Management and Budget (OMB) policy and Administration guidance. It also includes information on the Application Rationalization Data Dictionary, which aims to help agencies strategically and systematically identify business applications and determine which should be kept, replaced, retired, or consolidated.

Introduction to the Playbook

This playbook is a practical guide for application rationalization and IT portfolio management. Application rationalization is the effort to strategically identify business applications across an organization to determine which should be kept, replaced, retired, or consolidated. This includes developing a detailed inventory, with attributes and functionality, determining business value and total cost of ownership (TCO), and then comparing or rationalizing that inventory of applications as a whole to eliminate redundancies, lower costs, and maximize efficiency. Application rationalization helps Portfolio Managers improve their agency's approach to IT modernization. There is no one-size-fits-all application rationalization process, rather agencies should tailor their approach to fit mission, business, technology, human capital, and security needs.

Application rationalization drives improved IT portfolio management capabilities, empowers leaders to make better decisions, and enhances the delivery of key mission and business services. Successful application rationalization efforts require buy-in from critical stakeholders across the enterprise, including senior leaders, IT staff, cybersecurity experts, mission and program owners, financial practitioners, acquisition and procurement experts, and end user communities. Rationalization efforts rely on leadership support and continual engagement with stakeholders to deliver sustainable change. This playbook provides simplified steps that break application rationalization down into component parts and it addresses challenges and opportunities for IT leaders approaching application rationalization for the first time.

This playbook is designed to be iterative, and agencies are encouraged to collaborate and share best practices and lessons learned from their own application rationalization experiences. For more information, please join the Cloud and Infrastructure Community of Practice (C&I CoP). To learn and engage with C&I CoP, please email the Data Center and Cloud Optimization Initiative (DCCOI) Program Management Office (PMO) at dccoi@gsa.gov with your request to join.

Key Terms

Definitions of key terms used throughout this document.

- **Application** - A software program used directly or indirectly to support the program office in delivering on a business or mission function; includes mobile applications
- **Application owner** - The individual or group within the program office that directly oversees an application
- **Business value** - Qualitative and quantitative measures of an application's value
- **Component** - A discrete unit within a federal agency, such as a bureau or department
- **Enterprise** - An entire agency, including program offices and components
- **Portfolio Manager** - The individual or office responsible for executing application rationalization for the entire organization¹
- **Program office** - The office or organization within the agency that owns or operates an application that delivers a business or mission function
- **Technical fit** - A measure of an application's technological health

Disclaimer

This playbook was developed by the Chief Information Officer (CIO) Council and the Cloud & Infrastructure Community of Practice (C&I CoP), with input from key federal IT practitioners and industry representatives. This document does not provide authoritative definitions of IT terms and should not be interpreted as official policy or mandated action. Rather, this playbook supplements existing federal IT statutes and policies, and builds upon the key components of the Cloud Smart² strategy.

¹ Per FITARA and [EO 13833](#), the CIO must be involved in "all management, governance, and oversight processes related to IT." At some agencies, portfolio managers are senior members of the Office of the Chief Information Officer (OCIO), such as the chief enterprise architect, while other agencies identify other stakeholders to lead their application rationalization efforts. While agencies are free to include other stakeholders, the CIO, or a designee, must be included in the process.

²See <https://cloud.cio.gov/>.

A Six-Step Process for Application Rationalization

The six-step process outlined below is a structured, iterative approach to application rationalization for **IT Portfolio Managers**. The six steps provide discrete actions for agencies to consider when undergoing application rationalization. Agencies are encouraged to tailor these steps to meet organizational structures, unique requirements, and mission needs.

Step 1: Identify needs and conduct readiness assessment.

Work with critical stakeholders, such as the agency OCIO, to conduct an application rationalization readiness assessment, develop the application questionnaire, and create a baseline inventory.

Step 2: Inventory applications.

Conduct an Environmental Scan to identify applications not in the Baseline Inventory and send the Questionnaire to the stakeholders to capture relevant data pertaining to each application.

Step 3: Assess the business value and technical fit

For each application in the application inventory, analyze and validate business value and technical fit data captured in the Questionnaire. Engage program offices ensure data quality. Review the application inventory to identify dependencies and duplication.

Step 4: Assess the total cost of ownership (TCO)

Assess each application's TCO captured in the Questionnaire. Compare TCO in the current-state against estimated TCO in future-state architectures.

Step 5: Score applications

Based on the business value, technical fit, and TCO, score all applications and determine whether each should be reviewed, rewarded, removed, or refreshed.

Step 6: Determine application placement

Based on the application scores, develop and execute a change management and application migration strategy for future iterations.

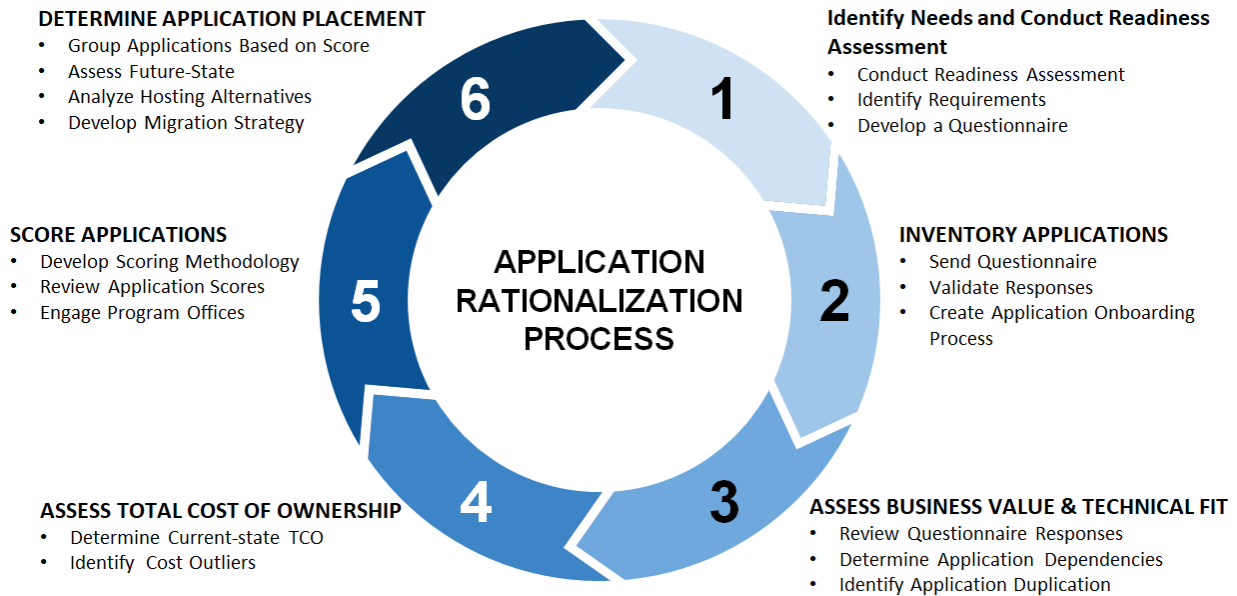


Figure 1: Application Rationalization Six-Step Process

Figure 1 shows application rationalization as an ongoing best practice for good IT portfolio management. The speed of technological change means there is constant investment in new applications, decommissioning legacy IT, and refactoring applications to reflect changing technology and business environments. Agencies must routinely update and rationalize their portfolios to enable IT managers to make informed business decisions. Application rationalization uncovers issues such as application duplication, siloed business units, and unnecessary IT costs, so agencies can address them head-on.



Step 1: Identify Needs and Conduct Readiness Assessment

Determine the scope and set governance for the application rationalization effort, then develop a standardized questionnaire and templates for all resources shared with program offices during the application rationalization effort.

1.1 Conduct Readiness Assessment

Before jumping into application rationalization, agencies should complete an application rationalization readiness assessment.

Link to [Application Rationalization Readiness Assessment Toolkit](#)

This Readiness Toolkit leverages organizational change management (OCM) best practices and provides templates to make the readiness assessment easy and straightforward. As part of this readiness assessment, agencies should assign an accountable portfolio manager, set up the application rationalization team (team) responsible for application rationalization and IT portfolio management in the future, establish a business case for application rationalization, engage OCIO and executive leaders from across the enterprise to ensure buy in for the effort, and conduct an environmental scan of existing application inventories using automated discovery tools or existing inventories as a baseline application inventory to start from. A good place to start when developing the baseline application inventory is with the agency's Disaster Recovery and Continuity of Operations Plans (DR/COOP), which must take into account contingency planning and backups for critical applications and services. An example of existing inventories can be found in [Appendix 1](#).

OMB Software License Management Policy

OMB policy M-16-12: Improving the Acquisition and Management of Common Information Technology: Software Licensing³ requires agencies to appoint a software manager responsible for managing agency-wide commercial and commercial off-the-shelf (COTS) software service agreements and licenses. Furthermore, M-16-12 specifically mentions Software Asset Management (SAM) tools, Software License Optimization (SLO) tools, Continuous Diagnostics and Mitigation (CDM) tools, Continuous Monitoring as a Service (CMaaS), network management tools, and finance and accounting systems to report on software inventory, prices, and usage. Many agencies already have mature software license management practices and inventories in place. Application rationalization can leverage this work as a starting place when building the baseline application inventory.

³ OMB Memo for M-16-12 for Category Management Policy 16-1 Improving the Acquisition and Management of Common Information Technology- Software Licensing. <https://hallways.cap.gsa.gov/app/#/doclib?document=8496>

1.2 Identify Requirements

Ensure the application rationalization effort aligns to current legislation, agency mission priorities, relevant OMB policies (e.g., CPIC budget guidance, Software Category Management), and other agency initiatives. See [Appendix 2](#) for a list of relevant government-wide legislation and policy. Additionally, determine the scope of the application rationalization effort in this step of the process. Many agencies, especially large, federated agencies, choose to down-select their initial application inventory to a component or subcomponents to more easily manage and refine the application rationalization process.

1.3 Develop a Questionnaire

Develop a questionnaire that will be sent to each application owner in Step 2 of the application rationalization process. The questionnaire is the primary data collection tool that will be used to compare applications across the enterprise. The questionnaire should, at minimum, capture business value, technical fit, and total cost of ownership (TCO) for each application. The questionnaire should also provide clear instructions to ensure uniform completion by respondents.

Questions related to business value should assess the following factors for each application (See [Appendix 3](#) for additional Business Value question examples):

- **Effectiveness** - the extent to which an application is a solution for the goal agencies are trying to achieve;
- **Mission criticality** - the degree to which an application is critical in supporting and executing the agencies' mission;
- **Utilization** - usage data for the application. Inventory tools can help agencies measure usage without relying solely on requirement information provided by an application owner;
- **Complexity** - the customization, unique features and functions enabled by the application. Applications with greater complexity typically require unique skills to develop and maintain, satisfy more technically difficult requirements, or pull from multiple data sources; and
- **Usability** - how easy it is for the user or customer to operate or learn.⁴

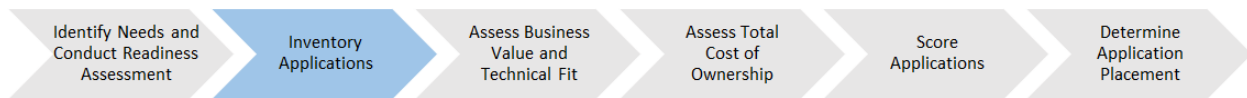
Questions related to technical fit should assess the following factors for each application (See [Appendix 4](#) for additional Technical Fit question examples):

- **Technical requirements** - what levels of storage, bandwidth, data, maintenance, and support are needed to make an application run;
- **Software and hardware version control** - how often is an application updated and how much marginal effort does each update require from administrators and

⁴ For information on usability, use the system usability scale to measure customer experience. Visit <https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html> for more information.

users;

- **Dependencies and interoperability** - to what degree do other applications or systems depend on this application to run, and what disruptions in other applications would affect it;
- **Scalability and adaptability** - can an application be scaled to onboard new users and can it be augmented to fit the needs of new user groups; and
- **Security standards** - is an application vulnerable to security attacks and does it fit into agency risk tolerance models.



Step 2: Inventory Applications

In Step 1 of the application rationalization process, agencies conduct a readiness assessment, develop a questionnaire that teases out relevant application information, and create a baseline application inventory. In Step 2 of the process, agencies deploy the questionnaire to application owners and program offices to collect relevant information on each in-scope application.

2.1 Send Questionnaire

Send the questionnaire to application owners or program offices for each in-scope application. This ensures uniform and reliable data collection, allowing the team to compare across applications.

2.2 Validate Responses

Review Questionnaire responses for completion and accuracy, then compare them with existing inventory sources. Follow up with the application owner or program offices if there are discrepancies between the responses provided on the questionnaire and information from existing inventory sources. The team now has an authoritative application inventory.

2.3 Create Application Onboarding Process

Work with the relevant stakeholders within the OCIO and other program offices to ensure new applications and services are added to the authoritative application inventory going forward. This ensures the application inventory is continuously updated and provides value in the future. Application rationalization is not a one-time exercise but should become part of normal business operations within the agency.



Step 3: Assess Business Value and Technical Fit

In Step 2 of the application rationalization process, agencies inventory applications by sending the questionnaire to each application owner and program manager, validate those responses, and develop a process for maintaining the application inventory in the future. In Step 3, compile the responses to the questionnaire and assess the business value and technical fit for each application relative to all the applications in the inventory.

3.1 Review Business Value and Technical Fit Responses

The questionnaire developed in Step 1 should, at minimum, collect information related to the business value and technical fit of each application. Often legacy applications are used past their support horizons, which increases operating costs and the risk of security vulnerability. Weigh the business value and technical fit responses based on unique business and mission needs. For example, an application's ability to perform core mission services, such as a legislative mandate, administration priority, or leadership objective, is often the most important factor when assessing business value and technical fit. There is no one-size-fits all application assessment methodology.

3.2 Determine Application Dependencies

The questionnaire should determine dependencies for each application in the inventory. Identifying upstream and downstream dependencies is critical for application rationalization because applications with many dependencies are often more challenging and costly to refactor, migrate, or decommission. Many systems and applications share code, databases, and functionality. Applications with many dependencies tend to have higher business value and applications. Although there are several commercial tools available to identify application dependencies, not all dependencies are easily discoverable with automated tools. Some dependencies, such as applications for training users or knowledge dependencies cannot be readily mapped with automated tools. Therefore, the questionnaire should still be used to validate dependencies in the application inventory.

3.3 Identify Application Duplication

Review the application inventory for duplication. If components are using different applications to perform similar, standardized software functions, there is likely a good business case for an enterprise solution or intra-agency shared service. It's common for components to be uncoordinated when purchasing applications, which leads to redundant purchases.



Step 4: Assess Total Cost of Ownership

In Step 3 of the application rationalization process, agencies assess the business value and technical fit of each application. Step 4 of the process builds off Step 3 and looks at each application’s total cost of ownership (TCO). Often agencies cite TCO as the most challenging part of application rationalization because there are often hidden or unknown costs. In this step of the process, agencies will assess TCO information from the questionnaire, identify cost outliers in the inventory, and provide IT investment recommendations based on agency priorities and current spend.

4.1 Determine Current-State TCO

The questionnaire provides TCO information for each application in the inventory. Often, agencies struggle to determine the exact cost of ownership for each application because of hidden costs, considerations around projected future costs, depreciated value, how to accurately account for cost savings and avoidances, convoluted service level agreements (SLAs) and terms of service, and other unknown costs.

This playbook suggests agencies simplify the complex process of determining to the penny the total cost of ownership for each application. Rather, the questionnaire sent to application owners and program offices in Step 2 should prompt respondents to provide cost estimates for their applications within given ranges. The precise cost of ownership is less important than the approximation of that cost with the added context of the application’s business value and technical fit all relative to the agency’s mission and business priorities.

Technology Business Management (TBM) helps address some of the issues in accounting for IT costs. TBM is a great place to start when trying to understand all the costs associated with hosting, securing, and providing service to existing applications. However, there may be non-IT costs that aren’t accounted for in TBM, such as costs associated with retraining or reskilling the agency’s workforce to use new tools and applications. To learn more about implementing TBM at your agency, please refer to the TBM Playbook found on [gsa.gov](https://tech.gsa.gov/playbooks/tbm/).⁵

⁵ <https://tech.gsa.gov/playbooks/tbm/>

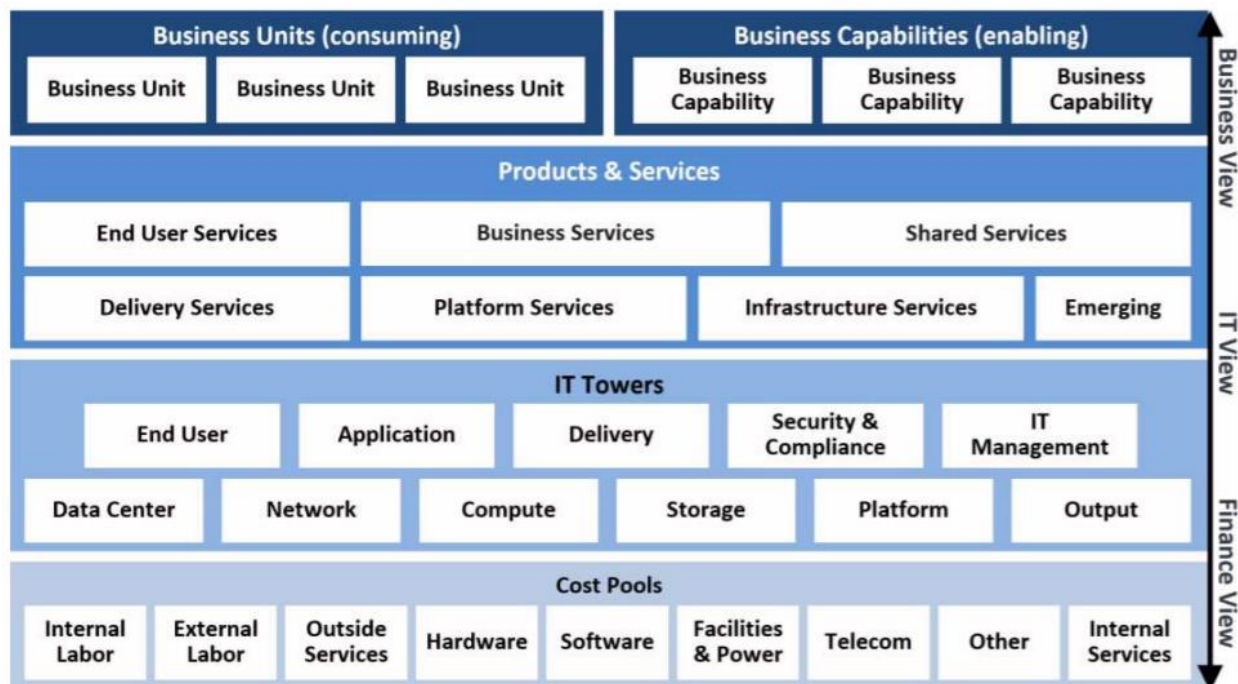


Figure 2: The TBM Taxonomy

4.2 Identify Cost Outliers

Work with application owners and program offices to ensure the most accurate and complete current-state TCO information is captured in the questionnaire, especially in the event that outliers are identified, such as COTS business applications that far outpace the cost per user compared to similar projects on the market and within the agency. Cost outliers that don't have corresponding high business value or technical fit are good candidates for review.

Case Study: DOJ Application Rationalization Experience

In 2019, the U.S. Department of Justice (DOJ) used this playbook to pilot application rationalization at their agency. Of the DOJ's 26 components, DOJ selected the Antitrust Division (ATR) to conduct the pilot and to provide the rest of the Department with lessons learned and a roadmap for full-scale application rationalization across the DOJ. DOJ shared those lessons with the Cloud and Infrastructure Community of Practice and some of the lessons are included below. Overall, agencies are encouraged to tailor process steps contained in this playbook to meet their individual agency's needs. DOJ and ATR provided the following lessons learned around how ATR adapted the playbook to meet ATR's specific application rationalization needs:

1. Define what applications are included in the inventory collection. A formalized definition should be documented and provided to all components participating in the application rationalization efforts to ensure all components and stakeholders

are in agreement with the scope applications in play. Furthermore, each question in the questionnaire should have specific definitions and directions to ensure, to the greatest extent possible, that applications are being assessed and considered using the same methodology.

2. Streamline questions related to total cost of ownership (TCO) for simplicity and create a standardized algorithm for calculated TCO to eliminate subjectivity and guesswork across components and programs. ATR determined that, as currently outlined, determining TCO for each application is prohibitively time consuming.
3. Tailor questions related to Business Value to meet agency specific needs. For ATR, most end users are litigating attorneys who did not have availability to participate in this effort. This made it difficult to accurately determine the Business Value for each application as the questionnaire is currently written.
4. Include a question for applications that are hosted in a physical, on-premise environment to determine whether they are eligible, or have been previously considered, for migration to the cloud. ATR suggested this was a relevant data point to determine the most appropriate future-state hosting environment for their applications.
5. ATR estimated the level-of-effort (LOE) to distribute and collect responses for the 148 applications in their inventory to be about 200 hours total. This number reflects ATR's decision not to request the TCO for each application because, ATR determined, this activity would be prohibitively time consuming.
6. ATR recommended that inventory collection and analysis should occur in an iterative manner. The first phase gathers general information to categorize applications, and the second phase gathers more detailed information to assess applications' Business Value, Technical Fit, and TCO. Following this two-phased approach can reduce reporting burden, because some applications may not need to provide such detailed information and can improve the quality of the data set.
7. ATR recommended DOJ should have a single system of record for the application inventories. ATR used a single Microsoft Excel Workbook that was sent to various ATR sub-organizations that subsequently engaged several application owners. A single system would overcome problems related to version control, redundant touchpoints, and data consolidation while, simultaneously, vastly simplifying the application rationalization process.



Step 5: Score Applications

In Steps 3 and 4 of the application rationalization process, agencies assess the business value, technical fit, and TCO for each application in their inventory based on the application rationalization questionnaire responses. Step 5 of the process compiles this data into a single score for each application that can be used to easily and succinctly compare applications to each other.

5.1 Develop a Consistent Scoring Methodology

To score each application, develop a consistent scoring methodology that is applied to all applications. This methodology should weigh factors relevant to each agencies' specific business and mission needs. A consistent scoring methodology ensures scores are unbiased and clear. The case study at the end of this section goes into greater detail about how one agency modified an existing scoring methodology to meet the agency's needs.

5.2 Review Application Scores

Review the application scores for each application in the inventory to ensure consistency. The application score should incorporate the business value, technical fit, and TCO factors collected in the application rationalization questionnaire sent to application owners and program offices. There is no single framework or template for scoring applications because the score should be weighted based on the specific requirements and priorities of the agency.

5.3 Engage Program Offices for Transparency and Feedback

Agencies cite clear and open communication with application owners and program teams - throughout the application rationalization process - as a key to successful implementation and adoption. At this point in the process, after each application owner and program office has completed the questionnaire and provided additional information for the applications and systems they manage, it is important to re-engage these stakeholders to make sure they understand how the data they provided will be used. To that end, the team should:

- Develop a communications strategy that enables stakeholders to learn about the scoring process, understand how information will be shared, and provide feedback;
- Share application scores with all program offices and application owners, to provide transparency into how applications perform across the enterprise;
- Promote internal discussions around solutions to better meet business or technical requirements;
- Refine the scoring methodology based on stakeholder feedback and input;
- Anticipate that some program offices will be reluctant to share information on their

applications. To mitigate resistance and promote collaboration, be proactive in soliciting feedback from the program offices;

- Host office hours for application owners to talk to the application rationalization team;
- Create FAQs about the scoring process and the rationale behind the questionnaire; and
- Conduct workshops for program offices to demonstrate how to score an application, to familiarize staff with the process.

Regular, ongoing communication can foster trust in the application rationalization process and make stakeholders more willing to engage the team in future steps and iterations of the application rationalization effort. The more iterative, agile, and collaborative the process, the more likely program offices are to support the effort.



Step 6: Determine Application Placement

In Step 5 of the application rationalization process, agencies compile information related to each application's business value, technical fit, and TCO to come up with an application score that can be used to compare applications. Step 6 of the process incorporates relevant information to determine the best placement for each application in the inventory

6.1 Group Applications Based on Application Scores

Group applications into the appropriate categories and develop a structured process to assess the hosting options for each application. In the template, applications are grouped into four categories: review, reward, refresh, or remove.

- **Review** - applications with low business value and high technical fit. These applications are candidates to maintain current funding levels, explore opportunities to enable greater business value, and consider lower-cost alternatives.
- **Reward** - applications with high business value and high technical fit. These applications are candidates for increased investment, enhanced functionality, and expanded use across the enterprise.
- **Refresh** - applications with high business value and low technical fit. These applications are candidates for increased investment to ensure the same high-level business value is delivered by more modern and secure systems.
- **Remove** - application with low business value and low technical fit. These applications are good candidates to decommission or to consolidate their functions within another application.

Figure 3, which uses dummy data, shows a visual on how applications can be scored. Consider modifying the parameters of the scoring quadrants to best meet your agency's needs.

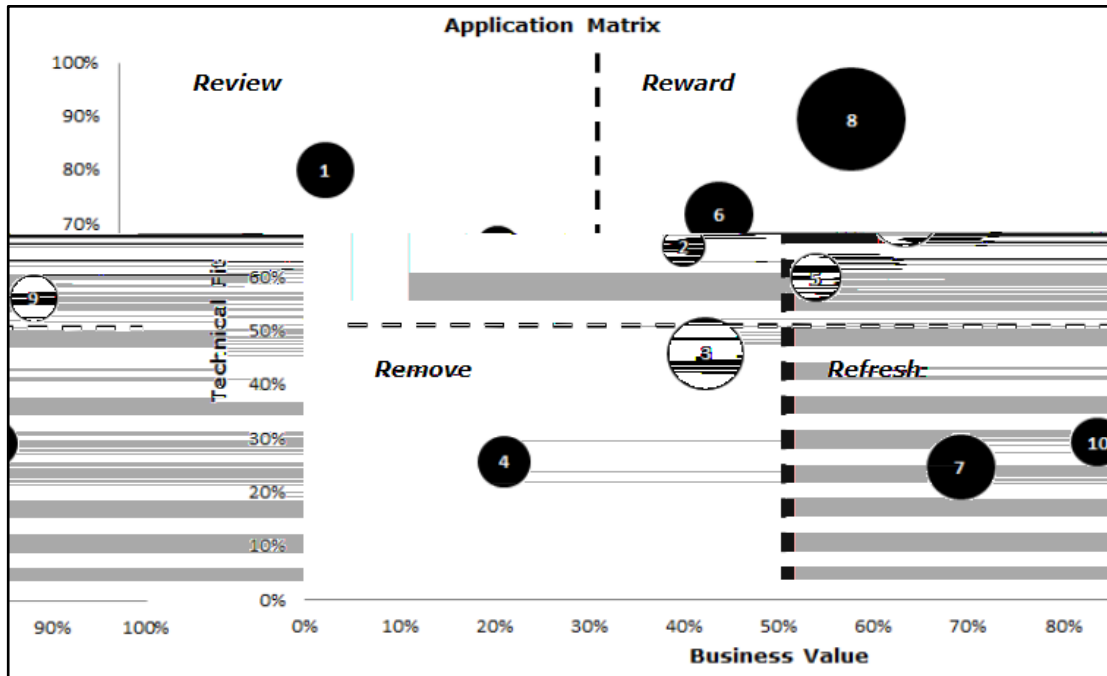


Figure 3: The application matrix. Applications with a greater TCO per user will appear as larger circles. Determine the appropriate point to delineate between applications to review, reward, refresh, and remove based on agency needs and available resources, and the relative sizes of each quadrant.

6.2 Assess Future-State TCO and Hosting Options

Future-state TCO is an important factor in assessing hosting options, but improved service delivery and customer satisfaction are major goals as well. Just because a hosting option saves money does not necessarily mean it is the option agencies should choose. Hosting options should be compared by costs, resiliency, reliability, agility, security, and service delivery and weighted in a manner consistent with agency business and mission goals. For example, the agency whose primary mission involves working with classified or otherwise sensitive information may have to weigh security considerations more heavily than other factors. Similarly, cost may eventually become a primary consideration for agencies that face budget constraints that would otherwise hamper their primary mission objectives. While there is no one method of weighing these factors, the process of assigning weights should be conducted in a transparent manner, with input from major stakeholders across the enterprise.

6.3 Analyze Hosting Alternatives for On-Premise Applications

When migrating from an on-premise solution to a new hosting environment, there are up-front costs associated with:

- Assessing the current-state;
- Planning for migration;
- Getting stakeholder buy-in;
- Running parallel systems;

- Vendor management;
- Training and reskilling; and
- Refactoring and replatforming existing applications if necessary.

Agencies will often experience a “migration bubble” caused by the increased up-front costs of migrating, followed by cost savings and avoidances in the future. These cost savings can be brought about by increased worker productivity, greater scalability, or more operational resiliency in the new hosting environment. This establishes a new cost baseline resulting in eventual O&M and DM&E cost savings.

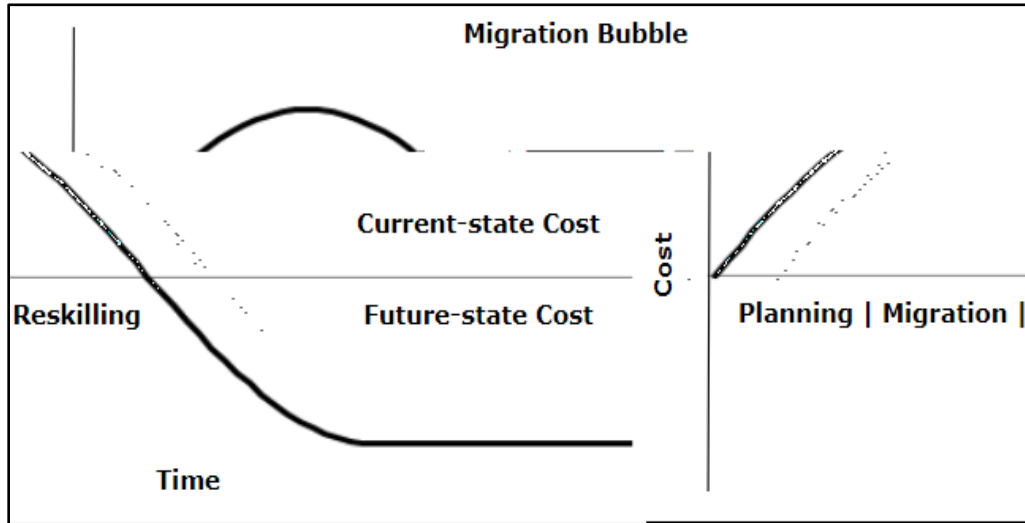


Figure 4: The Migration Bubble. This figure illustrates up-front cost increases caused by running current-state and future-state systems in parallel. While the future state shows a rebaselining of costs below the current-state costs, the actual cost of operating future-state systems depends on how many servers and support systems can be decommissioned or consolidated as part of the application rationalization effort and whether the future-state hosting environment is more efficient than the current-state.

Hybrid solutions, where applications or systems are run in the cloud and on-premise simultaneously, can greatly increase the size of this migration bubble. In such cases, the technological solution has to be weighed against the increase in costs.

Many applications cannot be effectively lifted-and-shifted into cloud environments without significant refactoring and modernization. Lift-and-shift is the least mature cloud migration option, so agencies are unlikely to realize all of the benefits of cloud until they consider, for example, a containerization or serverless model. It is important to keep in mind that beyond a certain point, marginal improvements in service delivery from advanced cloud services may not realize the cost savings described in Figure 3 or the benefits described above.

As automation and abstraction capabilities mature, agencies can focus more on mission and service delivery while also streamlining their business functions. Automation can increase productivity as staff members are freed from low-level maintenance on applications and can spend time innovating or focusing on other high-priority issues.

6.4 Develop Migration Strategy and Change Management Plan

To achieve the benefits of application rationalization, agencies require cultural buy-in from across the organization. Successful IT migration strategies require:

- Buy-in from senior leadership, the CIO, and the CFO to provide funds and backing for the migration effort;
- A communications strategy to inform and continually engage stakeholders;
- A vendor management plan to ensure contracts align to migration strategy;
- A workforce development plan to help end users adapt to the new environment; and
- A migration timeline and workflow map to execute migration strategy.

Workforce development is a critical part of Cloud Smart and is essential to a successful application rationalization and migration strategy. Agencies must not only train their staff on how to migrate into the new environment, but they must have enough competency to use the tools to make key decisions regarding future modernization plans. Agencies that outsource O&M or DM&E risk losing significant institutional knowledge when contracts end or new vendors are added.

Case Study: Application Placement

Since migrating to a new environment is both a technical and cultural challenge, successful migration plans must account for both. A small component of a much larger agency successfully migrated its applications to the cloud by strategically addressing the following technical and cultural parts of migration:

- **Cloud roadmap**

The roadmap documented the objectives of the cloud migration effort, identified key stakeholders, and developed a project plan to execute the migration. The purpose of the roadmap was to document the current environment and to map future-state vision. The component ensured all IT staff provided input on the roadmap and briefed senior leadership to establish executive buy-in.

- **Network mapping**

The agency fully mapped its network topology to understand application and data connections. This information allowed the agency to move to migrate to the cloud environment and quickly identify the cause of service outages as they arose. Engaging network service providers and incorporating agency's network experts early in the migration process were critical success factors.

- **Training**

Ensuring federal and vendor IT personnel could continue to support applications in the new environment allowed the component to keep costs low because new talent did not need to be brought in. It also increased cost savings because the remaining component staff could take advantage of cloud benefits. The component hosted formal training supported by vendors; ran virtual labs; and posted information on internal chat rooms, internal blogs, and LinkedIn for staff's convenience, in addition to encouraging attendance at external trainings. The component also hosted pilots with vendors where staff could experiment in the new environment. Training was a key component in driving the cultural changes needed for a successful migration because it demystified the cloud for staff and gave them the confidence to operate in that new environment.

- **Lift and shift, refactor, rehost**

Before moving any application into the cloud, the component had to determine which method it would use to deploy applications. Depending on their business value, costs, and technical capabilities, the component determined that certain applications were ready for lifting and shifting into the new environment while

others needed code updates to operate in the cloud. Because the component recognized that different applications needed to be treated differently, the method of delivery also required application-specific resources and planning. In the long term, the component is going through a major system modernization effort to update their application architecture and take better advantage of cloud services.

The above characteristics should be captured in any agency's migration plan. Compared to the larger agency, the component had a smaller universe of stakeholders to collaborate with and satisfy. This made developing and implementing the migration simpler than an enterprise-wide migration, but the practices are still applicable to any size organization. Constant and clear communication between the mission, IT, and business sides of the enterprise ensures buy-in for any migration strategy and guarantees the right information is shared, regardless of which environment an application is moved.

Conclusion

Application rationalization is integral to portfolio management and IT modernization. The six-step application rationalization process provides a structured approach that agencies are encouraged to use for future portfolio management and cloud migration strategies. Agencies that develop an authoritative application inventory will empower their leaders to make more informed IT strategies, allow procurement offices to buy services more efficiently, and enable users to deliver mission services to customers.

For some agencies, migrating on-premise applications to the cloud is prohibitively expensive and does not enhance service delivery. For other agencies, the benefits of hosting applications in cloud environments, such as increased productivity, scalability, agility, and operational resilience, justifies the upfront costs. This playbook encourages agencies to take a holistic view of the costs and benefits of migrating applications from on-premise to different environments including the business value, technical fit, and TCO.

Designed to supplement the Federal Government's Cloud Smart strategy, this playbook reinforces the need to reskill federal employees to operate and deliver mission service in any environment, compare security and backup costs in on-premise versus cloud environments, and rethink procurement processes to make smarter buying decisions that account for the TCO and work with existing CPIC guidance. Ultimately, application rationalization is a component of a broader federal strategy to use IT and services in a way that enables agencies to perform their missions faster and more effectively.

This playbook is intended to be a living document and is subject to future updates. Readers are encouraged to provide feedback and engage with other IT practitioners across the federal government. To provide feedback or learn more about potential collaboration opportunities, email the Data Center & Cloud Optimization Initiative (DCCOI) PMO at dccoi@gsa.gov.

Agencies are encouraged to join the C&I CoP and the C&I CoP's Application Rationalization Working Group. The CoP is a forum for federal practitioners to collaborate with their peers on cloud and IT infrastructure matters. The working group will serve as a dedicated space to add to this playbook and to discuss other relevant application rationalization matters. C&I CoP meetings are held on the first Wednesday of each month, except in August and January. For more information on the C&I CoP, the Application Rationalization Working Group, and to learn how to join either, email dccoi@gsa.gov.

Appendix

Appendix 1 - Example Inventory Sources

Example inventory sources include:

- Capital Planning and Investment Control Reports (such as those submitted to OMB);
- Financial Reporting Tools;
- Authorization to operate lists & management tools;
- Cybersecurity assessment and management tools;
- Software license optimization (SLO) tools and inventories;
- Configuration management database (CMDB) tools;
- Continuous Diagnostics and Mitigation (CDM) tools;
- Continuity of Operations Plans (COOP) and disaster recovery (DR) plans;
- Data Center Infrastructure Management (DCIM) tools;
- Data management systems;
- Hardware tracking systems;
- Licenses and service level agreements;
- Security operations tools;
- Software asset management (SAM) Tools; and
- Virtualization management systems.

Appendix 2 - Policies and Guidelines

Below is a list of official policies and guidelines that can impact how agencies determine their requirements in developing an application rationalization strategy.

Short Title and Link	Full Title
PMA	The President’s Management Agenda
MEGABYTE Act	Making Electronic Government Accountable By Yielding Tangible Efficiencies Act of 2016 or the MEGABYTE Act of 2016
FITARA	Federal Information Technology Acquisition Reform Act
FITARA Scorecard	House Committee on Oversight and Government Reform (OGR) Biannual IT Scorecard (See page 6)
FITARA Guidance	Templates, resources, and guidance to help agencies implement FITARA
CAP Goals	Cross-Agency Priority Goals
FY20 IT Budget - Capital Planning Guidance	FY20 IT Budget - Capital Planning Guidance

Short Title and Link	Full Title
OMB Circular A-130	Managing Information as a Strategic Resource (See Appendix II: Responsibilities for Managing Personally Identifiable Information)
M-15-14	Management and Oversight of Federal Information Technology
M-16-02	Category Management Policy 15-1: Improving the Acquisition and Management of Common Information Technology: Laptops and Desktops
M-16-12	Category Management Policy 16-1: Improving the Acquisition and Management of Common Information Technology: Software Licensing
M-16-21	Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software
M-17-22	Comprehensive Plan for Reforming the Federal Government and Reducing the Federal Civilian Workforce
M-18-23	Shifting From Low-Value to High-Value Work
M-19-26	Update to the Trusted Internet Connections (TIC) Initiative

Appendix 3 - Business Value Sample Questions

- What problem was this application designed to address?
- List the business process(es) this application supports (e.g., quarterly reporting to OMB, internal project management, order management transaction processing).
- When was this application originally developed?
- Who is paying for this application and how is it being funded?
- Which department business lines are using this application and where are they located?
- Is this application used by customers outside of the department?
- What is the application's average annual utilization?
- Does the information within this application need to be kept and stored? If so, for how long?
- Does the capability/functionality exist within another application? If yes, provide the name of the application(s). If no, reply None.
- How are you training new users of the application?
- What is the strategic direction of this application? Is there documentation for this plan?
- What is the importance of the application to the user's duties?
- How satisfied are you with the features of the application?
- How satisfied are you with the usability of the application?
- What effect would a 24-hour, unplanned outage of this application have on your organization?
- How well does this application meet its intended business requirements?
- Is this application an authoritative source/Exclusive Record of Origin (ROO) for the data it stores?
- Does this application have security controls in place?
- Does this application have redundancies in place to ensure continuity of operations?
- Does this application interface with and/or depend upon other applications?
- Is the application stack aligned with supported versions, or do parts of the application depend on obsolete technology?
- Does the application have maintenance issues that affect business operations?
- Is the application flexible and able to meet changing business requirements?
- Does this application require specialized expertise to maintain?
- Can this application quickly scale to handle greater transaction volumes and support additional users (internal or external to your organization)?

- What impact does upgrading the application software version have on other components of the application (e.g., custom features, permissions, etc.)?
- What is the timeline for this application to be sunsetted or retired?
- Can the application be moved to and run in a cloud efficiently?
- Does the application developer use the following modern development practices (e.g., Continuous Development/Continuous Integration; Configuration as Code; Version Control; Automated Testing; Agile, [including Scrum, Lean, SAFe])?
- How much data does this application store?

Appendix 4 - Technical Fit Sample Questions

- What office or component is responsible for the application's IT support/administration?
- List all contractor companies that support this application.
- Who is hosting this application? Is this application in the cloud?
- How many change requests do you receive per year?
- Does this application receive information from other applications?
- Does this application send information to other applications?
- What licenses are associated with the use of this application (if applicable)?
- Does this application have a valid ATO?
- Is the application web enabled? If yes, provide the URL.
- Is this application mobile enabled?
- How do users access/log in to this application?
- What databases does the application use?
- What reporting and analysis (BI) technology does the application use?
- What application and/or web server does the application use?
- What programming languages does the application use?
- What operating systems does the application use?

Appendix 5 - The Application Rationalization Data Dictionary

The Application Rationalization Data Dictionary is a supplement to the Application Rationalization Playbook to help agencies strategically and systematically identify business applications and determine which should be kept, replaced, retired, or consolidated. This resource establishes standards for data exchanges designed to manage application rationalization. Utilizing input from interagency stakeholders in the federal IT community, it establishes a data taxonomy and defines a technical schema for machine-readable data interchanges. Agencies are encouraged to use Application Rationalization Data Dictionary in tandem with current-state portfolio assessments to align IT assets with modernization priorities, and to share best practices and lessons learned from their own application rationalization.

For more information, please visit the [GitHub repository](#), which includes the data dictionary, technical schema, test data, and ReadMe.