

Where did all your MIPS go?

Truly understand your mainframe environment before you improve it

INTRODUCTION

On March 29, 2012, the White House announced a \$200 million initiative to improve the tools and techniques needed to access, organize and analyze information from large volumes of digital data. Currently, the federal government has numerous mainframe-based legacy systems. These systems manage and facilitate unthinkable amounts of data that utilize expensive computing power expressed in millions of instructions per second (MIPS), often causing mainframe system managers to prioritize processes that will not exceed system processing capacity limits. In order to achieve transformational IT – as required by the Administration’s Big Data Initiative – current data sets must be rendered useful and in turn, reduce the overall operations and maintenance (O&M) costs to running these mainframe-based data centers. Gartner states that “academic research has shown that as much as 25 percent of [mainframe] maintenance costs results from high levels of program and system complexity. Developing a more robust understanding of it is the first step towards reducing both complexity and maintenance costs.”¹

Micro Focus’ Enterprise Analyzer is a software tool that parses enterprise application portfolios and reveals dead or non-working code, highlights duplicate code and surfaces unnecessary redundancies. It also provides a comprehensive understanding of what application and workload software is contained on the mainframe – allowing agency leadership to determine how to best move forward to make the applications most valuable and reduce O&M costs in the austere budget environment.

“In the same way the past federal investments in information technology R&D led to dramatic advances in supercomputing and the creation of the Internet, the initiative we are launching today promises to transform our ability to use Big Data for scientific discovery, environmental and biomedical research, education and national security.”²

Dr. John P. Holdren, Assistant to the President and Director of the White House Office of Science and Technology Policy

CHANGE INCREASES COMPLEXITY

In typical government organizations, the complexity and number of applications has increased over time. This increase in complexity and numbers is driven by technology advances, budget fluctuations and organizational needs and requirement changes. Software applications are often critical for operating mission-critical functions. The applications reflect what the organization needed most at a certain point in time and, accordingly, the applications portfolio has been developed, upgraded and modified to be responsive.

Over time these changes will have affected every aspect of the enterprise itself and the wider environment in which it operates:

› Organization Structures

As budgets and priorities change, systems need to be aligned to meet new regulatory challenges and mandates.

› Users and Access Devices

With the Administration’s Digital Strategy announced in May³, government IT leaders are working to enable the mobile workforce and communicate inter and intra-agency as well as with the public via new tools on new platforms such as laptop computers, tablets and smartphones.

› Technology

Applications on the mainframe are still relevant and house exponential lines of code that support these systems. Additionally, many applications are no longer mainframe-based. Core agency systems run in distributed environments, some run in the cloud and many custom developed systems have been replaced with commercial-off-the-shelf (COTS) solutions.

> Application Needs

IT leaders and portfolio managers need to provide increased amounts of information and allow more people to access it, as well as interact with other internal and external departments, and utilize different technology tools that are not necessarily interoperable, while meeting the mission in an efficient and effective manner.

> People

The federal government is facing a large retirement wave as the baby boomers leave the workforce. Every four to eight years, the C-level changes as new Administrations lead the executive branch, and the Congressional Budget Office (CBO) and the Inspector General's offices always need data and ROI to prove the continuing value of applications and systems.

Changes to application portfolios will have been made in the context of budget, business priorities and available skills resources. Some applications haven't kept up, despite needing to, some will no longer be fully supported and some will have been patched up with a quick fix. The result: rather than a clear, structured environment that is easy to understand and maintain, the application portfolio can be disordered and difficult to analyze.

The increasing complexity of ever-evolving technology demands careful management. In order to define the roadmaps to take mission-critical applications forward it is essential to understand the current environment and to align IT and organization priorities.

Successful modernization projects require a rationale and prioritization plan for making decisions for making decisions, and a way of simplifying the complexity of expanding application portfolios. This is what Application Portfolio Management (APM) delivers: it enables the user to determine reliable and repeatable ways of analyzing your IT landscape for vital information regarding cost, value, complexity, risk, customer satisfaction and other key metrics.

If the first step towards IT modernization involves getting a clear view of the enterprise application ecosystem, the second involves analyzing the applications and planning what needs to change.

PLAN WHAT YOU NEED TO CHANGE

"I want us to ask ourselves every day, how are we using technology to make a real difference in people's lives."

– President Barack Obama

Before thinking about how to go about a mainframe modernization project, it is important to consider why change is needed. Large-scale internal IT projects typically support agency imperatives. These may be cost-driven like a system consolidation, platform retirement or replacement; or new requirements such as providing new applications; or reaching out to citizens through new interfaces or devices. Alternatively the dynamic for change could come from compliance or risk-management activities such as upgrades, process improvement and security activities. While there may be different reasons prompting the major change, the anticipated outcome and value is factored in to the desired results.

The influencing factors for mainframe modernization decisions are **cost, value to the organization and risk**. Analysis of these factors provides the critical information needed to move applications forward.

Cost. It's important to consider all the associated IT and operational costs together. This includes the cost of the application platform, supporting software, including maintenance, as well as attributed overhead costs (e.g. data center or cloud provider expense). There are also future costs of current systems, e.g. likely system upgrades, leasing renewals and potentially support staff contracts. Additionally, any 'new' system costs need to have been evaluated for comparison along the same lines. Typically there is a new hardware element as well as the purchase of new system software. Also, retraining on any new system has to be considered and incorporated.

Value to the Organization. Knowing how much the incumbent or outgoing systems return is as important as understanding projected post-change cost savings – from a business case rather than from any internal reporting system. Moreover, the applications that run legacy systems have years, and sometimes decades, of intellectual property priceless to maintaining government missions.

Risk / Operational Metrics. Typically plotting 'cost' against 'value' will give you a reasonable measure of any system from a business perspective. However there are dangers in ignoring the readily available and valuable operational data points:

➤ **Rate of Change**

Number of issues 'solved' by the system on average. This gives a good view of the flexibility of any system.

➤ **Number of Defects**

An overall measure of outstanding issues may indicate a level of robustness.

➤ **Rates of Change**

The amount of recorded change made is an important factor.

➤ **Application Complexity**

A number of standard metrics can be measured against applications to deduce 'complexity'

➤ **Customer / User Views**

Customer opinion can be determined through help desk systems or surveys.

➤ **Strategic Fit**

Systems conform to an internal architectural blueprint to a lesser or a greater extent and this information is typically recorded in a way that allows it to be rated.

So, if an application appears to be costly to maintain with modest value, at first glance it might seem a good candidate for replacement. Understanding the levels of detail required is a laborious exercise to undertake manually. The information collected would be a subjective view in any case (factual data is difficult to ascertain by purely visual inspection) and prone to error. Also, the task of manually collecting, storing, assessing and reporting on this data is obviously extremely costly.

UNLOCKING APPLICATION COMPLEXITY

In the current austere budget environment, it is smart to exploit enabling technology – APM – to inspect data that covers the IT ecosystem. Being able to analyze the systems that house this information directly means information can be pulled, stored, assessed and reported on instantaneously. Computer programs, supply chain management (SCM) systems, defect systems, help desk systems, financial systems and others can feed into a meta-repository to be used as the basis for detailed analysis.

This leads to a review of applications on a business value versus operational cost basis. This demands both business and technical transparency. High levels of complexity have been generated by the impact of organizational demands on technical deliverables in the form of systems and applications. Of course, the amount of analysis will vary according to the requirements being tested. Reviewing the factual information through the different views provided by APM technology makes it easier to prioritize the applications to be modernized according to key criteria relevant to organizational objectives.

According to Forrester Research, organizations look for transparency in two forms, "technical transparency articulates the state of the applications; linking that information with business transparency shows the 'who, where, why and when' of IT resource consumption." ⁴

Transparency is required to show how application and infrastructure investment decisions affect the organization and to evaluate IT activity as business process improvement, rather than pure technology improvement. The accessible information is then used to transform strategic planning and increase the speed of IT change as it is used as a clear definition of what needs to happen to move applications forward to achieve mission requirements.

Similarly, technical transparency drives the key APM activities that reduce the cost and complexity of the applications portfolio. Metrics that drive better rationalization and business decisions are collected and stored in a repository as a single, trusted 'source of truth'. This not only avoids the prospect of building or buying applications that are redundant or return limited value, it also reverses short-sighted decisions by driving more strategic thinking around application assets.

THE IMPORTANCE OF THE MISSION

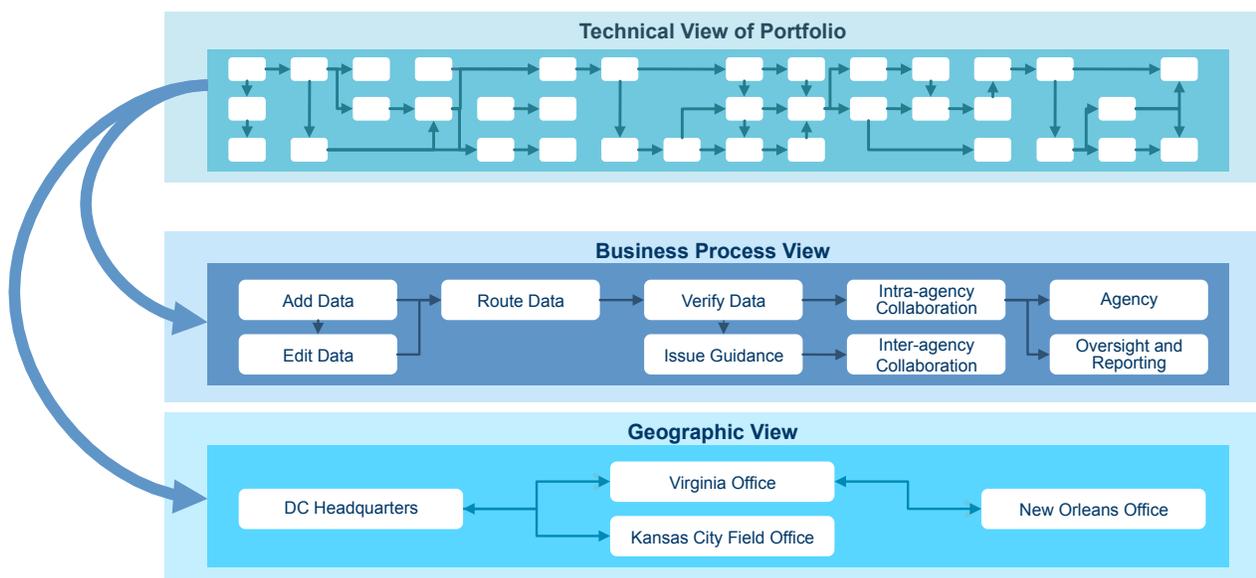
Making effective modernization change to an organization’s application portfolio rests on having a single source of truth. However, that is not the end of the process. The knowledge – or intelligence – has to be actionable to return value.

Application modernization activities have to start from an understanding of mission and IT considerations in order to prioritize the mainframe modernization opportunities. For that to happen, the technical view of the portfolio has to be accessible from the mission context to enable application service delivery teams to:

Understand applications as assets

While technical diagrams are useful for executing technical activities, for managers to understand the relationship between their operations and an application they must have a higher level view. Mission contexts enable users to 'abstract' their views to see how software is grouped into concepts that are useful for the organization. Managers can instantly see relationships and dependencies between functional areas and development teams and therefore visualize how a system could be architected better to support the mission.

To use a fictitious example, a federal agency headquartered in Washington, DC, with multiple field offices, would need to be able to view its IT portfolio in the context of business needs, geographical needs and potentially other areas of interest.



FOCUS EFFORT ON ASSETS THAT MATTER

The view of a set of mission contexts allow managers to focus resources just on sections of application portfolios that are mission critical. Managers needs to be empowered to target their analytics to a finite set of applications. Development teams need to drill-down into these context hierarchies to focus only on the software applications that relate to their needs and requirements specific to their mission context.

This enables users to answer questions like: Where are architectural inefficiencies in my processes? Which code should comply with stricter security requirements? Does migrating this code minimize risk and retain intellectual property? Where should I replace portions of my portfolio with packaged or redeveloped applications? These are the answers that will provide the impetus for change.

MANAGE APPLICATIONS AS ASSESTS

Portfolio decisions should always be made in the light of mission priorities. Technical metrics like 'lines of code' and 'cyclomatic complexity' of an application are often poor guides on their own for IT decisions. These must be combined with other measures and associated with the key performance indicators (KPIs) that the organization uses for decisions. The technical measures add value when they can demonstrate the inflexibility of a business process. They are more powerful when they are grouped with other measures like cost, risk and value.

DELIVERING APPLICATION BUSINESS INTELLIGENCE

Application portfolio management delivers fact-based application metrics that drive intelligent decisions. Putting technical insight, business requirements and mission context together provides information that can be used as the basis for action. Only when it is put to use does this information become business intelligence.

The scale and complexity of enterprise application portfolios makes it impossible to handle manually. Fortunately there are automated tools that provide insight into the application landscape within the mission context. Smaller organizations may have a simpler footprint, but larger organizations should consider automation in order to get any return from their modernization strategies in a meaningful timeframe. The alternative leaves the agency's modernization strategy on the road to nowhere as the application portfolio continues to grow even more complex before any modernization strategies can gain traction.

In summary, the mission and technical complexity of applications can prevent organizations from adapting quickly to respond to new requirements. To confront this challenge, the best practice is to collect targeted technical, business and stakeholder information and present it in meaningful contexts to the right users in the organization. Armed with this information, organizations can better allocate IT resources toward requirements. And, development teams can more proactively execute realignment activities.

Micro Focus is one of the leading suppliers of APM automation tools. Its Enterprise product set provides a comprehensive suite of tools to aid mainframe modernization strategies and deliver greater performance from mainframe assets. Micro Focus' Enterprise Analyzer is a key element of the suite. It enables government managers to assess the applications and answer key questions such as "What needs to change?", "What is impacted by this change?" and "How does this process work?" And it also gives the technical stakeholders an enhanced ability to understand application code and efficiently execute on the most important development and modernization activities.

With a clear vision for application portfolio management and application analysis, IT teams are equipped with essential capabilities to prioritize and execute the development activities that adapt and modernize applications.

By providing insight into the technical reality of complex application portfolios, Enterprise Analyzer reveals how applications are truly structured. This helps architects and managers identify ways to boost application efficiency and flexibility as well as accelerate optimization activities and ongoing maintenance.

USING KNOWLEDGE TO DRIVE CHANGE

Being able to collect and collate an unprecedented array of technical, fiscal and operational data into a single, central repository, presents a tremendous opportunity to build a decision-making that is based on accurate, up-to-date, comprehensive information. The varying challenges faced by organizations in the current budget environment require fluidity and flexibility to meet mission requirements and Office of Management and Budget (OMB) mandates such as data center consolidation and Cloud First initiatives.

Using our example, while the fictitious federal agency may well be structured from an application perspective by the various functions within the agency, it could be that the real mission challenges and key decisions need to be made according to the geographic performance of its field offices. Being able to examine criteria using parameters that are vital to the discussion is the key to taking enabling decisions. By providing various views of information, APM is effectively providing "business intelligence" for IT with unparalleled clarity and scope.

Micro Focus helps organizations plan and execute major IT modernization and transformation projects by providing business intelligence for IT through its application portfolio management solution. Boosting productivity, removing IT bottlenecks and accelerating innovation ... in short, understanding the current application landscape, and integrating intelligence into mission goals allows for enhanced modernization efforts with minimal risk and significant cost savings.

For more information about the Micro Focus Application Portfolio Management solutions visit www.microfocusfed.com.

REFERENCES

¹ "Application Modernization Depends on Legacy Understanding." Gartner research note G00219500. January 26, 2012. Vecchio, Dale.

² Executive Office of the President of the United States. "Obama Administration Unveils 'Big Data' Initiative: Announces \$200 Million in New R&D Investments." March 29, 2012

³ Executive Office of the President of the United States. "Digital Government: Building a 21st Century Platform to Better Serve the American People." May 23, 2012

⁴ Forrester Research, Inc. Application Portfolio Tools Miss the Mark. April 19 2011. Phil Murphy.

About Micro Focus

Micro Focus has proudly supported the government since our founding in 1976. For more information, visit us at www.microfocusfed.com.

Buying/Contact Information: Tod Tompkins, Vice President, U.S. Federal Government Sales, 301.838.5000 or tod.tompkins@microfocus.com.

For additional information please visit: www.microfocus.com

© 2012 Micro Focus Limited. All rights reserved. MICRO FOCUS, the Micro Focus logo, among others, are trademarks or registered trademarks of Micro Focus Limited or its subsidiaries or affiliated companies in the United Kingdom, United States and other countries. BORLAND, the Borland logo, AppServer and VisiBroker, among others, are trademarks or registered trademarks of Borland Software Corporation or its subsidiaries or affiliated companies in the United States, United Kingdom and other countries. All other marks are the property of their respective owners. WPEPPS0312