



WHITE PAPER

Unlocking Value in Your IT Landscape: A Strategic Guide to Consolidation in Scientific Informatics

Authors

Suchitra Ramaswamy, Strategic Advisor | Zifo

Paul Denny-Gouldson, Chief Scientific Officer | Zifo

Contents

Background	3
Introduction	3
Current situation	3
Problem statement	4
What if consolidation did not happen? What is the cost of doing nothing?	5
How does one go about consolidating their informatics landscape?	6
Before you begin...	6
Mindset alignment is essential for success	7
Aligning timescales is critical to managing expectations	7
Organizing your existing IT landscape	7
Early signs of success – how do you know it is working?	9
What does a healthy scientific informatics landscape look like?	10
How can one show speed and agility in consolidation?	11
The cyclic nature of consolidation and adoption	11
How can Zifo help?	12
About Zifo	14
Disclaimer	14

Background

This white paper integrates the outputs from Zifo's Customer Advisory Board (CAB) meeting with our analysis to address the issue of informatics consolidation. By synthesizing the learnings from the CAB meeting and our own research, we have transformed these best practices into a cohesive solution offering designed to help organizations understand and effectively implement informatics consolidation strategies.

We have noticed different organizations calling this exercise by different names – Application Portfolio Rationalization, IT Simplification, Systems Harmonization, Enterprise Application Integration, etc. Each term reflects a slightly different focus but ultimately aims to reduce complexity, reduce total cost of ownership, maintain high productivity and improve efficiency.

Introduction

Current situation

The modern Scientific Informatics landscape often comprises an ecosystem including multiple Electronic Lab Notebooks (ELNs), Laboratory Information Management Systems (LIMS), Chromatography Data Systems (CDS), Lab Execution Systems (LES), registration platforms, drawing tools, sample management, inventory, data orchestration, and many other specialized software solutions. For example, according to Zifo's internal knowledge:

- A global healthcare company manages 450-500 different applications solely within its R&D departments to support diverse research activities, data management, and regulatory compliance.
- A major player in the European pharmaceuticals and diagnostics sector employs 400-450 applications to handle laboratory information and clinical trial management.
- The CMC department of a global pharma/biotech organization utilizes 350-400 applications for process development, formulation, and analytical testing.

We have observed the same trends in manufacturing and supply chain, consumer product manufacturing and food & beverage domains. While each of these applications serves a specific purpose, their coexistence within the same environment can result in fragmentation, data silos, interoperability issues, obsolescence, and replication of capabilities in multiple systems, all resulting in heightened maintenance overheads and data integration complexities.

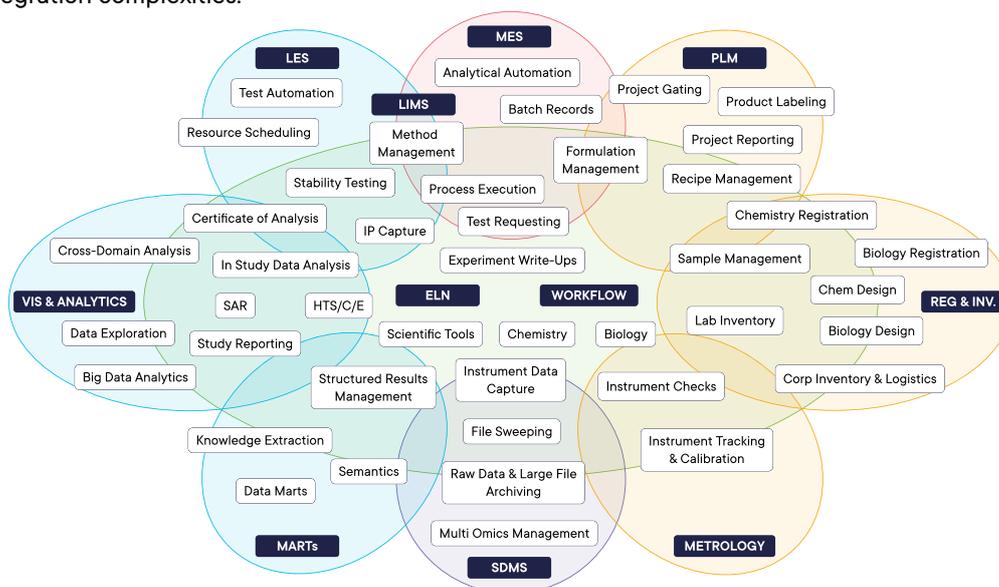


Figure 1. Software landscapes in science tend to look a bit like this – many types of systems and many variants of the same systems with lots of overlapping capabilities.

Problem statement

Imagine your organization has been around for several decades, and throughout your career, you've seen the evolution of technology and the increasing complexity of IT systems. Recently, your management presents you with a new challenge:

“We need to cut 20% from our software licensing costs by consolidating our systems.”

Or...

“We must reduce our IT footprint by consolidating systems, contributing to more sustainable and environmentally friendly IT practices.”

Or...

“We should integrate data sources and systems to enable more advanced AI analytics, cloud adoption and business intelligence capabilities.”

Gartner reports that more than 50% of organizations don't have clear measures of success assigned to their cost management initiatives. These asks are relevant regardless of whether we are in IT, business, or digital departments. The need to reduce operation costs, software licensing costs, streamline data management, and improve system performance touches every aspect of our operations.

This presents you with **Problem A** – “I don't know the full extent of what exists in my landscape today.” Is it 100, 500, or 1000 different software products? Where do you start with your inventory?

Once you are aware of your current inventory and landscape, it presents you with **Problem B** – “How do I maintain and rationalize my landscape? There are so many approaches and solutions available. Which one would work for me?”. Add to this the weight of digitization, automation and wanting to be more efficient, and it becomes a tricky balancing act.

| What if consolidation did not happen? What is the cost of doing nothing?



Ballooned Costs:

If there is no restriction on purchasing new software platforms, then soon you'd see multiple platforms in your landscape purchased under the term "fit for purpose". Maintaining multiple software platforms incurs high licensing fees, which can strain the IT budget. Diverse systems often require separate servers, storage, and maintenance, leading to duplicated infrastructure costs. Supporting multiple platforms demands a larger IT support team and higher maintenance costs.

Operational Inefficiency:

Managing a heterogeneous IT environment will require specialized knowledge for each system. Your IT team would spend significant time on routine maintenance and troubleshooting rather than focusing on strategic initiatives and innovations. Your Business teams would face significant delays when key users rotate roles, and investment in re-training becomes necessary.



Data Silos and Poor Integration:

In scientific organizations, it is now well-accepted that 'Data is our new currency.' When your data is scattered across multiple systems, it makes it difficult to integrate, analyze, and derive comprehensive insights. Duplicate data entries and inconsistencies can occur, leading to data integrity issues and unreliable research outcomes.

Compliance and Security Risks:

Ensuring compliance with regulations like GDPR, HIPAA, and FDA guidelines is challenging when data is spread across various platforms with different compliance capabilities. Multiple systems increase the attack surface, making the organization more susceptible to cyber threats. Patch management and security updates become more complicated and prone to oversight.



Innovation Stagnation:

The complexity of managing a diverse IT environment can slow down the adoption of new technologies and innovations. Your organization may struggle to respond quickly to new opportunities or changing market conditions due to the inflexibility of a fragmented IT landscape.

Duplication of Efforts:

Different teams might develop or maintain redundant processes and tools, leading to wasted effort and resources. Variations in data entry, storage, and management practices across platforms can result in inconsistencies and reduced data quality.



“Consolidation efforts and the elimination of technical debts often originate from leadership figures such as Lead Architects, CTOs, Global IT, or similar roles. Meanwhile, agile teams are generally accustomed to concentrating on tasks directed by their business counterparts. Without the implementation of scaled agile practices that balance these cross-cutting technical activities against the introduction of new features, there is a high probability that technical tasks will consistently be deprioritized.”

- Daniel Lipp, Chief Technology Officer – Crop Protection, Research & Development, Syngenta

| How does one go about consolidating their informatics landscape?

Before you begin...

Legacy Systems – handle with care: Scientific environments often harbor legacy systems with entrenched workflows and dependencies. Migrating or integrating these systems into a consolidated landscape requires careful planning, stakeholder engagement, expectation management, and risk mitigation strategies.

Interoperability should be an outcome, not a bottleneck: Ensuring seamless interoperability between consolidated platforms necessitates standardized data formats, robust integration frameworks, and adherence to industry standards such as HL7 and ASTM E1381.

User adoption is trickier than you think: Resistance to change among end-users can impede the success of landscape consolidation initiatives. Effective change management, user training, and stakeholder communication are essential to foster user adoption and mitigate resistance (especially for legacy migrations and consolidations). If the voice of the impacted user community is not satisfactorily heard, it could put the entire consolidation goal at risk.

Customization requirements will need your attention: Scientific workflows are often highly specialized and may require tailored software solutions to accommodate unique requirements. Organizations should evaluate the flexibility and extensibility of consolidated platforms to support customization while maintaining a standardized IT landscape.

Show caution with lock-ins: Optimistic consolidation enthusiasts often move from one extreme of multiple product families to the other extreme of one product family. This might cause you to be ‘locked in’ with one vendor. Designing a blend of old and new software products will make your landscape future proof and help with scalability.

Gain senior leadership alignment: Ensure that the strategic vision and objectives of the consolidation efforts are fully supported at the highest levels of the organization. When senior leaders are committed to the initiative, they provide the necessary resources, authority, and guidance to drive the project forward. This top-down support is essential for overcoming resistance, resolving conflicts, and maintaining momentum throughout the consolidation process.

Have you identified your sponsor?

Effective sponsorship for consolidation comes from having influential and committed executives who actively champion the initiative. These sponsors advocate for the project, secure funding, and ensure it remains a priority amidst competing business demands. They act as the bridge between the project team and senior leadership, providing strategic direction and addressing any obstacles that may arise. Strong sponsorship enhances the visibility and credibility of the consolidation effort and also ensures sustained engagement from all stakeholders.

Mindset alignment is essential for success

This involves ensuring that all stakeholders, from senior executives to front-line employees, understand and embrace the rationale behind the consolidation. Aligning mindsets requires effective communication about the benefits, such as improved efficiency, reduced costs, and enhanced data integration. Clear, transparent communication from leadership about the reasons for consolidation and its expected positive outcomes can alleviate fears and build trust. Engaging employees through participatory approaches, such as involving them in planning and decision-making, fosters a sense of ownership and commitment to the change. Recognizing and rewarding adaptability and innovation further reinforces the desired mindset shift, creating an environment where change is viewed positively and embraced as a path to organizational improvement.

Aligning timescales is critical to managing expectations

This involves setting realistic timelines that account for the complexity of the project, including phases for planning, implementation, testing, and user training. Clear, agreed-upon timescales help coordinate efforts across different departments and ensure that resources are available when needed. By aligning timescales, organizations can avoid rushed implementations that may lead to errors and ensure that each stage of the consolidation is completed thoroughly and effectively. This alignment also allows for timely adjustments and continuous improvement throughout the project lifecycle.

Organizing your existing IT landscape

This includes software applications, business processes, and stakeholder requirements to identify opportunities for consolidation and optimization. We advise implementing a dashboard to visualize all relevant application information and highlight segments with consolidation potential. The TIME framework helps organizations categorize their existing applications and systems based on their future role and investment priority. Here's a brief explanation of each component:

T

Tolerate applications or systems that are stable, reliable, and still serve a purpose but do not justify further investment.

Action: Continue to use these systems as they are without significant changes or additional investment. Plan for eventual phase-out as they become obsolete.

I

Invest in systems that provide significant value, have potential for further development, and align with strategic objectives.

Action: Enhance, upgrade, or expand these systems to maximize their benefits and ensure they meet future needs.

M

Migrate systems that are valuable but need to be moved to a new platform or technology to improve efficiency, security, or compatibility.

Action: Develop and execute a migration plan to transition these systems to newer, more sustainable environments.

E

Eliminate systems that are redundant, obsolete, or no longer provide value.

Action: Plan for decommissioning and remove these systems from the IT landscape, ensuring data and functionalities are appropriately transferred or archived.

Other frameworks for IT landscape consolidation include:

Gartner’s Pace-Layered Application Strategy:

- This framework helps organizations manage their application portfolios more effectively by aligning each application with its business context and rate of change.
- It categorizes applications into three layers:
 - Systems of Record: Core systems that are stable and critical for business operations.
 - Systems of Differentiation: Applications that provide unique capabilities and can be customized to gain a competitive edge.
 - Systems of Innovation: Experimental applications that support new business initiatives and innovation.

The Portfolio Lifecycle Framework:

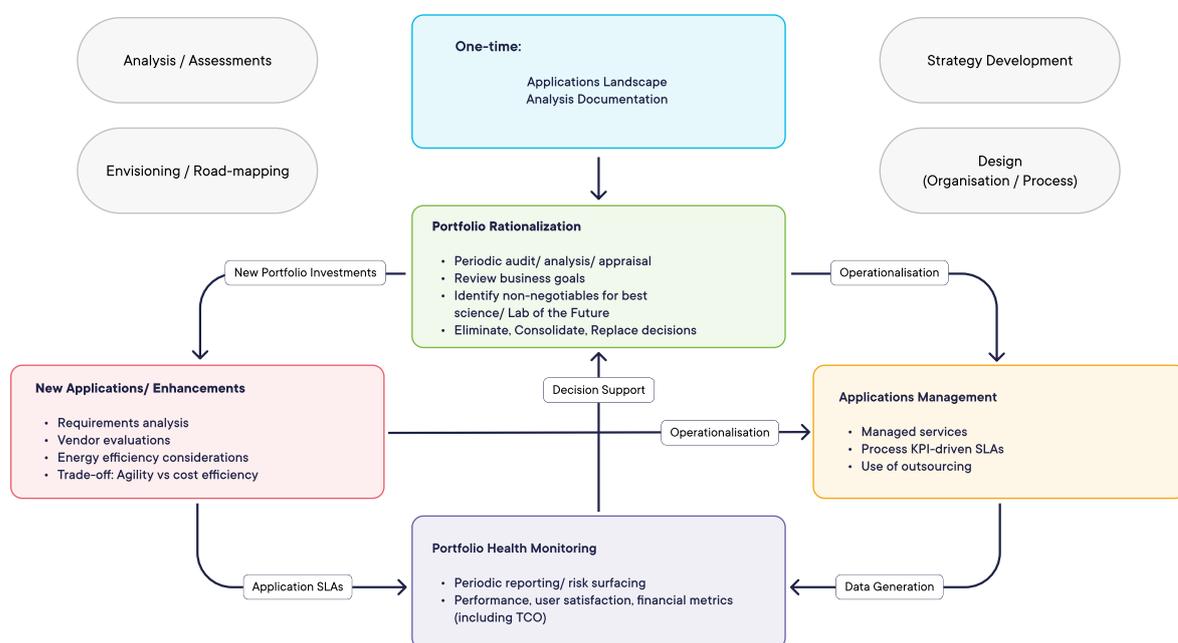


Figure 2. Cyclic phases of the Portfolio Lifecycle Framework for Scientific Informatics Landscapes

Application Portfolio Management (APM):

- APM involves a systematic approach to managing and optimizing the portfolio of applications within an organization, similar to TIME. It aims to reduce IT costs, improve performance, and align IT with business goals.
- Components:
 - Inventory: Catalog all applications in use.
 - Assessment: Evaluate the business value, technical condition, and cost of each application.
 - Action Plan: Develop a strategy for each application, whether to enhance, replace, or retire.

TOGAF (The Open Group Architecture Framework):

- TOGAF is an enterprise architecture framework that provides a comprehensive approach to designing, planning, implementing, and governing enterprise

information architecture. It helps organizations achieve alignment between IT and business goals, ensuring that IT investments support business strategies.

- Components:
 - Architecture Development Method (ADM): A step-by-step process for developing an enterprise architecture.
 - Architecture Content Framework: Provides a detailed model for organizing the architecture work products.

Using these frameworks in conjunction with the TIME framework can provide a comprehensive approach to IT landscape consolidation, ensuring strategic alignment and operational efficiency.

“While all these frameworks are valuable tools, the task of identifying overlaps in your system and data landscape and driving towards simplification remains a challenging endeavour. What criteria do you use to decide which systems to let go of and which to keep? At Roche, we invested in inventorying our system landscape and mapping our systems to business capabilities to identify overlaps. We also found it crucial to understand and manage the dependencies across applications to ensure that consolidation doesn’t disrupt critical functions or create new risks.”

- Angelika Fuchs, Head Data Products and Platforms, Pharma Research & Early Development, Roche

Early signs of success – how do you know it is working?

Indicators that your landscape consolidation was a success:

Annual Cost Savings:

- Reduction in Licensing Fees: Lower costs due to fewer software licenses.
- Decreased Infrastructure Costs: Savings from reduced hardware and maintenance requirements.
- Operational Efficiency Gains: Lower operational expenses from streamlined IT management.

Improved Operational Efficiency:

- System Uptime and Performance: Increased system reliability and faster performance metrics.
- IT Staff Productivity: Higher productivity of IT staff due to reduced complexity and better resource allocation.
- Reduction in IT Support Requests:
 - Support Tickets: Decrease in the number of IT support tickets related to system integration and data issues.
 - User Independence: Users becoming more self-sufficient with the new systems, requiring less IT intervention.
 - Incident and Problem Resolution Time: Decreased time to resolve IT issues and fewer incidents.
- Faster Processes: Noticeable improvements in the speed and efficiency of processes, such as data retrieval and reporting. Elimination of redundant data entry and processes.

Enhanced Data Integration and Accessibility:

- **Data Availability:** Improved access to data across the organization.
- **Data Consistency:** Higher data quality and reduced data redundancy.
- **User Feedback:** Positive feedback from users about data access and system usability.

User Adoption and Satisfaction:

- **Training and Support:** Successful completion of user training programs and positive feedback on support services.
- **User Engagement:** Increased usage of consolidated platforms and higher user satisfaction scores.
- **Ease of Use:** Users find the new systems easier to navigate and more intuitive compared to the previous fragmented systems.

Compliance and Security:

- **Audit Results:** Positive outcomes from compliance audits.
- **Security Metrics:** Reduced security incidents and vulnerabilities.

Smooth Transition and Minimal Disruption:

- **Migration Milestones:** Achieving key migration milestones on time without major disruptions to daily operations.
- **Low Downtime:** Minimal downtime during the transition phases, indicating effective planning and execution.

Enhanced Collaboration:

- **Cross-Departmental Collaboration:** Improved collaboration and communication across departments due to integrated systems.
- **Unified Data Access:** Easier access to a unified data repository, facilitating better decision-making.

“Legacy modernization is key to ensure an effective and secure application portfolio. Many years of experience has convinced me that in an area where “old” (but well-known systems) needs to be replaced, active and excellent change management is THE key success criteria. Missing the support of the impacted community makes transitions tough or even end in a failure.”

– Jens Stein, Product Manager: Laboratory Information Management Systems (LIMS), BASF Digital Solutions

What does a healthy scientific informatics landscape look like?

A healthy IT landscape is streamlined, efficient, secure, and aligned with the strategic goals of the organization. Here are the key characteristics:

Unified Systems and Platforms:

- **Interoperability:** Systems are integrated seamlessly, enabling smooth data flow and communication across platforms.

- **Standardized Processes:** Consistent processes and workflows across the organization reduce complexity and increase efficiency.

Cost Efficiency:

- **Optimized Licensing:** Reduced costs through the elimination of redundant software licenses and better-negotiated contracts.
- **Resource Utilization:** Efficient use of infrastructure and resources, minimizing waste and redundancy.

Enhanced Data Management:

- **Centralized Data Repositories:** Data is stored in centralized locations, making it easily accessible and reducing duplication.
- **High Data Quality:** Improved data accuracy, consistency, and integrity across the organization.

Scalability and Flexibility:

- **Adaptability:** The IT landscape can quickly adapt to changing business needs and scale to accommodate growth.
- **Modular Architecture:** Use of modular and flexible architectures that allow for easy addition or replacement of components.

User Satisfaction:

- **Intuitive Interfaces:** User-friendly systems that enhance productivity and reduce the learning curve.
- **Responsive Support:** Effective support mechanisms in place to address user issues promptly.

Security and Compliance:

- **Robust Security Measures:** Strong security protocols and measures to protect data and systems.
- **Regulatory Compliance:** Adherence to industry standards and regulatory requirements to mitigate risks.

How can one show speed and agility in consolidation?

In 9 out of 10 scenarios, the answer to “When should we have completed our consolidation?” is usually “Yesterday.” Demonstrating speed and agility in consolidation requires adopting flexible methodologies and leveraging modern technologies. Agile project management practices, such as iterative development and continuous feedback loops, enable quick adjustments and rapid delivery of incremental improvements. Utilizing cloud-based solutions and automation tools can streamline processes, reduce implementation times, and enhance responsiveness to changing needs. Additionally, encouraging a culture of innovation and empowerment allows teams to make swift decisions and implement solutions efficiently. By showcasing early wins and maintaining a dynamic approach, organizations can build momentum and demonstrate agility.

The cyclic nature of consolidation and adoption

IT landscape consolidation is not a one-time activity but a continuous, cyclic process. Evolving business needs demand that the IT landscape continually adapts to support new initiatives, processes, and technologies, fostering continuous innovation and growth, which necessitate regular system updates and enhancements.

Technological advancements introduce emerging tools and technologies that offer further optimization and efficiency, while legacy systems require periodic evaluation and potential migration to modern platforms. Continuous improvement is driven by ongoing performance monitoring and user feedback, leading to iterative enhancements that ensure systems remain efficient and effective.

Additionally, security and compliance remain paramount, with regulatory changes requiring system updates to maintain compliance and evolving security threats necessitating continuous updates to security protocols and measures.

Achieving and maintaining a healthy IT landscape requires recognizing that consolidation is a continuous, cyclic process. By regularly assessing, implementing, monitoring, and optimizing the IT landscape, organizations can ensure their IT infrastructure remains aligned with business goals, responsive to technological advancements, and resilient to evolving challenges.

How can Zifo help?

Usually we assess where you are in your consolidation journey, and start from there. However in the scenario that we were to start together from scratch, we would recommend the following order of activities.

Comprehensive Assessment and Inventory

The first step in landscape consolidation is a thorough assessment and inventory of the existing IT environment. This involves cataloging all software applications, systems, and tools currently in use across the organization. By employing automated discovery tools and conducting interviews with key stakeholders, we can gain a detailed understanding of the IT landscape, including legacy systems, redundant applications, and underutilized software. This comprehensive inventory forms the foundation for identifying consolidation opportunities.

Strategic Planning, Scientific Rationalization and Framework Application

Once the inventory is complete, we apply strategic frameworks (such as the ones listed in the section 'Organizing your existing IT landscape.') to categorize each system based on its current and future value to the organization, along with our scientific rationalization approaches.

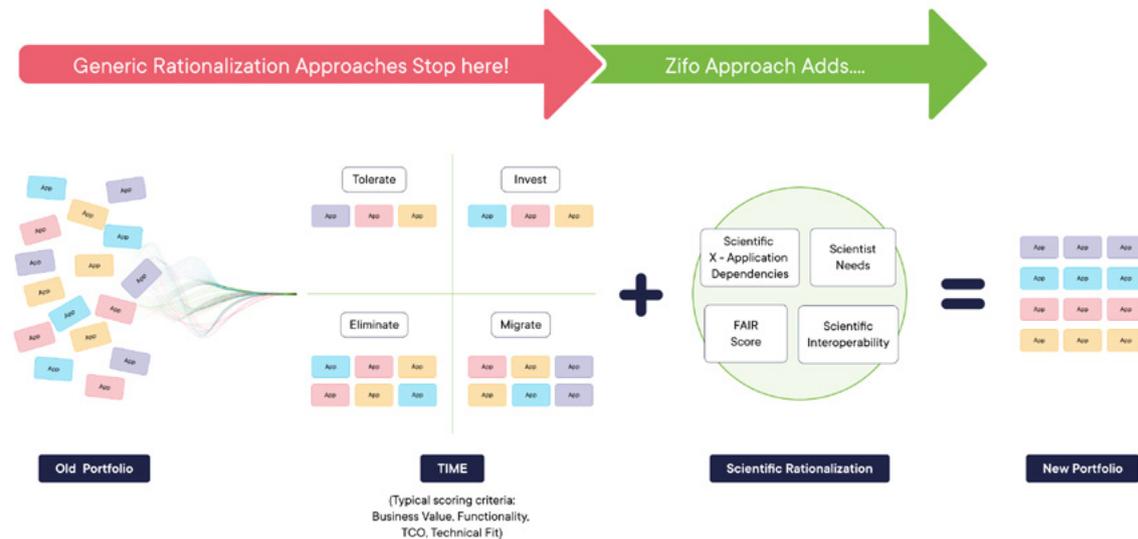


Figure 3. For Scientific Informatics landscapes, this additional rationalization activity puts the science in focus, for long-term adoption and interoperability.

This scientific rationalization phase ensures that consolidation efforts align with organizational goals and maximize resource efficiency.

Implementation of Consolidation Initiatives

With a clear plan in place, we proceed with the implementation of consolidation initiatives. This involves:

- **System Integration:** Integrate compatible systems to reduce redundancy and improve data flow. This may include adopting enterprise-wide platforms that consolidate multiple functionalities.
- **Data Migration:** Carefully migrate data from legacy systems to new platforms, ensuring data integrity and minimizing downtime. Employ data migration tools and best practices to facilitate a smooth transition.
- **Application Rationalization:** Streamline the application portfolio by eliminating unnecessary software and consolidating similar applications. This reduces annual maintenance costs and simplifies the IT environment.
- **Cloud Adoption:** Leverage cloud-based solutions to replace on-premises systems, enhancing scalability, flexibility, and cost-efficiency. Cloud platforms offer integrated services that can replace multiple standalone applications.

Continuous Monitoring and Improvement

Post-consolidation, continuous monitoring and improvement are crucial to maintaining an efficient and effective IT landscape. Implement performance monitoring tools to track system performance and user satisfaction. Regularly review and update the IT environment to address emerging business needs, technological advancements, and security threats.

Security and Compliance Management

Throughout the consolidation process, prioritize security and compliance management. Update security protocols and measures to protect against evolving threats, and ensure that all systems comply with current regulatory requirements. Conduct regular security audits and compliance checks to maintain a robust security posture.

Stakeholder Engagement and Change Management

Engage stakeholders throughout the consolidation process to ensure their needs and concerns are addressed. Develop a comprehensive change management strategy that includes clear communication, training programs, and support resources. This helps facilitate a smooth transition and promotes user adoption of new systems.

Cost-Benefit Analysis and Reporting

Conduct a cost-benefit analysis to quantify the savings and benefits achieved through consolidation. Regularly report progress and outcomes to senior management and stakeholders, highlighting key achievements, cost reductions, and performance improvements.

Our approach to landscape consolidation involves a systematic and strategic process that includes comprehensive assessment, strategic planning, implementation, continuous improvement, security and compliance management, stakeholder engagement, and detailed reporting. By following these steps, organizations can achieve significant cost savings, enhance operational efficiency, and create a more agile and responsive IT environment.



Figure 4. Benefits of Zifo’s approach to landscape consolidation and scientific application rationalization.

Disclaimer

Portfolio rationalization and landscape consolidation are complicated journeys and in our experience, each of our customers find themselves in different points of the journey relative to time. This whitepaper does not intend to provide solutions towards the complexities of ad hoc stops and starts of the consolidation process. We intend to provide broad strokes of the end-to-end process with ideas, frameworks and learnings from past successes. If you would like specific consultation for your organization's needs, feel free to reach out to us and we'd be happy to help you.



About Zifo

Science led, people driven, technology centered.

Zifo is the leading global enabler of AI and data driven enterprise informatics for science driven organizations. With extensive solutions and services expertise spanning research, development, manufacturing, and clinical domains, we serve a diverse range of industries, including Pharma, Biotech, Chemicals, Food and Beverage, Oil & Gas, and FMCG. Trusted by over 190 science-focused organizations worldwide, Zifo is the partner of choice for advancing digital scientific innovation.