

Intelligence Center Director:

Leading the Intelligent Enterprise



CONTENTS

1. Building a More Intelligent Enterprise

The path to the Intelligent Enterprise	7
Your role: The Intelligence Center Director	8

2. Establishing Processes and Standards

Evaluating your organization.....	12
Activity: Evaluate your organization	13
Intelligent programs: Setting standards for success	15
Foundational programs: Establishing the Intelligent Enterprise architecture	15
Exercise 2.1: Set up your Cloud environment	16
Platforms program: Managing the analytics architecture.....	18
Analytics: Managing federated data	20
Administration: Overseeing the Intelligent Enterprise.....	20
Exercise 2.2: Access Platform Analytics	21
Systems: Leveraging enterprise data assets.....	24
Database: Optimizing database performance.....	24
Identity: Securing digital and physical assets	25
Developmental programs: Creating powerful applications for end users	25
Applications: Governing analytical applications	25
Exercise 2.3: View and approve the dossier dictionary chapter template	26
Mobility: Deploying transformational mobile applications.....	28
Intelligence: Innovating the enterprise.....	29

	Departmental: Managing analytics for applications	29
	Services: Customizing and embedding applications.....	29
3. Developing a Successful Team with the Intelligence Center	The Intelligence Center.....	32
	Exercise 3.1: Hire an architect	35
	Establishing Intelligence Center service-level agreements	37
	Tracking KPIs to drive performance.....	37
	Exercise 3.2: Analyze the ETL dossier	38
	Intelligence Center meetings.....	39
	Intelligence Center certifications	39
	Enhance communication with HyperIntelligence	39
	Exercise 3.3: Create the Employee Profile card.....	40
4. Implementing the Intelligence Center and Programs	Initiating the Intelligent Enterprise strategy	46
	Leveraging a foundation for trusted and governed analytics	46
	Using federated analytics for foundational and developmental programs.....	48
	Consistent and trustworthy data in the Intelligent Enterprise	49
	Enterprise, departmental, and agile: Environment and application life-cycles.....	51
	Using Integrity Manager to automate project testing.....	52
	Best practices for integrity testing	56
	Exercise 4.1: Integrity Manager test analysis	57
	Promoting data usage across the Intelligent Enterprise	58
	Communicating and collaborating across the organization.....	59
	Supporting departmental analysts.....	59
	Creating and managing a project priority tracker.....	60
	Document repository.....	60
	Team empowerment through learning	60
	Exercise 4.2: Deploy the Employee Profile card	61
	Strengthening executive sponsor support.....	65
5. Maintaining and Monitoring the Intelligent Enterprise	Establishing a monitoring and maintenance strategy	66
	Reviewing architecture and performance	66
	Reliable system and environment performance	67
	Consistent platform environment performance	67

Stable dataset performance	68
Efficient and tracked operations applications	69
Stable mobile applications	69
Successful custom applications and services	70
Securing data.....	70
Exercise 5.1: Review the Intelligence Center dossier in Platform Analytics	71
Setting alerts on anomalous trends	74
Help requests: Standardizing tickets and issue resolution	75
Exercise 5.2: Use Workstation to monitor your environment	76
Managing and verifying your licenses.....	79
Ensuring full license use: License Manager.....	80
Analyzing license telemetry: Compliance Telemetry dossier	80
Exercise 5.3: Monitor the bank's compliance with the Compliance Telemetry dossier.....	80

6. Optimizing the User Experience

Driving adoption of your enterprise BI.....	88
Creating fault tolerant and highly available systems.....	89
Automated distribution and alerting.....	91
Implementing a successful upgrade strategy	91
The upgrade workflow	92
Performing an upgrade trial run	94
Capacity testing	94
Exercise 6.1: Prepare the upgrade dossier	95
Exercise 6.2: Review and analyze the upgrade dossier.....	99

BUILDING A MORE INTELLIGENT ENTERPRISE

To thrive in today's complex business landscape, organizations create and sustain technology-enabled insights that leverage data, people, and enterprise assets in aggregated and unique ways. Major forces drive enterprises to seek comprehensive business intelligence (BI) solutions and leverage their data, people, and enterprise assets.

- Data overload: Without federated analytics and standard data governance, enterprises are at risk for becoming over-saturated with data and losing the ability to make intelligent decisions. Smart data management is key for business success—enterprises need a single source of truth to help make smart business decisions, along with the right tools to analyze and collaborate on insights.
- Disruptive change: Every day, new technologies emerge, changing the BI landscape in dynamic ways. From Big Data to open source predictive analytics, the aggressive pace of change challenges organizations to successfully use new technologies to their full potential. To take advantage of these innovations, enterprises need a flexible foundation that powers the next wave of intelligence with an open platform.
- The era of personalized experience: Today, users want tailored answers to their questions without burdensome and complicated processes. From customized movie recommendations on streaming services to consuming data that is relevant to your job role, personalization plays a major role in the day-to-day.

Using innovations like Machine Learning, HyperIntelligence, and Natural Language Query, enterprises can deliver customized insights and answers to end users.

How are these challenges affecting your organization today?

Organizations can rise to meet these challenges by becoming an Intelligent Enterprise. The Intelligent Enterprise is a data-driven organization that effectively designs and implements BI solutions while promoting effective use of data across your enterprise.

In this course, we will focus on what a fully scalable Intelligent Enterprise looks like from the perspective of the Intelligence Center Director: an enterprise that is aligned with corporate standards and staffed with experts using best practices in their daily work. We will discuss how to navigate to an Intelligent Enterprise to help overcome major forces across the business environment.

The path to the Intelligent Enterprise

Becoming an Intelligent Enterprise requires the right tools and structure to balance traditionally counteractive forces—agility and governance, convenience and security, ease of use and enterprise functionality—all critical capabilities that the MicroStrategy platform is positioned to support with its unique intelligence architecture. In this course, you work at 101st National Bank, a large banking organization with several divisions, including credit cards, loans, and traditional bank accounts. The bank leadership wants to move towards becoming an Intelligent Enterprise, with you at the helm as the Intelligence Center Director.

A successful Intelligent Enterprise:

- Drives the adoption and success of enterprise BI.
- Coordinates BI implementations.
- Maintains sound data governance and a single version of the truth.
- Provides a formal approach to documenting processes, creating content, and ongoing maintenance.
- Ensures that BI is aligned with enterprise strategy.

To help organizations on their journey, MicroStrategy developed a comprehensive Map of the Intelligent Enterprise that lays out how organizations can leverage all of their assets to be successful while navigating external pressures. The Map contains every detail of how transform into an Intelligent

Enterprise. The following image shows you the general areas of focus at the highest level.



- **Intelligence Applications:** Applications such as data discovery tools, that empower every employee, partner, customer, and constituent. An Intelligent Enterprise supports both self-service data discovery and the delivery of specialized departmental and enterprise applications.
- **Intelligence Center:** Deploying, governing, and optimizing an Intelligent Enterprise ecosystem takes a team with the right skills. A dedicated Intelligence Center, staffed by administrators and architects, oversees specific aspects of a BI deployment and performance operations.
- **Intelligence Platform:** Should employ a metadata repository that indexes and abstracts an organization's data into an enterprise semantic graph, allowing users to rapidly build contextual applications and deploy them on any device.
- **Enterprise Assets:** A complete intelligence platform enables organizations to fully leverage their existing enterprise data assets—from RDBMS systems, to Multi-Dimensional Expressions (MDX) cube sources, Hadoop systems, NOSQL databases, and cloud-hosted data sources.

Your role: The Intelligence Center Director

The core of the Intelligence Center is your people, the architects who oversee and manage different departments within the Intelligent Enterprise. As the

Intelligence Center Director, you create intelligent environments by deploying a best-in-class BI architecture, supervising the Intelligence Center, and running Intelligence Programs, such as enterprise mobility solutions, to support enterprise and departmental analytics and mobility applications for all constituents.

PERSONAS



Intelligence Center Director (ICD)
Create Intelligence environments by deploying the Intelligence Architecture, supervising the Intelligence Center, and running Intelligence Programs to support enterprise and departmental analytics and mobility applications for all constituents.



Application Architect (APA)
Create, share, and maintain intelligence applications for the enterprise. Publish standardized application objects, and promote departmental applications from self-service into the enterprise environment.



Analytics Architect (ANA)
Create, publish, and optimize a federated data layer as the enterprise's single version of the truth. Build and maintain the schema objects and abstraction layer on top of various, changing enterprise assets.



Mobile Architect (MBA)
Build, compile, deploy, and maintain mobile environments and applications. Optimize the user experience when accessing applications via mobile devices. Integrate with preferred VPN, SSO, and EMM protocols.



Services Architect (SVA)
Inject, extend, and embed analytics into portals, third-party, mobile, and white-labeled applications. Publish web services and data services for use by Developers in building departmental applications.



Database Architect (DBA)
Design and maintain database enterprise assets. Optimize database performance and utilization based on query type, usage patterns, and application design requirements.



Platform Administrator (PLA)
Install and configure the Intelligence Architecture on-premises and/or in the cloud. Maintain the security layer, monitor system usage, and optimize architecture in order to reduce errors, maximize uptime, and boost performance.



System Administrator (SYA)
Set up, maintain, monitor, and continuously support the infrastructure environment through deployment on AWS, Azure, Windows, or Linux, all while optimizing performance and controlling costs.

As the Intelligence Center Director for your company, you oversee:

- Evaluating the current state of your organization's Intelligence Center
- Coordinating and supervising the Intelligence Center architects, administrators, and analysts
- Establishing developmental and foundational programs while setting best practices for optimization
- Overseeing the BI platform and application development and deployment
- Standardizing, managing, and optimizing your organization's Intelligence Environment with enterprise data sets and applications
- Building and operating an Intelligence Architecture by following Intelligence Program best practices

Along with your leadership experience, you were selected for this role because of your background in:

- Technology degree and leadership experience in business and data analysis
- Experience in IT management, with ITIL or similar technology platform
- Analysis experience with business requirements and functional specifications in a data warehousing environment
- Experience in industries such as banking or financial services
- Data governance experience

This course begins at the heart of the Map of the Intelligent Enterprise — evaluating your organization, then exploring the Intelligence Center and the processes and standards that drive success.

ESTABLISHING PROCESSES AND STANDARDS

Evaluating your organization

Every organization has to cope with external pressures that are constantly shaping the space in which they operate. These pressures influence every enterprise constituent in some way, and enterprises have to react to continue to do business, attract talent, serve customers, and grow. As the Intelligence Center Director, think about the external pressures on your organization. For example, at 101st National Bank, you want to consider:

- Regulatory requirements: Since the bank is international, you want to ensure that your analysts are compliant with GDPR, European data privacy regulations. You should work with the Intelligence Center to ensure that a personal data inventory is added to your business glossary and map all personal data to track how that data is being used.
- Technology opportunities: AI is receiving interest across organizations, and banking is no exception. The bank can now work through large sets of data for every decision, from back office operations to compliance. However, at the Intelligence Center level, you should ensure that datasets are not siloed and they meet regulatory compliance.

Do you think you and your teams are using your technology investments to their full potential? Why or why not?

- Market disruptors: The growth of mobile payment is fundamentally changing the payment industry. As 101st National Bank works to develop its mobile payment strategy, you want to ensure your team sets up the BI system to successfully capture and leverage all the data that will come from a mobile payment system.

What kinds of external pressures are affecting your industry?

In addition to understanding external pressures and their influence on your organization, you and other leaders want to catalog all of your enterprise assets. You will determine which data sources, systems, and capabilities your organization currently has and how they benefit different users and constituents. Then, determine what key pieces you are missing to become an Intelligent Enterprise. For example, is there unified usage of BI across your organization? Do you leverage enterprise mobility?

As the Intelligence Center Director, you should be aware of these external and internal pressures and how they affect your Intelligence Center. You are responsible for the Intelligence Center, including the operation of Intelligence Programs, the coordination and supervision of Intelligence Center roles, and planning the Intelligent Enterprise environments.

Activity: Evaluate your organization

In this activity, evaluate where the bank stands, then begin to implement programs that will standardize the use of BI across the organization.

- The Intelligence Center
 - The bank currently has leaders overseeing and standardizing each of the following:
 - Database enterprise assets
 - Enterprise BI architecture
 - The bank does not have leaders over the following:
 - BI applications, such as dashboards
 - A federated data layer that serves as the single version of the truth
 - Mobile applications, including maintenance and updating apps
 - Embedded analytics, such as white labeling applications and single sign-on
 - Infrastructure environment supported through Cloud

- BI technology architecture and implementation:
 - Data is stored in the cloud
 - Data currently flows from a Development Environment to an Enterprise Environment
 - The environment supports and uses multi-node clustering
 - No process exists to test app integrity and upgrades
 - The platform does include built-in 360-degree monitoring, however it is not fully leveraged
- There is no agile analytics environment for users to test applications in a sandbox.

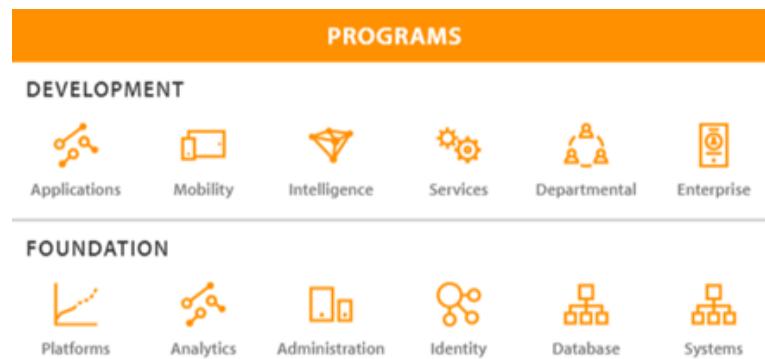
An agile environment allows users to build personal applications used for individual data discovery.

- The organization does use and build departmental applications, but they are deployed to an enterprise-wide environment. These include applications, such as business dashboards, built on departmental datasets based on departmental application standards, which tend to be less rigorous than enterprise standards. The applications are published to departmental intelligence environments.
- The organization does not employ enterprise analytics. These include applications, such as business dashboards, based on enterprise datasets that use application standards and published to an enterprise intelligence environments.
- The organization does not have an official, established framework, discipline, and architecture so analysts and developers can build and deploy mobile applications.
- The BI can integrate data from enterprise systems (for example, ERP, CRM, MRP, HR) and blend with other data sources to build custom analytics and mobility applications. However, this ability is not leveraged to the fullest extent.

How would you evaluate 101st National Bank? What areas do they need to focus on for future success?

Intelligent programs: Setting standards for success

After evaluating where 101st National Bank sits on the Map of the Intelligent Enterprise, you understand that the organization has the BI technology and infrastructure to become successful, however, many tools are not being fully leveraged nor standardized. As such, you want to begin implementing and overseeing programs that will drive success across the organization. These best in practice programs allow users across your organization to adopt BI technology with tools like HyperIntelligence and drive the use of federated analytics and transactional mobility.



By implementing a sequence of intelligent programs, you can set the stage for successful deployments, optimized systems, and satisfied constituents. As the Intelligence Center Director, you oversee your team of architects as they establish these developmental and foundational programs, then incorporate them into your operations plan. These programs allow you to direct the Intelligence Center, while giving managers and architects room to grow their own teams. Next, we will review each program you and your team will set up to ensure success.

Foundational programs: Establishing the Intelligent Enterprise architecture

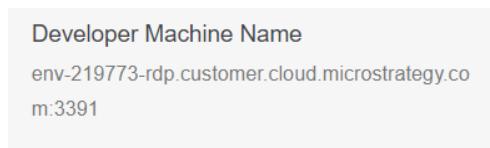
By creating foundational programs, 101st National Bank will be able to design, install, configure, and deploy optimized Intelligent Enterprise architectures. Foundational programs form the backbone of the BI architecture, ensuring the bank has a powerful foundation that contains a single version of the truth and is scalable across all users.

Exercise 2.1: Set up your Cloud environment

At 101st National Bank, MicroStrategy is hosted on a Cloud environment. In this exercise, you will use Command Manager, an administrator tool that enables you to perform various bulk administrative functions with scripts, to set up your environment for the course.

Access your MicroStrategy Cloud environment

- 1 On your local machine, in the MicroStrategy Cloud email, click **Access MicroStrategy Platform**.
- 2 In the **User name** and **Password** boxes, enter the login credentials provided in the MicroStrategy Cloud email. Click **Login**.
The MicroStrategy Cloud landing page is displayed.
- 3 In the Essential Connections area, click the **Developer Machine Name** to copy the link.



Developer Machine Name
env-219773-rdp.customer.cloud.microstrategy.co
m:3391

- 4 Log into the Windows machine in your cloud environment using Remote Desktop Connection. To do this, on your local Windows machine task-bar, click the **Search** box and type **Remote Desktop Connection**.
- 5 Click **Remote Desktop Connection** and do the following:
 - a in the **Computer Name** box, paste the machine name then click **Connect**.
 - b In the Windows Security - Enter your credentials window, click **More choices**.
 - c Select **Use a different account**, then enter your credentials from the MicroStrategy Cloud email and click **Login**.
 - d If you get a message regarding the identity of remote desktop not being verified, click **Yes**. You are now connected to the Windows machine in your cloud environment.

Add course exercise files

- 6 Copy and paste the **Exercise Files** folder your instructor sent you to the desktop of your remote machine.
 - 7 Right-click the **Exercise Files** folder, and click **Extract All**. In the Extract window, click **Extract** to add the files to your desktop.
-

Open Command Manager

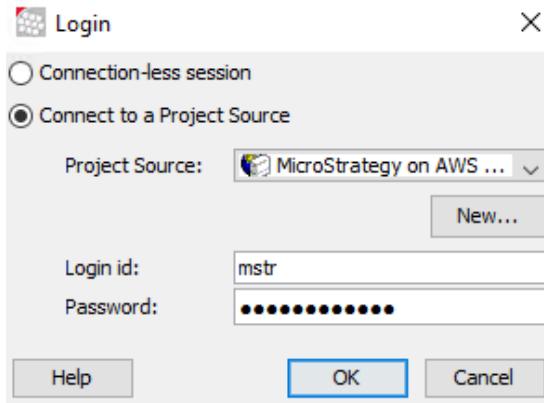
Command Manager speeds up common administrator tasks, such as:

- Creating, modifying, and deleting configuration objects (schedules, users, groups, and so on)
- Managing caches
- Modifying Intelligence Server and project configuration settings
- Triggering event-based schedules
- Creating, modifying, and deleting attributes, facts, filters, and metrics
- Publishing, listing, and deleting Intelligent Cubes

Typically, the Platform Administrator and Analytics Architect leverage Command Manager to perform these tasks. In this exercise, use a script to run objects in MicroStrategy and generate some telemetry data in the platform. You will monitor the platform throughout the class.

- 1 From the Windows desktop, open the **MicroStrategy Products** folder, and double-click **Command Manager**.
- 2 Select **Connect to a Project Source**.

- 3 For the **Project Source**, select **MicroStrategy on AWS I-Server**. Type your **Login id** and **Password** from the Welcome to MicroStrategy email. Then, click **OK**.



- 4 From the Windows desktop, open the Exercises folder and double-click **CommandManager_Script.txt**. This script modifies several MicroStrategy objects and creates subscriptions for later analysis.
- 5 Copy the contents of the text file.
- 6 In Command Manager, paste the copied content in the top half of the script area.
- 7 Click **Execute** to run the script. Identify any errors in the bottom pane.
- 8 If you see any errors, re-execute the impacted portions of the script. To do this, highlight a line in the top pane that was unsuccessful and click Execute. Repeat this process until all lines are executed without errors.
- 9 After all lines are executed successfully, close Command Manager without saving the script.

Platforms program: Managing the analytics architecture

The Platforms program manages the centralized platform architecture of an analytics deployment. For example, a Platform Administrator directs the configuration of MicroStrategy environments to ensure that they are well-tuned and optimized. Responsibilities include:

- Architecting, installing, configuring, and deploying the Intelligent Enterprise architecture.

- Designing the optimum architecture to deliver security, stability, scalability, and economy by combining platform capabilities with on-premises, cloud, and hybrid services.

In the Platforms program, you should ensure that your Platform Administrator establishes a daily checklist to manage each environment, as seen in the example below.

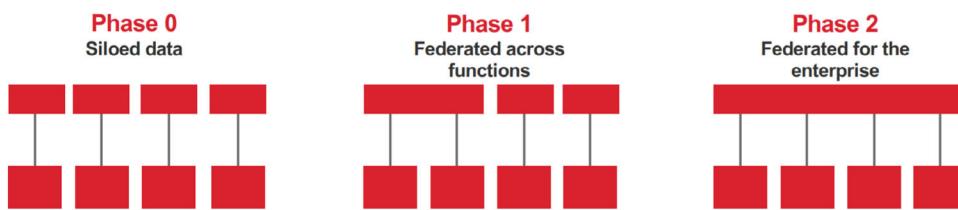
PLATFORM ADMINISTRATOR DAILY CHECKLIST		Environment Name		
		MSTR Version		
Installation Environment (Completed at time of execution by appropriate IT personnel:)				
<input type="checkbox"/> Dev <input type="checkbox"/> UAT (if checked, complete Operational Review prior to execution of checklist) <input type="checkbox"/> Departmental (if checked, complete Operational Review prior to execution of checklist) <input type="checkbox"/> Enterprise (if checked, complete Operational Review prior to execution of checklist)				
Installation Activities/Specifications		Pass / Fail	Version #	Release Iteration
1. Plan environments architecture, services architecture, security architecture, data and project architecture.		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
2. Manage user accounts and user groups within each platform		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
3. Manage user security and permissions for each project		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
4. Manage Distribution services for subscriptions and cube refresh schedules		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
5. Configure database instances and database connections for Intelligent Platform Environments		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
6. Execute Object Migrations between Platform Environments		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
7. Publish Platform Analytics reports		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
8. Check the Intelligent Platform Servers status (I-server, Web, Mobile, Collaboration, Usher)		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
9. Audit the Intelligent Platform configuration and track configuration changes		<input type="checkbox"/> Pass <input type="checkbox"/> Fail		
10. Submit Change Request for approval				

Analytics: Managing federated data

The Analytics program manages the centralized repository of reusable metadata objects, such as metrics and facts, and optimizes the data architecture. For example, the Analytics Architect uses MicroStrategy's connectors to provide a layer of federated analytics and combine multiple data sources to provide a seamless, cohesive picture of her business. With this layer of analytics, the analysts in the credit card and in small business divisions will use the same revenue metric, avoiding confusion and miscalculation.

The Analytics program establishes a business-driven schema design which is translated into a federated dataset that meets the needs across an organization. Once established, the business can rely on trusted data, which extrapolates the underlying complexities. Responsibilities include:

- Designing the optimal federated enterprise data layer and publishing it to analysts, data scientists, developers, and architects. The design phases are illustrated in the image below:



- Working with departments to evolve the data architecture to meet changing business needs.
- Validating data quality.

Administration: Overseeing the Intelligent Enterprise

The Administration program oversees the BI lifecycle, ensuring that mission-critical applications are always up and running. For example, the Platform Administrator develops guidelines for creating and managing different analytics environments and migrating objects across these environments. Responsibilities include:

- Monitoring, supporting, and maintaining the Intelligent Enterprise architecture to facilitate ongoing security, stability, and economy.
- Monitoring system use, automating tasks, and implementing upgrades to help ensure an optimal, reliable, and modern user experience.

Exercise 2.2: Access Platform Analytics

As the Intelligence Center Director, you want to monitor the status of your enterprise environment, from application usage to server status. With MicroStrategy Platform Analytics, you can access, analyze, and act on data in real time. In this exercise, you will access Platform Analytics to understand the telemetry tools you have available. In Chapter 6, we'll take a deeper dive into Platform Analytics. .

Connect to your Environment

- 1 From the Windows desktop, double-click **MicroStrategy Workstation**.

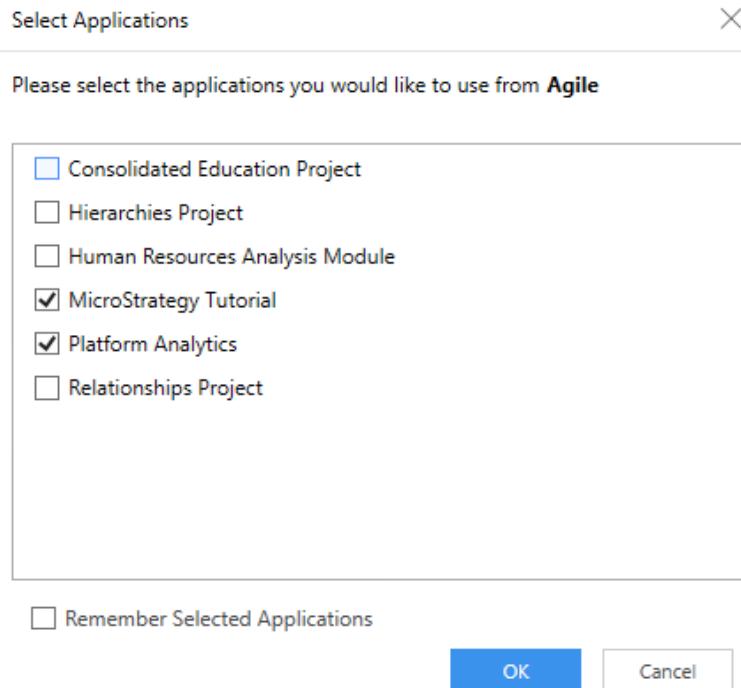


MicroStrategy Workstation combines the power of MicroStrategy Library, administration, project development, and content authoring into a single user experience. With Workstation, you can build and manage scalable enterprise content and systems easily in one place, including HyperIntelligence cards.

- 2 In the left pane, click **Environments**.
- 3 Click **Add New Environment Connection**.
- 4 In the **Environment Name** box, type **Agile**.
- 5 In the Library URL box, type **https://env-xxxx.customer.cloud.microstrategy.com:/MicroStrategyLibrary** where xxxx represents your environment number.

The Library Server is connected to both the Collaboration Server (which allows you to communicate via comments) and the Intelligence Server.
- 6 Click **Continue**.
- 7 Type your User Name and Password from the Welcome to MicroStrategy on Cloud email, select **Remember Me**, and then click **Connect**.

- 8 In the Select Applications window, select **MicroStrategy Tutorial** and **Platform Analytics**, then select **OK**. You are now connected to the applications (projects) in your MicroStrategy environment.



Now that you are connected to your environment, open the Platform Analytics application and browse its dossiers.

Access Platform Analytics

- 1 In the left pane, click **Applications** and then double-click **Platform Analytics**.
- 2 Navigate to the **Public Objects\Reports\2. Utilities** folder.
- 3 Cubes are automatically refreshed every 30 minutes. To ensure you have the latest data, right-click the **Platform Analytics Cube** and click **Refresh Dataset**.
- 4 In the Refresh window, click **Refresh** then click **Done**.
- 5 Navigate to the **Public Objects\Reports\1. Dossiers** folder. This folder contains pre-built dossiers that help you analyze the organization's

environments. These dossiers are designed to showcase some of the data that Platform Analytics captures for each system area.



Communicator
Messages



Compliance
Telemetry



Cube and Cache
Monitoring



Database Capacity
Planning



Error Analysis



Intelligence Center
Dossier



Object Telemetry



Performance
Troubleshooting...



Project Overview

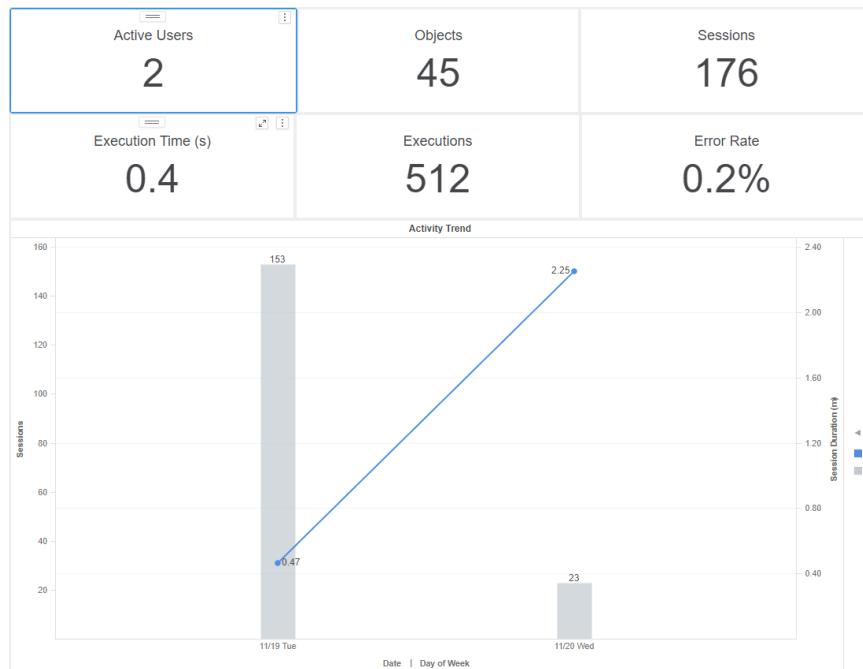


Subscription
Analysis



User Activity

- 6 Double-click the **Project Overview** dossier. The dossier opens in a new window.



Use this dossier to analyze the performance of the MicroStrategy projects, the users that connect to the projects, and the products they use to connect.

- 7 Use the Table of Contents to navigate through the dossier. What are your takeaways from this dossier?

For example, the Unreferenced Objects chapter displays objects that are unused:

Unreferenced Objects			
Project	Object Name	Object GUID	Object Type
Consolidated Education Project	%-Impacted	CC56F5E74B7C07052914A5B57A7E2171	Managed Metric
	%-Impacted - Air	58FCB3B144A483E7793701899AAB8D9F	Managed Metric
	%-Impacted - Car	18EBCB334049AE0E05C6638D5384104F	Managed Metric
	%-Impacted - Hotel	67060FCC433C036C6E1635BF04F5E15F	Managed Metric
	%-Impacted - Rail	1765CCF541DB7886D5AB7CB76CBE011B	Managed Metric
	%-Impacted_TBI	3E33946745BFDD1F06ED85B146CA1031	Managed Metric
	Account Name	EE50644B11E66D6CBA6C0080EF95EBEC	Managed Attribute
	Account Number	F2196B1C11E66E6B00000080EF258EBD	Managed Attribute

What should you direct your Analytics Architect to do with this information to improve performance?

Systems: Leveraging enterprise data assets

The Systems program enables organizations to fully leverage their existing enterprise data assets. For example, the Database Architect should ensure that before data stored in an enterprise data lake, it is federated, with proper data governance and securities applied to protect access to sensitive data.

Responsibilities include:

- Integrating data from enterprise systems (for example, ERP, CRM, MRP, HR) and blending with other data sources to build custom analytics and mobility applications.
- Designing, implementing, and optimizing an integrated architecture to overcome reporting limitations and extend the capabilities of enterprise systems of record.

A data lake is a data-centered architecture featuring a repository capable of storing vast quantities of data in various formats. Data from web server logs, databases, social media, and third-party data is added into the data lake. Data curation captures metadata and lineage and makes it available in the data catalog. Security policies, including entitlements, also are applied.

Database: Optimizing database performance

The Database program optimizes performance of the intelligence platform against various database technologies, such as Oracle, SQL, Snowflake, and HDFS. The program also includes optimization of relational, OLAP, big data,

unstructured, vector, and streaming platforms. For example, the Database Architect should establish best practices for data migration. Responsibilities include:

- Tracking throughput and performance.
- Providing architecture design and optimization recommendations to the database administrator.

Identity: Securing digital and physical assets

The Identity program is responsible for designing and publishing a digital identity architecture that enables enterprise-wide, multi-factor, geospecific digital authentication for internal and external users. For example, the Platform Administrator should specify the authentication modes that the platform administration team will configure to verify users' identity when accessing the analytics platform environments. Responsibilities include:

- Implementing the digital identity architecture and gateways on top of all logical and physical assets.
- Digitally securing all existing and new logical and physical assets.
- Integrating authentication, communication, and telemetry into other applications.

Developmental programs: Creating powerful applications for end users

Developmental programs help guide organizations to create powerful federated analytics, enterprise mobility, and enterprise applications.

Applications: Governing analytical applications

The Applications program oversees the standardization, creation, and deployment of governed analytics applications. For example, the Application Architect should implement organization branding requirements for dossiers, such as colors, fonts, icons, logos, and sizing. Program responsibilities include:

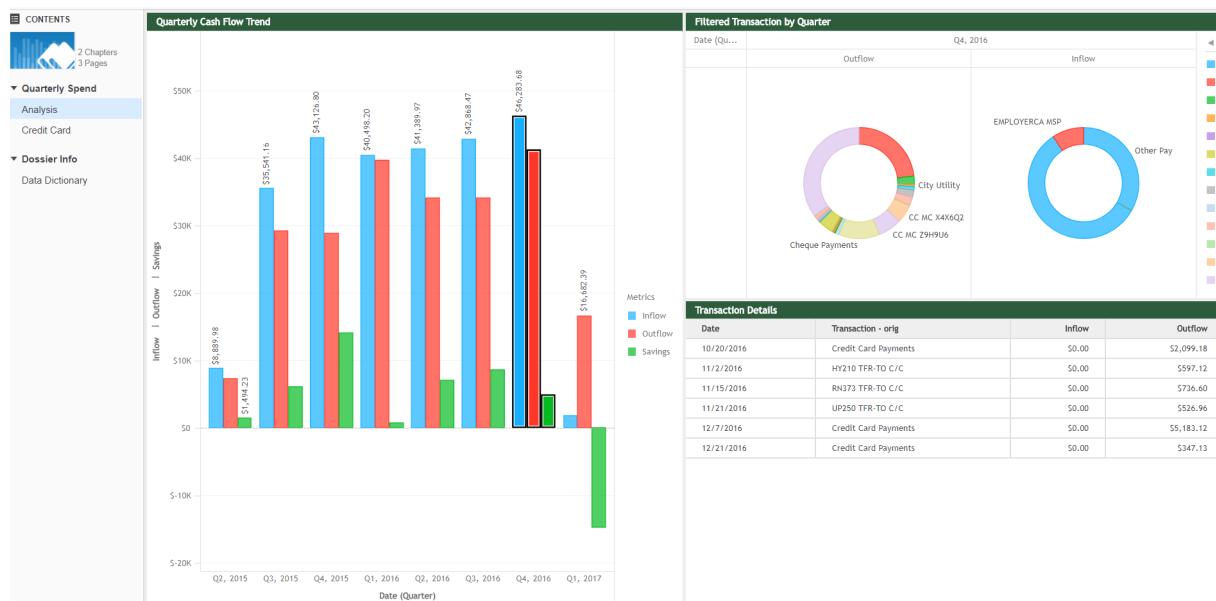
- Implementing a user-centered design that helps increase user adoption.
- Publishing an application framework and best practices that enable all analysts to build consistently impactful applications.

- Establishing a foundation of shared components to speed and standardize departmental application development.

At the 101st National Bank, for example, you've started to implement some of the dossier standards for analysts at the bank to follow:

- Data dictionary
- Maximum of two words for page and chapter names
- Standard naming conventions for dossiers: Start with three-letter names that indicating their department, followed by a period. Then the subject area of the dossier.
- Dates are all in the same M/D/YY date format
- Number separators
- All information is visible without scrolling on one dossier page

The CRD.Spend dossier follows all the standards, as seen in the image below.



Exercise 2.3: View and approve the dossier dictionary chapter template

To unify dossiers across 101st National Bank, you've requested that your Application Architect create a template for a data dictionary chapter named Dossier Info. This chapter should be added to all dossiers to ensure consistency in

all departmental and enterprise dossiers while providing a dictionary to help users understand the dossier components.

CONTENTS		
 1 Chapter 3 Pages	Chapter	Page
Dossier Info Summary Dictionary Plan	KPIs	Monthly
	Branches	Quarterly
Dossier Info Summary Dictionary Plan	Regional Details	Overview
	Branch Details	Provides overall ranking of all regions based on asset balance
	Summary	Provides regional-specific information on KPIs for selected regions
	Dictionary	Provides branch-specific information on KPIs and product mix by segment
Plan	Summary contains description of the dossier content.	
Statistics	Dictionary contains all objects from the Retail.Bank KPI Dossier with their abbreviation, full name, type, definition, unit, latency, and comments.	
	Plan	Plan contains details about future dossier development and enhancements.
	Statistics	Statistics contains the data on dossier usage (last refresh timestamp for each cube, # users, usage, etc.)

In this exercise, view and approve the Dossier Info template.

Add the template to the Tutorial project

- 1 In Workstation, click the **File** menu and click **Open Local Dossier**.
- 2 Navigate to the Exercise Files folder and open **Dossier_Info.mstr**.
- 3 View the **Summary** page. This page describes the dossier structure and details each chapter and page.
- 4 View the **Dictionary** page. This page contains all objects from the dossier with their abbreviation, full name, definition, latency, and comments. The Dictionary page helps clarify concepts, terms, and metrics that might be interpreted differently among teams in your organization.
 - Name is the abbreviated object name for each object on the dossier.
 - Latency is the data refresh period.
 - Description provides additional definitions like metric calculations and threshold conditions.
- 5 View the **Plan** page. This page contains the following details about future development plans:
 - Requirement describes the business need.
 - Next Steps describes how the requirement will be fulfilled.
 - The Owner is the individual responsible for the requirement development.
 - Chapter and Page detail where the development will be placed on the dossier.
 - Start Date, Target Date ,and % Done help to track the change progress.

- The Comments section contains any blocks and additional information around the requirement status.
- 6 Discuss with your peers — what other data points or pages would you add to this dossier? Does your organization currently do something like this?
- 7 Close the dossier.

Mobility: Deploying transformational mobile applications

The Mobility program is responsible for standardizing, creating, and deploying mobile analytics and digital transformation apps. For example, the Mobile Architect should require app landing pages to start with a simple and data-light document, with a clean look and easy access to links for various documents placed appropriately.

The example below provides an all-purpose landing page that easily guides users to the documents they need.



Program responsibilities include:

- Establishing a framework, discipline, and architecture so analysts and developers can build and deploy mobile applications.

- Establishing processes, protocols, and programs so the Intelligent Enterprise can consume apps on mobile devices.

Intelligence: Innovating the enterprise

The Intelligence program oversees advanced BI tools and concepts that have disrupted the landscape, such as artificial intelligence and machine learning. Mastering these tools and injecting them into the enterprise help drive user adoption and the move towards a self-service model where users can explore data on their own. Program responsibilities include:

- Injecting artificial intelligence, machine learning, deep learning, and predictive analytics algorithms into enterprise applications and federated datasets.
- Publishing and curating a library of data analysis models for analysts and departmental data scientists.

At 101st National Bank under the Intelligence Program, you've directed your Services Architect to leverage machine learning to enhance fraud detection mechanisms to move away from manual interventions.

Departmental: Managing analytics for applications

The Departmental program is responsible for overseeing and optimizing enterprise data to allow users to build governed, quality applications. For example, the Analytics Architect should establish dataset optimization techniques, such as limiting dataset scope, to maximize performance. Program responsibilities include:

- Empowering departments to rapidly build applications on federated trusted data using MicroStrategy or other tools (for example, Tableau, Power BI, Excel).
- Orchestrating collaboration with the Intelligence Center so datasets are continually evaluated, optimized, and updated.

Services: Customizing and embedding applications

An Intelligent Enterprise needs to support diverse modes of operation, from departmental implementations and enterprise-wide deployments that drive user adoption through customization, tailoring applications to end users and the overall business. The Services program is responsible for helping developers customize, extend, and integrate enterprise applications to achieve this goal. For

example, the Services Architect should oversee the development and use of plug-ins to connect to data sources. Program responsibilities include:

- Converting datasets and application components into published services for developers to inject intelligence into their custom applications
- Publishing samples and documentation to empower developers to use their preferred programming tools and languages.

DEVELOPING A SUCCESSFUL TEAM WITH THE INTELLIGENCE CENTER

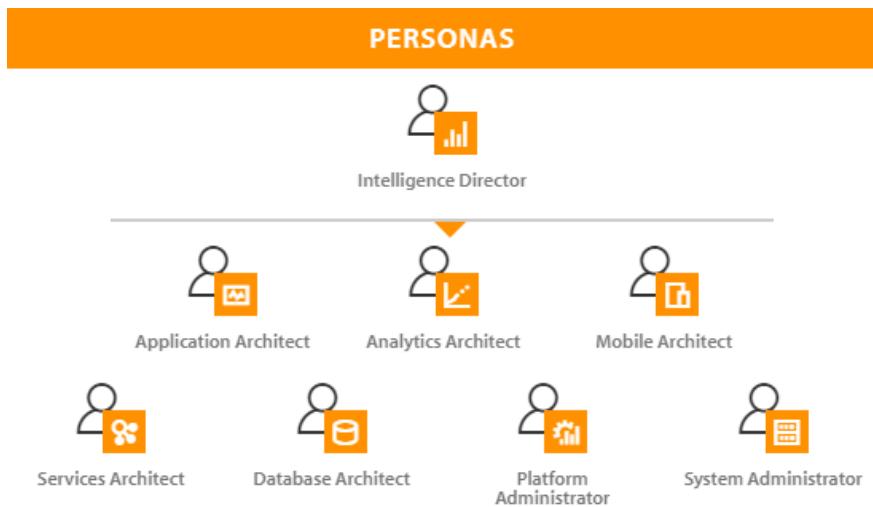
An Intelligent Enterprise depends on more than its technology — successful enterprises leverage the unified strength of their people. As the Intelligence Center Director, you are responsible for establishing a positive, data-driven culture and building a team that is able to leverage the organization's technology. Now that you've planned for the programs that 101st National Bank will implement, you want to focus on building the Intelligence Center and driving BI adoption across the organization.

What is your current team structure?

The Intelligence Center

The journey towards the Intelligent Enterprise begins with small, departmental initiatives. But as the scale and sophistication of deployments increase, it will

require a team of expert architects to properly maintain the platform and intelligence processes.



Deploying, governing, and optimizing an Intelligent Enterprise ecosystem takes a team with the right skill sets. To lead the ecosystem and drive user adoption, organizations should build an Intelligence Center, staffed by people who are skilled in specific aspects of a deployment. This ensures continual standardization, maintenance, and optimization across the organization. For example, the Application Architect ensures that all applications comply with corporate branding, while the Services Architect creates the SDK development process guidelines.

Each organization can take a unique approach to the Intelligence Center in a way that works for their size and structure. For example, a smaller businesses may have one person acting as the Mobile Architect and Application Architect, overseeing all applications and their implementation, regardless of the consumption medium.

Each role is described below. Think about these roles as we review them — are you currently filling any of these positions? How could your organization leverage this model to operate more intelligently?

Intelligence Center Director

- As we have learned, the Intelligence Center Director creates intelligent environments by deploying a best-in-class BI architecture, supervises the Intelligence Center, and runs Intelligence Programs, such as enterprise mobility solutions, to support enterprise and departmental analytics and mobility applications for all constituents.

Application Architect

- Creates, shares, and maintains intelligence applications for the enterprise. Publishes standardized application objects and promotes departmental applications from self-service into the enterprise environment.

Analytics Architect

- Creates, publishes, and optimizes a federated data layer as the enterprise's single version of the truth. Builds and maintains the schema objects and abstraction layer on top of various, changing enterprise assets.

Mobile Architect

- Builds, compiles, deploys, and maintains mobile environments and applications. Optimizes the user experience when accessing applications via mobile devices. Integrates apps with preferred VPN, SSO, and EMM protocols.

Services Architect

- Injects, extends, and embeds analytics into portals, third-party, mobile, and white-labeled applications. Publishes web services and data services for use by developers to build departmental applications.

Database Architect

- Designs and maintains database enterprise assets. Optimizes database performance and utilization based on query type, usage patterns, and application design requirements.

Platform Administrator

- Installs and configures the Intelligence Architecture on-premises and/or in the cloud. Maintains the security layer, monitors system usage, and optimizes architecture to reduce errors, maximize uptime, and boost performance.

System Administrator

- Sets up, maintains, monitors, and continuously supports the infrastructure environment through deployment on AWS, Windows, or Linux, while optimizing performance and controlling costs.

Exercise 3.1: Hire an architect

The bank wants to hire an Analytics Architect and an Application Architect. They've asked you to write the prerequisites for the job description. In this exercise, write down the experience and qualifications these potential hires should have. Afterwards, discuss your ideas with your peers. What similarities did you list? What differences?

As an example, below are the experience and qualifications for a Mobile Architect in an Intelligent Enterprise organization:

- Experience architecting MicroStrategy Mobile Applications end to end.
- Thorough knowledge of all capabilities in the MicroStrategy Suite, including Developer, Workstation, and Web.
- Extensive hands-on experience with the following technologies: AirWatch MDM (or similar MDM solutions), Android, Windows, and Apple iOS platforms.
- Ability to debug and fix technical issues.
- Ability to interact with business users to gather requirements and provide support.
- Ability to develop comprehensive project plans, define project scope, and establish key performance indicators (KPIs).
- Performance tuning and troubleshooting experience.
- Knowledge of performance best practices and how to build apps that are resource efficient.
- Strong communication skills and ability to communicate with both technical and business users, and both internal and external customers.

Use the space below to write your requirements.

Establishing Intelligence Center service-level agreements

As the Intelligence Center Director, you should establish service-level agreements (SLAs) that serve as the contract between your team and the organization. Intelligence Center SLAs should include the following:

- Availability. For example, environments should be available during regular business hours with maintenance scheduled during weekends or non-peak times.
- Performance. For example, dossiers and reports should take five seconds or less to load.
- Operation. For example, data should be refreshed every day.
- Cost. For example, ensure that the budget aligns with effective use across the Intelligence Center.
- Time to resolution. For example, all help desk requests should be resolved within 24 hours depending on severity of issues.

The SLAs should also describe how levels are tracked and measured, and the roles, responsibilities, metrics, notification strategies, and escalation processes.

Tracking KPIs to drive performance

You should establish and capture benchmarks that will drive performance and demonstrate value for your team, such as, number of resolved help requests and application usage. These Key Performance Indicators (KPIs) will help your team to clearly understand their role within the organization, and convert enterprise strategy into specific actions that can be implemented by the Intelligence Center. At 101st National Bank, for example, you want to establish the following KPIs for ETL (extract, transform, load):

- The batch load time should begin at the close of business for the west coast branches and complete one hour before opening on the east coast.
- There should be zero job failures.
- No rows should be rejected.

Exercise 3.2: Analyze the ETL dossier

To track KPIs, your Application Architect should work with her team to build dossiers and reports that allow you to monitor performance across daily, weekly, monthly, and quarterly intervals. For example, your team should create an operational dossier that measures processes in real-time to enable analysts to fix problems as they happen and optimize performance, such as tracking ETL job errors or query response times. The Database Architect and Analytics Architect can take immediate action to investigate and fix the problem.

In this exercise, you will analyze the ETL dossier and evaluate where your team needs to focus.

Add the dossier to your environment and analyze the data

- 1** In Workstation, click the **File** menu then select **Open Local Dossier**.
- 2** Navigate to the **Exercise Files** folder and open **ETL Monitoring.mstr**.

The screenshot shows the MSTR interface with the following details:

- Left Sidebar:**
 - CONTENTS**: 2 Chapters, 5 Pages
 - KPIs**
 - Daily**
 - Weekly**
 - ETL**
 - ETL Summary**
 - ETL Failure Analysis** (selected)
 - ETL Performance Analysis**
- Main Area - Top Table (Failure Detail):**| Subject Area | Workflow Name | User Name | Workflow Run Time In Mins | Workflow Start Time | Workflow End Time | Session Run Status Desc | Session Failed Rows |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Consumer | wf_Consumer | Administrator | 0 | 9/25/2017 6:30:00 AM | 9/25/2017 6:30:25 PM | Failed | 0 |
| 5 | 1/1/2018 12:30:00 AM | 1/1/2018 12:35:49 PM | Succeeded | 0 |
| 6 | 11/6/2017 12:30:01 AM | 11/6/2017 12:36:49 AM | Succeeded | 0 |
| | 12/30/2017 12:30:00 AM | 12/30/2017 12:36:11 AM | Succeeded | 0 |
| | 12/30/2017 6:30:00 AM | 12/30/2017 6:36:58 AM | Succeeded | 0 |
| | 12/31/2017 6:30:00 PM | 12/31/2017 6:36:47 PM | Succeeded | 0 |
| | 9/2/2017 12:30:00 AM | 9/22/2017 12:37:48 AM | Succeeded | 0 |
| | 9/2/2017 12:30:00 AM | 9/23/2017 12:37:08 AM | Succeeded | 0 |
| 8 | wf_Consumer | Administrator | 9/23/2017 6:30:01 PM | 9/23/2017 6:37:47 PM | Succeeded | 0 |
| 9/24/2017 6:30:00 AM | 9/24/2017 6:37:56 AM | Succeeded | 0 |
| 9/24/2017 6:30:00 PM | 9/25/2017 6:37:56 PM | Succeeded | 0 |
| 9/25/2017 12:30:00 AM | 9/25/2017 12:37:52 AM | Succeeded | 0 |
| 12/27/2017 12:30:00 AM | 12/27/2017 12:37:58 AM | Succeeded | 0 |
| 12/30/2017 12:30:01 PM | 12/30/2017 12:37:15 PM | Succeeded | 0 |
| 12/30/2017 6:30:00 PM | 12/30/2017 6:37:43 PM | Succeeded | 0 |
| 12/31/2017 12:30:01 PM | 12/31/2017 12:37:13 PM | Succeeded | 0 |
| 1/1/2018 12:30:00 PM | 1/1/2018 12:37:40 PM | Succeeded | 0 |
| 1/1/2018 6:30:00 PM | 1/1/2018 6:37:17 PM | Succeeded | 0 |
| 1/6/2018 12:30:01 AM | 1/6/2018 12:37:33 AM | Succeeded | 0 |
| 1/6/2018 6:30:01 PM | 1/6/2018 6:37:59 PM | Succeeded | 0 |
| 1/7/2018 12:30:00 PM | 1/7/2018 12:37:44 PM | Succeeded | 0 |
| 9/23/2017 6:30:00 AM | 9/23/2017 6:38:18 AM | Succeeded | 0 |
| 9/23/2017 12:30:00 PM | 9/23/2017 12:38:10 PM | Succeeded | 0 |
| 10/7/2017 12:30:01 PM | 10/7/2017 12:38:34 PM | Succeeded | 0 |
| 10/7/2017 6:30:00 PM | 10/7/2017 6:38:44 PM | Succeeded | 0 |
| 10/9/2017 6:30:00 PM | 10/9/2017 6:38:44 PM | Succeeded | 0 |
| 12/27/2017 12:30:00 AM | 12/27/2017 12:36:33 PM | Succeeded | 0 |
| 12/28/2017 12:30:01 AM | 12/28/2017 12:38:26 AM | Succeeded | 0 |
| 12/29/2017 12:30:01 PM | 12/29/2017 6:38:23 PM | Succeeded | 0 |
| 1/1/2018 6:30:01 AM | 1/1/2018 6:38:34 AM | Succeeded | 0 |
| 1/6/2018 12:30:00 PM | 1/6/2018 12:38:30 PM | Succeeded | 0 |
| 1/7/2018 17/2018 6:30:01 PM | 1/7/2018 6:38:21 PM | Succeeded | 0 |

- 3** Navigate through the dossier and discuss the following with your peers:

- Which SLAs are not being met? Do multiple data sources have issues?
- How would you approach your team to fix the anomalies?

- What diagnostics are missing from this dossier? What other data point would you add?

Intelligence Center meetings

Best Practice

To plan, identify, and resolve relevant issues and drive accountability, you should establish weekly meetings with the Intelligence Center architects. A weekly meeting also builds a culture of feedback and fosters a sense of camaraderie among the architects that they should emulate amongst their own teams. To run an efficient and effective meeting, an Intelligence Center Director should:

- Make meetings consistent. Hold them at the same time each week at a time that does not fall during peak hours.
- Use meetings to build a strong team and reinforce cultural values; celebrate victories and foster accomplishments.
- Set a clear weekly agenda to allow architects to prepare and use their time wisely.
- Document and follow up with action items to ensure next steps are taken.

Intelligence Center certifications

You should ensure that your Intelligence Center staff have the levels of expertise, both in MicroStrategy and in their day-to-day role, required to succeed in their roles. To help equip Intelligence Center Architects with a deep understanding of MicroStrategy's product capabilities and best practices in specific areas of expertise, your architects should be certified in their roles. To learn more about certifications, visit the MicroStrategy Education website here: <https://www.microstrategy.com/us/services/education>.

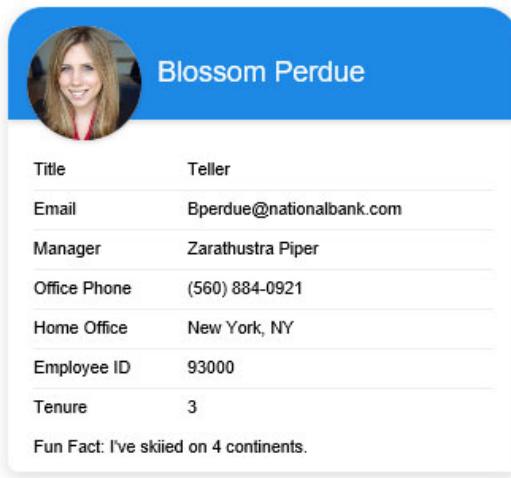
Enhance communication with HyperIntelligence

To enhance collaboration when working with others in the organization, the Intelligence Center should be able to quickly access their colleagues' information. This helps break down silos that may form between departments and encourage smart, data-driven decisions across the organization.

Exercise 3.3: Create the Employee Profile card

To accomplish this communication goal, build the Employee Profile HyperIntelligence card. MicroStrategy HyperIntelligence enables you to deliver critical information to people in your organization through informative cards that contain key performance indicators about a given topic, such as contacts, customers, or products, through a Chrome browser plug-in, HyperMobile app, and the HyperIntelligence for Office Outlook add-in.

When an employee's name surfaces in Outlook, Chrome, or their calendar on their mobile device, the following card will show:



Typically, the Application Architect and her team will build HyperIntelligence cards for your organization.

Add and wrangle the data in your environment

MicroStrategy can connect to many different data sources, including human capital management tools such as Workday. In your organization, you can leverage this data to include real time data in your cards. For the purposes of this class, use an Excel file that contains 101st National Bank employee information.

- 1 From Workstation, in the left pane, click **Create New Dataset**, point to **Agile**, then click **MicroStrategy Tutorial**.



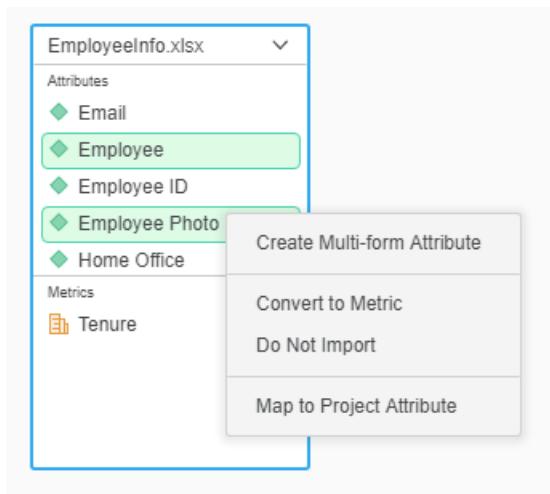
- 2 In the Data Sources window, select **File from Disk**, then click **Choose Files**.
- 3 From the **Exercise Files** folder, double-click **EmployeeInfo.xlsx**.
- 4 Click **Prepare Data**.
- 5 You want the card to display the employee's picture. To display a photo in your card, the data must be an HTML tag. Right-click **Employee Photo**, point to **Change Data Type**, and click **HTML tag**.
- 6 If a dataset contains an email address, users can click the email address in the card to launch a new email message. To enable this, right-click **Email**, point to **Change Data Type**, and click **Email**.

Create a multiform attribute

Your card is displayed based on a keyword attribute, but you may want the card to display with additional attributes. For example, in a card tracking stock performance, you would want the card to surface based on the stock ticker or the company name, and display both attributes in the card header.

In this case, you want both the employee photo and the employee name to show in the header. To do this, create a multiform attribute with Employee Photo and Employee name.

- 7 Select the **Employee** attribute, then press **CTRL** on your keyboard and click the **Employee Photo** attribute.
- 8 Right-click **Employee** and select **Create Multi-form attribute**.



- 9 Name the new attribute **Employee**, then click **Submit**.

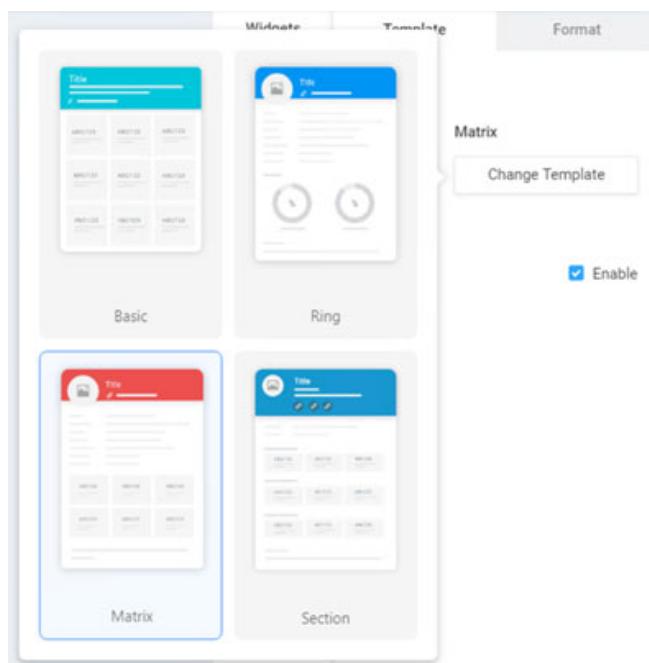
10 Click Finish.

- 11** In the Save As window, double-click the **MicroStrategy Tutorial** folder, then double-click the **Public Objects** folder.
- 12** In the **Save As** box, change the name from New Dataset to **EmployeeInfo**, then click **Save**.

You have created your dataset. Now, you can create a HyperIntelligence Card based on your data.

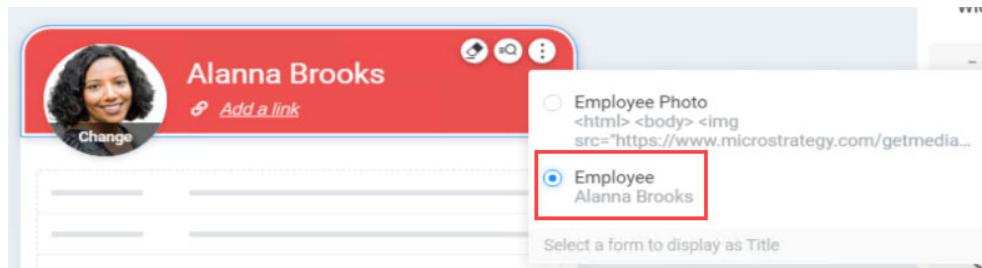
Build the card

- 1** In the left pane, click **Datasets**.
- 2** On the toolbar, click **Refresh** .
- 3** Right-click **EmployeeInfo**, then select **New Card from EmployeeInfo**.
- 4** To change the card template, in the right pane, click **Change Template**.
- 5** Select the **Matrix** template.



The Basic card template does not include a photo, so it is not the best fit for your card. While the other card profiles include a photo, the Matrix card template is the best fit for the Employee card design.

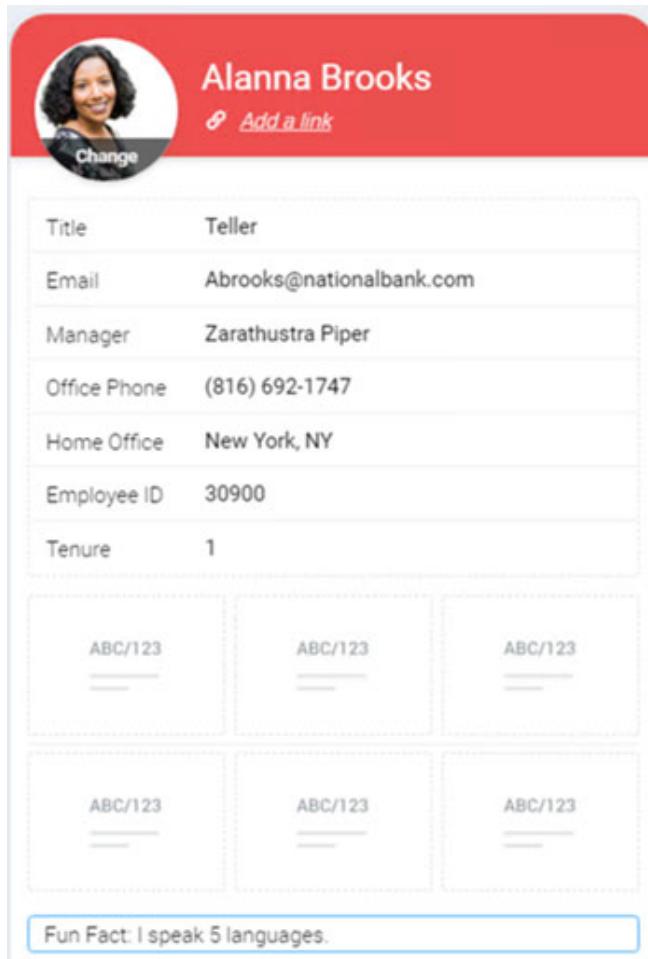
- 6 Drag and drop the **Employee** attribute to the card header.
- 7 To display the employee's name, select the **Menu**  icon, then select **Employee** as the form to display.



Add additional attributes

- 8 Drag and drop the following attributes and metric to the template directly under the header:
 - **Title**
 - **Email**
 - **Manager**
 - **Office Phone**
 - **Home Office**
 - **Employee ID**
 - **Tenure**
- 9 You want to add the Fun Fact attribute to the card. Footers are the best area for descriptive attributes that are longer, or URLs that might take up more

space on the card. Drag and drop the **Fun Fact** attribute to the footer drop zone.



The image shows a digital employee profile card for Alanna Brooks. At the top, there is a circular photo of a woman with dark hair, identified as Alanna Brooks. Below the photo is a "Change" button. To the right of the photo, her name "Alanna Brooks" is displayed in bold black text, followed by a link icon and the text "Add a link". The main body of the card contains a table with the following data:

Title	Teller
Email	Abrooks@nationalbank.com
Manager	Zarathustra Piper
Office Phone	(816) 692-1747
Home Office	New York, NY
Employee ID	30900
Tenure	1

Below the table is a grid section divided into six smaller boxes, each containing the text "ABC/123". At the bottom of the card is a blue footer bar with the text "Fun Fact: I speak 5 languages.".

10 Save your card in the **Public Objects** folder as **Employee Profile**. In the next chapter, you will test and deploy your card across the bank.

IMPLEMENTING THE INTELLIGENCE CENTER AND PROGRAMS

Initiating the Intelligent Enterprise strategy

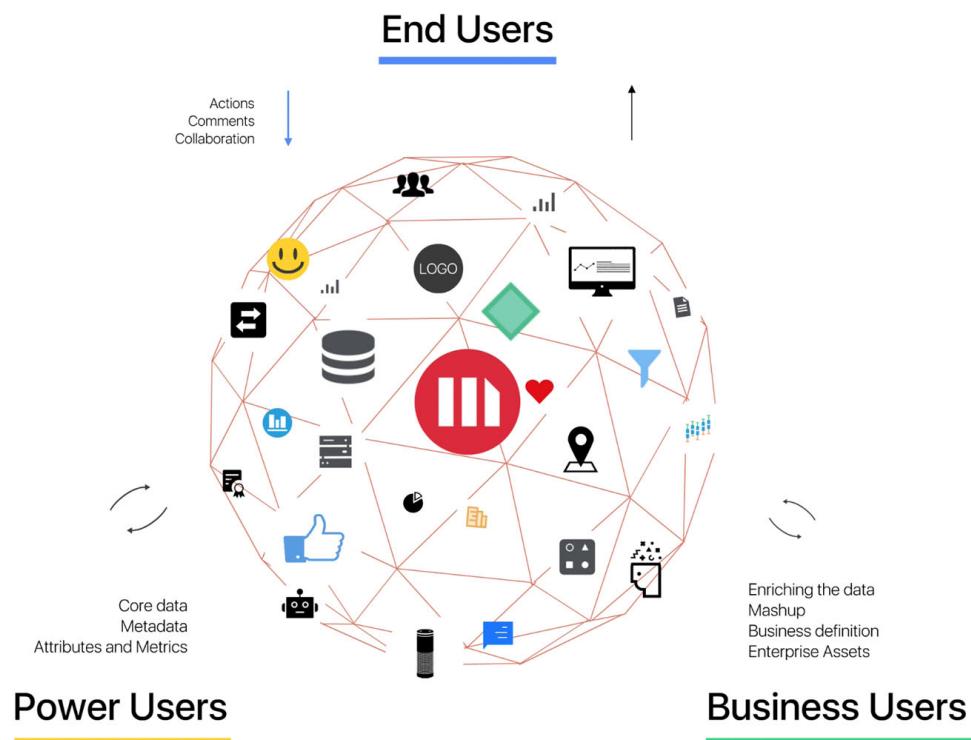
Now that you've begun to establish intelligent programs, put together your Intelligence Center, and developed standards for working with departmental analysts, you want to implement your strategy. In this chapter, we discuss:

- Data governance and a federated data infrastructure
- Enterprise, departmental, and agile environments
- Daily system health stats
- Tracking help requests
- Working with executive sponsors

Leveraging a foundation for trusted and governed analytics

To actualize the programs you've established, you can use MicroStrategy's metadata repository that indexes and abstracts an organization's data into an

enterprise semantic graph, allowing users to rapidly build contextual applications and deploy them on any device. The metadata repository also serves as the foundation for trusted and governed analytics.

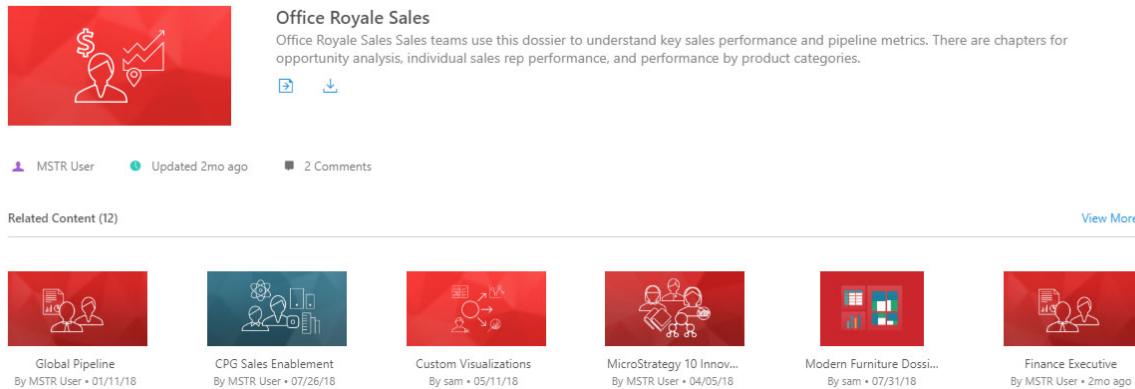


Within MicroStrategy, the enterprise semantic graph supplements metadata content and conceptualizes enterprise assets into a common, foundational business glossary. As seen in the above image, everything from Library comments and geo-location information to attributes and filters is stored in the enterprise semantic graph. As the Intelligence Center Director, you should leverage the semantic graph to track all your organization's objects, optimize overall performance, and understand the data in your organization to ensure users get the information they need.

The semantic graph provides:

- Real-time usage information to understand relationships in the system, using Platform Analytics capabilities and telemetry.

- Recommendation and insight engines. For example, the information contained in the graph helps users find relevant dossiers and documents in MicroStrategy Library.



The screenshot shows the MicroStrategy Intelligence Center interface. At the top, there's a red header bar with the title 'Office Royale Sales'. Below it, a detailed description reads: 'Office Royale Sales Sales teams use this dossier to understand key sales performance and pipeline metrics. There are chapters for opportunity analysis, individual sales rep performance, and performance by product categories.' Below the description are two blue download icons. Underneath the header, there are user details: 'MSTR User' (profile icon), 'Updated 2mo ago' (calendar icon), and '2 Comments' (comment icon). A horizontal line separates this from the 'Related Content (12)' section. This section displays six smaller dossier cards, each with a red background and a white icon. From left to right, the cards are: 'Global Pipeline' (person with document icon), 'CPG Sales Enablement' (person with chart icon), 'Custom Visualizations' (two people with chart icon), 'MicroStrategy 10 Innov...' (two people with gear icon), 'Modern Furniture Dossi...' (person with document icon), and 'Finance Executive' (person with document icon). Each card also includes a small text description and a timestamp.

The MicroStrategy architecture provides a robust Google-like index for enterprise data and assets. That index is continually enriched with location intelligence and usage telemetry—enabling AI-powered experiences through governed, contextual, and personalized recommendations and insights.

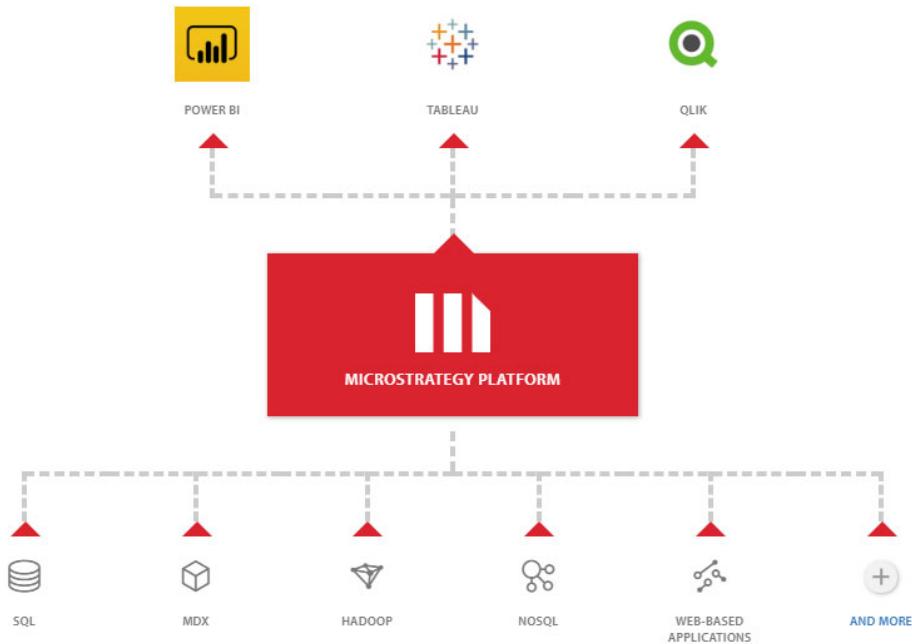
Using federated analytics for foundational and developmental programs

Intelligent Enterprises are increasingly dependent on large, federated collections of data. A modern intelligence platform brings together certified, federated collections of data that can be published to enterprise architects and departmental analysts while enforcing a single version of the truth. With this increasing scale, organizations also need to publish and package data in ways that simplify the development process and ensure high performance.



MicroStrategy's connectors provide a layer of federated analytics that combine multiple data sources to provide a seamless, cohesive picture of your business, and then leverage that data in other analytic tools. For example, a dossier can access objects from a MicroStrategy project, a web page, and a Salesforce report,

to combine sales data, customer reactions, and marketing information that are kept in separate systems in a single display.



Many of the company's analysts use Web or Workstation to create informative, interactive visualizations with the combined, certified data. For the business user that prefers to work with Tableau, Qlik, or another BI tool, MicroStrategy's connectors allow him to leverage the governed data extracted by MicroStrategy. By using MicroStrategy as the core platform to tie these tools together, the organization can bring the benefits of MicroStrategy's security and single version of the truth to safeguard self-service analytics across the enterprise.

Federated analytics allows access to data and its insights, by importing it into MicroStrategy for modeling and analysis, and by extracting it for use in other tools that do not have the metadata, governance, scalability, and enterprise reporting capabilities required to broadly deploy analytics.

Consistent and trustworthy data in the Intelligent Enterprise

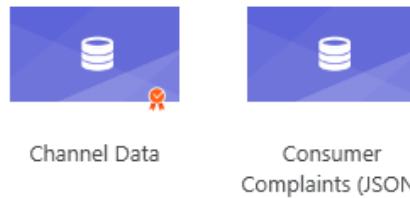
An Intelligent Enterprise maintains sound data governance and a single version of the truth, while supporting personal, feature-rich data discovery. As the Intelligence Center Director, you should fully understand your organization's data governance strategy to ensure the business can realize the full potential of your data technologies and tools within a trusted environment. You should oversee

the implementation and maintenance of data governance within the Intelligence Center.

The diverse data sources and complex data types require a highly managed and monitored data management strategy throughout the Intelligent Enterprise. Data governance sets the blueprint for managing data assets, which includes layers such as the architecture, the operational framework, and the processes. Within the Intelligence Center, each architect assists in maintaining enterprise-wide data governance. You should include data governance as a topic in your weekly Intelligence Center meetings.

Below are examples of how architects contribute to an enterprise data governance strategy:

- **Analytics Architect:** Directs the creation of enterprise datasets that enable rapid application development on a single version of the truth, and devises a strategy to help organize objects, such as attributes and metrics, into datasets that serve a functional purpose. For example, with MicroStrategy, the Analytics Architect can certify objects. A certified dataset indicates to a business user that the data has been inspected for integrity and quality. Certified datasets must be valid, secure, and high-performing.



In the image above, the Channel Data cube is certified, as noted by the red icon.

- **Application Architect:** Requires that application designers use data that is correct and verified (the single version of the truth).
- **Mobile Architect:** Ensures that mobile application designers are using the correct, approved MicroStrategy objects. For example, the Mobile Architect at one organization requires that the Profit metric comes from the Sales project. Designers have access to multiple projects that have the Profit metric, but for consistency, designers can only use Profit from the same project.
- **Database Architect:** Establishes and oversees master data management to link all of the enterprise's critical data to a common point of reference and allow for consistent data definitions.

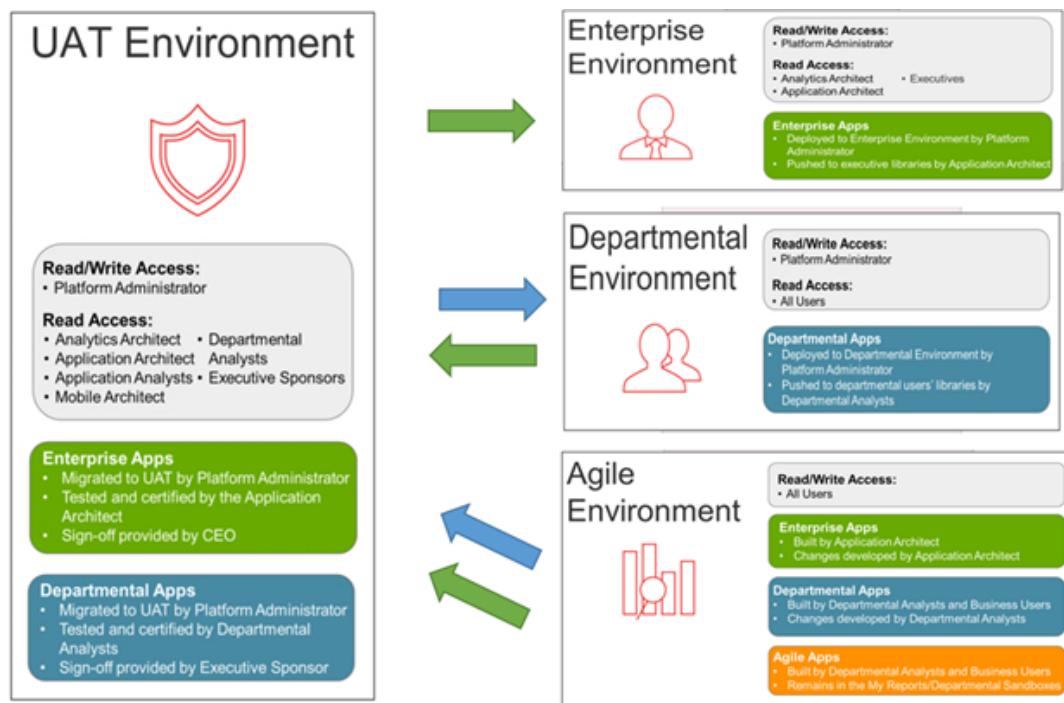
Does your organization employ a data governance strategy? If so, how does data governance impact your current role? Find the items on the Map where your organization has applied data governance.

Is your organization currently using this model? Why or why not?

Enterprise, departmental, and agile: Environment and application life-cycles

Best Practice

When evaluating your enterprise, you discovered the users do not have an agile sandbox, and applications are pushed from development to enterprise environments without standards in place. To provide optimized enterprise-wide and self-service data discovery, you want to implement an environment and application life-cycle as described below:



In an Intelligent Enterprise, an application is created in an agile environment. If a personal or departmental application proves to be popular and meets user needs, it is moved to the User Acceptance Testing (UAT) environment. The application is tested in the UAT environment, and verified to meet the application standards and guidelines. It is then published to the enterprise or departmental environments for wider use.

These environments allow applications to run at optimal performance and provide the right information to the right users. As the Intelligence Center Director, you oversee the development of each environment and ensure that they are being leveraged appropriately. During your weekly meetings with the Intelligence Center, review usage of each environment and ensure applications are pushed to the appropriate users.

Using Integrity Manager to automate project testing

All BI projects require design, development, and testing as a part of their life cycle. Before making changes to the production environment, your team must determine how specific changes in a project environment, such as the regular maintenance updates to application objects or hardware and software upgrades, affect the reports and documents in that project. As the Intelligence Center Director, you should ensure your team thoroughly analyzes any changes to production environments before going live across the organization.

You should require your team to use MicroStrategy Integrity Manager to quickly and efficiently test multiple reports, documents, and dossiers from different environments to uncover inconsistencies and discrepancies in the result sets and different output formats. As the Intelligence Center Director, you should understand Integrity Manager reports, so you can read the results and delegate appropriate tasks throughout your team to ensure a smooth transition or upgrade process.

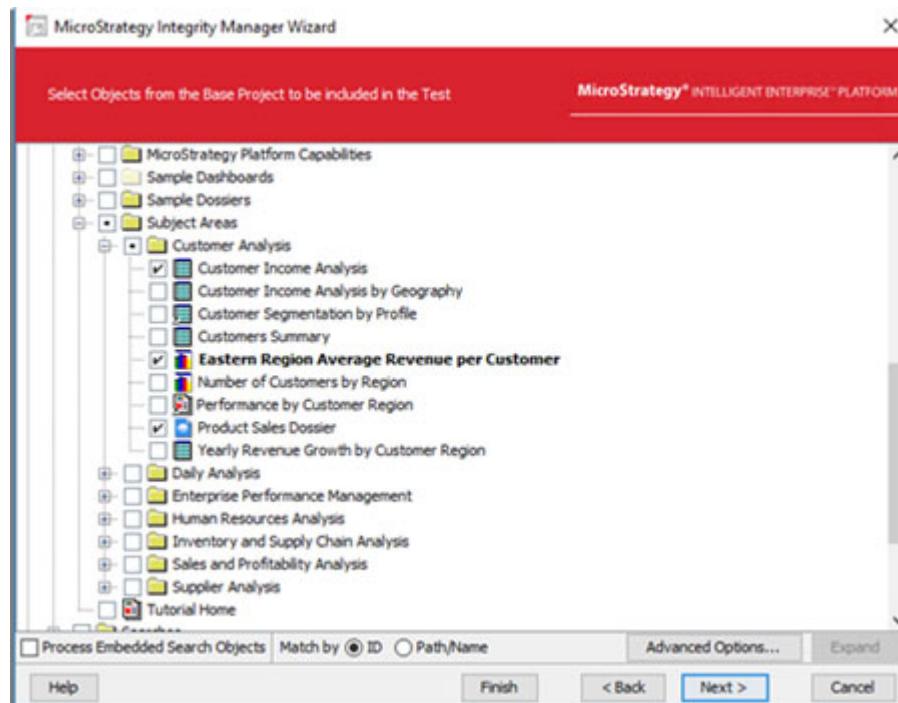
When the Analytics and Application Architects make changes to objects in the development environment, the objects need to be tested before migrating them to the production environment. For example, adding a data element to a visualization changes the output formats of a dossier. As this change can potentially impact all users currently consuming the outputs, every single output format needs to be tested. You and your team should use Integrity Manager to evaluate the impact as part of the change management workflow.

Unit testing can be performed on reports, documents, and dossiers to evaluate the impact on the daily changes made to application objects within development environments. To better understand this process, we can examine a typical development cycle. Three objects have been changed in the development environment in the following example:

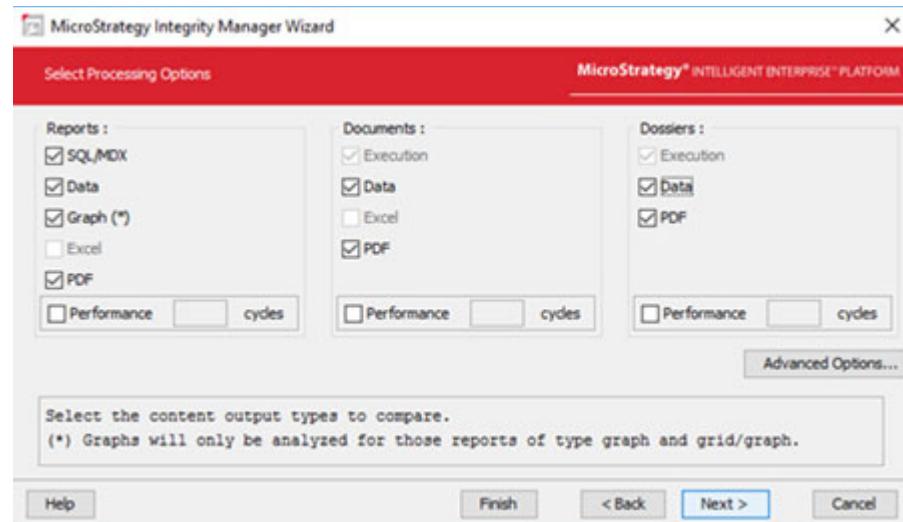
Object Name	Environment	Object Type	Location	Modification
Customer Income Analysis	National Bank BI - Dev	Report	Shared Reports\Subject Areas\Customer Analysis	Added Profit metric
Eastern Region Average Revenue per Customer	National Bank BI - Dev	Document	Shared Reports\Subject Areas\Customer Analysis	Changed graph series to column
Customer Income Analysis By Geography	National Bank BI - Dev	Dossier	Shared Reports\Subject Areas\Customer Analysis	Added Profit metric as a line to the chart visualization

Your Application Architect can compare each object modified in the development environment to the same object in the production to uncover the potential impact of the changes. In Integrity Manager, running a Project vs. Project test, the Application Architect connects to the development environment first, then connects to the production environment.

The objects modified in the development environment are then selected.



For each object type, the Application Architect can select processing options. She can select what report, document, or dossier output that Integrity Manager should analyze.



When the Application Architect executes the Integrity Manager test, information about the integrity of each tested object displays in the Results Summary area. You can analyze the data integrity on reports, documents, or dossiers while the test is still executing. Using Integrity Manager, you can quickly view discrepancies in data down to the cell level and share these results with others in HTML or XML format.

Selecting the Customer Income Analysis report confirms that the profit metric was added to the report data, as seen in the image below.

The screenshot shows the MicroStrategy Integrity Manager Results Summary screen. The top navigation bar includes File, View, Run, Help, and various icons. The main area has tabs for SQL/MDX, Data, Graph, Excel, PDF, Details, and Notes. The 'Data' tab is selected and highlighted with a red box. The 'Base' section displays a table with columns: Region DESC, Income Bracket ..., Revenue, and Profit. The 'Target' section also displays a similar table. A red box highlights the 'Profit' column in both tables. The status bar at the bottom right shows the date 'Jul 30, 2019' and time '4:13 PM'.

Region DESC	Income Bracket ...	Revenue	Profit
Central	20K and Under	\$115,841	\$15,953
	20K-30K	\$106,535	\$14,816
	30K-40K	\$75,557	\$9,867
	40K-50K	\$218,642	\$33,697
	50K-60K	\$198,328	\$31,079
	60K-70K	\$179,365	\$27,041
	70K-80K	\$147,423	\$23,003
	80K-90K	\$110,132	\$18,067
	90K-100K	\$78,579	\$12,430
	Over 100K	\$63,232	\$10,348
Northeast	20K and Under	\$144,885	\$18,612
	40K-50K	\$432,829	\$66,072
	Over 100K	\$114,111	\$44,875

Region DESC	Income Bracket ...	Revenue	Profit
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	60K-70K	\$179,365	\$27,041
	70K-80K	\$147,423	\$23,003
	80K-90K	\$110,132	\$18,067
	90K-100K	\$78,579	\$12,430
	Over 100K	\$63,232	\$10,348
Northeast	20K and Under	\$144,885	\$18,612
	40K-50K	\$432,829	\$66,072
	Over 100K	\$114,111	\$44,875

If the report has other outputs such as PDF, Excel, or graph, the architect can review the impact of the change on each outputs.

The screenshot shows the MicroStrategy Integrity Manager interface. At the top, there's a menu bar with File, View, Run, Help. Below it is a toolbar with various icons. The main area is titled 'Results Summary' and contains a table with three rows:

Sequence	Object Type	Name (Base)	Status	SQL/MDX	Data	Graph	Excel
1		Product Sales Dossier	Completed	N/A	X	N/A	N/A
2		Customer Income Analysis	Completed	X	X	N/A	N/A
3		Eastern Region Average Revenue per Customer	Completed	✓	✓	X	N/A

Below the table, there are status indicators: 'Ready' (green checkmark), 'Total: 3', 'Completed: 3', and 'Errors: 0'. The bottom navigation bar includes tabs for SQL/MDX, Data, Graph, Excel, PDF, Details, and Notes. The main content area is split into 'Base' and 'Target' sections, both titled 'Customer Income Analysis'. Each section contains a table with columns: Region, Income Bracket, Metric, Revenue, and Profit. The 'Profit' column is highlighted with a red border in both tables. At the bottom of the interface, it says 'Page 1 of 3 | Total of 4 difference(s) in 3 page(s)'.

The Profit metric was added as a line to the chart visualization in the Product Sales dossier. The visualization and the output format of the dossier in PDF are both impacted by this change as shown in the following image.

This screenshot shows the MicroStrategy Integrity Manager interface comparing the 'Base' and 'Target' environments for the 'Product Sales Dossier' object.

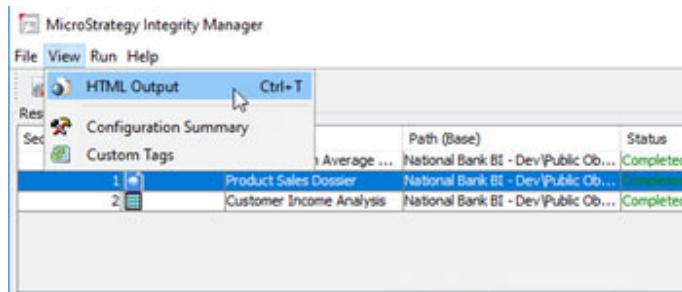
The 'Results Summary' table shows the following data:

Sequence	Object Type	Name (Base)	Path (Base)	Status	SQL/MDX	Data	Graph	Excel	PDF
3		Eastern Region Average ...	National Bank BI - Dev\Public Obj...	Completed	✓	✓	X	N/A	X
1		Product Sales Dossier	National Bank BI - Dev\Public Obj...	Completed	N/A	✓	X	N/A	X
2		Customer Income Analysis	National Bank BI - Dev\Public Obj...	Completed	X	X	N/A	N/A	X

The 'Base' section displays a chart with 'Revenue' on the Y-axis and time on the X-axis, showing a fluctuating pattern. The 'Target' section also displays a similar chart for the same period, showing a slightly different pattern. The bottom navigation bar includes tabs for SQL/MDX, Data, Graph, Excel, PDF, Details, and Notes.

HTML output of an Integrity Manager test

After the execution of an integrity test, Results Summary HTML and XML files are generated. If you are analyzing the data in Integrity Manager, you are viewing the ResultsSummary.xml file. However, you can view the results in HTML form outside of Integrity Manager. The ResultsSummary.html file enables you to share test results with anyone, regardless of whether they have access to Integrity Manager. In addition, you can open the HTML file from within Integrity Manager.



Best practices for integrity testing

Best Practice

Establish the following best practices when testing your upgrade with Integrity Manager:

- Create an integrity test comparing reports from the upgraded test environment with the same reports in the production environment. This allows you to easily identify any differences.
- Execute the tests against the production data warehouse. If this is not possible, test against a data warehouse that closely resembles the production data warehouse.
- Execute the tests under production users, groups, and security roles instead of specially-created integrity test users and groups. This way, the tests match the production environment as closely as possible.
- Use prompt answers that are used in the production environment.

Exercise 4.1: Integrity Manager test analysis

In this exercise, review the results of an integrity test performed by the Analytics Architect to examine the impact of the changes made in production. Analyze the output of an Integrity Manager test.

Analyze the Integrity Manager test

- 1 From the **Exercise Files** folder, extract **IM Test Analysis.zip** to a folder on your local machine.
- 2 Open the **IM Test Analysis** folder.
- 3 Right-click **ResultsSummary.html**, select **Open with**, then select **Internet Explorer**.
- 4 In the Navigation Links pane, expand **Executions**, then select **Execution Statistics**.
- 5 Answer the following question:
 - Which comparison tests did not match in the two environments?
- 6 In the Navigation Links pane, expand **Executions**, then select **Execution Summary**.
- 7 Answer the following questions:
 - What are the objects that were tested?
 - What are the comparison test that were performed for each object?
 - Which comparison tests were the same in both environments?
- 8 In the Navigation Links pane, expand **Executions**, then select **Execution Details**.
- 9 Answer the following questions:
 - What outputs are available for the Operational Performance Scorecard?
 - What outputs are available for the Yearly Category Sell-through graph?

Promoting data usage across the Intelligent Enterprise



DATA SCIENTISTS

Build and publish advanced statistics, predictive models, and machine learning algorithms using libraries such as TensorFlow, R, Python, and MATLAB, that are leveraged by Analysts and Developers.



BUSINESS USERS

Explore and interact with published analytics. Enhance applications using self-service data discovery to create custom groups, derived metrics, and dynamic filters. Foster adoption through collaboration and sharing.



DEVELOPERS

Inject, extend, and embed intelligence into custom and third-party applications using programming languages such as JavaScript, Java, PHP, Python, SWIFT, Objective-C, C#, .Net, and other common languages.



ANALYSTS

Create, share, and maintain intelligence applications for the department using enterprise security, data, and application objects to help ensure a single version of the truth.

Each role in the enterprise leverages data to help make business decisions, from the front desk staff to data scientists. Within MicroStrategy, HyperIntelligence is the most easily accessible way for users to consume data by simply hovering over a key word to see information about customers, products, and employees. Users can then take data discovery to the next level by interacting with a dossier to drill into information and visualizations to enable informed insights. In the example below, a sports analyst is able to see match information for upcoming soccer matches in Library, while viewing team statistics through a HyperIntelligence Card.

Match Date	Match	Team	Player Last Name	Assist Player Last Name
03/01/2019	Manchester City vs Liverpool	Manchester City	Sané	Sterling
		Live		
		Ma	Manchester City	x
		3 • Premier League • England		valho
02/01/2019	AFC Bournemouth vs Watford	AFC		
		Wa		
		AF	20	47
		Wa	Matches Played	Matches Won
		Wa		Points
	Huddersfield Town vs Burnley	Bur		
		Hud	54	38
		Bur	Goals For	Goals Against
		Hud		Goal Difference
	Newcastle United vs Manchester United	Ma		
		New		
		Ma		
	West Ham United vs Brighton & Hove Albion	We	89.1%	64.3%
		Wat	Pass Accuracy %	Possession %
		Wat		%Hit Target
		Brighton & Hove Albion	Duffy	Groß
		Cataneo		Lukaku

At the analyst level, users can build dossiers with that same dataset in either MicroStrategy Web or Workstation. Finally, at the administrator level, organizations can leverage MicroStrategy Workstation to analyze how users interact with data and dossiers with network topology. Administrators can also understand usage telemetry within the MicroStrategy platform in real-time with

Platform Analytics. A successful Intelligence Center collaborates with all stakeholders to promote data literacy across the organization.

The Intelligence Center Director is responsible for delivering these data usage methods across the Intelligent Enterprise to drive BI adoption and data-driven decision making. For example, with HyperIntelligence at the bank, you worked with the Application Architect to set best practices and standards for deploying departmental and enterprise cards. Once a departmental analyst has created the card, all the following conditions must be met before deployment:

- Card follows best practices.
- Card has a description that distinguishes it from other certified Cards.
- Card should have a different color from the cards that are already certified.
- Card is shared with the proper audience.
- Card that match on the same information that already exists, like Companies, Employees, and Products, should be the same height/size.

Communicating and collaborating across the organization

To help drive data adoption in every department, your team should collaborate across departments. For example, through corporate communication channels such as Slack, you can advertise office hours and encourage one-on-one training on relevant applications. Raising the business intelligence IQ of an organization can often be a cultural shift, moving from ad hoc projects to an integrated analytics model. The more your team communicates with the enterprise, the better equipped users will be the understand the benefits of analytics and move towards making analytically driven decisions.

Supporting departmental analysts

Departmental analysts are responsible for their department's data and applications. For example, the lead analyst for the risk management department created the loan risk dossier for her team to analyze the risk of loan default. She worked with the Analytics Architect to ensure that her dossier met the standards for the departmental environment.

The Intelligence Center should support analysts and developers by setting standards for scoping projects, proper dataset usage, application design, and deployment. These standards help departmental analysts achieve their strategic goals while providing a cohesive structure for data analytics across the

organization. You should also establish quarterly departmental project reviews to items such as project status and analyst needs from the Intelligence Center.

Creating and managing a project priority tracker

To ensure projects are properly tracked and completed within deadlines, you should create a project priority tracker saved in the document repository in an Excel file or a dossier. Below is an example of a tracker you want to implement at the bank:

Priority	Intelligence Center Architect	Project Name	Resource	Next Milestone and Date	Status
P2	Analytics	Credit Card Transactions	Josh, Amelia	Load detailed credit card transactions by 8/4	Work in progress
P1	Application	Employee HyperIntelligence Card	Mark	Deployed card on 6/20	Complete
P1	Mobile	Sales iPad Deployment	Rachel, Carlos	Add new tablets to EMM by 7/1	Work in progress

Document repository

In addition to the communication channels between you and other architects in the Intelligence Center, you must construct a communication channel to share documentation between your team members, other teams, and project stakeholders. To do this, create a central documentation repository using a documentation management platform like SharePoint that enables you to maintain documents, control access, and track changes. You can store and track documentation using your organization's preferred method, such as a wiki, issue tracking software, or file management system.

Providing access to documentation is a vital component of project tracking and continuity. The document repository should contain folders for individual projects, as well as a dedicated folder for standards and guidelines.

Team empowerment through learning

Training drives end user adoption and employee satisfaction. If end users aren't properly trained, adoption and value creation become much slower and difficult to achieve. Many BI providers, including MicroStrategy, provide education

services, which can consist of training and certifications for all associated users. Training can be provided for any key group associated with a BI project.

While the other architects are responsible for more specific trainings, such as app development, you are need to establish a training process and a workplace that encourages continuing education. For example, for all bank employees, you can record a training on how to utilize MicroStrategy Library to analyze applications and collaborate with colleagues.

Do you currently run regular trainings? What types of training would you want to leverage across your organization?

Exercise 4.2: Deploy the Employee Profile card

To encourage data drive decision making and collaboration across the organization, you want to deploy the Employee card across the entire bank, not just within the Intelligence Center. Working with your Platform Administrator, you can deploy the card to Chrome, Outlook, and mobile devices across the organizations. The image below, for example, displays using the HyperIntelligence for Outlook add-in.

The screenshot shows an Outlook inbox with an email from Zarathrusa Piper. The email body contains a message about bringing Thad Charles on as an Office Manager. Below the message, there is an Employee Profile card for Thad Charles. The card includes a photo, his title (Recruiting Coordinator), email (Tcharles@nationalbank.com), manager (Alison Emanoil), office phone (601) 644-1963, home office (Springfield, MA), tenure (4.5 years), employee ID (22450), and a fun fact ("Fun Fact: I ate a scorpion in Arizona").

RE: Bringing Thad Charles on as our Office Manager

Hi Angel, hope you're doing well. I was chatting with Blossom Perdue about bringing on Thad Charles as our new Office Manager, what do you think? He's been a Rockstar as a Recruiting Coordinator, and wants to move to our New York branch. Let me know your initial thoughts, from there I'll set up interviews through Sophie Chandler over in Springfield.

Thanks,
Zarathrusa

Zarathrusa Piper, Branch Manager
(829) 313-7360
ZPiper@nationalbank.com

101st National Bank

4 Cards

Employee Profile (3)

Blossom Perdue Thad Charles

Zarathrusa Piper

Thad Charles

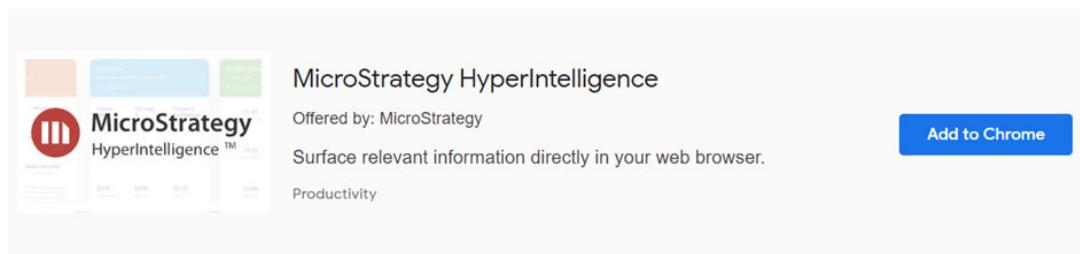
Title	Recruiting Coordinator
Email	Tcharles@nationalbank.com
Manager	Alison Emanoil
Office Phone	(601) 644-1963
Home Office	Springfield, MA
Tenure	4.5
Employee ID	22450

Fun Fact: I ate a scorpion in Arizona.

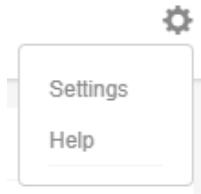
In this exercise, add the Chrome extension and leverage the Employee Profile card you created to view details about colleagues at 101st National Bank.

Add the HyperIntelligence plug-in to your Chrome browser

- 1 On your remote Windows machine, launch the **Chrome** browser from the desktop.
- 2 Navigate to <https://chrome.google.com/webstore/category/extensions> in Google Chrome.
- 3 In the **Search** box, type **MicroStrategy** and press **Enter**.
- 4 Click **Add to Chrome** on the MicroStrategy HyperIntelligence extension.



- 5 In the pop-up window, click **Add extension**.
You are notified that HyperIntelligence has been added to your Chrome browser and the MicroStrategy logo is shown on your toolbar.
- 6 On the toolbar, click **MicroStrategy HyperIntelligence** .
- 7 You can change the plug-in to point to different environments. To display cards created in your environment, click the **Gear** icon, then click **Settings**.



- 8 Click the **Pencil**  icon next to the Environment URL. In the Confirm Action window, click **Yes**.
- 9 In the **Environment URL** box, type <https://env-XXXX.customer.cloud.microstrategy.com/MicroStrategyLibrary>, where XXXX represents your environment number.
- 10 Click **Save**. This connects your plug-in to your MicroStrategy environment.

11 On the toolbar, click **MicroStrategy HyperIntelligence**. In the login window, type the user name and password from your Welcome to MicroStrategy Cloud email.

12 Click **Log in with your credentials**.

Your extension displays all the available cards that you can access in your environment.

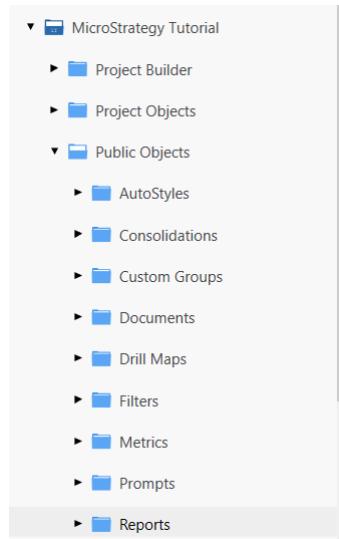
13 Click the toggle switch next to **Employee Profile** to activate the card.

View the Employee Profile card within a dossier

A departmental analyst built a dossier for HR employee analysis at the bank. With HyperIntelligence, you can add another layer of data without needing to navigate to another page or dossier. First, add the dossier to your environment.

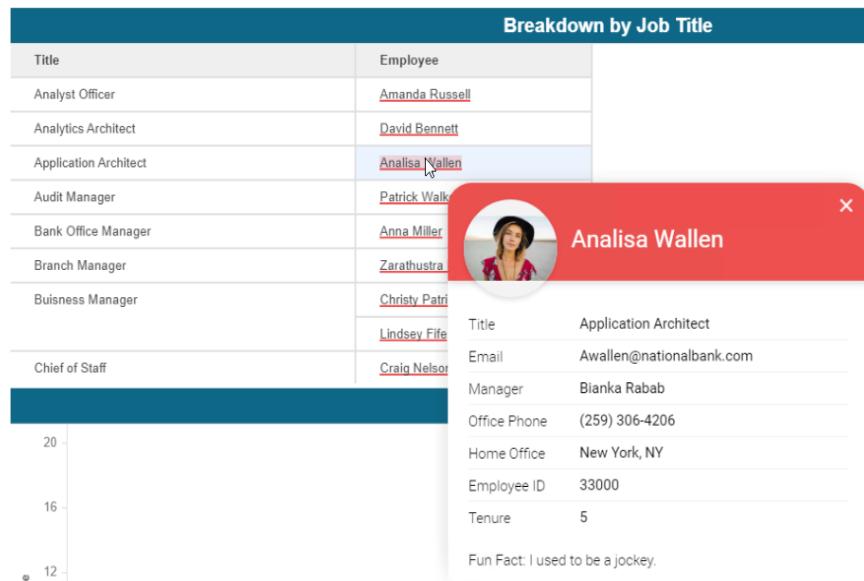
- 1** On your remote Windows machine, launch **Workstation**.
- 2** In the left pane, click **Environment**, and connect to your Agile environment if not already connected. Select the **MicroStrategy Tutorial** project.
- 3** From the **File** menu, select **Open Local Dossier**.
- 4** Select the **Employee_Dossier.mstr** file from the Exercise Files folder.
- 5** To launch the dossier in Library, first save the dossier in your environment. To do this, click **File** then **Save As**.

6 Save your dossier as **Employee_Dossier in the **MicroStrategy Tutorial\Public Objects\Reports** folder.**



- 7 In the dossier window, from the **Share** menu, select **Get Link**. Then, click **Copy**.**
- 8 Switch to Chrome and paste the URL in the address bar to open the dossier. Log into Library using your mstr credentials.**
- 9 In the Allow Notifications window, select **Allow** to enable notifications.**
- 10 Click **Table of Contents** and navigate to the **Job Title Breakdown** page. Hover over any of the employee names to view their card. The**

HyperIntelligence plug-in and the dossier are both powered by the same MicroStrategy data.



Strengthening executive sponsor support

Strong executive sponsorship and support is one of the keys to the success of an Intelligence Center. As the Intelligence Center Director, you are responsible for relaying the business value of your team's work and continuously advocating for governed analytics across the organization.

You should showcase your team's successes, such as:

- Number of Help Desk tickets closed
- Cross-departmental value, for example showcasing a dossier built for Finance to track expenses, or a regression model leveraged by the credit card team to analyze credit risk
- Projects completed and future work with delivery dates
- Stability of the organization's analytics environment

What other KPIs would you want to use when communicating with executive sponsors?

MAINTAINING AND MONITORING THE INTELLIGENT ENTERPRISE

Establishing a monitoring and maintenance strategy

As the Intelligence Center Director, you are responsible for running, maintaining, and monitoring your organization's applications and environments. As the bank matures into an Intelligent Enterprise, you should plan your monitoring strategy to maintain a stable and easy-to-use analytics environment. It is also important that you manage, verify, and audit your product licenses to ensure license compliance.

In this chapter, we will discuss monitoring your Intelligent and Departmental programs to ensure continued success.

Reviewing architecture and performance

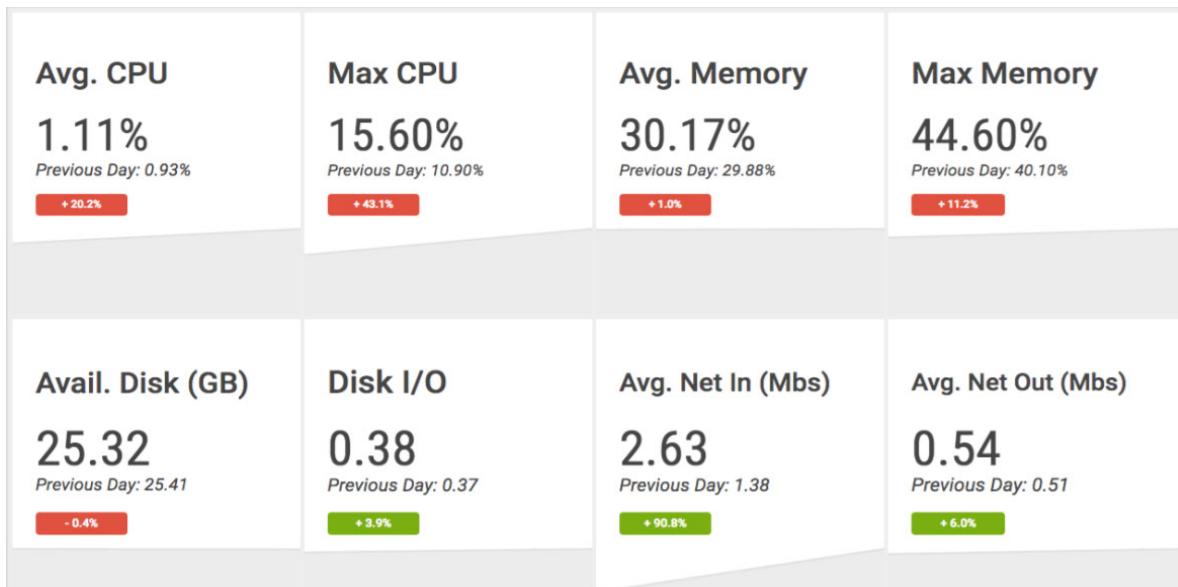
To maintain sound performance of the programs you've implemented and your BI technology, you should establish guidelines that the Intelligence Center will follow. Oversee each architect's work as they review the status of their programs and assist them in building appropriate dossiers to track performance. Below we will review some of the key components to audit on a daily basis.

Reliable system and environment performance

Environment reliability defines the availability and robustness of each system component. Reliability is an important aspect to consider in your infrastructure. MicroStrategy users expect to have access to data at all times, regardless of external factors such as hardware malfunctions or inadequate resources.

As the Intelligence Center Director, and in collaboration with the System Administrator, you should track SLAs such as current system status, length of status, CPU, and memory. You should also work to identify components with poor trends and system bottlenecks that can contribute to ineffective application performance, ensure that dollars are going to effective use and that waste is minimized, and align future spending with effective programs.

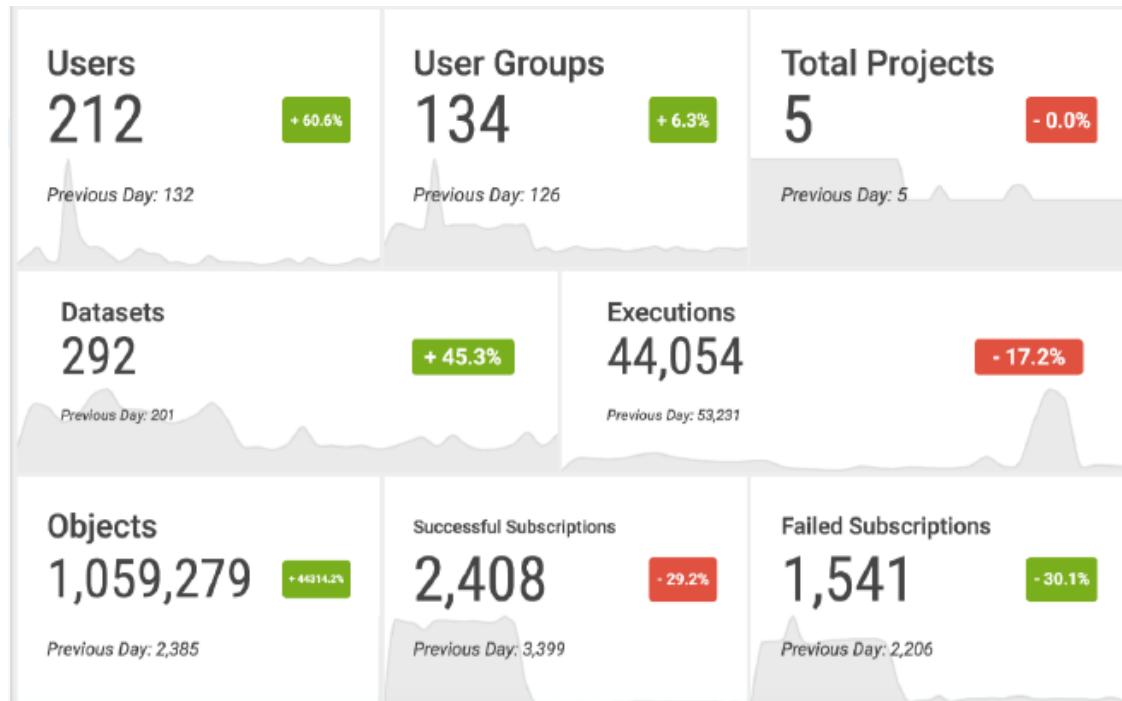
For example, the following dossier displays key performance indicators for hardware resources, built using data from infrastructure monitoring tools such as SolarWinds and New Relic:



Consistent platform environment performance

Analytics platform environments must be monitored to ensure that performance standards are maintained and data is consistently delivered to users. To monitor environments, you should require the Platform Administrator and his team to track statistics, identify baselines for the various performance metrics, and quickly diagnose performance anomalies.

For example, the following dossier displays key performance indicators for daily platform administration:



Stable dataset performance

Datasets must be monitored on a daily basis to ensure that performance standards are maintained and data is consistently delivered to end users. To monitor datasets, you should instruct the Analytics Architect and her team to track statistics, identify baselines for performance metrics, and quickly diagnose performance anomalies.

For example, unused datasets in MicroStrategy projects can be problematic because they consume resources and may contain irrelevant data that business users should no longer consume. In the Project Overview dossier in Platform

Analytics, the Application Architect can view unused objects that should be removed.

Unreferenced Objects

Project	Object Name	Object GUID	Object Type
MicroStrategy Tutorial	# Of Ncaa Bids	196D0F3E11E3AECA64C200802F47DBAB	Managed Metric
	# of NCAA Bids (SignedInt)	2F14B94011E5BEF900000080EF85899C	Managed Column
	# Of Ncaa Championships	196DCA1F11E3AECA000000802F47DBAB	Managed Metric
	# of NCAA Championships (SignedInt)	2F1F797011E5BEF900000080EF85899C	Managed Column
	# Of Reviews	1B1EC1E511E468FECA4A00802F87A27D	Managed Metric
	# Of Used & New	1B1F759511E468FECA4A00802F87A27D	Managed Metric
	#Clients	21FDC38811E79D591B8E0080EF651106	Managed Metric
	#Employees	21FDA9D411E79D591CC00080EF651106	Managed Metric
	% Closed under 1 week	5C8659D740FC8EBEC3140381C6E4E8A1	Managed Metric
	% Exp comp to market	1804D45C11E79D5918CD0080EF651106	Managed Metric

Efficient and tracked operations applications

You should ensure the Application Architect and his team regularly monitor applications to ensure they are running correctly and consistently, and to proactively discover problems. KPIs to track include current application status, most and least popular applications, trend of active users, and average number of datasets per application. These KPIs help determine which applications should be deprecated, which applications are not currently performing and need a fix, and which applications are using a large number of datasets.

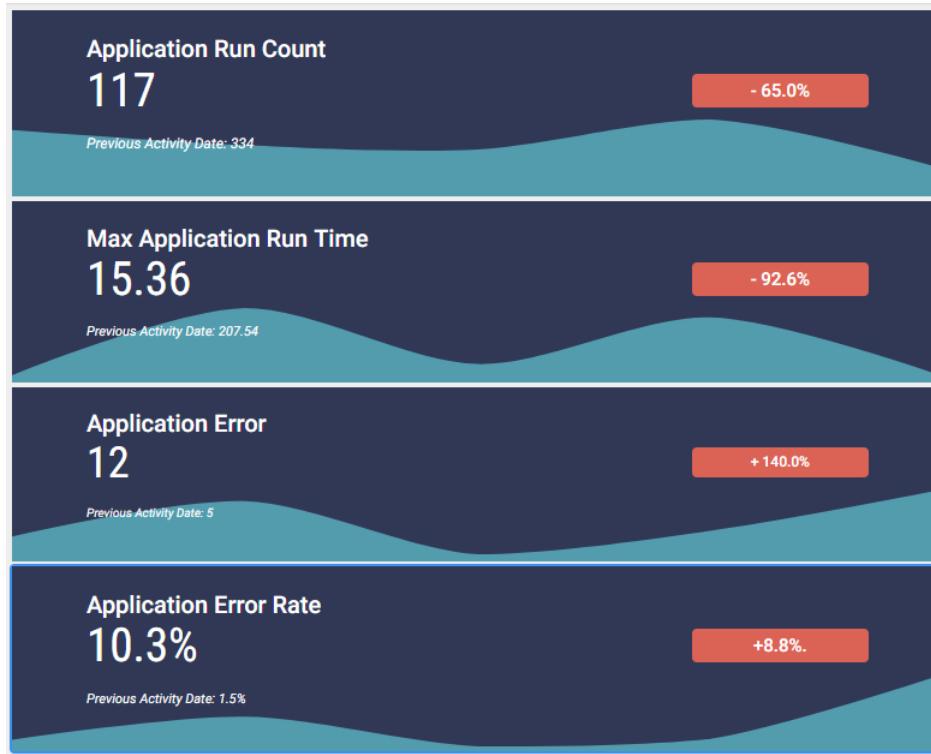
For example, in the Project Overview dossier, the Application Architect can track popular applications, error rates, and execution time.



Stable mobile applications

The Mobile Architect is responsible for tracking and monitoring data such as mobile app usage statistics, crash logs, and mobile server reports to ensure mobile applications are properly functioning for end users. For example, the

Mobile Architect at the bank created a dossier that tracks the following KPIs, along with details on execution times, errors, and user engagement:



You should also ensure that your Enterprise Mobility Management deployment is monitored by tracking KPIs such as the number of managed mobile devices and managed applications, the adoption rate for managed devices, and the success of application pushes.

Successful custom applications and services

The Services Architect is responsible for tracking success of her customized applications, APIs, and data connectors. As the Intelligence Center Director, you should ensure she is tracking all appropriate components, and monitor these KPIs at a high level.

Securing data

To ensure best-in-class data governance, the Intelligence Center should continually evaluate privileges of groups across the enterprise. As the bank has data that includes Personally Identifiable Information (PII), such as bank account numbers, you want to ensure the PII is handled appropriately. You should work

with the Platform Administrator to monitor security filters in placed based on department, division, group, business unit, and employee login.

Exercise 5.1: Review the Intelligence Center dossier in Platform Analytics

Best Practice

Though your architects manage each of their specific components, as the Intelligence Center Director you are responsible for overall performance. To help you monitor the Intelligence Enterprise, review the Intelligence Center dossier to check system usage and trends. You should analyze this dossier at the beginning of each day to prevent issues and proactively evaluate enterprise environment performance.

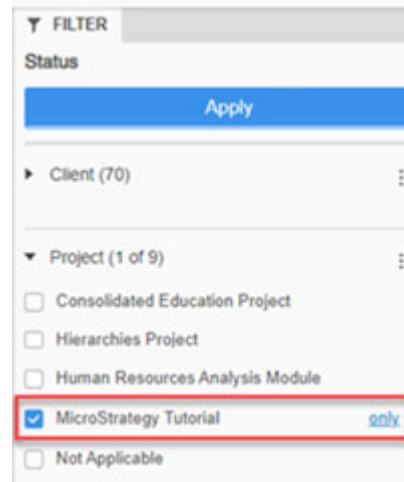
Access the Intelligence Center dossier

- 1 Open **Workstation** and connect to the **Platform Analytics** project.
- 2 In the left pane, click **Applications** and double-click **Platform Analytics**.
- 3 Navigate to the **Public Objects\Reports\1.Dossiers** folder.
- 4 Open **Intelligence Center Dossier**.

The Key Indicators page in the Status chapter displays high level information about user activity in your BI environment. You can specify the projects that send telemetry data to the Platform Analytics repository.

- 5 In the Filter panel, expand **Projects**.

-
- 6 Scroll down and hover over **MicroStrategy Tutorial**, then select **only** and click **Apply**.



By filtering for a particular project, you can narrow the results of your analysis. You can also use other criteria as a filter. For example, if you learned that your mobile users were experiencing performance issues, you can filter by client, then select Mobile. You can then evaluate the execution times and usage patterns for content accessed via mobile devices.

- 7 Take a few minutes to explore the other chapters and pages in this dossier. Is there any information that you would want to investigate further?

Understand the Underperforming Applications page

As you design a monitoring strategy for your BI platform, you can use the Underperforming Application page to identify long running applications that do not meet your execution wait-time standard. You can then notify your Analytics or Application Architects to optimize and improve the performance of these applications.

- 1 From the **Architect Guidance** chapter, select **Underperforming Applications**. Here, you can view the objects that are taking longer than usual to execute. You want to view the top 10 dossiers with the longest execution time.

- 2 In the grid visualization, hover in the top left corner of the visualization pane and click **Advanced Qualification** to change the visualization filter.

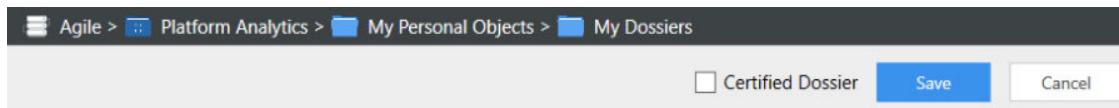
- 3 In the Advanced Filter Editor window, click the **Response (s)** metric to change the value for this filter.

- 4 You can modify the value, range, and operator to filter data shown in the final grid. In the Edit Qualification window, under the **Value** text field, change the value from 10 to **1**.

- 5 Under **Operator**, select **By Rank**.
- 6 Select **Highest**, then enter **10** for **Value** to view the top 10 dossiers in terms of execution time. Then click **OK**.
- 7 Click **Save** to view your changes.

Share the analysis

- 1 From the **File** menu, click **Export to PDF**.
- 2 Click **Export**, and then **Save**.
- 3 From the **File** menu, click **Save As**.
- 4 **Save** the dossier in **Platform Analytics/My Personal Objects/My Dossiers**.



- 5 In the dossier, from the **Share** menu, click **Get Link**.
- 6 Click **Copy** and paste the link in **Chrome**.
- 7 If prompted, log in with your Cloud credentials. The dossier opens in Library.
- 8 Click the **Comments** icon in the top menu, then type **@admin** and select the **Administrator** user.
- 9 Type **see this page to check underperforming applications**.

You can search for and tag any user such an administrator or an architect in your Intelligence Center to collaborate and discuss your findings.

- 10 Click **Post** to add your comment to the dossier.

Setting alerts on anomalous trends

Collaborate with your team to set up automatic alerts for when the system or platform is down, or not performing at 100% reliability. For example, the System and Platform Administrators can create alerts that notify the Intelligence Center

when key hardware parameters exceed predefined threshold limits. Parameters can include CPU usage, memory usage, I/O requests, free disk space, file descriptor counts, and so on. You can also create alerts based on network utilization parameters like bandwidth and network utilization.

The following image contains a list of alerts that you might require your team to create using SolarWinds.

Component	Monitoring platform	Alert
MicroStrategy Intelligence Server	SolarWinds	Service Down
Server downtime	SolarWinds	Host Down
MicroStrategy Listener	SolarWinds	Service Down
PDF Export – TCP port 20100	SolarWinds	Service Down
Web Server	SolarWinds	Service Down
Collaboration server port 3000	SolarWinds	Service Down
Mongo DB	SolarWinds	Service Down
Disk space	SolarWinds	Less than 10%
CPU utilization	SolarWinds	CPU 60% - Condition must exist for more than 2 min

Additionally, within MicroStrategy, you can create email subscriptions to alert you when a certain threshold is met on a report, document, or dossier. For example, you can leverage the Intelligence Center dossier to send an alert when the failure percentage for an environment is greater than 0.0%.

Help requests: Standardizing tickets and issue resolution

As users work with your enterprise platform, they may encounter issues that your team is responsible for solving. First, you should create a professional workflow for help requests for the enterprise platform. For example, you can leverage an internal IS system, adding an option for analytics requests.

You should also establish standards for priority and resolution time based on the severity of the issue and how it affects the day-to-day work of the organization. At

the bank, for example, you decided that the following issues fall under the P1 category:

Priority	Definition	Resolution Time
P1	System Down	2 hours
P1	Quarter close reporting	1 business day
P1	Enterprise dossiers not running due to system outage	1 business day
P1	Enterprise dossiers not running due to other issues such as cubes not publishing	1 business day

The appropriate architect should work with his team to meet the resolution SLAs you establish. You should require that teams track their resolution time in your help desk system appropriately with an optimal ticket request workflow to leverage these statics for KPI reporting.

Exercise 5.2: Use Workstation to monitor your environment

In this exercise, leverage Workstation telemetry to maintain and monitor system usage.

Manage the nodes and servers in your environment

- 1 In Workstation, in the left pane, click **Monitors**.

The topology lists all servers connected to your environment where MicroStrategy has been deployed.

- 2 Click the arrow under **Needs Attention** to expand it.



The node's services are displayed, as shown below. The green check mark next to each service indicates that the service is running.

env-241145laiouse1		Needs Attention
14 Services 10.250.150.96		
Certificate Store	Started	✓
Collaboration		✓
Export		✓
Identity Telemetry		✗
Intelligence		✓
Library		✓
Mobile		✓
Modeling		✓
Store		✓
Telemetry		✓
Telemetry Cache		✓
Telemetry Consumer		✓
...		...

- 3 Switch to the Services view, by clicking **Services** on the left.



- 4 All environment services are displayed, grouped into folders. Expand **Library**, then click **Library(1)** to view the service details, including its dependencies.

You can use Workstation to monitor and manage all servers in your MicroStrategy environment. For example, if a particular service is not performing as expected, use the topology view to check the status and dependencies for that service.

View security certificates

Best Practice

Periodically check security certificates in environments to ensure that the organization is in compliance. In Workstation, you can view all security certificates installed in your environment on the Certificates screen. For each certificate, you can view its associated service, the node and port where the certificate is installed, and its expiration date.

- 1 Click **Certificates** on the left pane.

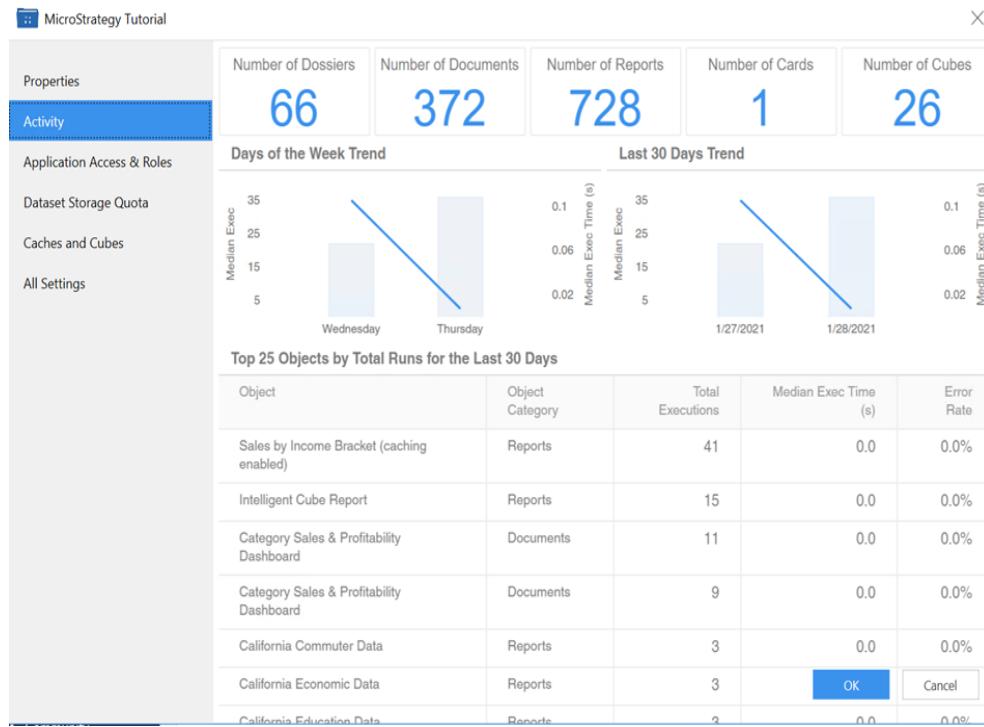
Service	Node	Port	Expires	
Collaboration	env-219773laiouse1 (10.250.149.247)	3000	In 6 years 10/12/2026	
Mobile	env-219773laiouse1 (10.250.149.247)	8443	In 6 years 10/12/2026	
Web	env-219773laiouse1 (10.250.149.247)	8443	In 6 years 10/12/2026	
Modeling	env-219773laiouse1 (10.250.149.247)	10443	In 19 years 7/1/2040	

- 2 In the Collaboration row, click the **Preview Certificate**  icon to view the certificate details.
- 3 Click **Done**.

Analyze user engagement

- 1 In the left pane, click **Applications**.
- 2 Right-click the **MicroStrategy Tutorial** application then select **Properties**.

3 In the left pane, click **Activity.**



Your Platform Administrator can also use the Application Properties window to view and edit governing settings, such as number of jobs, idle time, memory, and cache.

4 Click through the options on the left pane — are there any other settings you would change to optimize the Intelligence Server?

How does your organization analyze user adoption and engagement? Do you track engagement within specific applications, across overall BI usage, or both?

Managing and verifying your licenses

License compliance is an important factor in a successful Intelligent Enterprise. You should ensure the Platform Administrator and his team proactively manage the licenses that your organization has purchased. For example, your Platform Administrator should ensure that your organization has received all the required MicroStrategy products in accordance with its software agreement and license type. MicroStrategy uses the following categories of licenses:

- Named User Licenses, in which the number of users with access to specific functionality is restricted

- CPU Licenses, in which the number and speed of the CPUs used by MicroStrategy server products are restricted

Ensuring full license use: License Manager

Your administrators can use MicroStrategy License Manager to ensure that your organization stays in compliance with its contract and license agreement. Managing your licenses can help you take full advantage of your licenses. For example, you might have a CPU-based Intelligence Server license for four CPUs, but only be using two CPUs. An audit of your licenses can alert you to this issue and you can then modify your setup so that you use all four of your licensed CPUs.

You can also use License Manager to plan for future license needs based on system usage, while allowing you to leverage MicroStrategy features and functionality.

The details of working with MicroStrategy License Manager are fully covered in the Platform Administrator learning path.

Analyzing license telemetry: Compliance Telemetry dossier

In addition to License Manager, the Compliance Telemetry dossier in Platform Analytics provides you and the Platform Administrator an easy way to monitor system and product usage, ensuring that your organization remains in compliance with licensing agreements.

Platform Analytics has the added benefit of analyzing license telemetry using the power of MicroStrategy dossiers. Additionally, Platform Analytics can help you analyze compliance results across multiple environments.

The Compliance Telemetry dossier can be accessed from the Platform Analytics project. This dossier is also embedded in the License section of MicroStrategy Workstation. In the following exercises in this chapter you will use the dossier in both environments.

Exercise 5.3: Monitor the bank's compliance with the Compliance Telemetry dossier

The Compliance Telemetry dossier provides insight into what products and quantities are being used based on privilege checks, as well as how existing

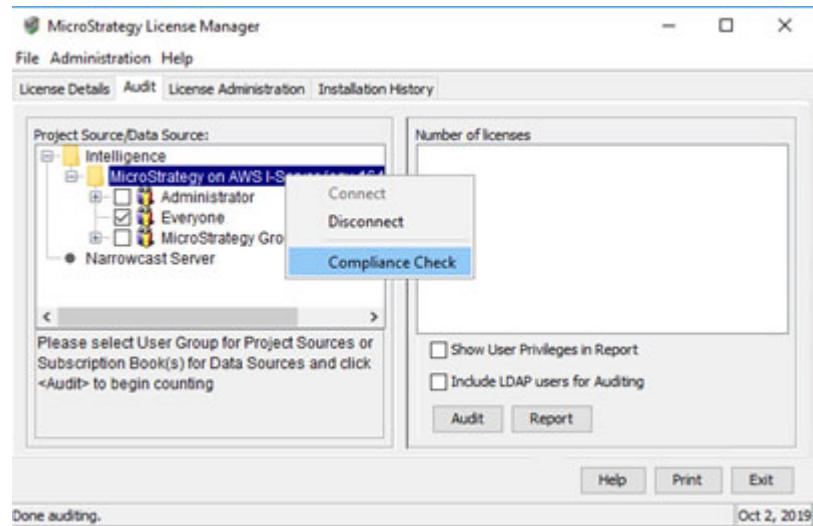
privileges map to MicroStrategy product packaging. MicroStrategy Intelligence Server performs an automatic Named User compliance check once a day according to the schedule set in the server configuration. When this schedule is triggered, the data is updated in Platform Analytics.

To ensure that Platform Analytics contains compliance telemetry data, you need to trigger the compliance check using License Manager. In this exercise, you want to check that the bank is in compliance. First, trigger the Named User compliance check in MicroStrategy License Manager, then log in to Platform Analytics to view the Compliance Telemetry dossier.

Manually trigger the compliance check using License Manager

- 1 On the remote Windows machine of your cloud environment, click the Windows **Start** button, click **MicroStrategy Tools**, and select **License Manager**.
- 2 In the User Account Control window, click **Yes**.
- 3 On the **Audit** tab, expand the **Intelligence** folder, then expand the **MicroStrategy on AWS I-Server** project source.
- 4 In the **Login id** and **Password** boxes, type the login credentials listed in the Welcome to MicroStrategy Cloud email.
- 5 Click **Connect**. Click **OK** in the message regarding establishing the connection.
- 6 Select **Everyone**, if not already selected.
- 7 To trigger the compliance check, right-click **MicroStrategy on AWS I-Server**, then select **Compliance Check**.

By triggering the compliance check, the Intelligence Server sends telemetry data about your license usage to Platform Analytics.



- 8 The License Manager windows shows you that the connection to the server was successful. Click **OK**.

To view compliance telemetry in Platform Analytics, access the Compliance Telemetry dossier.

- 9 Click **Audit**. License information is displayed in the right pane.

- 10 Exit License Manager.

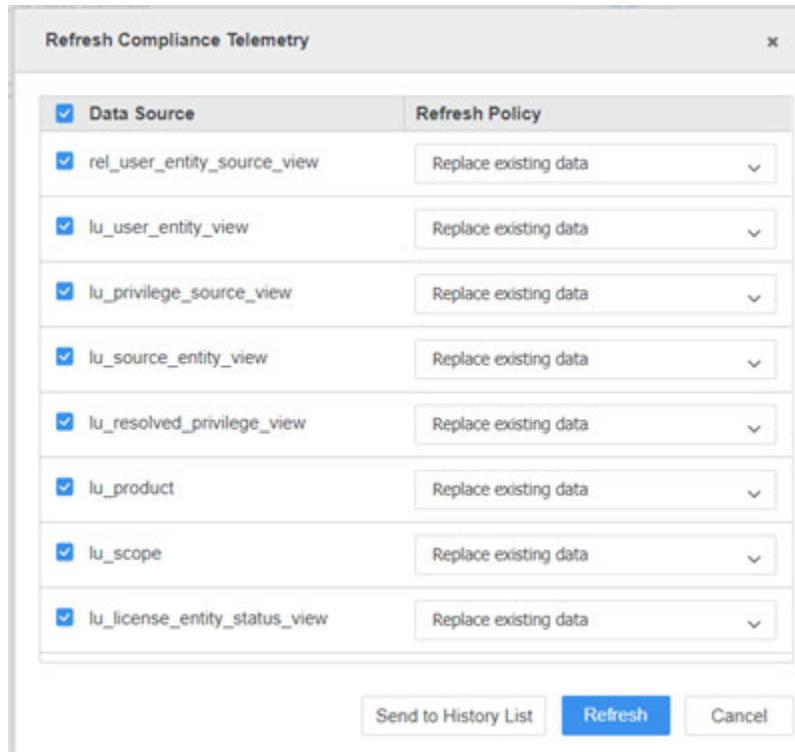
Access the Compliance Telemetry dossier

Now, analyze the Compliance Telemetry dossier in Platform Analytics.

Refresh the Compliance Cube and access the Dossier

- 1 Because we triggered the compliance check, we need to refresh the data cube. In Workstation, click **Datasets** in the left pane.
- 2 Search for the **Compliance Telemetry** cube.

3 Right-click the **Compliance Telemetry** cube and select **Refresh Dataset**.



- 4** Click **Refresh** to update the cube.
- 5** Click **Done** after the cube has been published.
- 6** In the left pane, click **Applications**. Then, double-click **Platform Analytics**.
- 7** Navigate to **Public Objects\Reports\1.Dossiers** folder.
- 8** Open the **Compliance Telemetry** dossier.



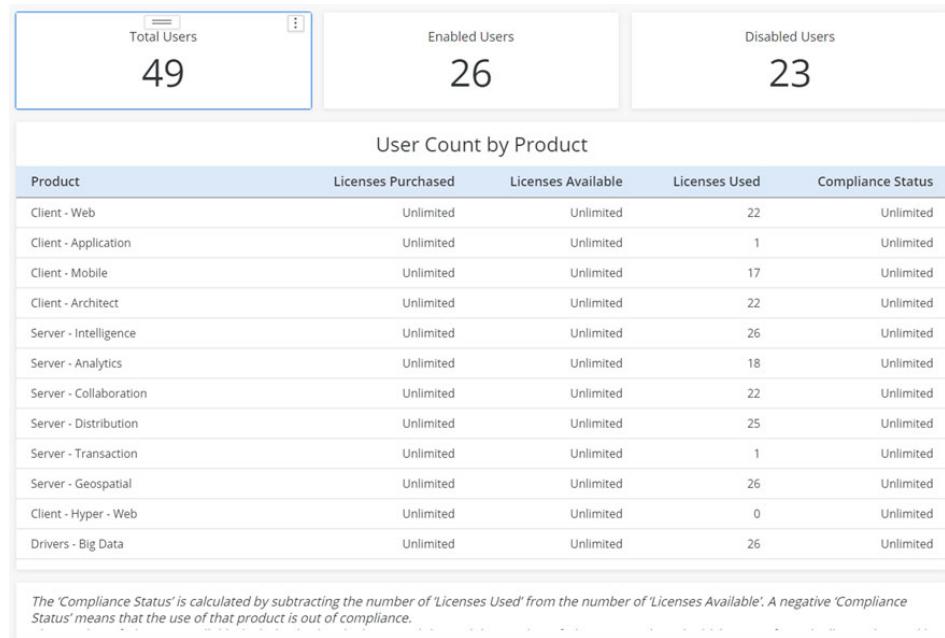
The information displayed on your dossier may be different than the information shown below.

Explore the Compliance Telemetry Dossier

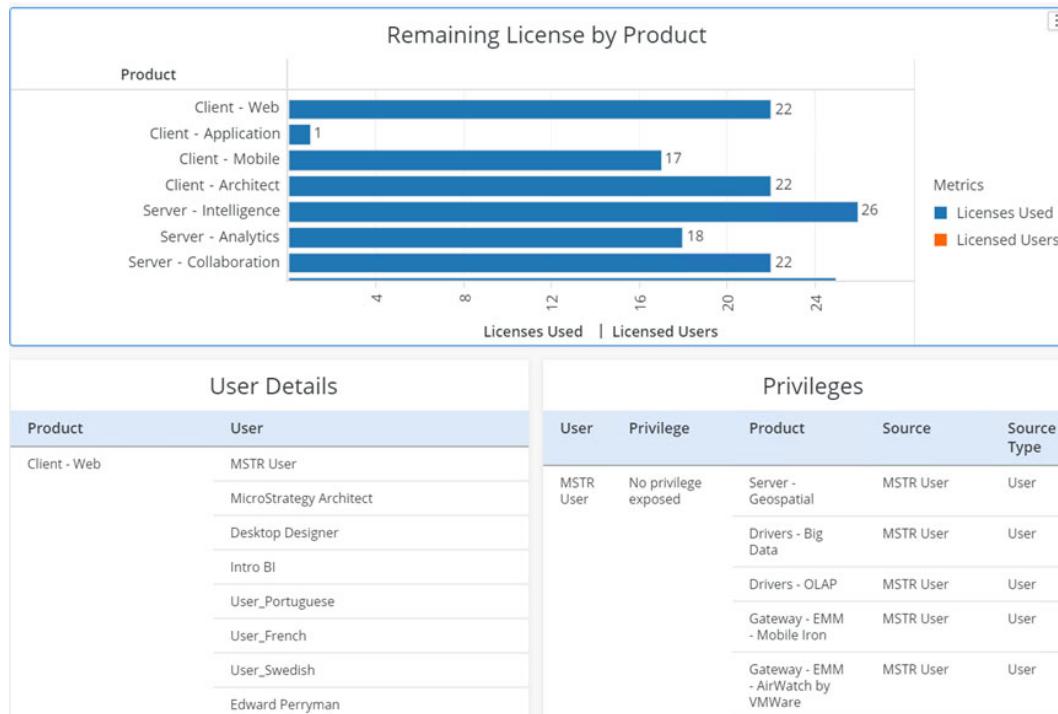
Explore the various chapters of the dossier:

- 1 License Overview**—Provides a summary of environment, account, and product and license information. Pre-formatted thresholds are applied to the Compliance column, which makes out-of-compliance usage instantly recognizable. Reporter and Intelligence are represented in independent

sections to help quickly pinpoint issues about the number of accounts enabled for the current license.



2 Product Details—Provides more in-depth analysis of license usage at the product level, as well as detailed information on each user and their associated privileges.



3 User by Product—Provides details of the Named User license and a reference to which privileges are associated with which sections of the product licenses. It consists of a Product-Privilege matrix which displays the relationship between each of the products for which the privilege requires a Named User license.

User	Client - Web	Client - Application	Client - Mobile	Client - Architect	Server - Intelligence	Server - Analytics	Server - Collaboration	Server - Distribution	Server - Transaction	Server - Geospatial	Drivers - Big Data	Drivers - OLAP
MSTR User	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖
Business User	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
Cloud Analytics	❖	N/A	N/A	❖	❖	N/A	❖	N/A	N/A	❖	❖	❖
Edward Perryman	❖	N/A	N/A	❖	❖	N/A	❖	❖	N/A	❖	❖	❖
ffdemo	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
Intro BI	❖	N/A	❖	❖	❖	N/A	❖	❖	N/A	❖	❖	❖
MicroStrategy/Architect	❖	N/A	N/A	❖	❖	❖	❖	❖	N/A	❖	❖	❖
MicroStrategy/Report Developer	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
MicroStrategy/Web User	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
Peter Rose	❖	N/A	N/A	❖	❖	N/A	❖	❖	N/A	❖	❖	❖
San Francisco Manager	❖	N/A	N/A	❖	❖	❖	❖	❖	N/A	❖	❖	❖
SDK Designer	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_French	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_German	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Italian	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Japanese	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Korean	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Portuguese	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_SChinese	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Spanish	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_Swedish	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖
User_TChinese	❖	N/A	❖	❖	❖	❖	❖	❖	N/A	❖	❖	❖

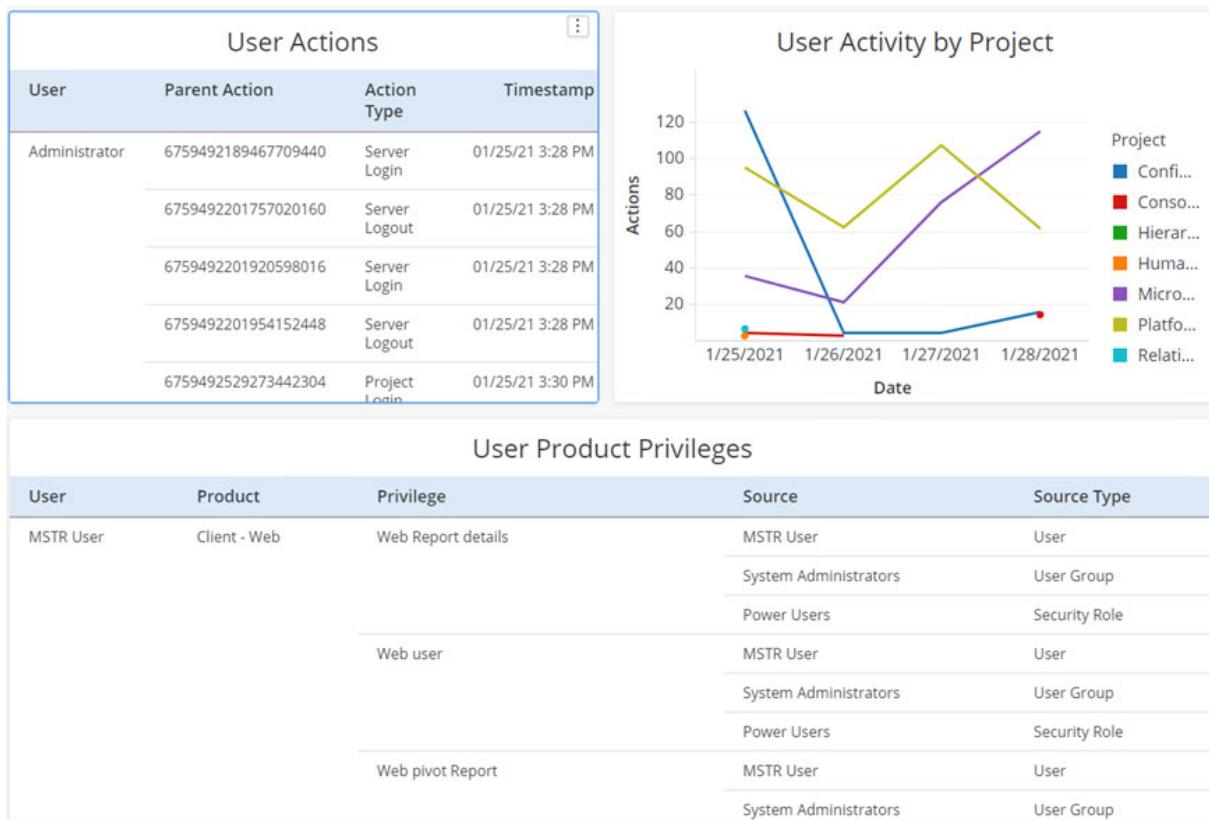
Each client license requires a corresponding server license, so a client privilege automatically consumes a server license, with the exception of Reporter (Web Reporter) privileges. The privileges associated with the Reporter product are listed in their own column in the matrix.

4 CPU License—Provides you with the number of CPUs related to your license.

5 User Project Access — Provides an overview of user, project access, and last log-in.

6 User Details — Provides details of user actions, activity, and privileges. You can use this information, along with User Project Access, to determine who

should have their privileges revoked from to reach compliance with your organization's purchased licenses.



Monitor compliance with the embedded compliance dossier in Workstation

In addition to the Platform Analytics project, the Compliance Telemetry Dossier can be accessed from MicroStrategy Workstation. This dossier is embedded in the License section of Workstation.

- 1 In Workstation, from the left pane, click **Licenses**.
- 2 Navigate to the **Product Details** page.
- 3 On the top visualization, click the **Client-Web** bar.
- 4 In the **User Details** grid visualization, select **Business User**. Business User's privileges are displayed.

You can view the detailed privileges assigned to a specific user by selecting him on the User Details grid.

OPTIMIZING THE USER EXPERIENCE

Driving adoption of your enterprise BI

To ensure adoption and the success of your enterprise business intelligence program, the user experience must be optimized. The better performance you can provide, the more beneficial your BI applications become to your users. You and your team of architects are responsible for driving a positive user experience.

Achieving high performance is only part of the formula for success. As the number of users increases, you must ensure that the architecture can easily scale to support the growth in users, traffic, and data volume. This chapter highlights the various capabilities of an enterprise BI platform that form the foundation for building and deploying enterprise analytics. Topics covered include:

- Creating a fault tolerant and highly available BI environment
- Delivering personalized content to users on a variety of devices
- Automating routine administration tasks to reduce overhead and cost
- Tracking and monitoring system performance
- Defining your upgrade methodology

Creating fault tolerant and highly available systems

Best Practice

You should ensure that your team is taking full advantage of fault tolerance features that your enterprise BI platform offers. For example, MicroStrategy failover support ensures that your BI system remains available for use if an application or hardware failure occurs.

Clustering Intelligence Servers increases resource availability. If one Intelligence Server in a cluster fails, other Intelligence Servers in the cluster can pick up the workload. This prevents the loss of valuable time and information if a server fails. Servers configured in a cluster work cohesively as a single logical unit, and the workload can be distributed across the nodes.

Available resources are dynamically adjusted based on real-time workload, allowing your enterprise to maximize utilization. The Intelligence Server can be clustered with up to eight separate nodes to deliver linear scalability and performance. The table below shows the typical number of users that a multi-cluster environment can support.

Nodes	Throughput (RPM)	Active Users	Total Users
1 Node	1,052	3,412	17,059
4 Nodes	4,166	13,511	67,557
8 Nodes	7,272	25,061	125,303

Benefits of clustering

- **Increased resource availability:** If one Intelligence Server in a cluster fails, the other Intelligence Servers in the cluster can pick up the workload. This prevents the loss of valuable time and information if a server fails.
- **Strategic resource usage:** You can distribute projects across nodes in whatever configuration you prefer. This reduces overhead because not all machines need to be running all projects, and allows you to use your resources flexibly.
- **Increased performance:** Multiple machines provide greater processing power.
- **Greater scalability:** As your user base grows and report complexity increases, your resources can grow.
- **Simplified management:** Clustering simplifies the management of large or rapidly growing systems.

Workload balancing strategy

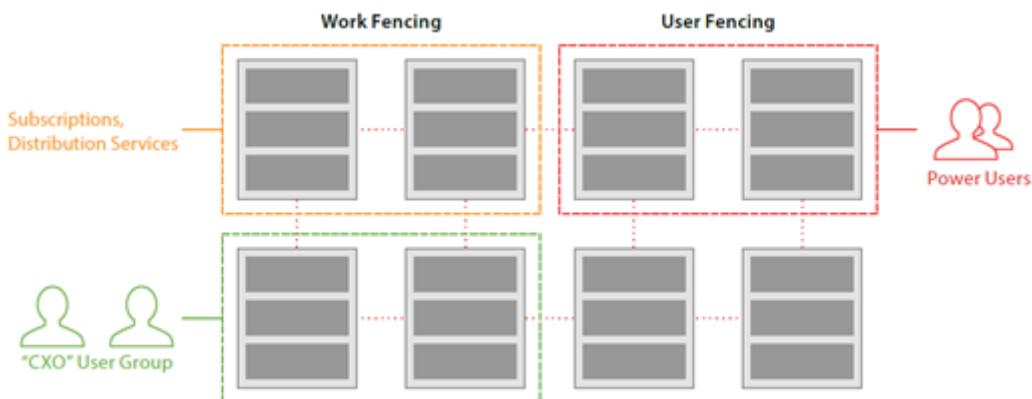
As your Intelligence Center designs and deploys your web and mobile BI applications, users running the apps will need to connect to your BI platform to submit queries and retrieve data. MicroStrategy is based on a multi-tier architecture, where Web/Mobile servers communicate with the data warehouse through the Intelligence Server. You should determine a workload balancing strategy. With load balancing you can achieve even distribution of user sessions across Intelligence Servers, so that no single machine is overwhelmed.

Project distribution and project failover

Another added benefit of clustering is that you can distribute projects across those clustered machines. All servers in a cluster do not need to be running all projects. Each node in the cluster can host a different set of projects, which means only a subset of projects need to be loaded on a specific Intelligence Server machine. This feature provides you with flexibility in using your resources, as well as better scalability and performance because of less overhead on each Intelligence Server machine.

Isolating workloads: Work fencing/user fencing

User fences and workload fences reserve nodes of a cluster for either users or a project subscription. The platform automatically reallocates computing resources in response to increased or unexpected demands on the system, with self tuning options to prevent processing bottlenecks.



Typically, the majority of nodes in a cluster will not be part of a fence, making them available for general use. This allows your team to selectively configure specific nodes for different use cases. If developers require heavy computing power, administrators can dedicate a server specifically for those developers. CXOs typically need immediate access to essential KPIs, so you might give them

their own dedicated server to increase speed of access. Take flexible advantage of the possibilities to determine how you want your administrator to reserve specific nodes to satisfy different use cases.

Automated distribution and alerting

Your enterprise BI platform must allow users to distribute analytical findings throughout the organization, using a wide variety of formats, and to package analytics into dashboards that can be readily consumed on any device. As the Intelligence Center Director, you should set up a distribution process that is highly automated, enabling a user to build a report once and publish it to thousands of users within your organization. Without automated publishing features, your users would be forced to create multiple instances of the same report, an inefficient process that delays the distribution of critical insights and creates ongoing issues with version control.

You can automate the delivery of reports and dashboards with out-of-the box MicroStrategy functionality to deliver personalized reports, documents, and notifications to thousands of users. In addition, with the collaborative capabilities available with MicroStrategy dossiers, your users can easily share content among themselves, helping increase BI adoption across different departments.

With the platform's alerting features, users can closely monitor KPIs and automatically trigger detailed reports or alert messages when thresholds are reached. Security filters and ACLs set at the user level guarantee personalization and security when delivering a single report or dashboard to thousands of users.

Implementing a successful upgrade strategy

The bank will upgrade their BI software in the next year. As the Intelligence Center Director, you are responsible for determining and implementing a successful upgrade process. To optimize the results of your BI software upgrade, you must achieve the following goals:

- **Provide continuity:** Develop an upgrade plan, perform extensive testing, and introduce the new environment in a way that does not interrupt daily analytics processes and workflows.
- **Maintain or improve performance:** Test performance during the upgrade to ensure that your new environment matches or improves on the performance experience provided by the old environment. If performance is reduced in the new environment, you may benefit from hardware upgrades.

- **Empower users:** Educate MicroStrategy users on new features and workflows to ensure continuity in their existing processes and encourage modern data analysis practices.

These upgrade goals can be achieved by executing a proven strategy to implement the upgrade, as outlined in the following section.

The upgrade workflow

The upgrade workflow consists of several phases that enable you to successfully move from your existing MicroStrategy installation to a new version of MicroStrategy. The workflow breaks down the process into the following manageable chunks:

- 1 **Review:** Investigate the existing hardware, software, and human resources.
- 2 **Plan:** Create a high-level list of actions. Establish milestones to mark your achievements.
- 3 **Dry run:** Set up a test environment where you will perform the upgrade to uncover technical problems and identify solutions.
- 4 **Test:** Perform iterative testing in the test environment. Ensure that stakeholders accept the test results.
- 5 **Release:** Perform the upgrade in the actual environment and cut over from the old environment.
- 6 **Monitor:** Track performance and ensure that users can perform their duties.

As you identify your implementation team, coordinate stakeholders to ensure that the upgrade meets the needs of the organization. Each new MicroStrategy product release introduces new features across the analytics, mobility, and security platform. These features are designed to provide better performance and scalability to enhance overall user experience. You will likely need to meet with MicroStrategy administrators and other stakeholders to develop a plan to leverage these features across your organization.

To ensure a smooth transition to the upgraded environment, you might include the following roles on your upgrade team:

- **Executive sponsor:** Authorizes funding and secures executive buy-in for the upgrade. Establishes the success criteria for the upgrade.

- **Business users:** Impacted by feature and workflow updates. Specifies usage scenarios for the MicroStrategy platform.
- **Project Manager:** Plans and coordinates the upgrade effort. Tracks progress, anticipates roadblocks, and resolves technical issues.
- **Quality assurance:** Performs feature, regression, and acceptance testing to ensure data and feature continuity.
- **Infrastructure team:** Maintains the hardware and software components required to ensure the MicroStrategy platform's availability and efficacy.
- **MicroStrategy team:** Manages and maintains the objects, connections, and settings for the MicroStrategy platform. Includes architects, developers, and administrators.
- **Training team:** Communicates changes in features, settings, and workflows to MicroStrategy users.

While the executive sponsor and business users help you achieve buy-in for the upgrade, the remainder of the roles implement the steps to upgrade the software.

As you compile your team, begin to identify the tasks that each role must accomplish in each phase of the upgrade workflow. For example, during the Review and Plan phases, the executive sponsor might authorize funding for the project. List the tasks for each role in each phase, and then create a chart that enables you to quickly identify the roles required in each phase.

Determine your upgrade methodology

Before you begin the upgrade process, you need to decide on an upgrade methodology to follow. Choose the best option based on the size, complexity, and acceptable downtime for your particular environment.

- **In-Place Upgrade:** The upgrade is made directly to the current in-place environment hardware. Your MicroStrategy environment will be unavailable to end users throughout the upgrade process. This option works best for smaller deployments and those where downtime is acceptable.
- **Parallel Upgrade:** The upgrade is first executed on a test environment, which is configured to mirror the current production environment. Once the upgrade process, data validation, and performance tests are completed and evaluated, the testing environment can be configured for use as the new production environment.

Performing an upgrade trial run

While the Intelligence Center Director may not be involved in every step of the upgrade process, it is paramount that you have a overall understanding of the process and validation procedures.

Your production environment contains several variables which can have unique interactions with the MicroStrategy platform upgrade process. You can investigate these interactions by initially performing the upgrade process and testing in a test (also known as a sandbox) environment that is not connected to your live production system. To ensure that your test environment represents an accurate update experience, duplicate your production environment into the test environment before you perform a trial upgrade and begin testing.

Capacity testing

The MicroStrategy Capacity Testing Tool is a client application used for executing a set of end-to-end performance tests on content objects such as reports, documents, and dossiers. To determine the performance impact of an upgrade, your team should perform a baseline test prior to the upgrade, then perform the test on the upgraded environment.

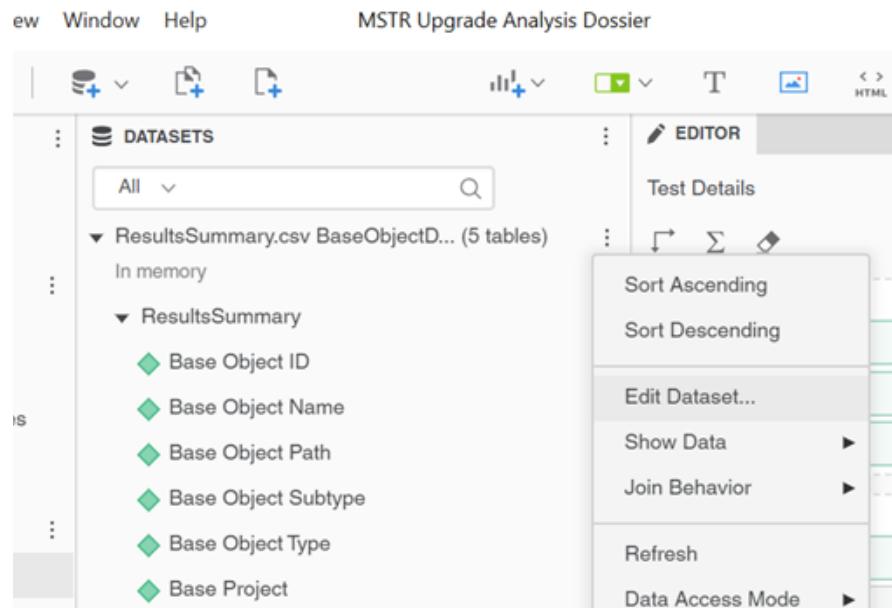
Both Integrity Manager and the Capacity Testing tool generate test result data into output files. When the tests are complete, several .csv files are created in each tool's output folder. You can analyze the results of the comparison tests by uploading them into the Upgrade Analysis dossier.

Exercise 6.1: Prepare the upgrade dossier

In this exercise, examine and analyze the results of tests executed by your team to evaluate the integrity and performance of your new MicroStrategy system. Before upgrading the production environment, your System and Platform Administrators duplicated the production environment on a sandbox and performed an in-place upgrade. The results of their tests, performed both before and after the upgrade, are provided for your analysis.

Identify your Integrity Manager results datasets

- 1 On the Windows desktop, open the **Exercise Files\Upgrade Analysis** folder and double-click **MSTR Upgrade Analysis Dossier.mstr** to open the dossier in Workstation.
- 2 In the Datasets panel, right-click the **ResultsSummary.csv BaseObject (5tables)** dataset and select **Edit Dataset**.



- 3 You need to refresh the tables with the data from your architects. Click the arrow at the top of the **ResultsSummary** table and select **Edit Table**.

The screenshot shows the MicroStrategy Intelligence Director interface. A context menu is open over the 'ResultsSummary' table, with the 'Edit Table' option highlighted. The table contains data from a CSV file, with the first few rows shown below:

Base Object ID	Base Object Name	Base Object Path	Base Object Subtype	Base Object Type	Base Project
2BCCDFE9403A495026170A290F37B	Revenue and Profit Trends by Region	MicroStrategy Tutorial\Public Objects	768	3	MicroStrategy Tutorial
77FA9904445F8AA080AC08F2613	Inventory Summary - BCH, EDH, Uni	MicroStrategy Tutorial\Public Objects	768	3	MicroStrategy Tutorial
7D4C933C04F1B299689F93964210	Rush Orders by Call Center	MicroStrategy Tutorial\Public Objects	768	3	MicroStrategy Tutorial
FBC2ECD3146DC480715457891A6FB	Inventory by Category - Quantity	MicroStrategy Tutorial\Public Objects	774	3	MicroStrategy Tutorial

- 4 Click **Choose files**, then navigate to the **Upgrade Analysis** folder.
- 5 Double-click the **ResultsSummary.csv** file to open it, then click **Refresh**.
- 6 Repeat the same steps for the remaining tables and files:
- BaseObjectDependency - BaseObjectDependency.csv
 - TargetObjectDependency - TargetObjectDependency.csv

- TargetObjUpgradeImpact - TargetUpgradeImpact.csv
- TargetDepObjUpgradeImpact - TargetUpgradeImpact.csv

The screenshot shows the Maptive Intelligence Director interface with five datasets listed in a grid:

- ResultsSummary**: Contains attributes like Base Object ID, Base Object Name, etc.
- BaseObjectDependency**: Contains attributes like Base DOID, Base DONAME, etc.
- TargetObjectDependency**: Contains attributes like Target DOPATH, Target Dependent..., etc.
- TargetObjUpgradeImpact**: Contains attributes like Target Datetime, Target HOST, etc.
- TargetDepObjUpgradeImpact**: Contains attributes like Target Dependent..., Target Dependent..., etc.

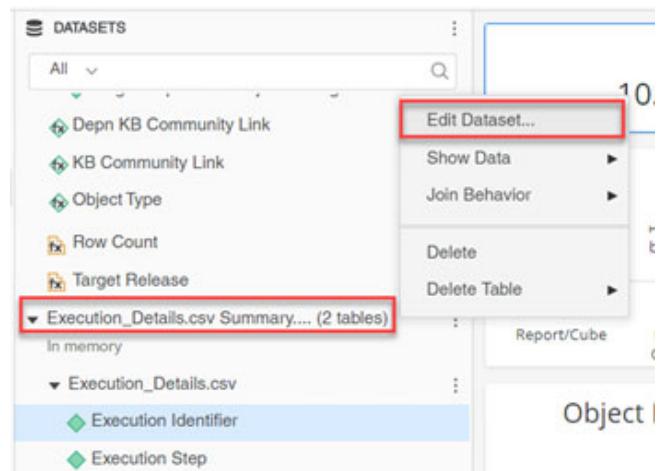
Below the datasets is a data preview table titled "TargetDepObjUpgradeImpact Data preview (shows 33 rows of data)". The table has columns for Target Dependent Object..., Target Dependent Object ID, Target Dependent Object Na..., Target Dependent PID, Target Dependent Proj..., and Target Dependent Object Ch...". The data shows various entries for objects like env-127007iahouse1 and env-127007iahouse2 across different categories like Inventory by Subcategory and Enterprise Performance Management.

7 Click **Update Dataset**.

8 From the **File** menu, click **Save** to save your dossier.

Update execution details dataset

- 1 Update the dataset containing the test execution details. In datasets panel, scroll to find the **Execution_Details.csv Summary...(2 tables)** dataset. Right-click the dataset and select **Edit Dataset**.



- 2 Click the arrow at the top of the **Execution_Details.csv** table and select **Edit Table**.
- 3 Click **Choose files**, then double-click the **Execution_Details.csv** file from the Upgrade Analysis folder. Then click **Refresh**.
- 4 Repeat the same steps for the **Summary.csv** table using the **Summary.csv** file as the source.
- 5 Click **Update Dataset**, then **Save** your dossier.

Exercise 6.2: Review and analyze the upgrade dossier

After you refresh the Upgrade Analysis dossier, you can begin analyzing the results of your tests. To ensure the bank's upgrade went smoothly, analyze the results of the Integrity Manager tests that compares the upgraded environment to the baseline environment. Quickly identify reports, documents, and dossiers that have differences in SQL, data, or performance.

Use the images in this exercise to check whether your dossier returns similar results.

Comparison mismatches in test results contain hyperlinks to the MicroStrategy Community site with more details. For this class, default security settings in Internet Explorer on your Cloud machine prevent access to external URLs. Before continuing with the rest of your exercise, change your default browser to Chrome.

Understand and analyze the Upgrade Impact Results chapter

Change the default browser on your remote machine

- 1 First, change your default browser to Chrome. On your remote desktop Windows task bar, click the **Search** box and type **Default**.
- 2 Click **Default app settings**.
- 3 In the Settings window, below Web Browser, click **Internet Explorer**.
- 4 Select **Google Chrome**. Then close the Settings window.
- 5 Open the **MSTR Upgrade Analysis Dossier**, if it is not already open.

Analyze the Object Overview page

- 6** From the Contents pane, navigate to the **Object Overview** page in the **Upgrade Impact Results** chapter.

The screenshot shows the Object Overview page with the following data:

Object Type		Object	Execution Status	SQL Comparison Status	Data Comparison Status	Excel Comparison Status	PDF Comparison Status	Performance Improvement
Report/Cube	Customer Geography	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Not Tested	Not Tested	6.116%
	Enterprise Performance Management Dashboard	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Not Tested	Not Tested	43.534%
	Inventory by Subcategory	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Not Tested	Not Tested	10.101%
	Invoice Statement(s) by Selected Customers	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Not Tested	Not Tested	14.532%
	Operational Performance Scorecard	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Not Tested	Not Tested	-9.042%

Below the grid are two smaller sections: "Object Path & Changes" and "Dependent Objects & Changes".

- 7** Click the **Object** header in the Object Overview grid visualization to clear the filter.

The screenshot shows the Object Overview page with the "Object" column header highlighted in red. The grid contains the following data:

Object Type	Object	Execution Status	SQL Comparison Status
Report/Cube	25 Advanced Sorting - Hierarchical	■ ■ ■	■ ■ ■
	iph - How do Tenure and Time Affect Average Emp to Revenue?	■ ■ ■	■ ■ ■
	Average and Standard Deviation in Daily Sales	■ ■ ■	■ ■ ■
Document/Dossier	Balanced Scorecard	■ ■ ■	Not Tested

- 8** In the Object column, click the **25 Advanced Sorting - Hierarchical** report.

The Execution, SQL, and Data test for this report did not produce any object mismatches that were affected by upgrading (changing the version) of the MicroStrategy software.

The Object Overview grid is a selector for the bottom grids, Object Path & Changes and Dependent Objects & Changes. If the object encountered a change (as a result of the upgrade), then the Object Path & Changes grid lists the object's name, path, the change identifier (ex. US120878), and a link. This

link navigates to a MicroStrategy Knowledge Base article to help explain any mismatches that the object encountered.

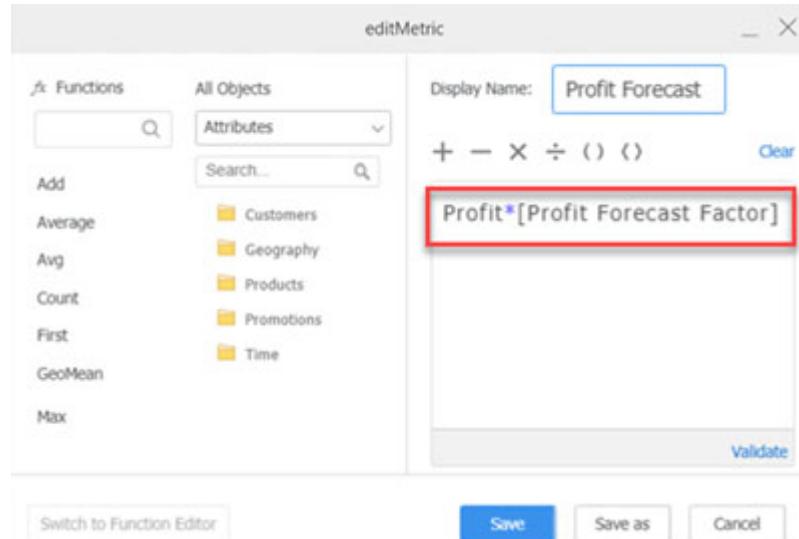
- 9 Click **Call Center Performance** under objects. This is the report that is flagged with a red indicator under the Data Comparison Status.

Report/Cube	Big Decimal (Discontinued Code - 20 Digits)	Not Tested	Not Tested	1.130%
Call Center Performance	■ ■ ■	◆	Not Tested	-0.781%

- 10 Click **link** in the Object Path & changes visualization to open the relevant Knowledge Base article.

- 11 As you read the Knowledge Base article, scroll down to the **Cause** section to get a deeper understanding of the data comparison mismatch.

This mismatch is listed as expected behavior. A random function generator was used in one of the metric (KPI) calculations. A random function always produces a different result when executed. If you opened this report in MicroStrategy Developer and viewed the definition of the Revenue Forecast metric, you would see that it is using a random function as part of its calculation, as shown below.



12 In the Object Overview grid, click the **Operational Performance Scorecard** document.

Object Overview						
Object Type	Object	Execution Status	SQL Comparison Status	Data Comparison Status		
Enterprise Performance Management Dashboard		Not Tested	Not Tested	Not Tested		Not Tested
Document/Dossier	Inventory by Subcategory	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Invoice Statement(s) by Selected Customers	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Operational Performance Scorecard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Performance by Customer Region	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Report/Cube	Pie Chart - Region Revenue by Quarter and Manager	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Document/Dossier	Product Performance Detailed Analysis	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Regional Performance Management Dashboard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested

The image below shows the Operational Performance Scorecard document.



Documents can contain datasets from one or more reports. The Operational Performance Scorecard document contains several datasets. Each dataset is tested individually as well as the document itself.

When you select a document in the Upgrade Analysis dossier, the execution mismatches related to that document are listed in the Object Path & Changes

grid, and the execution mismatches related to the individual datasets within that document are listed in the Dependent Objects & Changes grid.

Object Overview							
Object Type	Object	Execution Status	SQL Comparison Status	Data Comparison Status	Excel Comparison Status	PDF Comparison Status	Performance Improvement
Document/Dossier	Enterprise Performance Management Dashboard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	+0.53%
	Inventory by Subcategory	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	-0.50%
	Invoice Statement(s) by Selected Customers	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	+0.50%
	Operational Performance Scorecard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	-0.04%
	Performance by Customer Region	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	-0.00%

Object Path & Changes				Dependent Objects & Changes		
Target Object Name	Object Path	Target Object Changes ID	KB Community Link	Target Dossier	Target Dependent Object Changes ID	Dep KB Community Link
Operational Performance Scorecard	MicroStrategy Tutorial\Public Objects\Reports\Enterprise Reporting\Documents\Operational Performance Scorecard	US117457	link	Service\Datasets\Operational Performance Scorecard\Others Analysis		
Invoice Analysis	MicroStrategy Tutorial\Public Objects\Reports\MicroStrategy Platform Capabilities\Monitored	US120878	link		US120878	link

13 Analyze the execution tests for all the objects listed in the Object Overview grid, then answer the following questions:

- How many object tested (reports, documents, and dossiers) encountered a change?
- Do any objects fail the upgrade validation?

Analyze the Changes Encountered Page

The Changes Encountered page displays the number of changes that were returned from the execution of all content objects and their dependent objects.

14 From the Contents pane, navigate to the **Changes Encountered** page.

15 In the Changes grid, select any change identifier to filter the Objects Affected grid to see which objects from the test were affected by the change.

# of Changes Found	Changes						
3	<p>Tx</p> <p>DE99583 KB442190: When using non-aggregatable metrics in Dossiers with multiple templates and chapters, incorrect values are retrieved link</p> <p>US117457 KB442291: Different data is seen during integrity manager test when there is an Auto-text used in the Document/Dossier. link</p> <p>US120878 KB441536: Different data is seen during integrity manager test when there is a RandBetween function used in the report/document link</p>						
Objects Affected							
Object Type	Object	Object Path	Execution Status	SQL Comparison Status	Data Comparison Status	Excel Comparison Status	PDF Comparison Status
Document/Dossier	Call Center Performance	MicroStrategy Tutorial\Public Objects\Reports\MicroStrategy Platform Capabilities\Ad hoc Reporting\Component Objects\Call Center Performance	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Enterprise Performance Management Dashboard	MicroStrategy Tutorial\Public Objects\Reports\Enterprise Reporting\Documents\Enterprise Performance Management Dashboard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Operational Performance Scorecard	MicroStrategy Tutorial\Public Objects\Reports\Enterprise Reporting\Documents\Operational Performance Scorecard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Performance by Customer Region	MicroStrategy Tutorial\Public Objects\Reports\Enterprise Reporting\Documents\Performance by Customer Region	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
	Regional Performance Management Dashboard	MicroStrategy Tutorial\Public Objects\Reports\Enterprise Reporting\Documents\Regional Performance Management Dashboard	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested

Read the Object Mismatches w/o Changes Page

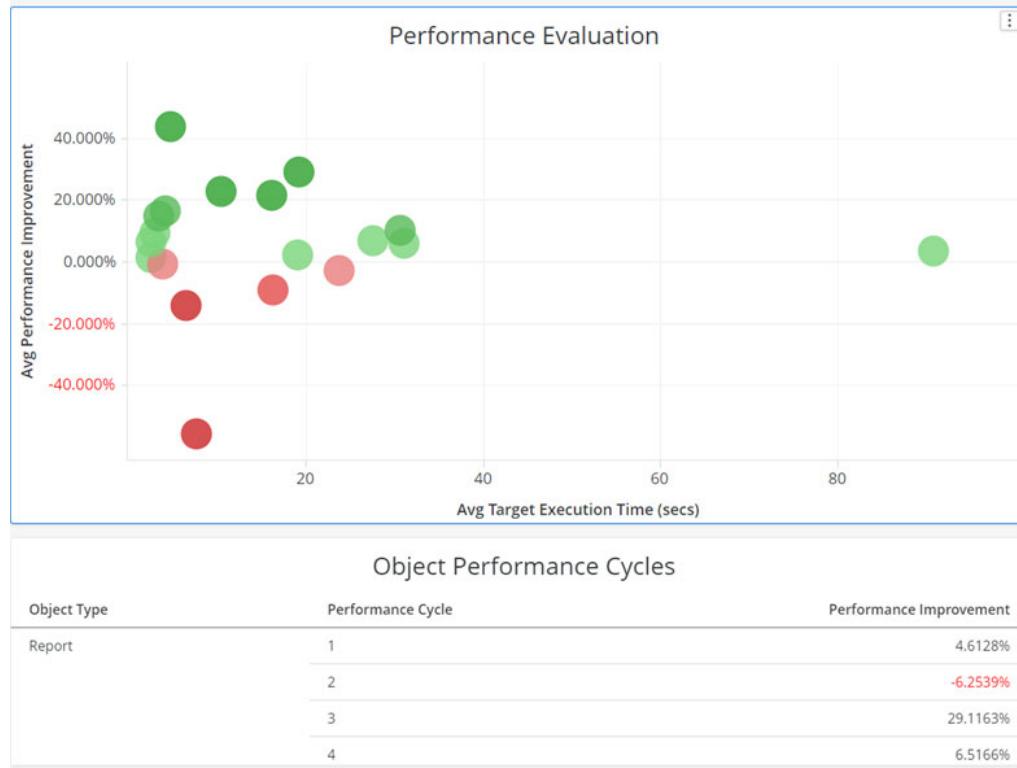
16 Navigate to the **Object Mismatches w/o Changes** page.

This page lists those objects that were tested and returned a comparison mismatch for SQL Comparison or Data Comparison, but did not encounter any changes that can explain the mismatch. These mismatches could be due to explainable occurrences, such as different environments pointing to different warehouses, dynamic date prompts, and so on. However, they should be examined further with Integrity Manager's ResultsSummary.html to see the exact SQL and data differences to help explain why they are not matching.

Analyze the Performance Evaluation Page

17 Navigate to the **Performance Evaluation** page.

If performance testing was done within Integrity Manager by running multiple executions of content objects, then this bubble graph helps quickly identify if the object's performance was better or worse than Base versus Target versions. The Object Performance Cycles grid shows the average performance gain or loss of objects by type. To see the specific gain or loss for a content object, you can select a bubble to filter the Object Performance Cycle grid.



18 From this page, answer the following questions:

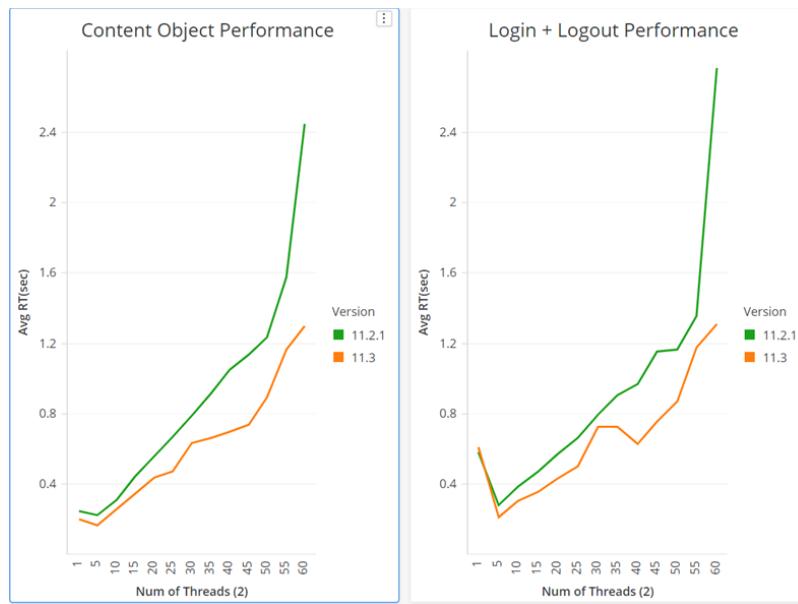
- Which object had the highest performance gain?
- Which object had the longest average execution time?
- How many cycles were executed for each test?

Analyze and understand the Capacity Results chapter

1 From the Contents pane, navigate to the **Summary** page.

The Summary page displays a high-level overview of the projects tested by users across versions. This provides an average response time comparison for quick analysis. The bubble chart shows the average response for each version for the number of threads, or jobs, that were executing simultaneously from the tool. As the number of threads and the stress on the Intelligence Server increase, errors are received which make the bubble sizes larger, displaying stress on the server.

2 Navigate to the **Performance by Execution Type** page.



The end-to-end testing that the tool provides includes logging in and logging out. With the Performance by Execution Type page, your Platform Administrators can see the performance of the content objects or logging in and logging out.

3 Navigate to the **Execution Details** page.



The Execution Details page uses an outline grid to provide every single execution value for every step, down to the thread used. Clicking a step targets and filters the bottom grid, Execution Step Comparison by Version. As with the Summary page graph, your Platform Administrators can see the performance for each thread for an exact step for a specific user. This view can help in identifying outliers or nuances in performance from one step for a content object or logging in/logging out that may be performing poorly.

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