Align MDM and BPM for Master Data Governance, Stewardship, and Enterprise Processes

IBM Redbooks Solution Guide

An enterprise can gain differentiating value by aligning its master data management (MDM) and Business Process Management (BPM) initiatives. MDM provides data consistency to improve the integrity of business processes, making those processes smarter, more effective, and productive. BPM is an agile process platform that can provide consistent visibility, collaboration, and governance. By aligning MDM and BPM initiatives, organizations can optimize their business performance through agile processes that empower decision makers with the trusted information that can provide a single version of truth.

From a technical perspective, MDM is a set of software solutions that manage the creation, governance, delivery, and use of master data across the organization, as depicted in Figure 1. IBM® InfoSphere® Master Data Management creates trusted views of data assets and elevates the effectiveness of an organization's most important business processes and applications. It improves business results, lowers costs, reduces risk, and enables strategic agility to meet current and future business needs. Enabling those capabilities is the primary topic of this IBM Redbooks® Solution Guide.

Figure 1 MDM and BPM alignment

Did you know?

Master data is the one true source of data about entities, such as customers, patients, suppliers, partners, products, materials, employees, and accounts. It is the basis for the high-value, core information that is used to support critical business processes across the enterprise. It is also at the heart of every business transaction, application, report, and decision.

Organizations hold and replicate master data across many different applications and customer touch points, such as order processing, customer service, and reporting systems. However, many of these source systems create, update, and maintain the data in their own unique way, typically resulting in a lack of consistency among them. With no single, unified, and accurate "version of truth" for the data, critical business processes are hampered and that incorrect data can lead to poor decisions and result in poor business outcomes. By aligning MDM and BPM, high-performance, agile business processes can use trusted and accurate information to improve performance, bringing trusted data to processes and more agility to data stewardship.

Business value

Organizations are looking to transform their businesses. One way is by creating a synergistic value with MDM and BPM. To fully realize that goal, they must bring their MDM and BPM projects closer together. Aligning the priorities, goals, requirements, milestones, and stakeholders of these often separate teams affords significant benefit to each team, and the organization and its employees benefit. A combined MDM and BPM solution brings more value to business processes. As a result, enterprises are looking for ways to connect all of these processes in a managed technology solution. The IBM InfoSphere MDM product portfolio provides a way to apply governance to enterprise master data by using IBM InfoSphere MDM solutions.

Many companies have deployed MDM strategies to resolve the problem of inconsistent data. MDM is a discipline that provides a single, unified, and trusted view of master data entities for any user or application. From a technical perspective, MDM is a set of software solutions that manage the creation, governance, delivery, and use of master data across the organization. MDM connects all the information that was gathered about a particular entity or event from all the enterprise systems to form a more complete view of that entity or event to enable an understanding of its true value. MDM also provides mechanisms and governance for consistent use of master data across the organization. As a result, MDM enables better business processes.

BPM methodologies, supported by a Business Process Management System (BPMS), allow for the rapid creation of value-centric process solutions with a dramatically reduced time to return on investment (ROI). When implemented, these processes are more easily modified to adapt to change, whether as a result of market conditions, regulations, or strategic shifts in corporate goals. By abstracting the business process logic and rules from traditional applications and services layers into business processes, the reuse and efficiency of IT resources increase. Business key performance indicators (KPIs) and data governance metrics, intrinsically provided by process solutions that are implemented by a BPMS, prove the effectiveness of process improvements, allowing businesses to better prioritize their IT Initiatives.

Many of the benefits of BPM are realized during an enterprise's first process implementation, such as an IBM led Quick Win Pilot (QWP). QWP is a 12-week services offering that achieves only a limited production release. It often creates a chain reaction of process-oriented adjustments that allow businesses to achieve dramatic improvements. Often, only the degree to which senior business and technical leaders can transform their IT and business operation dictates how these process successes can be scaled into BPM programs that support and drive corporate initiatives. Such initiatives include improved product quality, reduced time-to-market, expanded markets, increased customer satisfaction, and improved profit margins.

Solution overview

IBM InfoSphere Master Data Management creates trusted views of data assets and elevates the effectiveness of an organization's most important business processes and applications. It improves business results, lowers costs, reduces risk, and enables strategic agility to meet current and future business needs.

The IBM InfoSphere Master Data Management platform provides the assurance that enterprise master data is accurate, valid, relevant, and timely, and it can be trusted. InfoSphere MDM provides trust through its own data governance and stewardship processes for continuous enforcement of data quality, ensuring that business process requirements are satisfied. MDM and BPM are a mix of technology and methodology that enable organizations to improve process performance through better management and governance.

Regardless of how good the quality of the information is that a business maintains, the desired business goals cannot be realized if the main business processes have the following characteristics:

- Are inefficient
- Do not meet client needs
- Are difficult to adapt to meet new business challenges

By aligning MDM and BPM, high-performance, agile business processes can use trusted and accurate information to improve performance, bringing trusted data to processes and more agility to data stewardship. For the key business drivers and value propositions to align MDM and BPM projects, see the white paper, "Transforming business processes by aligning BPM and MDM," at this website:

http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&htmlfid=WSW14176USEN

A combined MDM and BPM solution brings the following benefits:

- Provides ways to work together to improve the business processes
- Enables the capability to apply governance to enterprise master data
- Ensures that complete, accurate, and trustworthy information is available to the business processes

The points at which MDM and BPM intersect are called *patterns*. MDM and BPM have the following patterns:

- Master data creation

  After an organization identifies its master data, the organization must aggregate it to link and resolve duplicates and to ensure that processes are not creating duplicates. The master data creation process calls for master data to be added to the MDM hub. In this pattern, customer on-boarding, account creation, vendor on-boarding, and other typical business processes push the master data that they author into MDM and search MDM to update existing master data. Probabilistic, deterministic, and other automated entity consolidation techniques are applied to resolve the master data into the single accurate version of the truth.

- Master data consumption

  Master data is created for use within business processes. Business process decisions that use accurate data are more productive and efficient. Consider the following example where a business process does not use accurate data. John's business recently moved. When he places an order with the call center representative (Billy), John is not found by his address or his home phone number. The customer relationship management (CRM) system creates an unwanted duplicate account.

  John expects this purchase to promote him to a higher class of service that includes free shipping. John is confused when he sees that his invoice has a shipping charge. He calls back to customer service where, after some investigation, Sue finds two accounts for John with the same cell phone number. Sue attempts to resolve the issue: updating the contact information for the original account and deactivating the duplicate account. Sue must manually upgrade John's class of service, and his recent purchase history is orphaned from this account.

  Every process uses data. Whether data comes from various enterprise systems or one application, it must be accurate and trusted before it can be used. Whether human or automated, decisions are only as good as the information available at the time they are made. MDM ensures that accurate, trusted master data is available to the process decisions that need it.

● Master data governance

Creating master data and using it within business processes are the two primary points where MDM and BPM intersect within a business. In some scenarios, newly created master data must have additional assurances applied before business users can have confidence in the master data. This confidence can be required for consumption within their business processes, as illustrated in Figure 2.
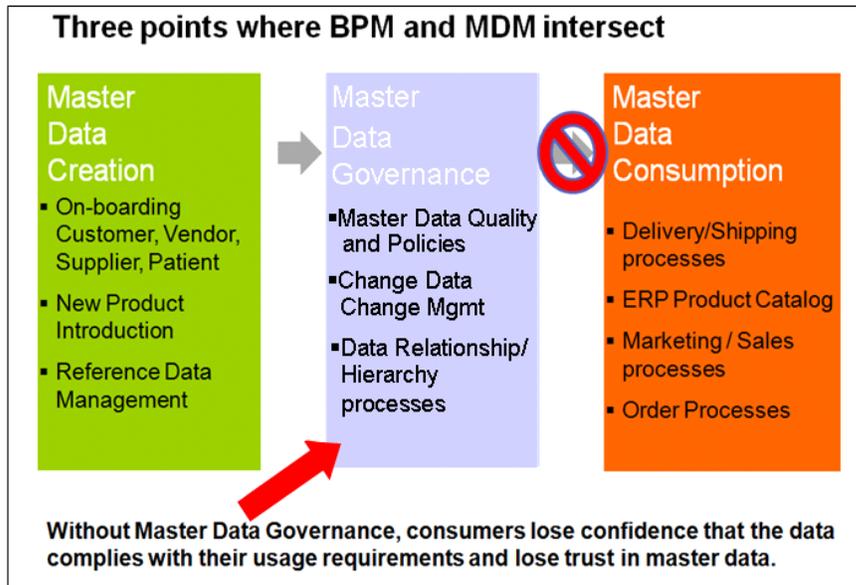

Figure 2 MDM and BPM intersections

Master data governance provides business owners assurances that master data is a trusted asset that is ready for use within their business processes. Consuming processes have requirements with which master data must comply. These consumption-centric master data requirements can include attribute validation requirements that are associated with the completeness of a record, specific attribute values, and code table validation. Master data governance provides the capabilities that are necessary to administer and monitor these requirements as policies. Using a master data governance process to enforce these policies provides the assurances to business owners that master data is not only accurate but also supports their usage requirements. BPM Express, the program that supports MDM, is the platform for implementing this process-oriented data stewardship.

Figure 3 shows the master data governance process to enforce these policies. This process includes policy administration, policy monitoring, and policy enforcement.

Figure 3 Master data governance process to enforce policies

With the capabilities provided by IBM InfoSphere Master Data Management (MDM), organizations can easily add master data to their enterprise processes, such as customer on-boarding. These processes ensure that decision makers have the accurate, single version of truth for making informed decisions. These same capabilities bring process-oriented data stewardship to the organization, providing assurances that master data complies with enterprise process requirements.

Solution architecture

IBM provides a number of tools with each component in the solution architecture.

IBM Business Process Manager

The following tools are provided to facilitate rapid construction of the business process across an organization:

● IBM BPM Process Designer

  IBM Process Designer provides a rich environment so that process designers can develop, test, deploy, and version business processes across their organization. Process Designer also provides an advanced extension framework so that custom components can be easily plugged in to further extend the base capabilities.

● IBM Process Portal

  IBM Process Portal for IBM Business Process Manager is a runtime platform for deployed business processes. By using Process Portal, a user can authenticate with their credentials and use a runtime environment to run process steps that are assigned to the user. Process Portal provides web-based capabilities so that users can see all outstanding tasks that are assigned to them in one place. The web-based capabilities also give users the ability to start any new processes that they are authorized to launch. Graphical-based reporting capabilities are provided so that a user can monitor individual and team performance for a particular time.

- Java Integrator

  This node is a Java class to be provided by an integration developer that defines the operations that must be started on the consuming systems. The Java integration node can then be configured to run a method within the class to run a transaction against the consuming system.

- Web Services Integrator

  This node provides a simple way to integrate a business process with services that are provided by other systems that use a service-oriented architecture (SOA). For example, it allows a Web Services Description Language (WSDL) from a consuming system to be uploaded to BPM Process Designer.

MDM Integration approaches

The following tools are provided to facilitate rapid construction of business process across an organization:

- MDM Web Services

  The InfoSphere Master Data Management platform provides several web services interfaces so that external systems, such as the MDM virtual eSOA interface and the MDM physical web services, can act on MDM data.

- Virtual MDM Java Interface

  The InfoSphere MDM platform provides includes a Java application programming interface (API) for interacting with the virtual MDM data model. This API works against the physical representation of the data within the virtual data model.

MDM Application Toolkit capabilities

This toolkit provides a suite of value-add capabilities to facilitate construction of process-oriented MDM-powered applications. The MDM Application Toolkit takes advantage of the extensible nature of Process Designer to provide more capabilities to organizations that build MDM applications within IBM Business Process Manager. The MDM Application Toolkit includes the following features:

- Pre-built business objects that represent commonly described MDM business objects

- Business objects that represent generic virtual MDM data types for use against the virtual MDM Java interface

- Additional UI controls

- Several pre-built integration services to perform common operations against MDM data

Usage scenarios

In this scenario, we put a focus on master data governance and stewardship as a critical part of enterprise solutions. We think master data governance and stewardship are requirements for defining and maintaining the data derived from the integration of Master Data Management and Business Process Management. That is, you not only need to access and use trusted data and use proven business practices, but you must maintain the data over time and integrate it with your other enterprise solutions.

Here, we define master data governance for multidomain master data management (MDM) with several data governance aspects and policy control types. *Master data* refers to data that is foundational to business processes and is widely distributed. The distributed data, when well managed, directly contributes to the success of an organization, and when not well managed, poses the most risk. In addition, we describe the roles of the data governance processes and key performance indicators (KPIs) and their critical importance for achieving mature levels of data governance.

It is commonly recognized that business information is one of the most important assets of any modern enterprise, and is typically built into enterprise policies. However, these policies often cannot be acted upon because there is no commonly accepted standard for measuring and reporting on the corporate information assets. A lack of information asset KPIs makes it difficult to establish data governance organizations. In addition, it is also difficult to assign individuals who are accountable for the quantity and quality of enterprise information assets overall. These assets might greatly contribute to the equity of the corporations and market capitalization, but it is often difficult to set meaningful quantitative targets for corporate information assets, their growth, and improvement.

Master data typically includes a few major master information domains, such as party/customer, product, location, service, account, employee, and supplier, and it includes the relationships between those domains. In addition, master data includes reference data that serves as qualifiers for the master information domains, such as account types, customer categories, industry codes, and geographical areas. The reference data justifies a priority treatment of master data, which requires both technology and business strategy.

In many enterprises, master data has been a major strategy and implementation focus area for the last few years, and the effort requires support from business. Insufficient business directions can adversely affect the outcomes of the MDM initiative. By the nature of master data, its broad distribution, and multifunctional use, no single business function can take exclusive responsibility for master data requirements, rules, and processes. In some cases, requirements from different functional areas can even conflict with each other in terms of their content and priorities. This situation substantiates the need for a cross-functional master data governance council. The MDM market recognizes that data governance is critical for enterprise MDM implementations. Master data governance is a discipline that concentrates on controls, methodologies, capabilities, and tools that have been developed by modern MDM over the last decade.

Master data governance has the following objectives:

- Establish a master data governance council or board.

- Formulate master data governance policies that establish accountability and enforcement.

- Monitor, oversee, and enforce proactive, collaborative, and effective data stewardship that is driven by data governance.

- Acquire and use tools that enable master data governance and data governance-driven stewardship, including policy administration, enforcement, remediation, and monitoring.

IBM offers a comprehensive set of products and components for master data management and governance.

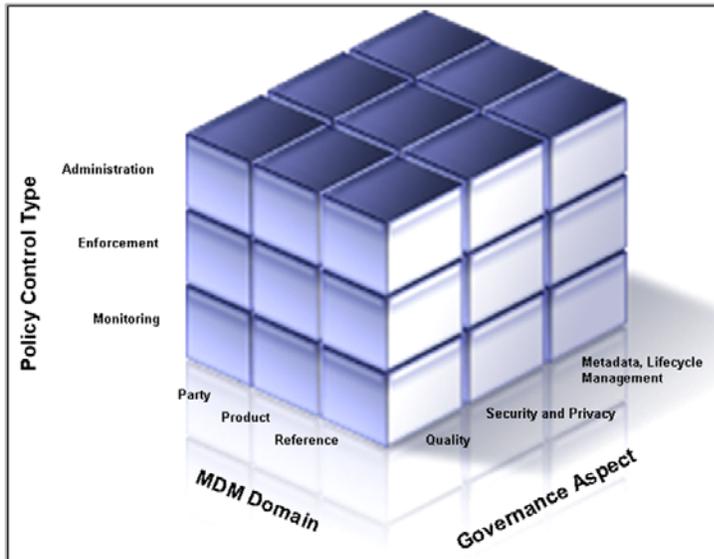Figure 4 illustrates the IBM multidimensional approach to master data governance.

Figure 4 Multidimensional approach to MDM

As illustrated in Figure 4, policy management is addressed by policy administration, enforcement, and monitoring components. All aspects of master data governance are addressed. The governance aspects include data quality and stewardship for master data, data visibility, privacy, and security (especially critical for customer data), and business and technical metadata. The master data governance council is a cross-functional leadership team. This team works to approve and establish policies that dictate how master data is captured, managed, propagated, and used across the enterprise to achieve short-term and long-term goals. The pursuit of master data governance is an ongoing effort, rather than a one-time project.

Data stewards are responsible for everyday operations that enforce the guidance and policies of the master data governance council. Policy enforcement in mature data governance can require complex data stewardship remediation processes to adequately support business and master data governance requirements with agile and flexible data flows. Traditionally built applications might be unable to provide the required level of agility and flexibility in the administration of master data governance policies and their remediation. This requirement puts forward the need to use Business Process Management (BPM) software and templates that are integrated with MDM.

Master data governance is part of an information governance or data governance discipline. The primary focus is on master data implementations where modern MDM patterns are used with MDM data hub technologies. If an enterprise establishes a data governance council, a section of this council that specializes on MDM can play a role on the master data governance council. Conversely, if a data governance council is not established in the enterprise, master data governance can become a seed and starting point for an enterprise data governance council. Most information governance and data governance methodologies lack a master data focus and do not reflect the specifics of modern MDM hub implementations. Few organizations achieve high master data governance levels of maturity. The percentage is even lower than for data governance in general.

Master data quality

Master data quality relies on the following components to effectively manage master data, policies, processes, metrics, and KPIs.

Policies

One goal of master data governance is to enable a master data governance council to define and issue master data quality policies. Policies or sets of business rules quantify the policy compliance criteria and define how certain levels of data quality can be achieved. Hard policies prevent a record from being saved if a policy is not met and prevent more flexible soft policies. By using soft policies, you can save records even if a record does not comply with data governance policies. The noncompliant records are routed to a data stewardship in-box for resolution. In IBM InfoSphere Master Data Management V10.1, policy administration and policy enforcement are implemented within IBM Business Process Manager Express. Policy monitoring is implemented in the Master Data Policy Dashboard. IBM Cognos® is used to report on the data quality metrics and their compliance with established policy targets.

Processes

Also known as procedures, workflow, or practices, master data quality processes define how policies are to be implemented. Usually, processes refer to the role or job function that is responsible for taking an action. They might also specify certain systems, screens, or forms that users in those roles must read, follow, or complete. The processes also address how exceptions are managed, which is typically by starting a separate process.

Processes might specify certain time constraints for a process. For example, they might state that certain actions must be accomplished within a number of hours, minutes, or seconds. Processes might also specify escalation paths for higher-level approvals by people in other roles. The processes might start other processes. Therefore, use care to ensure that the processes and procedures are clearly articulated, leave little, if any, room for misinterpretation, and are as complete as possible.

Processes are also meant to be living specifications. That is, as experience is gained by practitioners, as systems and regulatory guidelines change, and as other factors come into play, policies and procedures might change.

Metrics and KPIs

Data governance is a control discipline. A master data governance council initiates its control through master data quality policies. Metrics are necessary to the degree that the master data governance council wants to monitor and measure the levels of quality and consistency that are being achieved, in accordance with policies. For example, a policy states that a goal of completeness or uniqueness must be achieved, or the number of overlays must be reduced. Then, the metrics are the measurements that are taken so that managers can monitor trends in achieving the goals of the policies.

The policies that are defined by the master data governance council must be clearly defined. Mature data governance processes require quantitatively managed goals, advanced statistical metrics, and techniques. Quantitative process improvement objectives must be firmly established and continuously revised to manage process improvement. Advanced scoring algorithms are developed and used to quantify the similarity of records for matching. Scoring above a certain threshold indicates that the two records belong to the same customer. This approach has been successfully used in probabilistic matching. The same scoring APIs can be used to quantify the completeness of the entity records. The metric that is obtained by scoring a record on itself is referred to as *self-score completeness*.

Go to the IBM Redbooks site (http://www.redbooks.ibm.com/) and download Redbooks publication, *Aligning MDM and BPM for Master Data Governance, Stewardship, and Enterprise Processes*, SG24-8059, for more detailed information about aligning MDM and BPM to enable trusted and accurate information to be used by business processes to optimize business performance and increase agility for data stewardship. It also provides beginning guidance on these patterns and where cross-training efforts might focus.

Integration

With the capabilities provided by IBM InfoSphere Master Data Management (MDM), organizations can add master data to their enterprise processes (such as customer on-boarding). These processes ensure that decision makers have the accurate, single version of truth for making informed decisions. These same capabilities bring process-oriented data stewardship to the organization, providing assurances that master data complies with enterprise process requirements.

Business processes inevitably need to interact with other systems across the enterprise. Whether the system is a customer relationship manager (CRM), enterprise resource planning (ERP), or MDM system, data must be retrieved from these systems and decisions must be made on the data as part of a business process. A *business process definition* defines the various steps of this process, such as when and how a user is required to interact with the process. It also defines the points in the process that are required to make calls into other systems to get data. How the business process integrates with the other systems largely depends on the requirements of the business process and the integration options that are provided by the other systems.

Figure 5 illustrates the role of a business process definition in defining the interactions between a business user and the remote systems that store the data for action as part of the business process.
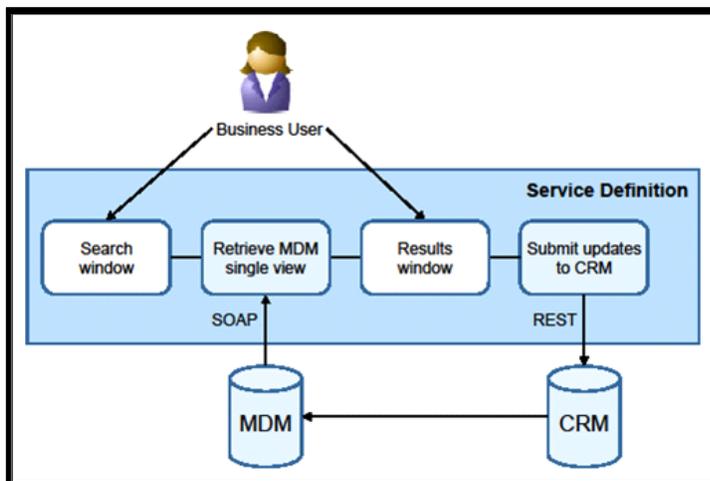

Figure 5 Defining interactions

IBM Business Process Manager provides a rich set of pre-built integration components that facilitate interacting with other systems across an enterprise, for example:

- Java Integrator
- Web Services Integrator

When you consider a business process that involves operations against a master data hub, determining which integration approach to choose depends on Web Services Integrator and Java Integrator. InfoSphere Master Data Management provides rich interfaces that allow integration by using Web Services Integrator or Java Integrator components. Therefore, the choice can depend on the unique requirements of your business process and the environment in which it operates.

MDM Application Toolkit

The IBM InfoSphere Master Data Management platform includes the MDM Application Toolkit. This toolkit provides a suite of value-add capabilities to facilitate the construction of process-oriented MDM-powered applications. The MDM Application Toolkit takes advantage of the extensible nature of Process Designer to provide more capabilities to organizations that build MDM applications within IBM Business Process Manager.

The MDM Application Toolkit includes the following features:

- Pre-built business objects that represent commonly described MDM business objects
- Business objects that represent the generic virtual MDM data types for use against the virtual MDM Java interface
- Additional UI controls
- Several pre-built integration services to perform common operations against MDM data

Any combination of these capabilities can be used with the base capabilities that are provided by Process Designer to accelerate the construction of business processes.

Supported platforms

For more information, see the Systems Requirements for InfoSphere Master Data Management Server at this website:
http://www-03.ibm.com/software/products/us/en/infosphere-master-data-management/

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Related information

- Aligning MDM and BPM for Master Data Governance, Stewardship, and Enterprise Processes:
http://www.redbooks.ibm.com/abstracts/sg248059.html?Open

- *InfoSphere Information Server Deployment Architectures*, SG24-8028:
http://www.redbooks.ibm.com/abstracts/sg248028.html?Open

- "Creating a BPM Center of Excellence (COE)," REDP-4898:
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- *Scaling BPM Adoption: From Project to Program with IBM Business Process Manager*, SG24-7973:
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- Business Process Management with IBM Business Process Manager, TIPS0938:
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- *Smarter Modeling of IBM InfoSphere Master Data Management Solutions*, SG24-7956:
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    On this page, enter IBM InfoSphere Master Data Management Server, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.

The information in this Solution Guide applies to Version 10 IBM InfoSphere Master Data Management Server, IBM Business Process Manager V7.5 Express, and IBM Business Process Manager V7.5 Standard or Advanced editions.

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