

Rev up your business rules engine

Drive more efficient rules management with Deloitte's Application Modernization innoWake™ Discovery and Mining solutions and IBM Operational Decision Manager for z/OS®

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Harnessing the power of business rules to manage the next normal

The ability to manage business rules is important because enterprise applications contain the rules that express the corporation's core business knowledge, processes, and intellectual property. If these business rules are buried deep inside millions of lines of legacy code, it can present multiple challenges and limitations.

For one, documentation of applications may be out of date, incomplete, or missing entirely. As a result, business leaders often lack visibility into how rules work and how rule changes can potentially impact application performance. And because the rules are embedded in code, even a minor change requires that business users ask IT to make code alterations. That presents a problem, according to results from [Deloitte's Mainframe Market Pulse Survey 2020](#), which explored the attitudes of 261 business and that IT decision makers across data-intensive and security-focused industries.

In particular, these leaders validated the enduring role of mainframe-based technologies in hybrid strategies and that IT leaders across industries are fine-tuning their rules engines. The survey found that:

- More than half are leveraging rules engines to manage code within mainframe applications
- 88% are considering modernizing their rules engines
- Among the respondents who have already launched application modernization initiatives, 38% said upgrading their rules engine is a key priority.¹

What's more, hard-coded rules are often scattered across multiple areas of the application. Manually identifying all rule instances and dependencies is both arduous and time consuming. Changes to a single rule, for instance, can require extensive regression testing on all associated rules in specific modules and components. And that can increase the time to market, costs, and risks.

It's not surprising that updating rules engines and adoption of business rules management systems (BRMS) have become key priorities.

Organizations that have ready access to business rules in a BRMS with the ability to adjust them efficiently and effectively to meet functionality or requirements changes, can become more nimble, competitive, and successful. This agility to quickly adjust business processes has many use cases across a variety of industries including determining benefits and improving regulatory compliance, to name a few.

IBM zODM is a BRMS that can help create a more automated, modern, sustainable, self-service model for business rules management. IBM zODM enables cross-functional business and IT teams to develop, change, and manage rules using a single automated tool and process. To accelerate the benefits, centralized rules management organizations can take advantage of Deloitte's Application Modernization powered by innoWake Discovery and Mining solutions to help automate, streamline, and accelerate the extraction of business rules and integration into IBM zODM.

BRMS use case examples



Banking and financial services

- Automated loan processing
- Personalized offers
- Fraud prevention and detection
- Regulatory compliance



Government and education

- Eligibility evaluation
- Benefit detection
- Appeal management
- Tax calculations



Insurance

- Member enrollment
- Automated claim processing
- Underwriting
- Notifications and alerts
- Data validations



Retail

- Logistics and supply chain management
- Price point optimization
- Product management
- Vendor management

1. Base: 261 business and IT decision makers with authority or influence over mainframe decisions

Source: A commissioned study conducted by Forrester Consulting on behalf of Deloitte Consulting LLP, June 2020

The synergies between Deloitte innoWake and IBM zODM solutions

IBM zODM supports the creation, management, testing, and governance of business rules and events, which are stored in a central repository that can be accessed across multiple environments.

Key features of IBM zODM include:



RULES PERSISTENCE: IBM zODM enables rules persistence in both file and Db2 databases. Copybook layouts are created with all rule parameters categorized as input or output. File layouts can accelerate processing, whereas Db2 persistence can simplify updates.



NON-MAINFRAME CALLS: IBM zODM rules can be invoked from non-mainframe applications using API gateways.



VERSIONING AND CHANGE MANAGEMENT: IBM zODM version-control maintains all previous versions and supports change-management features across multiple regions and logical partitions.



MULTIPLE ENVIRONMENT SUPPORT: The IBM zODM rules engine works across environments within mainframes, including IMS batch, Customer Information Control System (CICS), Information Management System Data Communications (IMS DC), and IBM Db2 batch.

Deloitte's innoWake Discovery and Mining suite complements the built-in benefits of IBM zODM. Our solutions enable the efficient identification, extraction, and migration of business rules to IBM zODM—accelerating the process up to six times faster than via manual extraction.

Key features of Deloitte innoWake Discovery and Mining include:



CANDIDATE BUSINESS RULES: Algorithms scan code and assign a probability it includes a business rule to each logical code statement. This facilitates quality control, speeds up the process, and helps cross-functional teams gain confidence in business rules extraction—all while enabling subject matter experts to focus on priority rules.



DATA DICTIONARY: Auto-identify data elements to categorize rule candidates, giving you a plain-English translation of relevant data elements and helping users better understand business rules. Mapping of data elements also allows for faster understanding of rule processes.



INNOWAKE DNA CLUSTERS: Algorithms identify clusters of code with similar patterns to quickly pinpoint replicated processes in which duplicated or cloned business logic may exist. Organizations can prioritize rule-mining efforts, consolidate rules, and identify candidates for microservices.



WORKFLOW MANAGEMENT: Facilitate the review of rules to enforce governance and streamline approval iterations.

How it works: An integrated solution for rules management

Deloitte's innoWake Discovery and Mining solutions can expedite integration with IBM zODM in a few steps:



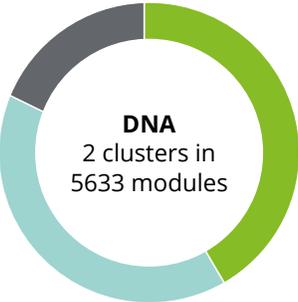
1. DISCOVERY

Deloitte's innoWake Discovery solution identifies candidate rules

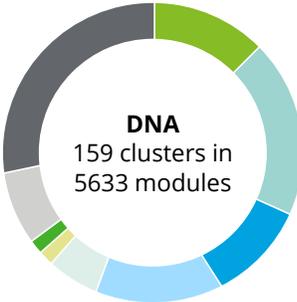
innoWake Discovery identifies candidate business rules using proprietary and extensible algorithms that provide upfront visibility into potential rules and their locations. To accelerate and prioritize analysis, candidate rules are automatically categorized based on probability. The automation of this phase helps reduce human error.

Additionally, innoWake Discovery solution uses algorithms to identify DNA clusters of code with similar patterns. This enables analysts to quickly pinpoint replicated processes that contain duplicated or cloned business logic. Doing so can reduce analysis and review cycles, which in turn can speed deployment, promote consolidation of rules, and identify candidates for microservices.

innoWake DNA analysis output example



Sequencer: **COBOL Methods**
 Similarity: **Weighted Levenshtein**
 Clustering: **Louvain**
 Two clusters cover 82.10% of the modules (4681 out of 5633 modules)



Sequencer: **COBOL Skeleton**
 Similarity: **Weighted Levenshtein**
 Clustering: **Louvain**
 The top five clusters cover 60.07% of the modules (3384 out of 5633 modules)

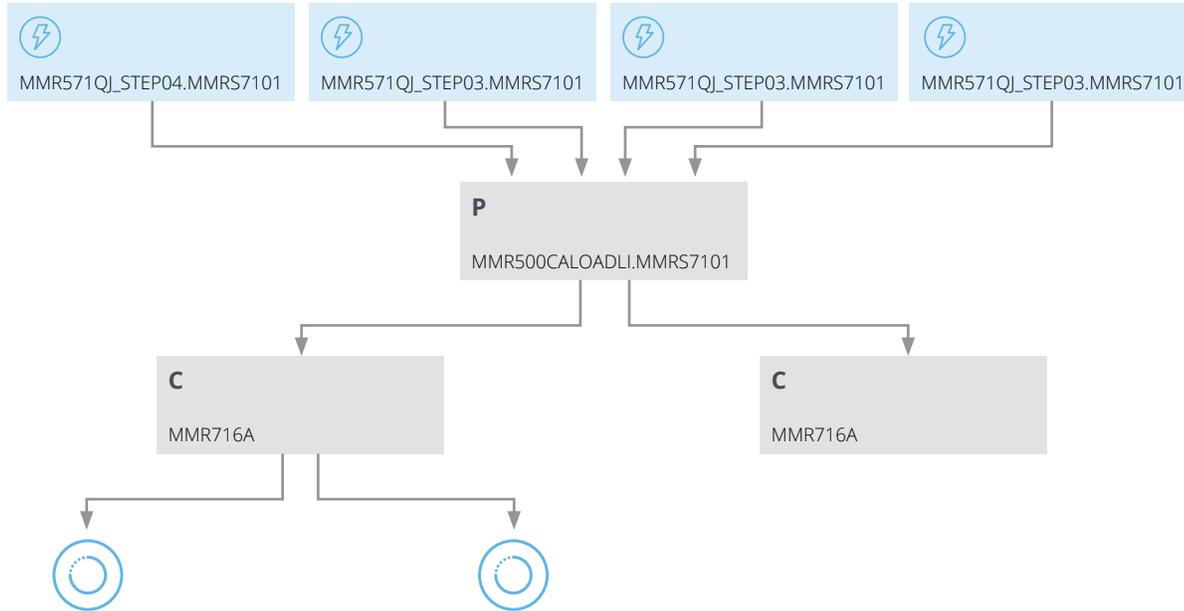


2. MINING

Deloitte's innoWake Mining solution helps expedite and manage the business rules extraction process

Once business rules have been determined, innoWake's Mining DNA cluster module identifies relevant data elements, validations, and taxonomy to prepare rules for extraction. DNA cluster analysis maps data elements against rule candidate conditions and calculations. Input data fields are confirmed using dependency analysis, while data-flow analysis traces application access, data movement, and alteration.

innoWake dependency mapping example



The Data Dictionary feature auto-identifies data elements and categorizes dependencies within rule candidates that act upon them. Plain English translation of relevant data elements can improve knowledge of business rules, while mapping of data elements to input and output functions can accelerate understanding of rule processes. These features enable business users to manage rules independent of the mainframe application logic—and without reliance on IT to make code changes.

The innoWake Mining solution uses taxonomy to map application components with functional processes. This helps improve visibility into the functional relevance of components, their workflow, and execution. The use of plain-English language terms allows non-technical users to easily understand rule functions and approve or reject candidate business rules. Together, these features can help lower the cost of adding, removing, or modifying rules.

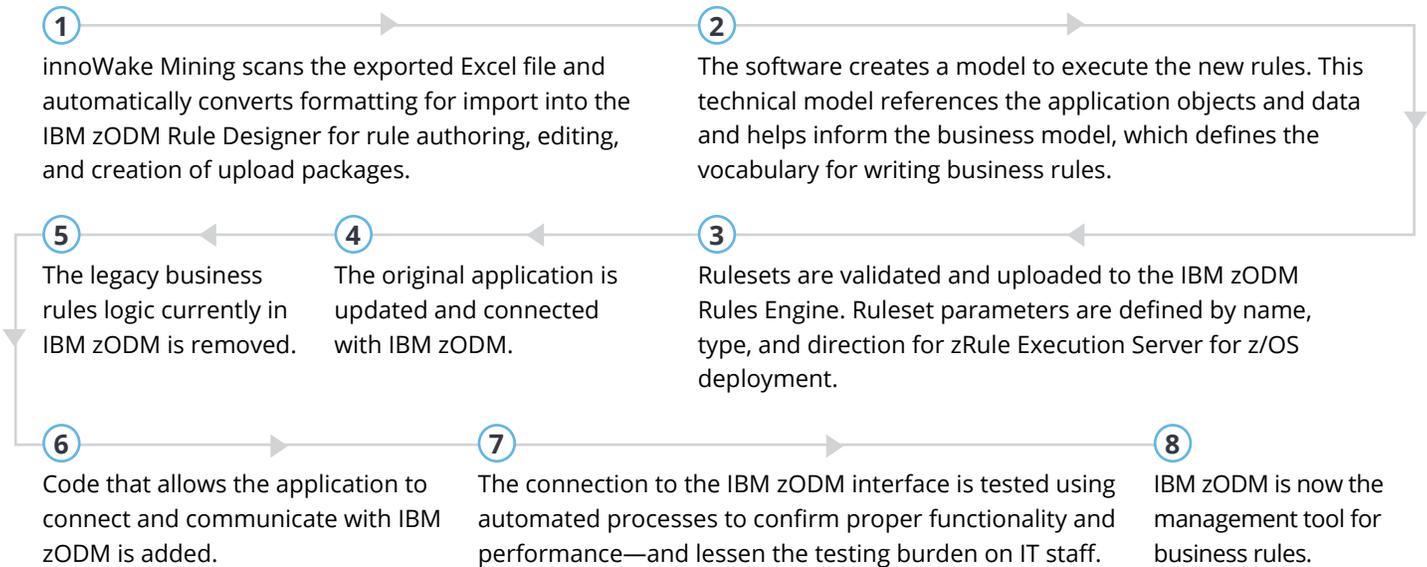
Analysts can also generate reports based on rule category, business context, or rule evaluation status (e.g., candidate rules vs. approved rules). Multiple file formats are supported for exporting rules, including comma-separated values (CSVs), Excel, JSON, and XML. Enhanced transparency across functions can reveal how rule changes affect responsiveness to business needs.



3. INTEGRATION

Deloitte's innoWake Mining solution maintains an enterprise repository of extracted rules and integrates relevant rules into the IBM zODM repository for editing and execution

Here's how it works:

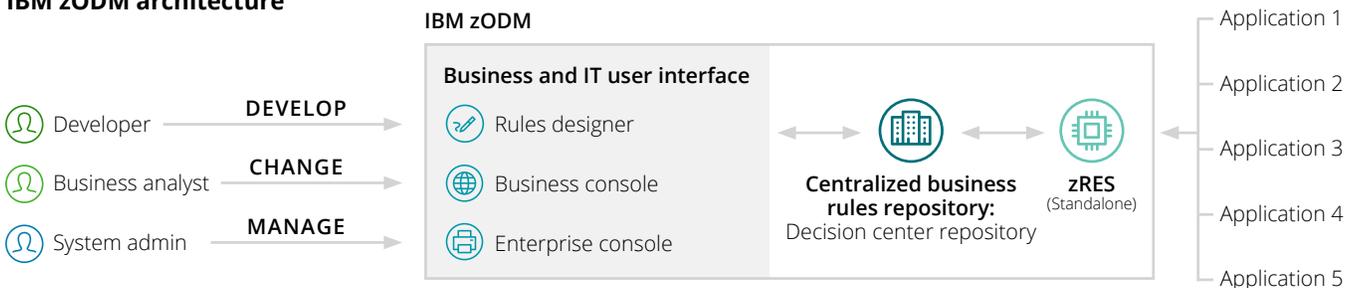


4. MAINTENANCE

IBM zODM enables users across the organization to easily develop, change, and manage rules

- ▶ **IBM zODM** offers environments tailored to the needs of different users in the organization: developers, business analysts, and systems administrators.
- ▶ **Rules designer:** An Eclipse-based environment that enables developers to concurrently author, edit, and debug code and rules. Key features include correction of rules, decision flow control, code-generation wizards, source code control integration, and detection of conflicts and redundancies.
- ▶ **Business console:** A collaborative environment that allows non-technical business analysts to manage, edit, and modify rules using plain English-language terms.
- ▶ **Enterprise console:** Allows system admins to deploy rules in projects and implement administrative features like project security and permissions.
- ▶ **Decision center:** Provides a rule repository and collaborative web consoles that enable business users to author, manage, validate, and deploy rules—with minimal dependency on the application development team.
- ▶ **zRule Execution Server (zRES):** Provides the development and runtime components for a rule-based solution, as well as the ability to improve business decisions by testing the ruleset execution and simulating scenarios.

IBM zODM architecture



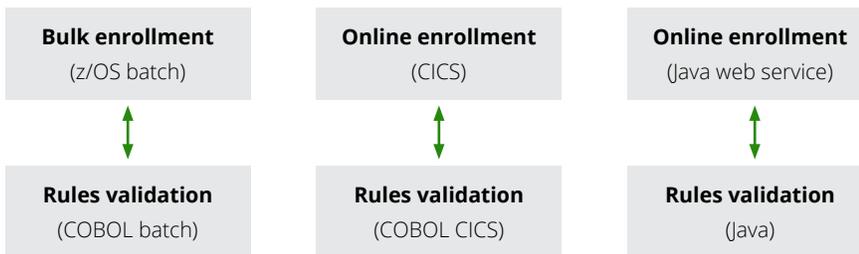
Health care insurance enrollment

A USE CASE EXAMPLE

There are many use cases for implementing a BMRS, including cross-industry examples in banking and financial services, government and public sector, insurance, and retail. For example, health care insurance enrollment is a complex initiative in which multiple levels of validation are performed at different stages of application processing.

The legacy health care enrollment functionality used hard-coded business written in disparate languages rules and spread across three applications: Batch enrollment, online enrollment (CICS), and online enrollment with Java web services.

Legacy architecture before IBM zODM



This required that any rule changes be implemented in multiple environments and technologies, a process that was cumbersome, risky, and costly.

To accelerate the analysis and rules extraction to IBM zODM, we used the innoWake Discovery and Mining solutions to quickly hone in on and extract a subset of member enrollment business rules. Some examples of critical rule types that can be extracted from legacy code are:

-  **State specific:** Verifies whether the plan member resides in the member home state or out of state.
-  **Rating type:** Ratings are based on product types such as medical, dental, or vision.
-  **Age check:** Determines whether age rules exist for program eligibility.
-  **Provider/physician check:** Based on the product subtype, primary care physicians for members are identified.

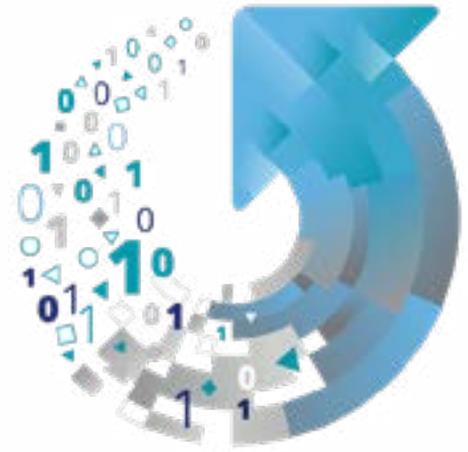
These rules are then migrated to IBM zODM using the automated deployment process described above. When compared with the challenges of manual management of hard-coded business rules, IBM zODM enables organizations to streamline the business rules management, assist IT, and save costs.

The power of business rules management

There's no doubt that manual management of business rules is a complex initiative that requires a deep understanding of how legacy mainframe applications interact with rules—and often, significant investment. It doesn't have to be that way.

Automated business rules management, when properly implemented, can help companies achieve a number of operational benefits and boost agility. Plain-language rules are consolidated in a centralized location, which enables business analysts to better understand them and make changes without help from IT. IT staff can more freely collaborate on rule changes and perform automated updates on a consistent and timely basis. And the overall organization stands to benefit from increased operational efficiencies, cost savings, and improved business performance.

Deloitte's innoWake Discovery and Mining solutions now provide automated processes that streamline extraction of rules into IBM zODM. And that makes achieving the advantages of business rule management more accessible than ever.



Our experience can accelerate the journey. Ready to get started?

Stephen Hodges

Specialist Leader, Application Modernization
zODM Solution Contact
Deloitte Consulting LLP
shodges@deloitte.com

Keith Cox

Application Solutions Offering Leader
Managing Director
Deloitte Consulting LLP
kecox@deloitte.com

Terri Cobb

VP, IBM Alliance Lead
Deloitte Consulting LLP
tecobb@deloitte.com

Bob Miller

IBM Alliance Solution Architect and Legacy
Transformation Lead
Deloitte Consulting LLP
robmiller@deloitte.com

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