



# Transformation from Business Analyst to Knowledge Engineer

Building Business Capability  
Fort Lauderdale, FL  
Thursday, November 14, 2019 8:00AM

# SPEAKER

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## Ben-Johan van der Walt (Solutions Architect - Vizuri)

Solutions Architect leading the Business Rules and Process practice for Vizuri. Ben-Johan architects, develops and implements business rules and processes automation systems to improve customer agility and profitability all while bridging the gap between business and IT.

# LEARNING OBJECTIVES

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- Who is responsible for managing organizational knowledge?
- How can an organization be successful at managing knowledge?
- What role does a Knowledge Engineer play?
- What are the responsibilities of a Knowledge Engineer?
- What skills and capabilities are needed to be a Knowledge Engineer?
- What Business Automation Tools and Technology are used by a Knowledge Engineer?



# AGENDA

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- Challenges companies are facing today
- Business rules approach differs from traditional applications
- Knowledge is Power
- Organizational vs. Tribal Knowledge
- Knowledge Based Lifecycle
- A new position emerges
- Who exactly is a knowledge engineer
- Roles vs. Position of a Knowledge Engineer
- Responsibilities of a Knowledge Engineer
- Skills and Capabilities of a Knowledge Engineer
- BRMS tools and technology

# CHALLENGES COMPANIES ARE FACING TODAY

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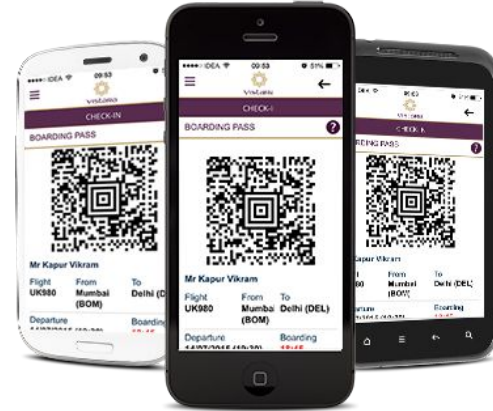
- Complex Decisions - Ability to reduce decisions to practice
- Time-to-Market - Ability to quickly capture new markets
- Manual Time-consuming Tasks
- Consistency - Uniformly apply validation and conformity checks
- Risk Mitigation - Balancing Experience and Knowledge
- Workflow Management - Process and Performance Metrics and Unpredictability



# BUSINESS THE SAME BUT TECHNOLOGY CHANGES



YESTERDAY



TODAY



TOMORROW

# KNOWLEDGE MANAGEMENT APPROACH

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- Also known as a Business Rules Approach
- Business Rules Approach is a methodology
- Special technology by which organizations capture, challenge, publish, automate, and change rules from a strategic business perspective
- Formalizes Business Rules in a language that everybody can understand
- Helps develop a Business Rules Management System (BRMS)
- Is an *automated* system in which the rules are separated, logically and physically, from other systems



# KNOWLEDGE MANAGEMENT APPROACH

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- Shared across datastores, user interfaces, and applications
- An approach aimed to guide the delivery of externalized rules, to form part of an integral, active and automated component in systems architecture.
- A knowledge-focused approach of designing new systems.
  - It is no longer acceptable to bury that knowledge deep in code where no one knows what it is.
  - It is no longer acceptable to have that knowledge locked in bondage where it cannot change on demand

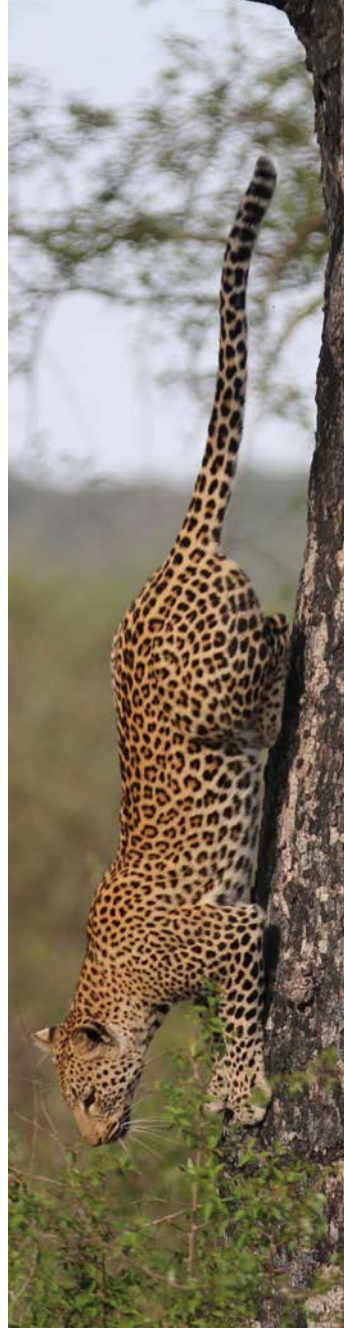


# KNOWLEDGE MANAGEMENT APPROACH

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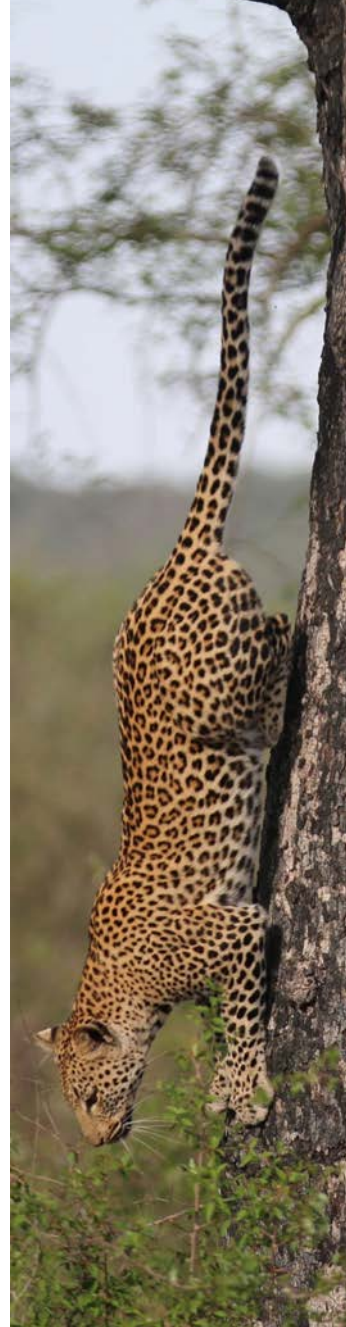
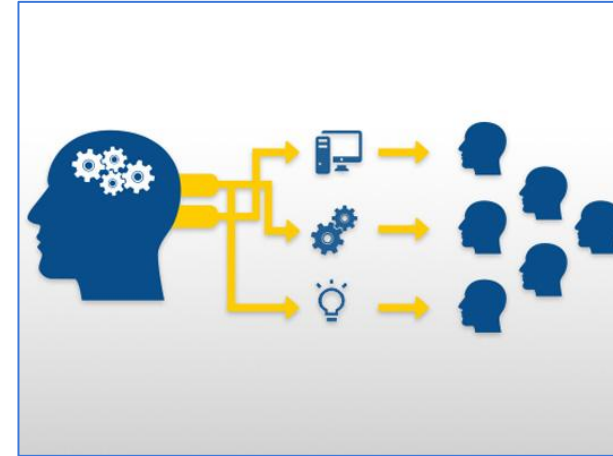
- Companies have increasingly struggled with the upkeep of business decisions and processes
- The IT group in the organization comes under renewed pressure to roll out changes faster than ever before
- As an organization matures, there arises a growing need for managing business rules

*They need a new approach ... a Business Rules Approach ...*



# ORGANIZATIONAL vs. TRIBAL KNOWLEDGE

- Organizational
  - Creates a Single Source of Truth
  - Centralizes knowledge to a single location
  - Provides interfaces for integration and consumption
  - Architects decisions as single-purpose microservices that are composable
  - Modernization strategy
- Tribal
  - Known only within a subset of individuals
  - Know-how or collective wisdom - “what to do” or “how to do it”
  - Have elders that tell, share, and reinforce lore
  - Technical and operational debt
  - Rules no longer valid or needed but persist



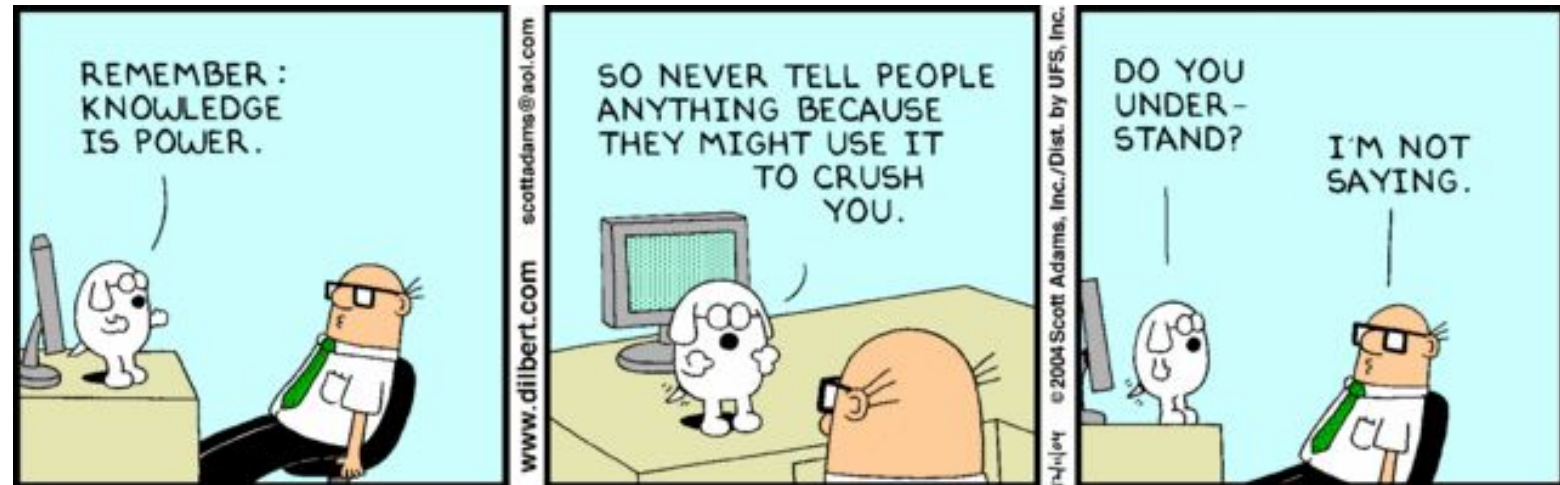
# KNOWLEDGE IS POWER



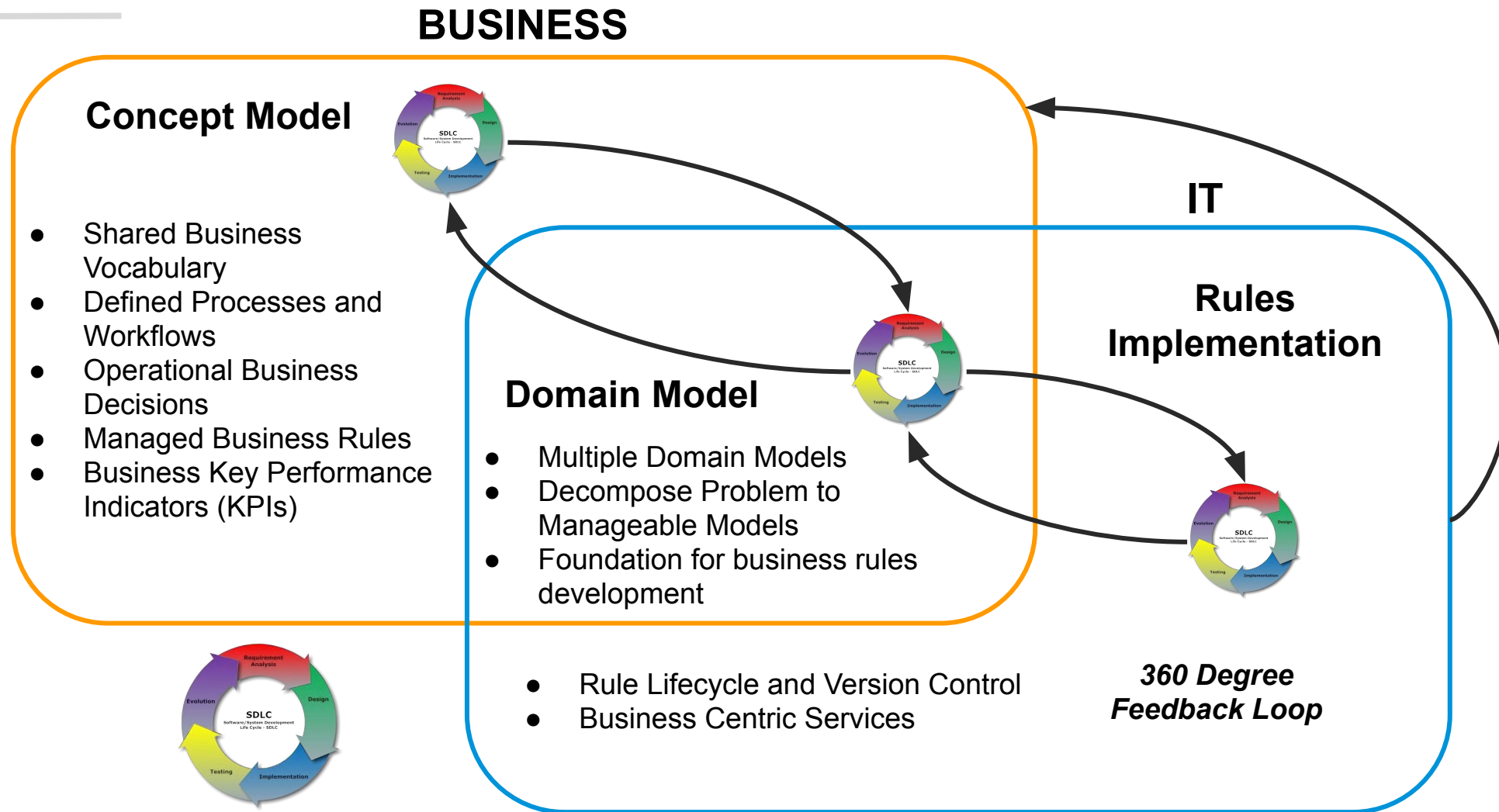
Knowledge must be shared to be powerful.

Isolation creates chaos and is the foundation of Tribal Knowledge and Shadow-IT

Organizational Concept of Operations provides a basis for Knowledge Sharing and Dissemination



# KNOWLEDGE BASED LIFECYCLE



# THE SCARECROW HAD IT RIGHT

*"Knowledge Management is the process of capturing, distributing, and effectively using knowledge. It is a **discipline** that promotes an **integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets.** These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers."*

"If I only had a brain"



<sup>1</sup> Source: Koenig, M.E.D. (2012). What is KM? Knowledge Management Explained, <http://www.kmworld.com/>

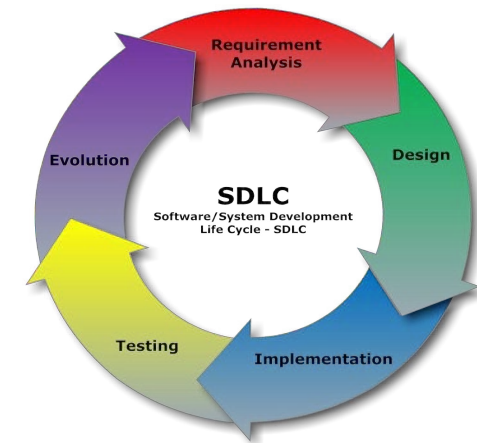
# KNOWLEDGE-BASED SYSTEM

A *Knowledge-Based System (KBS)* focuses on systems that use knowledge-based *techniques* to *support* human *decision-making, learning* and *action*<sup>1</sup>

Knowledge-Based IT (KB-IT) is the application of KBS techniques aligning Business and IT

- Design process
- Models and methods
- Software tools
- Decision-support mechanisms
- Digital representation, and
- System architectures

<sup>1</sup>Source: Fujita, H., & Lu, J. (2012). *Knowledge-based Systems, Volume(31)*, pp. 1-211.



**Knowledge-Based Lifecycle**



# SO WHAT?

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Whether organizations want to acknowledge it or not, knowledge has become the center of modern software architectures

- How can we, as an organization, be successful at managing knowledge?
- Who is going to manage the knowledge lifecycle?
- Who is going to operate and maintain the knowledge-based system?
- Who is going to maintain and enforce the knowledge discipline?

IT??

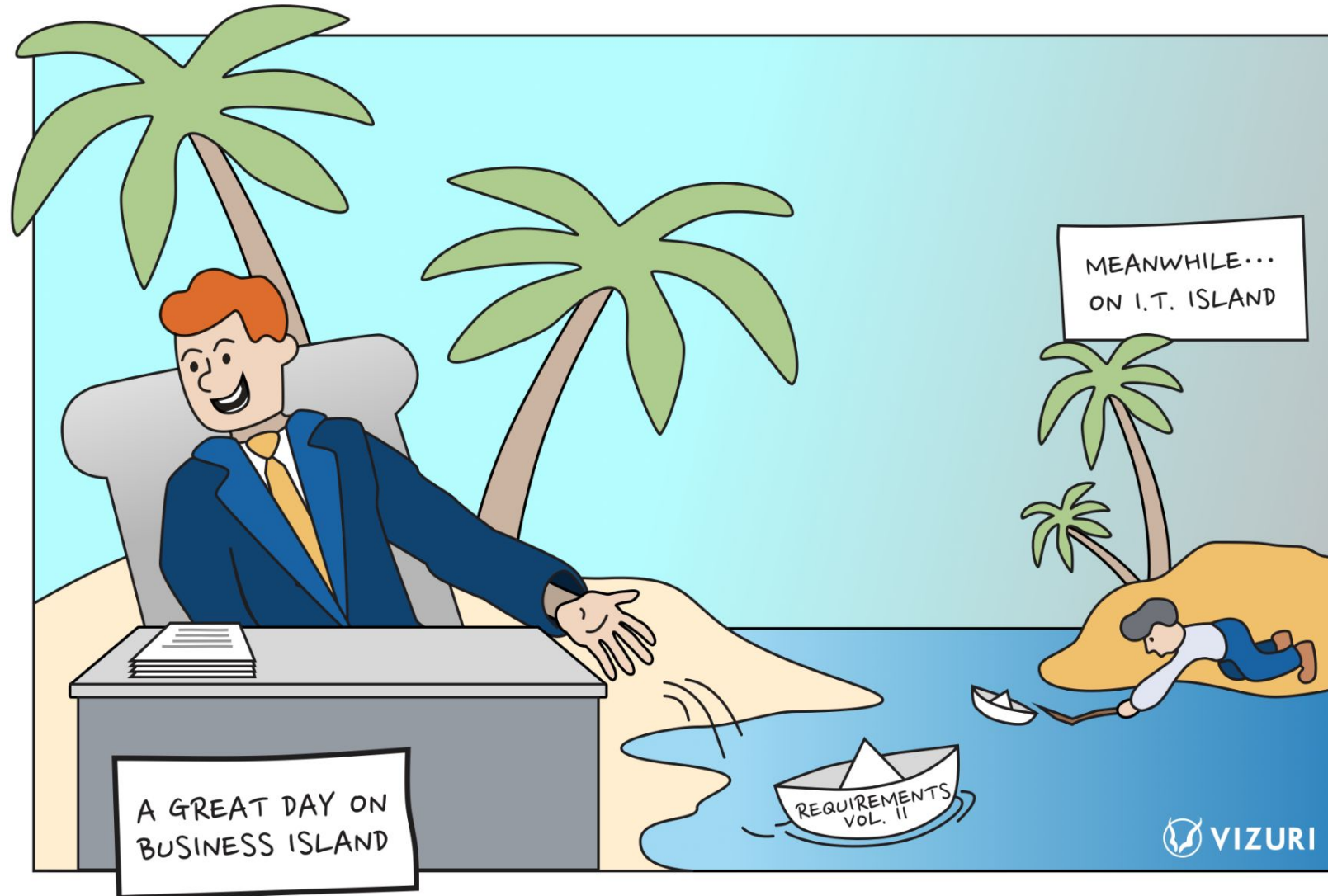




*Business Decision Automation is accomplished by executing rules.*

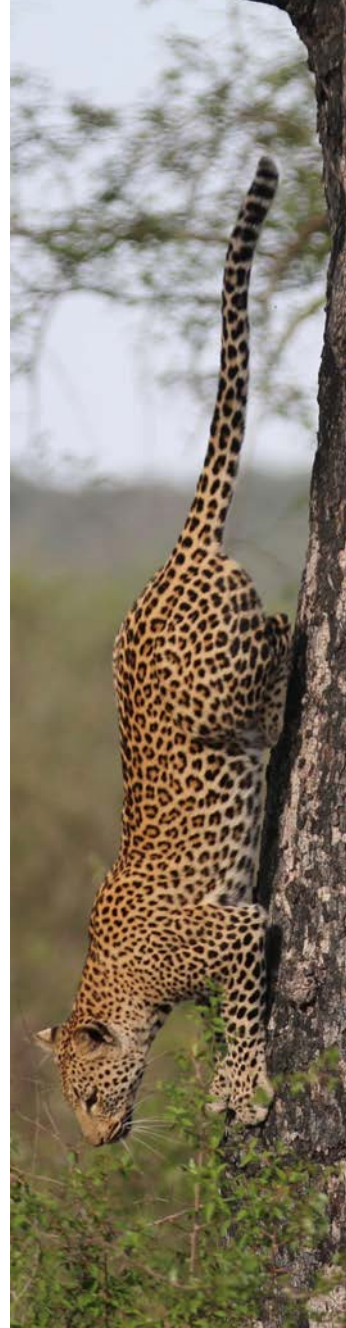
*Rule Analysis without implementation is, at best, pie in the sky.*

# BUSINESS HANDING OVER RULES TO IT



# SHARED RESPONSIBILITY - POSITION IMBALANCE

- Rules implementation is not the responsibility of the IT organization anymore, it is a shared responsibility
- A responsibility/position imbalance is:
  - A state where roles and responsibilities are clouded due to the introduction of a new business function and technologies that blurs the line where ownership and responsibilities have traditionally been clearer
  - Largely due to an integrated workflow that now includes automation and separation of concerns



# KNOWLEDGE ENGINEERING

## BUSINESS

**Knowledge Engineer**

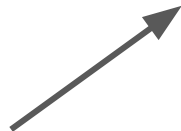
## IT

- **Business Analyst**
- **SME**



- **Software Analyst**
- **Developer**
- **Architect**

- Business Processes
- Decision Management
- Develop a Concept Model
- Rule Harvesting



- APIs
- Rules Authoring
- Develop a Domain Model
- Rule Implementation

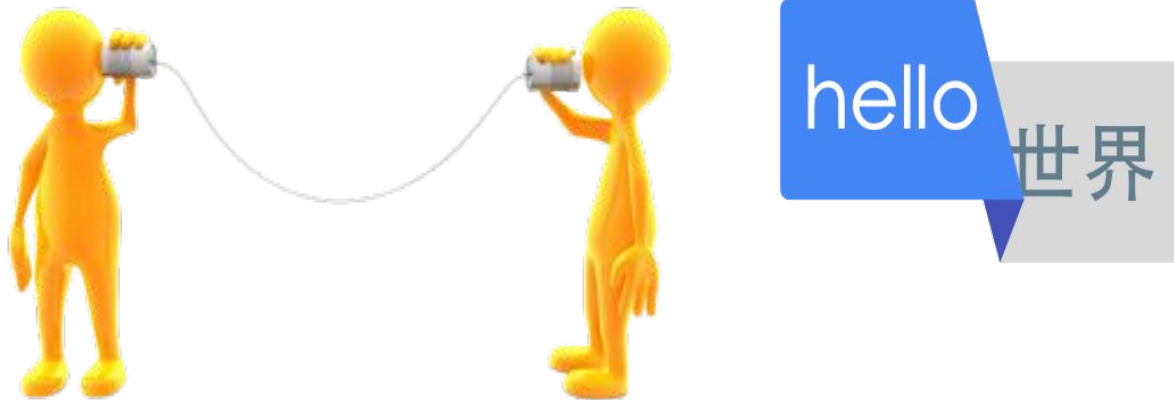
# BRIDGE THE GAP

- Align Outcomes With Expectations
- Business groups and IT require a lexicon to “bridge” the communication gap

What the business envisioned ...



...and what IT delivered ...



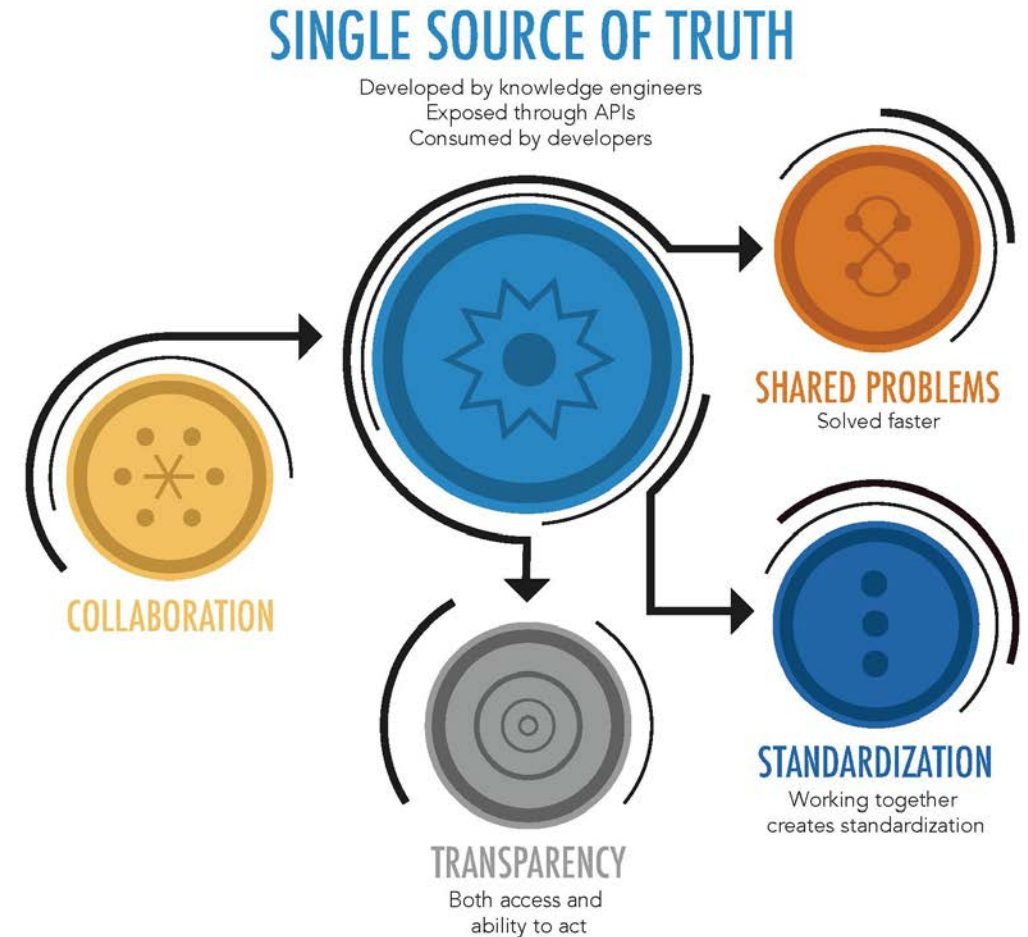
# WHY IS THERE A DISCONNECT?

- Business logic  $\neq$  IT code
- Business logic = policies and strategies of the business
- Domain model typically overlaps with the Technology implementation, which needs to be separated and decoupled
- Traditional technology solutions tend to be implemented as “point” solutions that are cryptic, duplicated, and buried within code
- Business logic is often implemented as “code” between technologies (e.g. User Interface, Database, etc.)
- Stakeholders may have a different view of the “facts” and how things “connect” together



# DEV/OPS FOR KNOWLEDGE MANAGEMENT

- Business Rules
  - Developed by Knowledge Engineers
  - Expose through APIs
  - Consumed by Developers
  - Implemented as Micro Services
- Incrementally iterate through the Concept, Domain, and Rule Sets and implement feedback



# ROLES vs. POSITION

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- Business Analyst is a position, Knowledge Engineer is a role
  - The Knowledge Engineer will become a position in the future
- Knowledge Engineer plays the role of:
  - Consultant to all rules projects on both business and IT
  - Gatekeeper of the Domain model
  - Collector,
  - Assimilator,
  - Protector, and
  - Governor of knowledge.





# KNOWLEDGE ENGINEER RESPONSIBILITIES

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- Produce a well-formed lexicon that can be understood by all parties involved; also known as the domain model
- Police and oversee the collection, assimilation, protection and governance over organizational processes and decisions
- Coordinate knowledge related activities across the organization and internal groups
- Ensure that business decisions are implemented accurately and adhere to standards and guidelines
- Enforce Business Rules



# KNOWLEDGE ENGINEER RESPONSIBILITIES (CONT.)

- Identify existing Business Rules
- Ensure the quality of Business Rules
- Ensure traceability, visibility, and consistency of Business Rules
- Promote Business Rules best practices and make recommendations
- Be the “Bridge between the Business and IT groups
- Prevent duplicate definitions and implementations of Business Rules



# SOFT SKILLS

- Ability to see the big picture
- Leadership
  - Inspire and motivate others
- Mentor for others
- Problem-solving
  - Find solutions for complex issues
- Analytical ability
  - Break things down into smaller manageable pieces
- Good communicator
- Ability to listen
- Diplomacy
  - Consideration in dealing with others
- Educating the business and IT in the business rules approach



# HARD SKILLS

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- Ability to capture business rules and business processes
- Able to use standards and notations for developing business rules and processes for example:
  - Decision Model and Notation (DMN)
  - Business Process Model and Notation (BPMN)
- Author rules using a Business Rule Management Systems
- Ensure that rules are authored using the right authoring formats to support the type of rules being implemented
- Verify and validate that decisions are executing correctly and matches business intent
- Understand and use new Technology and tools to develop and share rules
- Know the domain model and make recommendations to prevent contamination



# CAPABILITY COMPARISON

- Some capabilities and skills of a Knowledge Engineer overlap with that of a Business Analyst and Systems Engineer
- However, new skills and capabilities need to be acquired

Capabilities	Business Analyst	Knowledge Engineer	Systems Analyst
Excels in communication and conflict resolution	✓	✓	✗
Identifies business rules	✓	✓	✗
Understands business decisions and processes	✓	✓	✗
Develops a Concept Model	✓	✓	✗
Develops a Domain Model	✗	✓	✓
Implements/authors rules using a Business Rules Management System (BRMS)	✗	✓	✓
Understands Decision Model & Notation (DMN) and BPMN (Business Process Model & Notation)	✗	✓	✓
Maps/translates IT domain to Concept and Domain models	✗	✓	✓
Develops a vocabulary/lexicon that overlaps both the domain and concept models	✗	✓	✗
Manages the knowledge lifecycle	✗	✓	✗
Possesses awareness of business rule sets across the entire organization	✗	✓	✗
Assesses and support organization rules/decisions	✗	✓	✗
Ensures that business rules adhere to standards and guidelines	✗	✓	✗
Maintains a repository of all business rules	✗	✓	✗
Bridges the gap between business and IT	✗	✓	✗
Responsible for visibility, quality, consistency, and traceability of business rules	✗	✓	✗

# CAPABILITY COMPARISON

Capability/Skills	Knowledge Engineer	Business Analyst	Developer/ Architect
Excels in communication and conflict resolution	✓	✓	✗
Identifies business rules	✓	✓	✗
Understands business decisions and processes	✓	✓	✗
Develops a Concept Model	✓	✓	✗
Develops a Domain Model	✓	✗	✓
Implements/authors rules using a BRMS	✓	✗	✓
Understands DMN and BPMN	✓	✗	✓
Maps/translates IT Domain to Concept and Domain models	✓	✗	✓

# NEW CAPABILITY REQUIRED

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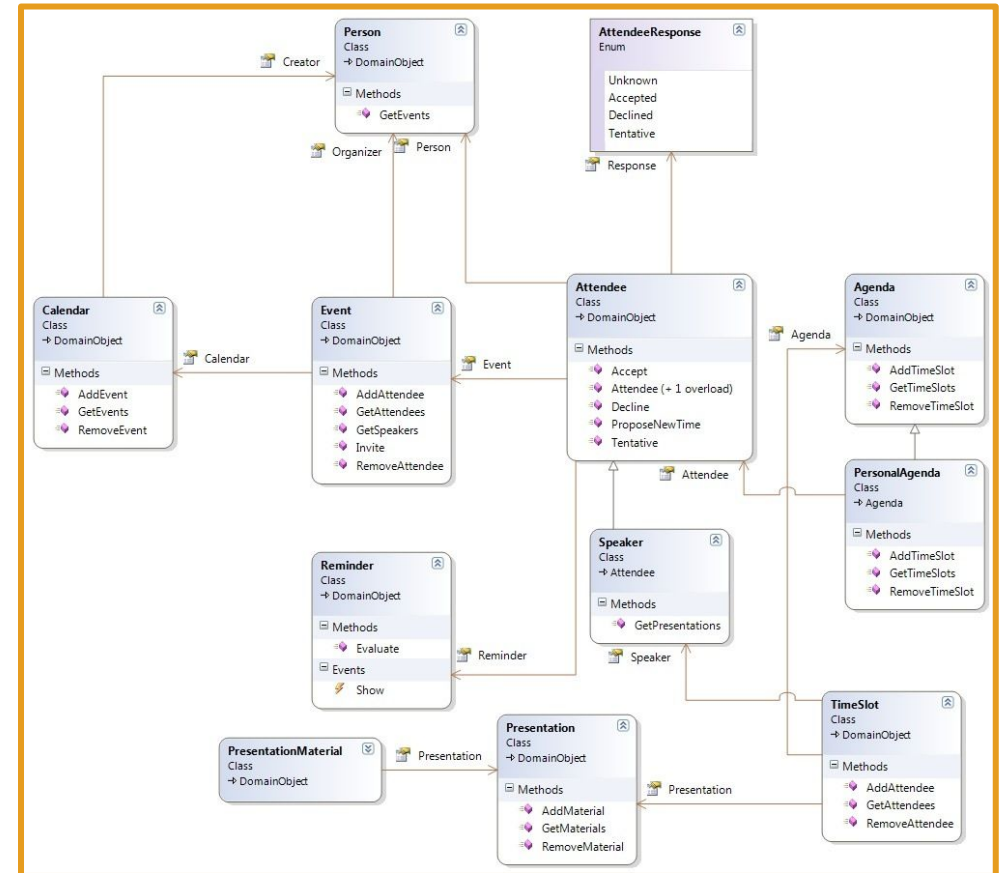


- Develops a vocabulary/lexicon that overlaps both the domain and concept models
- Manages the knowledge lifecycle
- Maintains visibility, quality, consistency, and traceability of business rules
- Possesses awareness of business rulesets across the entire organization
- Assesses and supports organization rules/decisions
- Ensures that business rules adhere to standards and guidelines
- Maintains a repository of all business rules
- Bridges the gap between business and IT



# KEEPER OF THE DOMAIN MODEL

- Domain model is the rule language
- Foundation on which all rules are built
- Tendency to be taken over by the IT group
- Prevents duplication of terms, attributes, conditions and rules
- Proper translation between IT fact model and business rules domain model





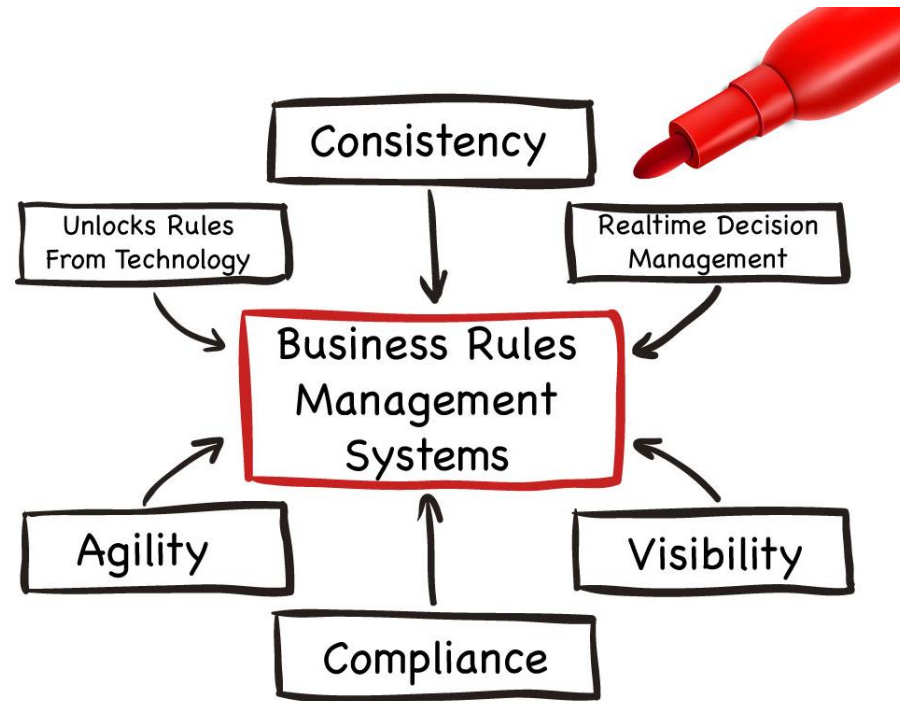
# BUSINESS FOCUS

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<b>Business Analyst</b>	<b>Knowledge Engineer</b>
Focus on meeting the objectives of a specific project	Focus on ensuring that the business rules are consistent across the organization
Focus on short term goals	Focus on long-term effect of the business rules on the organization
Recording business rules as part of capturing business requirements	Defining rules across products and service across the company
Focus on the immediate business needs	Focus on the entire knowledge life cycle
Focus on communicating business rule requirements within a given project	Focus on educating and collaborating with Business and IT in the knowledge discipline

# BUSINESS AUTOMATION TOOLS & TECHNOLOGY

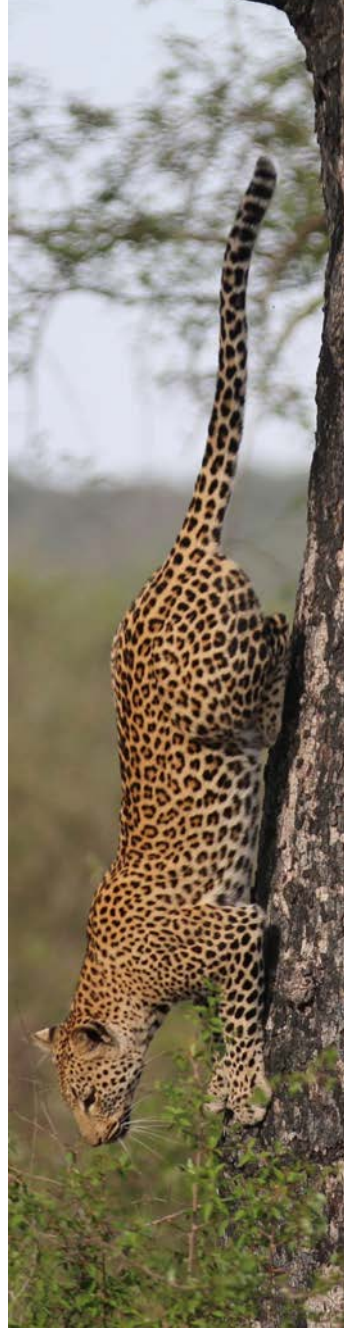
- The Knowledge Engineer must know how to use a Business Rules Management Systems to implement and produce Automated Processes and Decisions



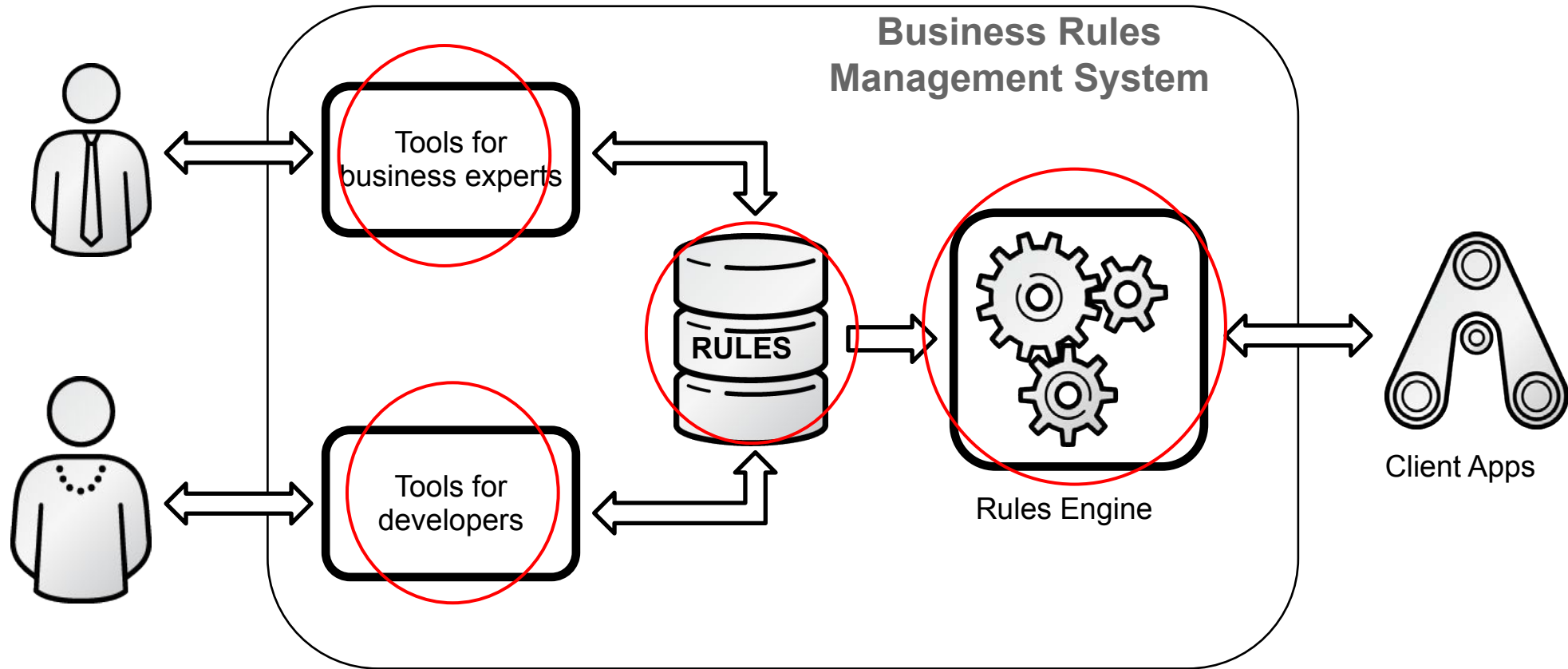
# VALUE OF BPM AND RULES TECHNOLOGY

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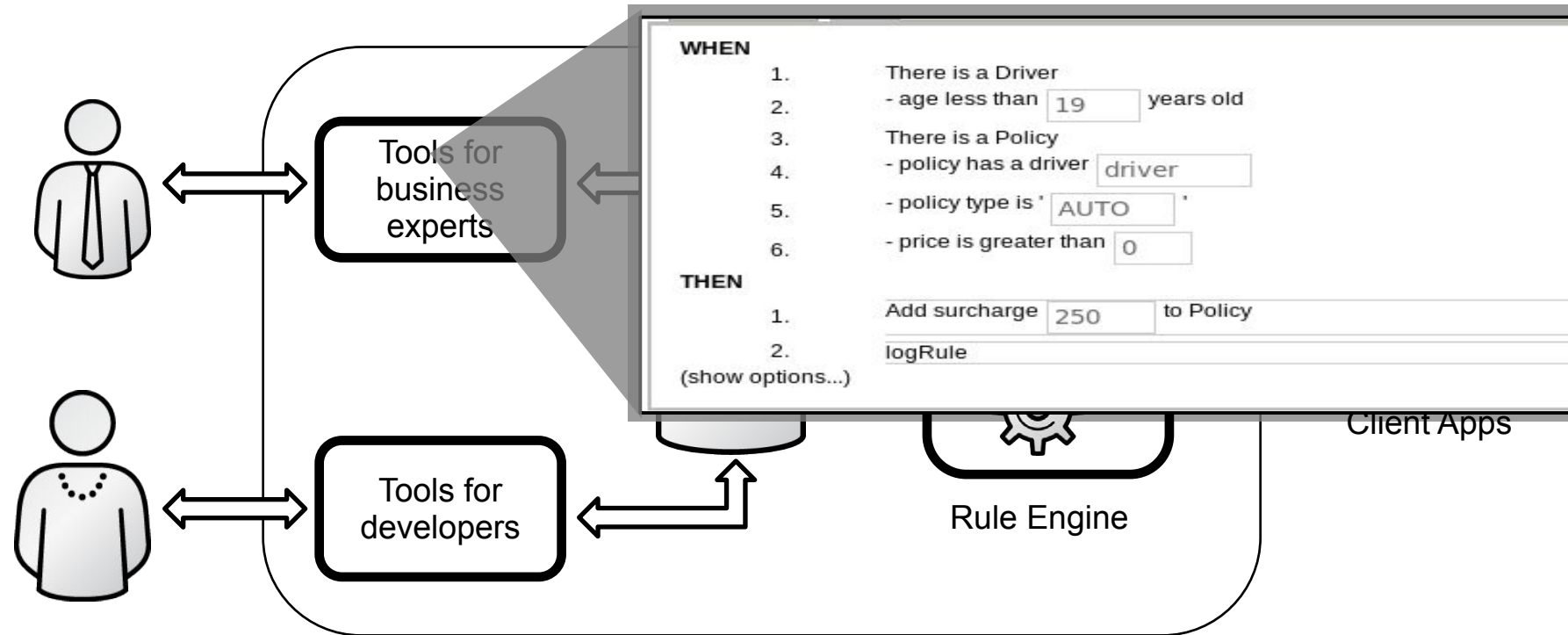
- Unlock Rules from underlying application technology
- Enforce business processes and rules consistently
- Ensure compliance to organizational and regulatory requirements
- Gain visibility into business operations
- Enable decision management in real-time through algorithmic approaches
- Eliminate the business risks associated with “Adverse Selection”



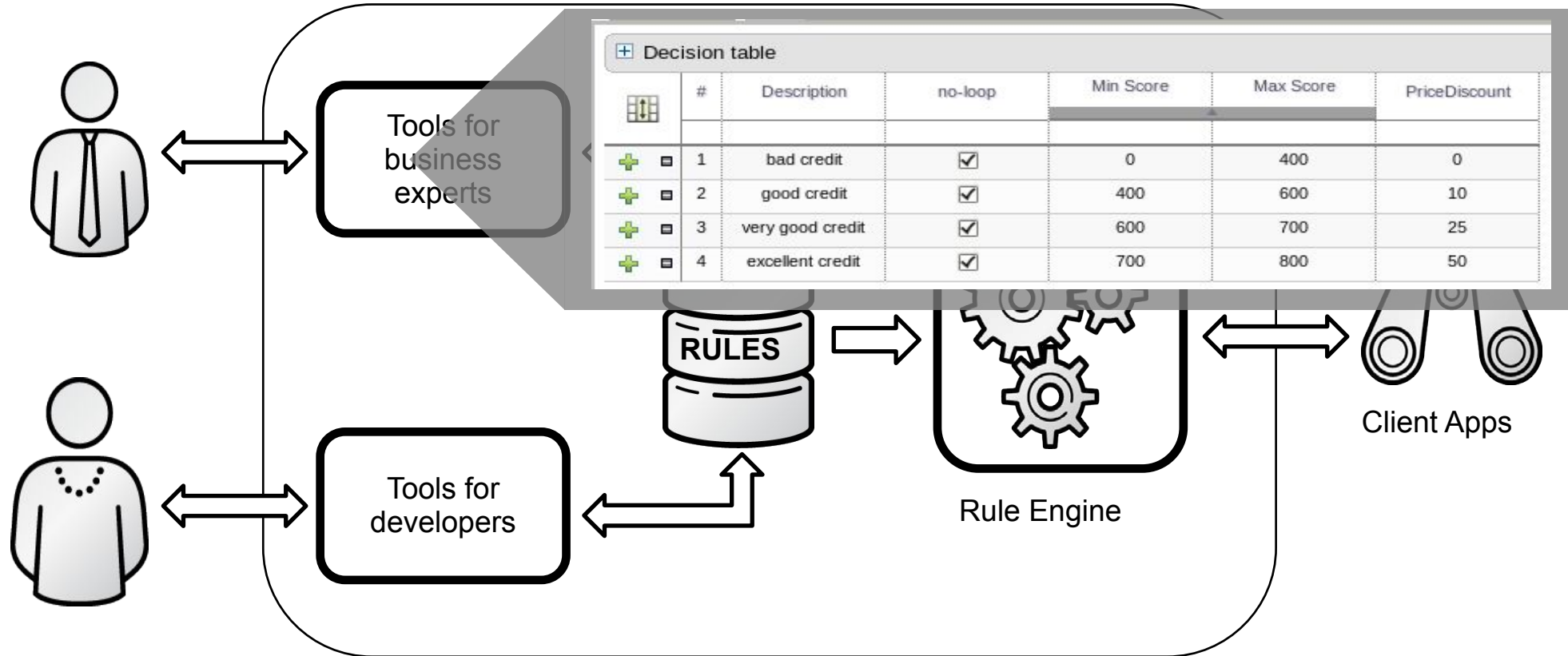
# PROCESS/DECISION AUTOMATION TOOLS



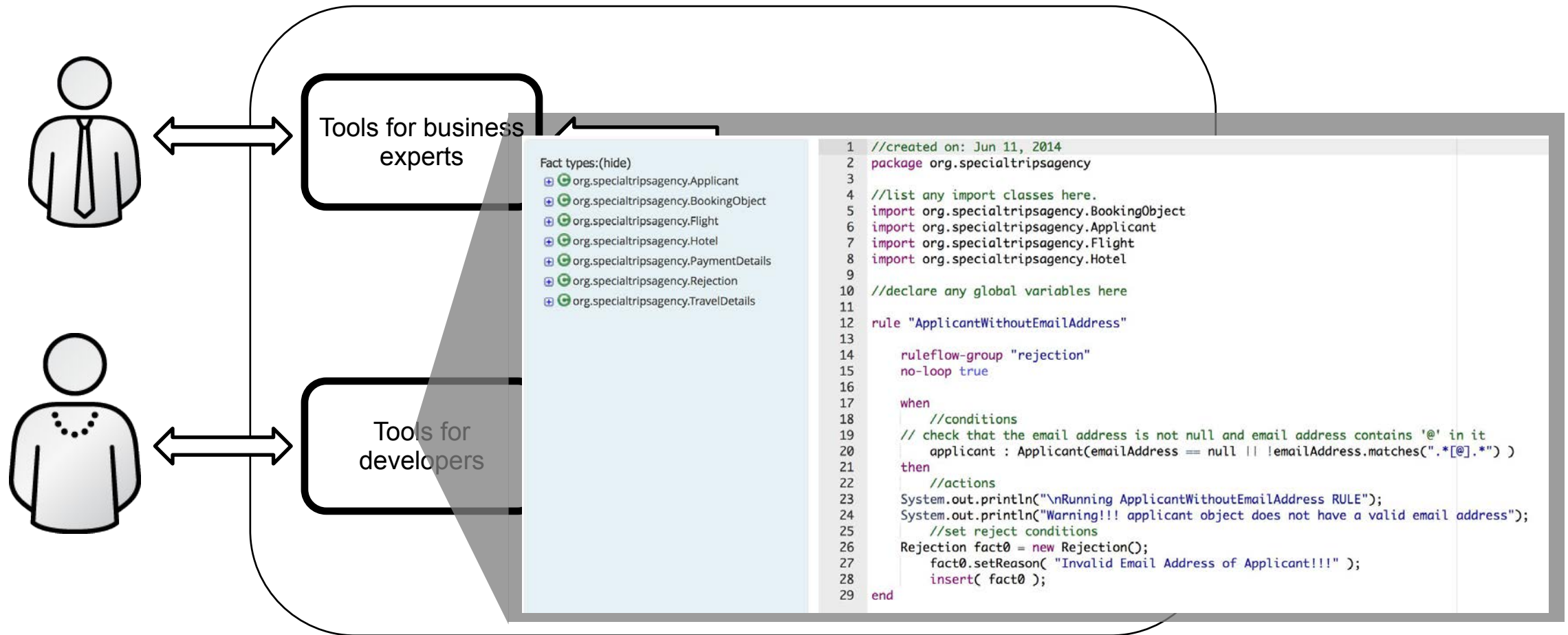
# RULE AUTHORIZING USING GUIDED EDITORS



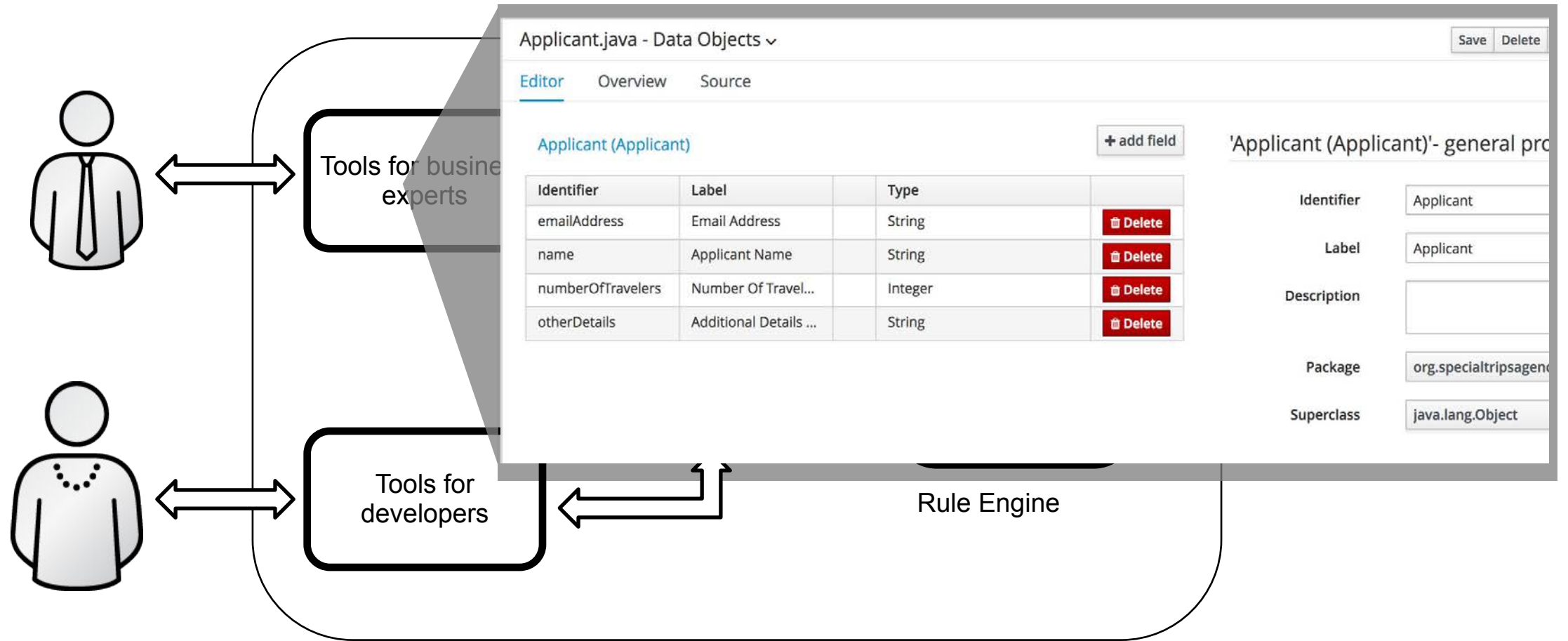
# AUTHORING RULE PATTERNS USING GUIDED TABLES



# TECHNICAL RULES FOR DEVELOPERS



# DATA MODELING





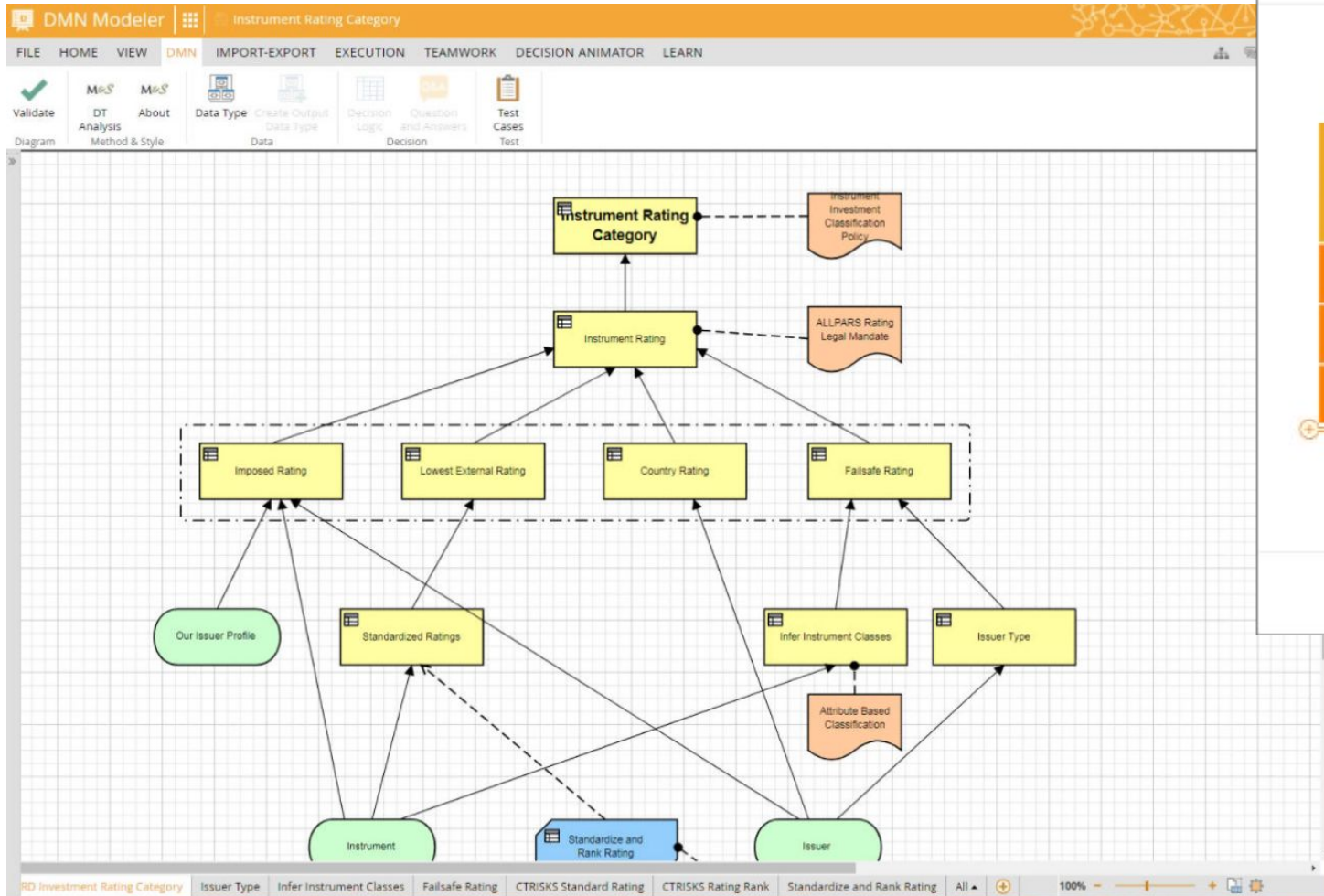
# DECISION MODEL & NOTATION (DMN)

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- DMN is an open standard. Like BPMN, its concepts and formats are not the protected intellectual property of a tool vendor or consulting firm
- DMN provides a tool-independent decision modeling notation designed by expert practitioners from FICO, Oracle, IBM, KPI/Sapiens, and others.
- New DMN-based decision modeling tools are becoming available, separate from the BRMS, with the ability to translate their business-friendly and verifiable models into the rule languages of popular business rule engines
- The advantage of an industry-standard decision modeling notation also includes lower-cost tools and wider availability of training and support



# DOMAIN MODEL AND NOTATION



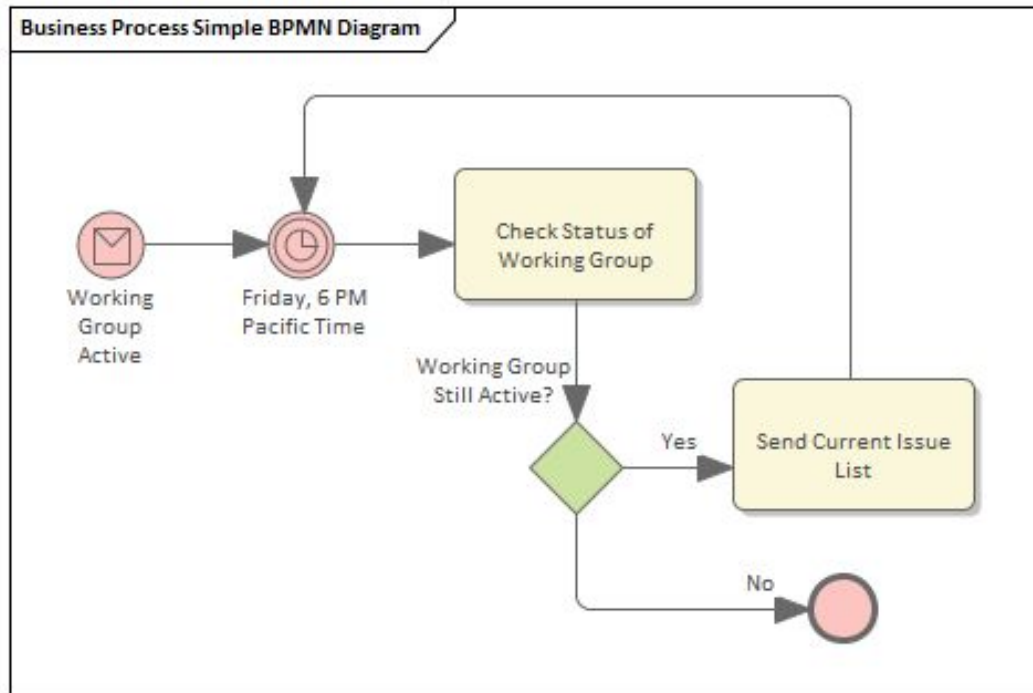
Decision Table - Eligibility

	inputs		outputs	
UC	Eligibility	Bureau Call Type	Strategy	Description
	Collection (ELIGIBLE, INELIGIBLE)	Collection (FULL, NONE, MIN)	Text	
1	INELIGIBLE		DECLINE	
2	ELIGIBLE	FULL, MIN	BUREAU	
3	ELIGIBLE	NONE	THROUGH	

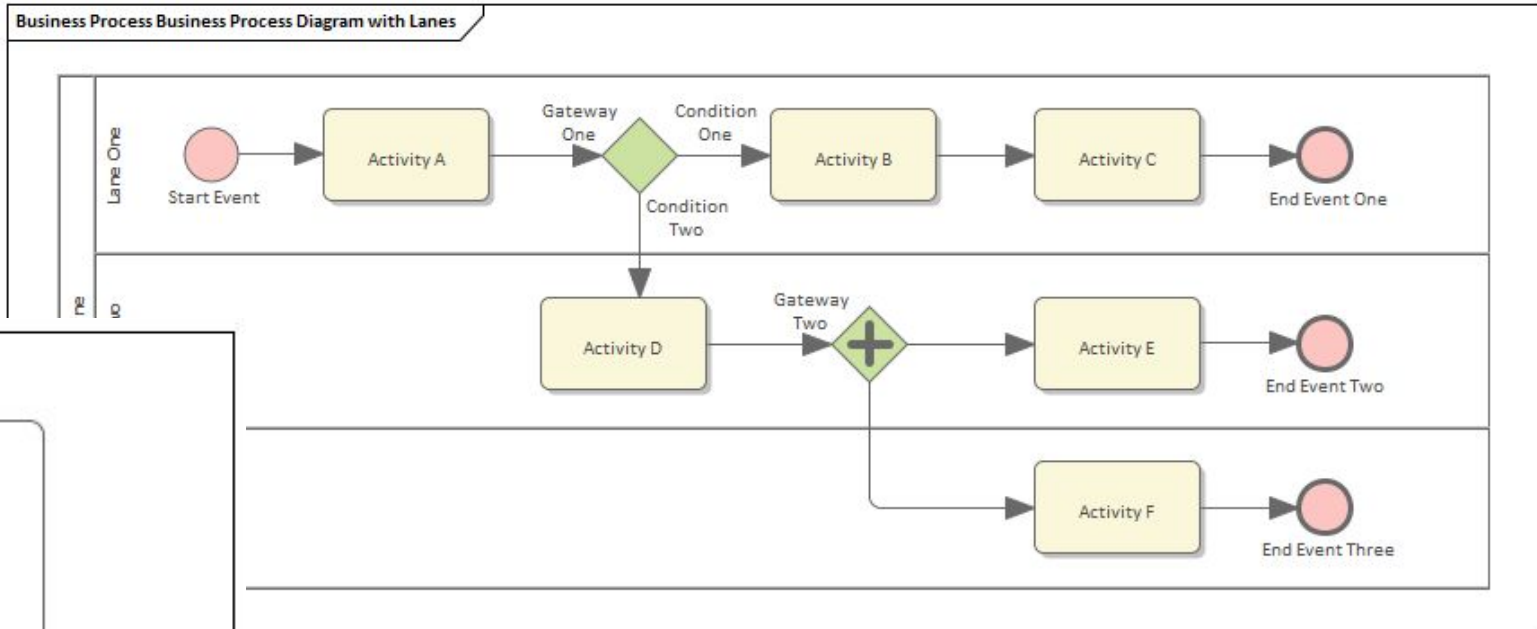
Close

# BUSINESS PROCESS MODEL AND NOTATION (BPMN)

Business Process Simple BPMN Diagram



Business Process Business Process Diagram with Lanes



# CONCLUSION

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- Whether organizations want to acknowledge it or not, knowledge has become the center of modern software architectures
- Need to bridge the gap between business and IT
- Need to address the responsibility/position imbalance
- Need to become knowledge engineers
- Acquire new skills - soft and hard
- Embrace technology
- Be part of the transformation and don't get left behind





# THANK YOU

## HEADQUARTERS

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## CONTACT US

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# QUESTIONS

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