

RED HAT
SUMMIT

BUSINESS RULES IN HEALTHCARE: GOOD ADVICE FROM THE REAL WORLD

Phil Simpson, Moderator
Sr. Principal Product Marketing Manager
Red Hat

May 4, 2017

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HM HEALTH SOLUTIONS

Anthony Roscoe
Manager, Core Architecture

Joyson Jacob
Senior Architect, Platform Architecture

May 4, 2017



Overview

HM Health Solutions (HMHS) provides innovative, technology-based solutions that enable health plan clients to achieve top-line revenue growth while reducing costs and increasing competitiveness in the market. Launched in 2014, HMHS provides software and technology solutions across multiple product lines, including Medicare, Medicaid, commercial, and individual.

The Enterprise Health Solution (EHS) is a comprehensive cloud-based multi-tenant turnkey solution. When health plan clients invest in EHS, they gain access to experienced people, proven business processes, and an integrated platform. With EHS, health plan clients achieve revenue growth, increased membership, and differentiated member experiences. With HMHS' commitment to quality, excellence in delivering solutions, and continuous product enhancements, clients can continue to adapt to their rapidly changing market needs.

HMHS is a committed community partner. The company and its employees regularly volunteer time and resources to a number of nonprofit organizations, including Variety, Boy Scouts of America, and the Challenged Athletes Foundation.

Awards & Recognition



HM Health Solutions earns HITRUST certification

HM Health Solutions earned HITRUST (Health Information Trust Alliance) Common Security Framework certification for its main claims processing systems as well as for those of affiliate United Concordia Dental. The certification recognizes the highest level of privacy and security for clients and partners.



HM Health Solutions earns "ISO9001:2008 Quality Management System" certification

HM Health Solutions' Output Services has "ISO9001:2008 Quality Management System (QMS)" certification for its two print facilities. HMHS underwent a rigorous auditing process from a third party to demonstrate compliance with the internationally recognized 9001 standard.

Fast Facts



9.7 million
members managed

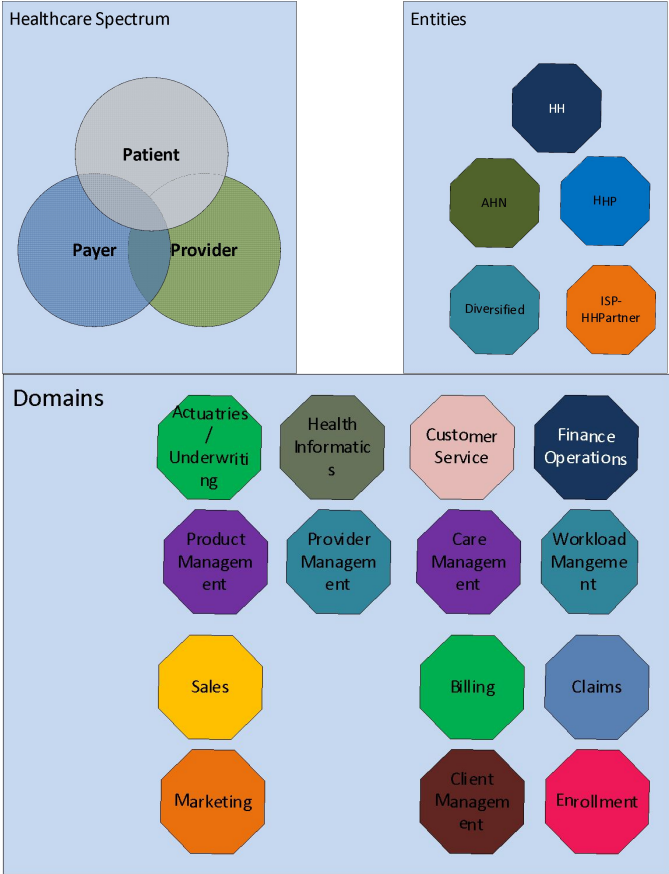
Members managed by HM Health Solutions grew to over **9.7 million** — 2 million members were added to the platform through our partnership with Blue Cross Blue Shield of Minnesota.

150 million
claims processed



HM Health Solutions processed **over 150 million claims** in 2016 on behalf of its health plan customers.

Business Rules Management : Capabilities



Leverage for Business Capabilities

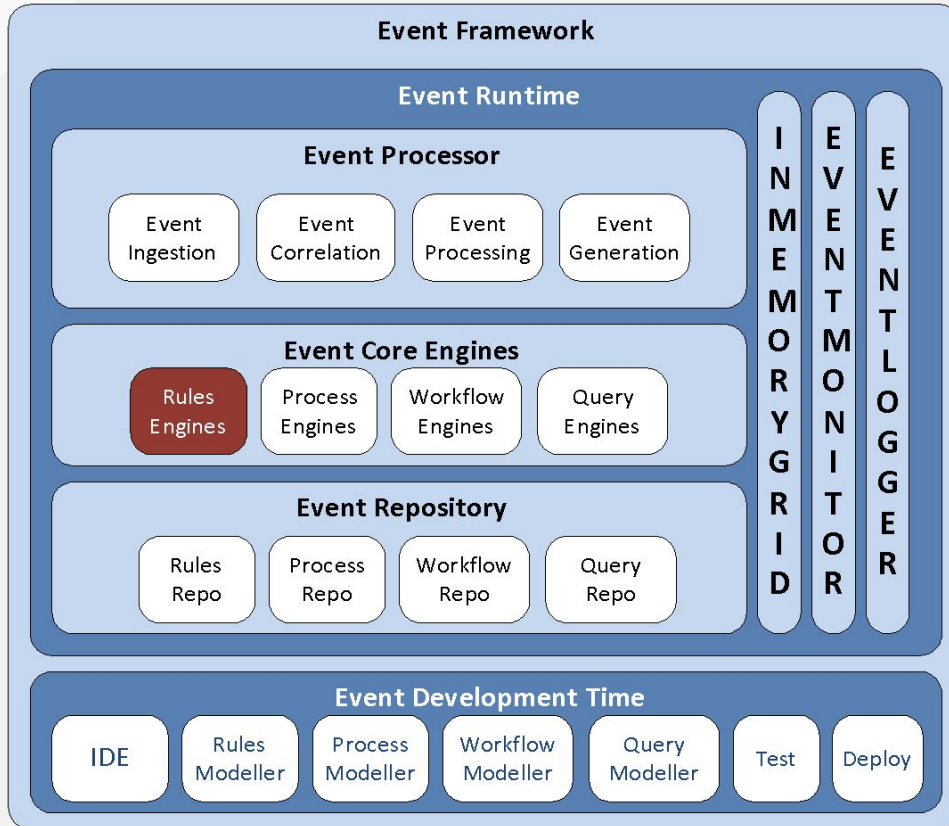
- Quickly adapt Business Rules as necessary
- Shorten Development Cycles
- Centralize Decision Logic
- Separate Business Rules from applications and services
- Millions of Rule executions per day

Leverage for IT Capabilities

- Dynamic Rules Updates
- Support multiple versions of rules
- Lightweight business rules engine
- Rules exposed in an “Embedded” and/or “Decision as a Service” mode



Enterprise Health Platform – Event Driven Architecture



Red Hat Business Rules Management System -- (BRMS)

- Web Authoring and Rules Management – Business Central
- Eclipse IDE plug-in for developers
- Business Rules Engine – KieServer

Enterprise Health Platform – Use Cases

Platform Current Usage

- Member Event Interaction Tracking
Transactions: Approx. 1 Million Per Day
Rule Complexity: Medium-High
- Care Cost Estimator (Proxy Prefix Identifier)
Transactions: Approx. 1K Per Day
Rule Complexity: Low



Platform Future Usage

- Category of Service (Medicaid, Medicare)
Transactions: Approx. 200K Per Day
Rule Complexity: Medium-High
- Care Cost Estimator (Projected Care Costs)
Transactions: Approx. 5K Per Day
Rule Complexity: High



Enterprise Health Platform – Conceptual Architecture



Key Takeaways

- Write Rule Once and deploy it as a Service and/or Embedded option
- Custom fit into existing UC Build and UC Deploy procedures using REST API

Define Ownership, Governance, Code Samples and Est. Matrix

- Pilot Owner** Anthony Roscoe
- Platform Owner** Michael T Battles
- Capability Manager** Chi Pham
- Enterprise Architect** David Nowka
- Platform Architect** Joyson Jacob
- Platform Support** Kris Kniha, Shiveeta Mattoo
- Infrastructure Contact** Aaron Boyd
- Release Management** Alan Parker
- Database** Dean Bittner

Capability: Rule Engines	Platform: Business Rules Management System				Vendor: Red Hat Ino	Product: Red HAT BRMS				
	Business Owner	Technology Owner	Infrastructure Owners			Operational Owner				
R = Responsible A = Accountable C = Consulted I = Informed	Enterprise Arch	IT Health Core Arch	Spring/DB/ES	Network Eng	Open 5PA- Oper/Infra Sys	MiddleWare Services	Open Data/BI Services	DevOps	Platform Owner	AppDev
Facilitator	Sam June	Anthony Roscoe	??	Don Matush	Don Matush	Vince Crose	Joseph Clever	Mike Vole	Mike Battles	
Capability Strategy/Roadmap	RA	R	I	I	I	I	I	I	C	I
Platform Funding		RA	I	I	I	I	I	I	I	I
Platform Strategy/Roadmap	R	RA	I	I	I	I	I	I	C	I
Vendor Mgt Relationship	C	RA	I	C	C	C	C	C	C	I
Product Installation	C	C	I	I	I	RA	RA	I	C	I
Product Configuration	C	C							RA	C
Product Security	C	C							RA	C
Product Training	C	C							RA	C
Product Monitoring	C	C							RA	C
Product Support	C	C							RA	C
Infrastructure Network Installation				RA					C	
Infrastructure Hardware Installation		C			RA				C	
Infrastructure Software Configuration		C			RA				C	
Base Software Configuration		C				RA			C	
Database Software Configuration		C					RA		R	
App Release Management		C						RA	C	
App Product Usage Tracking									C	RA

RULES-Mode	Process	Resource Skillset	Rule Complexity	Rule Permutations	Deployments
EMBEDDED	REALTIME	Low	S-SMALL	<100	DEV
DAAS	BATCH	Medium	M-MEDIUM	>100 <500	QAS
		High	L-LARGE	>500 <1000	PRD
			XL-EXTRA-LARGE	> 1000	

Rules	Rule Complexity	Effort (Hours) + One Time Overhead	Effort (Week)	Understand - Rule	Java POJO	DRL, Decision table	Unit Test	Release Management
		20	40					SRC/Build/Deploy
Rule_Template	S-SMALL	54	1.35	8	8	8	4	4
	M-MEDIUM	74	1.85	16	8	16	8	4
	L-LARGE	98	2.45	24	8	24	16	4

Spreadsheet - Rule

DRL - Rule

```
rule "Student FirstName is null"
activation-group "students"
when
  student: Student(firstName==null)
then
  System.out.println("Student FirstName is null" + student.getFirstName());
end
```

DAAS - REST/JSON

```
DEV: https://brmsdev.highmark.com/kie-server/services/rest/server/containers/instances/ctrl-2.1.0
JSON Request:
{"batch-execution": {
  "lookup": "getStudentSession",
  "commands": [
    "insert()",
    "getObject()",
    "log:highmark.brms.Student"
  ]
}}
Response:
{"firstName": "Tom",
 "lastName": "Sawyer"}
```

EMBEDDED - Java

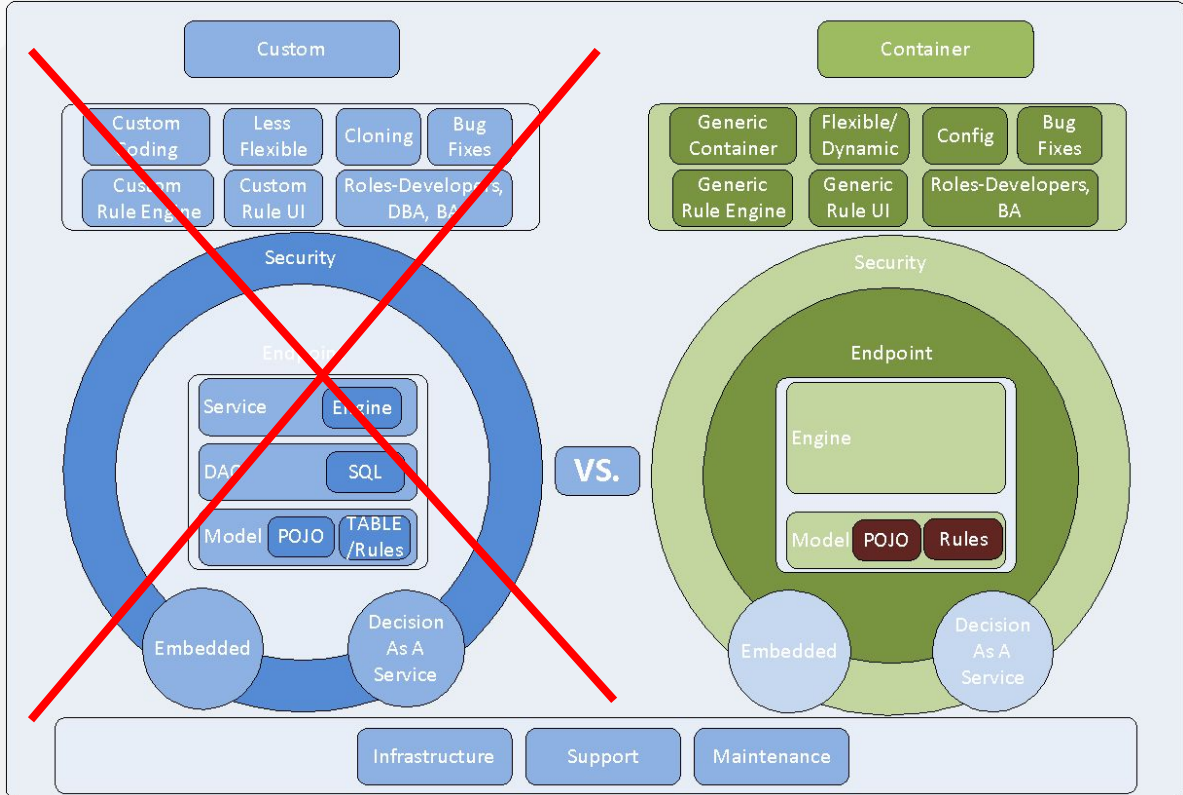
```
public void executeRule(){
  KieServices kieServices =
  KieServices.Factory.get();
  KieContainer kieContainer =
  kieServices.getKieClasspathContainer();
  KieSession kieSession =
  kieContainer.newKieSession("kession-
  rules");
  kieSession.insert(student);
  int retVal= kieSession.fireAllRules();
  System.out.println("Results: Student->"
  + student + " retVal->" + retVal);
}
```

Rule Complexity:Resource Skillset	Effort (Hours)	Skillset/Dependencies
S-SMALL:High	54	Knows Plugin vs Business Central Rules Designer
M-MEDIUM:High	74	Experience in writing Rules - DRL, Decision Tables
L-LARGE:High	98	Core Java
S-SMALL:Medium	74	Web-Service - Client
M-MEDIUM:Medium	98	Understands Highmark Processes (SARA, Harvest, GIT, UC Build, UC Deploy)
L-LARGE:Medium	120	Embedded vs Service
S-SMALL:Low	98	
M-MEDIUM:Low	120	
L-LARGE:Low	240	

Rule ID	Rule Complexity	Resource Skillset	Effort (Week)
Rule_1	M-MEDIUM	High	74.00
Rule_2	L-LARGE	Medium	120.00



Evangelizing with Developers



Key Takeaways

- New/Maintenance rules development time reduced by 3:1 ratio
- Reduces and/or eliminates Custom Rule Engine Core development and maintenance
- Industry standard Rule Engine that has algorithms in-built for performance and speed

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RED HAT BRMS REDEFINES HEALTHCARE INNOVATION

Robert Barker
Application Director Clinical

Patricia Bogoevici
Director, Consulting

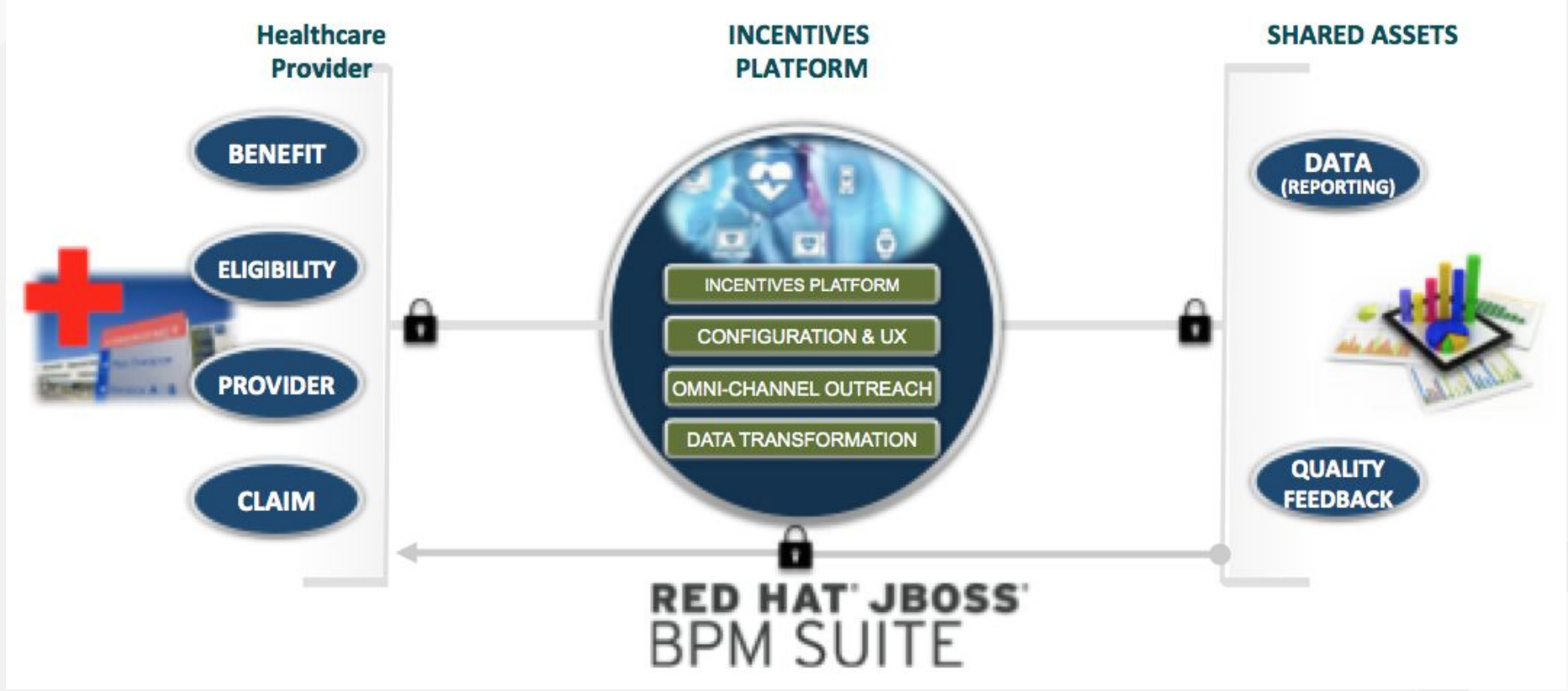
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RED HAT BRMS Redefines Healthcare Innovation

Key focal points for this session

- **Collaboration, culture change and the removal of silos**
- **Real world example**
- **Empowering delivery teams to innovate in US Healthcare**
 - **The power of DevOps and Agile and modern software engineering**

Use Case – Healthcare Provider Incentives Platform



Big Data & Business Rules Approach

Business Rule Configuration versus Code Development: Enables speed to market.

Volume (data at rest): terabytes, exabytes, petabytes and zettabytes of data.

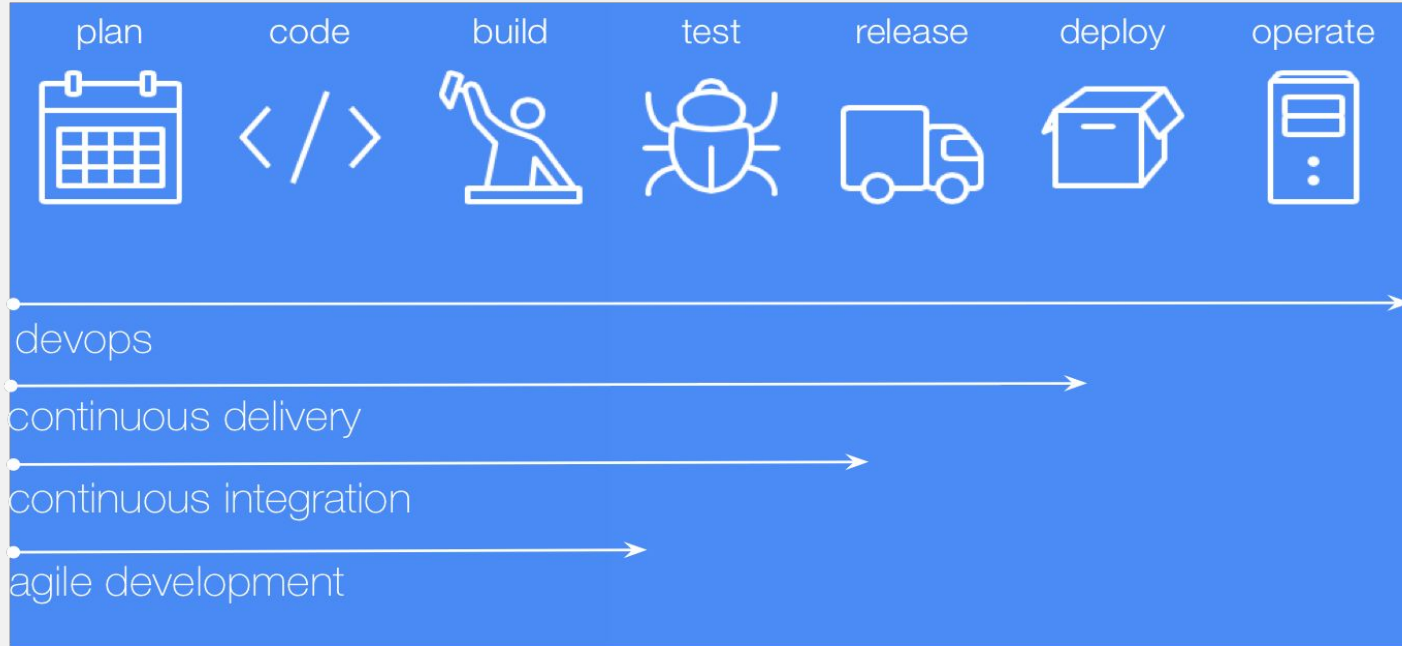
Velocity (data in motion): capturing and processing streaming data in seconds or milliseconds to meet the need or demand.

Variety (data in many forms): structured, unstructured, text, multimedia, video, audio, sensor data, meter data, html, text, emails, etc.

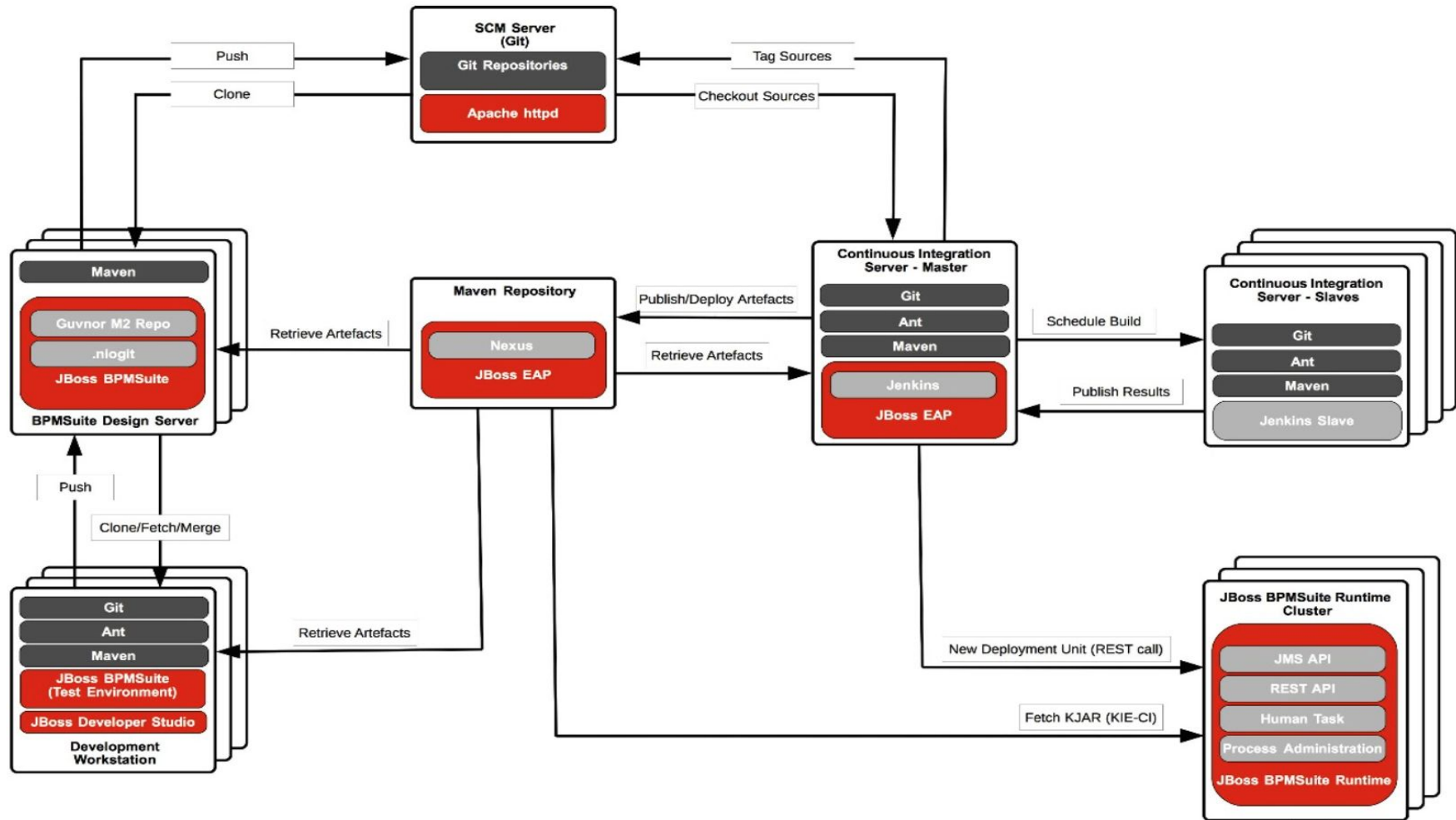
Variability (data in change): the differing ways in which the data may be interpreted; different questions require different interpretations. Data flows can be highly inconsistent with periodic peaks.

Value (data for co-creation): The relative importance of different data to the decision-making process.

DevOps, Agile and modern software engineering



collaborate



PANEL DISCUSSION

HM Health Solutions

Anthony Roscoe
Manager, Core Architecture

Joyson Jacob
Senior Architect, Platform Architecture

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Cigna

Robert Barker
Application Development
Director

Red Hat

Patricia Bogoevici
Territory Services Manager

Michael Holp
Application Platform Sales Specialist

Phil Simpson
Product Marketing Manager

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THANK YOU



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The logo consists of a red speech bubble shape pointing downwards, containing the text "RED HAT" in a smaller font above "SUMMIT" in a larger font, both in white.

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EXPERIENCE
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