Real-time Fraud Detection for Mobile Enterprises: IBM Smarter Process with Predictive Analytics September 17, 2014

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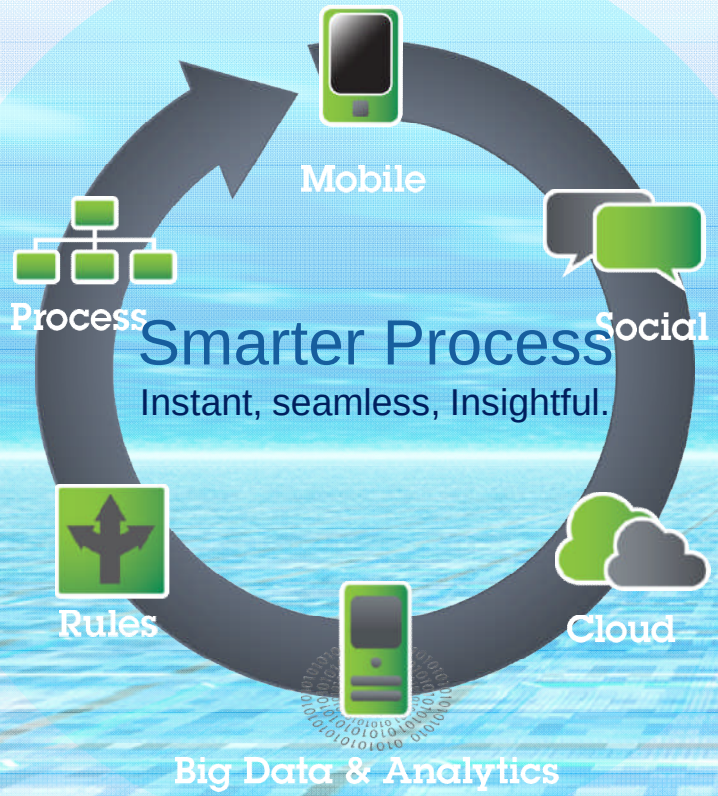
Agenda

- Smarter Process Strategy : mapped to Fraud Detection components
- Why Focus on Fraud & Financial Crimes
- Why System z for Fraud Detection
- Integrating Transactions and Analytics with Efficiency
- Overall Reference Architecture for System z detection
- Demo of Optimized System z Fraud Detection
- Summary

Smarter Process

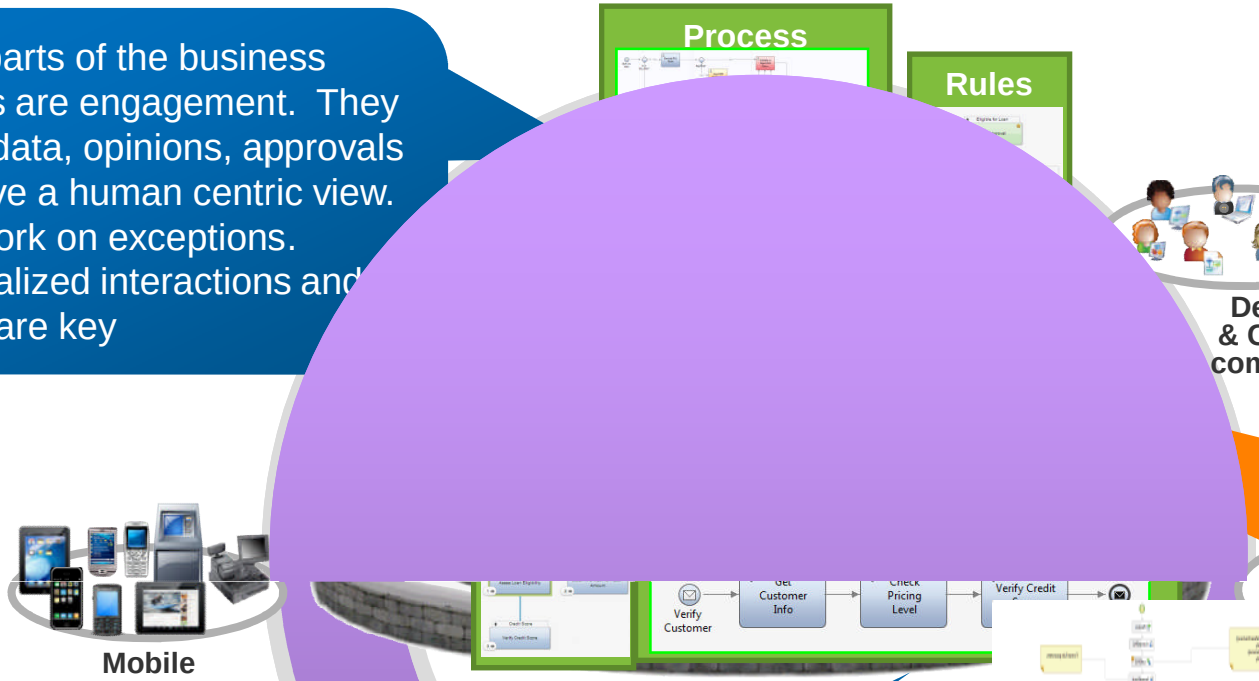


Smarter Process is…

IBM's approach
for driving ***innovation***
into day-to-day
business operations
to
transform the customer experience

Smarter Process in the future world of SOE (and SOE and SOR)

Some parts of the business process are engagement. They gather data, opinions, approvals and have a human centric view. They work on exceptions. Personalized interactions and mobile are key

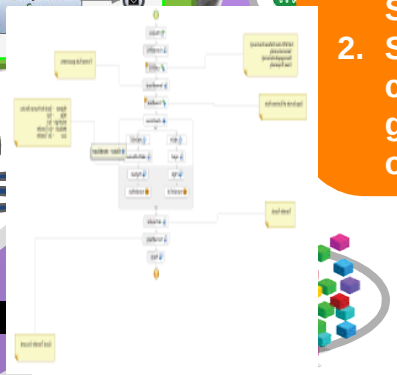


Developer & Customer communities

1. Top down HC drives a connector going from outer ring SOE to inner ring SOR.
2. STP drives a connector that goes from SOR to outer ring SOE

zConnect ?

Mobile PoS, ATMs



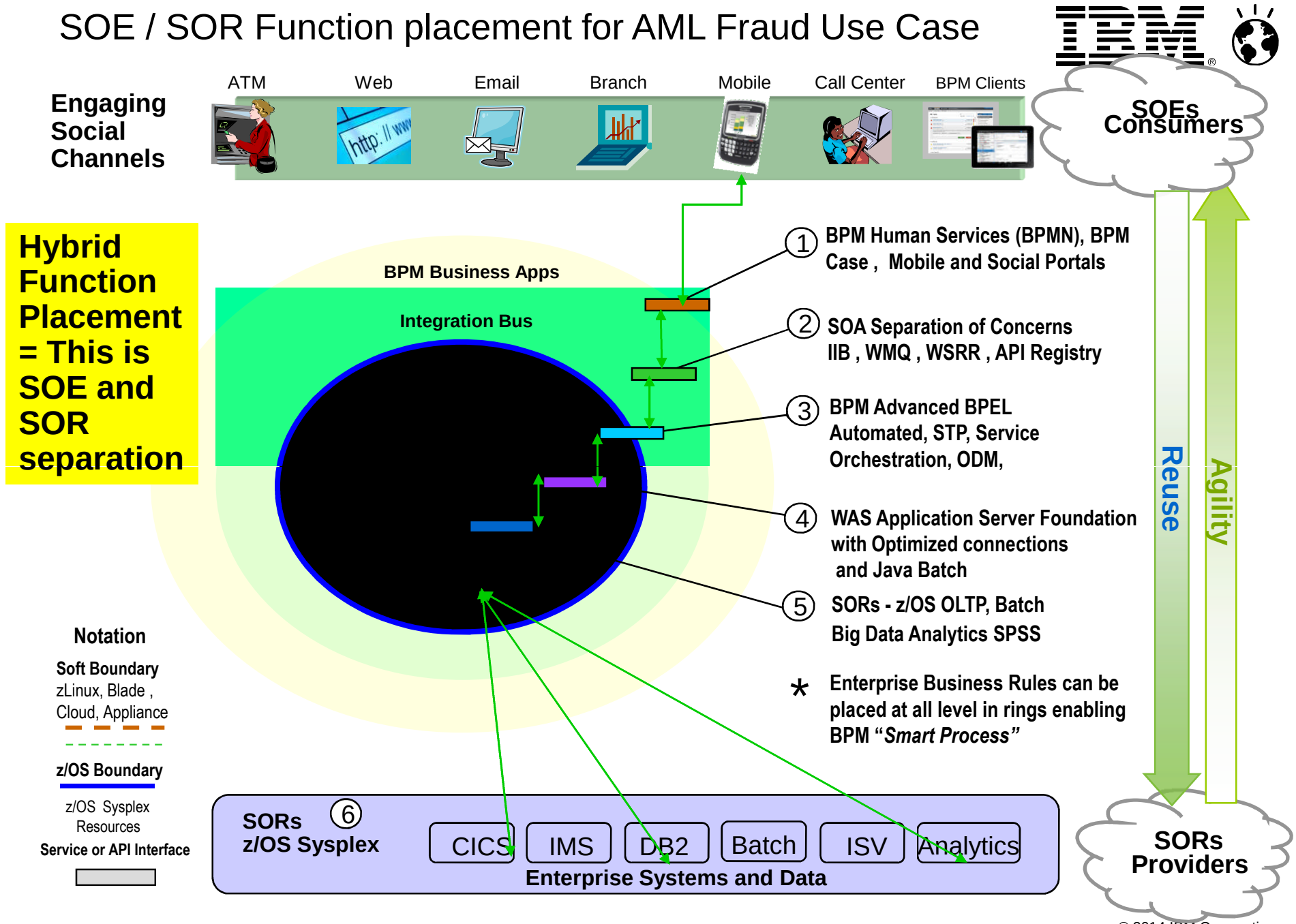
Big Data

And Analytics

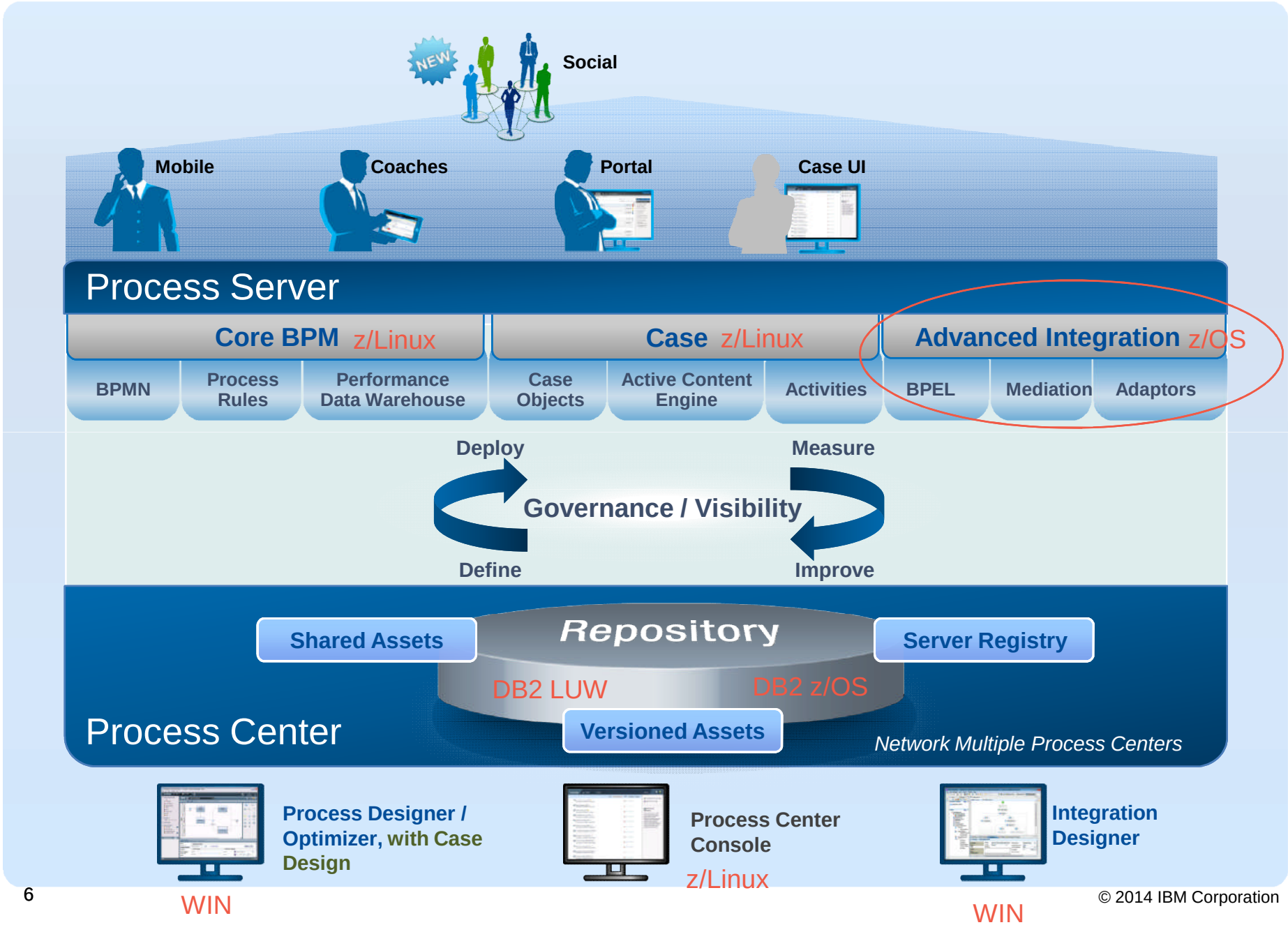
Straight through processes start here, they live here, they are close to the data and assets. Process fragments and orchestrations are here too. They evolve more slowly.

Trading partner communities

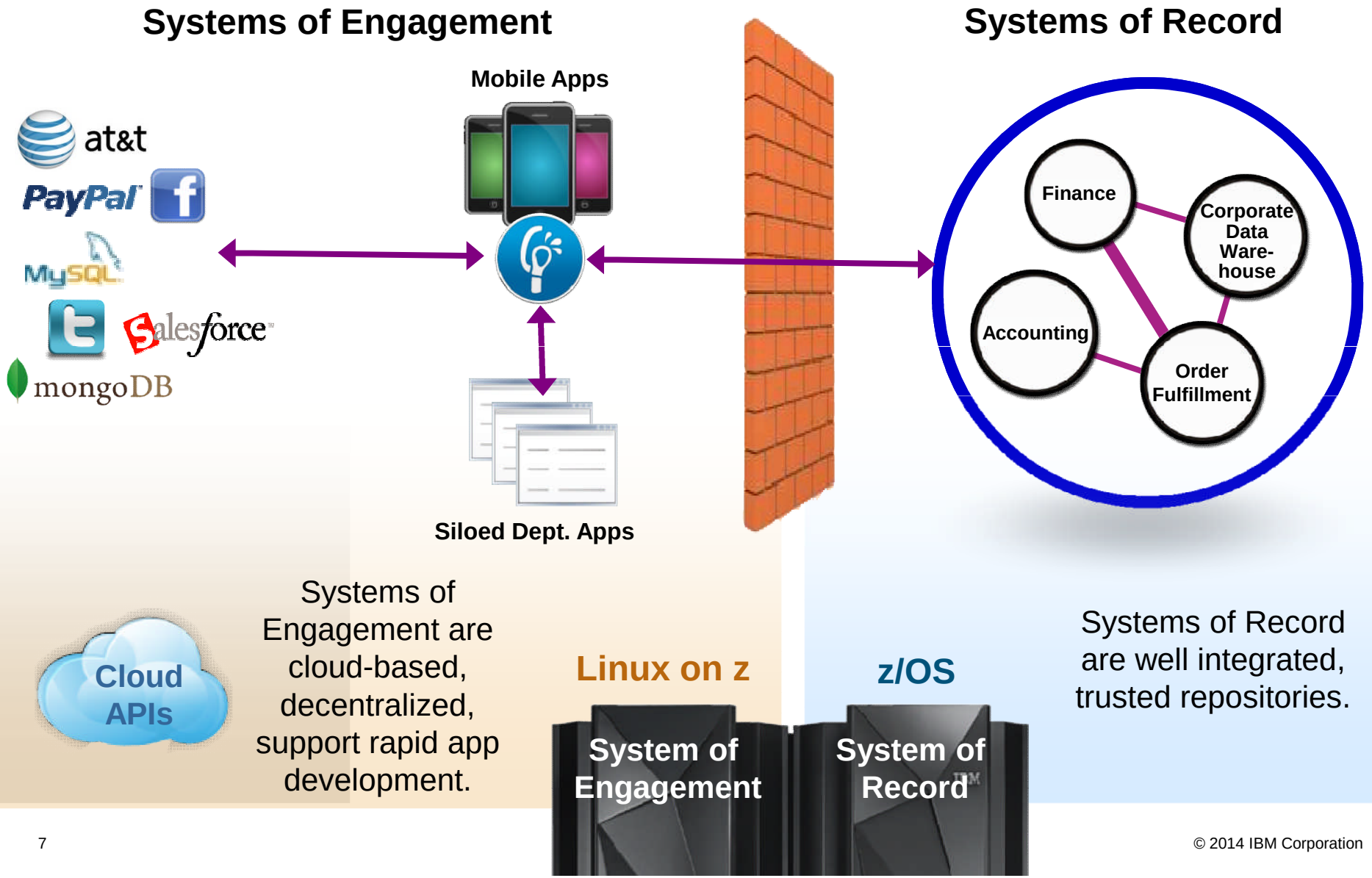
SOE / SOR Function placement for AML Fraud Use Case



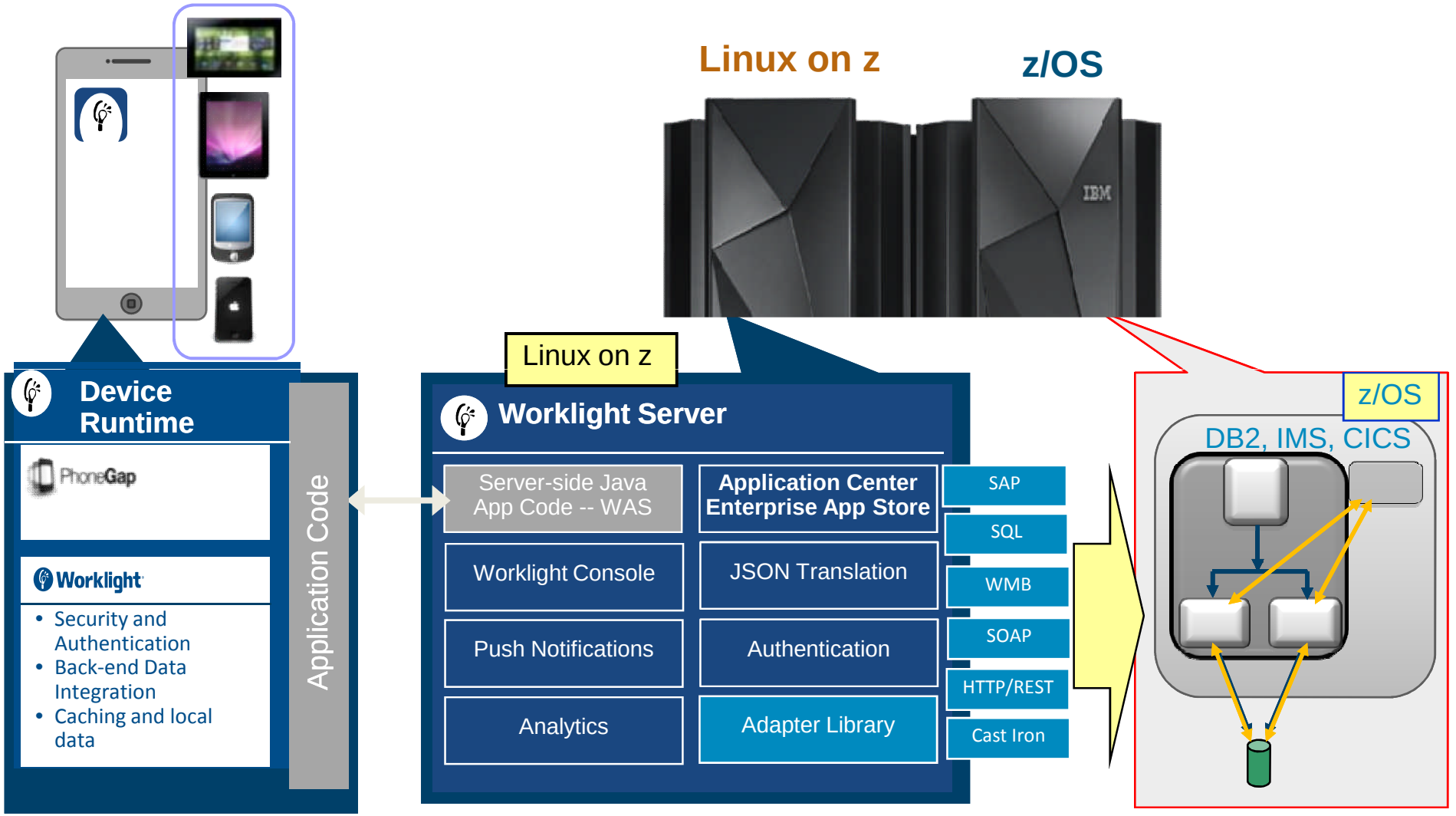
IBM Business Process Manager and AML Fraud Use case



System z bridges Systems of Record and Systems of Engagement



IBM Worklight Server on System z



Why Focus on Solutions for Financial Crimes?

*Opportunities to *complement* and *supplement* structures in place today*

- **Anti Money Laundering compliance fines still occurring**
  - http://www.theguardian.com/business/2014/may/30/bnp-paribas-faces-10bn-fine-us-sanctions-investigation

	Named Officer	Sanctions Screeing	Know Your Customer	Suspicious Reporting	Policies and Procedures	Training	Testing	Criminal Activity	Fines and Penalties
2011		X	X	X	X	X			$8.9M
2010		X	X	X	X	X			~$1B
2010		X							$500M
2010			X	X	X	X			$160M
2009		X							$350M
2008	X		X	X		X	X		$27M
2008				X			X		$15M
2007		X	X	X	X	X	X		
2007		X	X	X	X	X	X		
2007			X	X					$31M
2007	X	X		X			X		$80M
2006			X	X				X	$25M
2006			X	X				X	$38M
2005			X				X		$80M
2004			X	X	X	X		X	$41M

- **Ongoing fraud losses require a more proactive, pre-loss approach to detection and prevention**

$226B

Estimated loss due to healthcare fraud

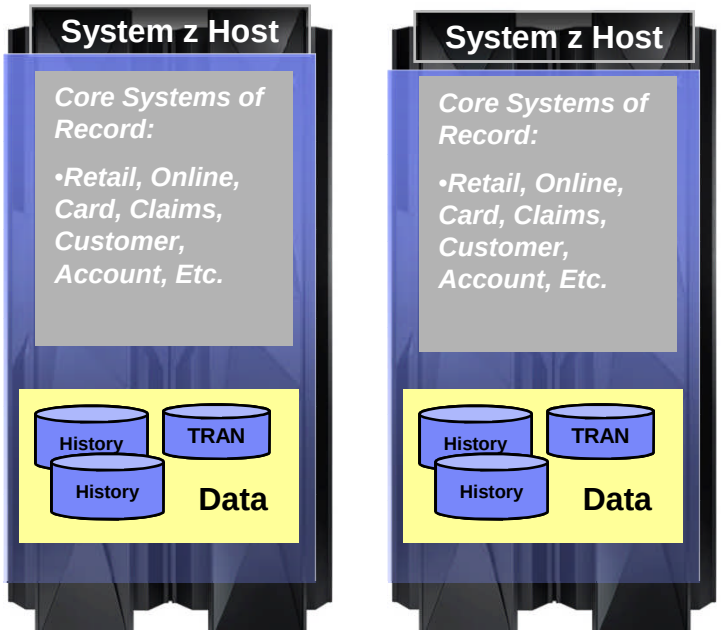
16%

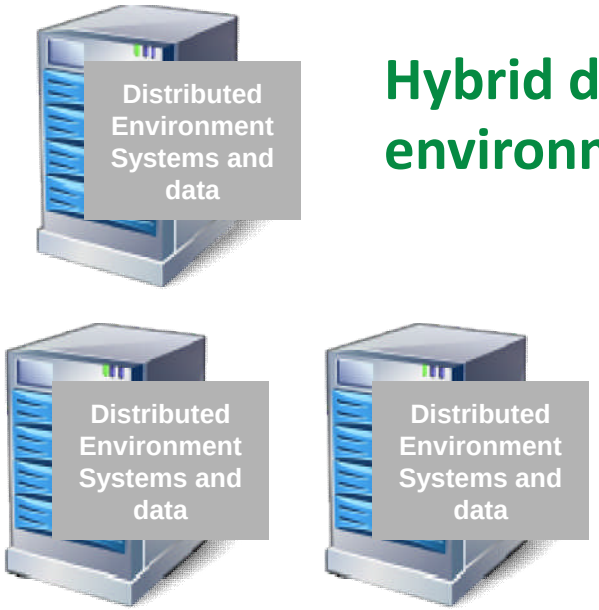
Government tax revenues lost to non-compliance

$79B

Estimated loss in US due to insurance claims fraud

Where are the transactions & data that feed fraud analytics?





Hybrid data environments

- ❖70% of the data accessed for analytics originates on System z
- ❖2/3 of business transactions for US retail banks run directly on mainframes
- ❖Businesses that run on System z
  - 25 of the top 25 worldwide banks
  - 23 of the top 25 U.S. retailers
  - 9 of the top 10 global life/health insurance providers
  - 64% of Fortune 500
  - 45% of Fortune 1000
  - 71% of Fortune Global 500

Significant portion of data resides on System z

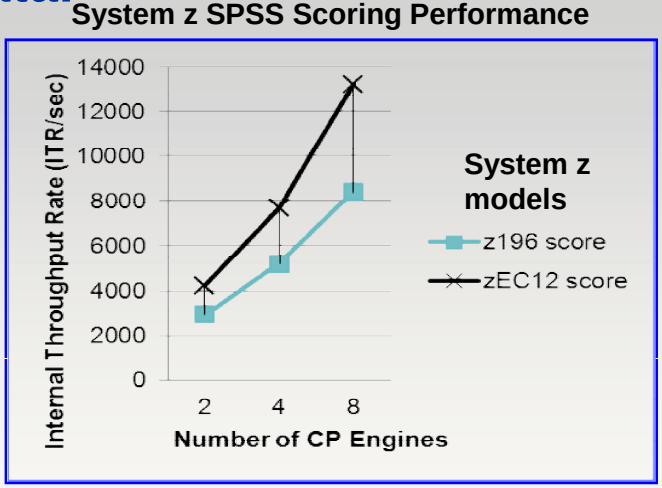
Optimize Detection When Data Resides on System z

♦ *IBM has invested in key analytic technologies for System z*

★Unique: execute predictive ***models inside transactional database***, with little data movement

- ★ ***7x performance*** improvement compared to moving data for analytics
- ★ Achieve **huge scales** of execution without performance degradation
- ★ Leverage historical and current transaction data to produce **most accurate results**

Co-locate analytics with data!



Execute thousands of model scores per second with very high scale

♦ *Available System z Business Solutions:*

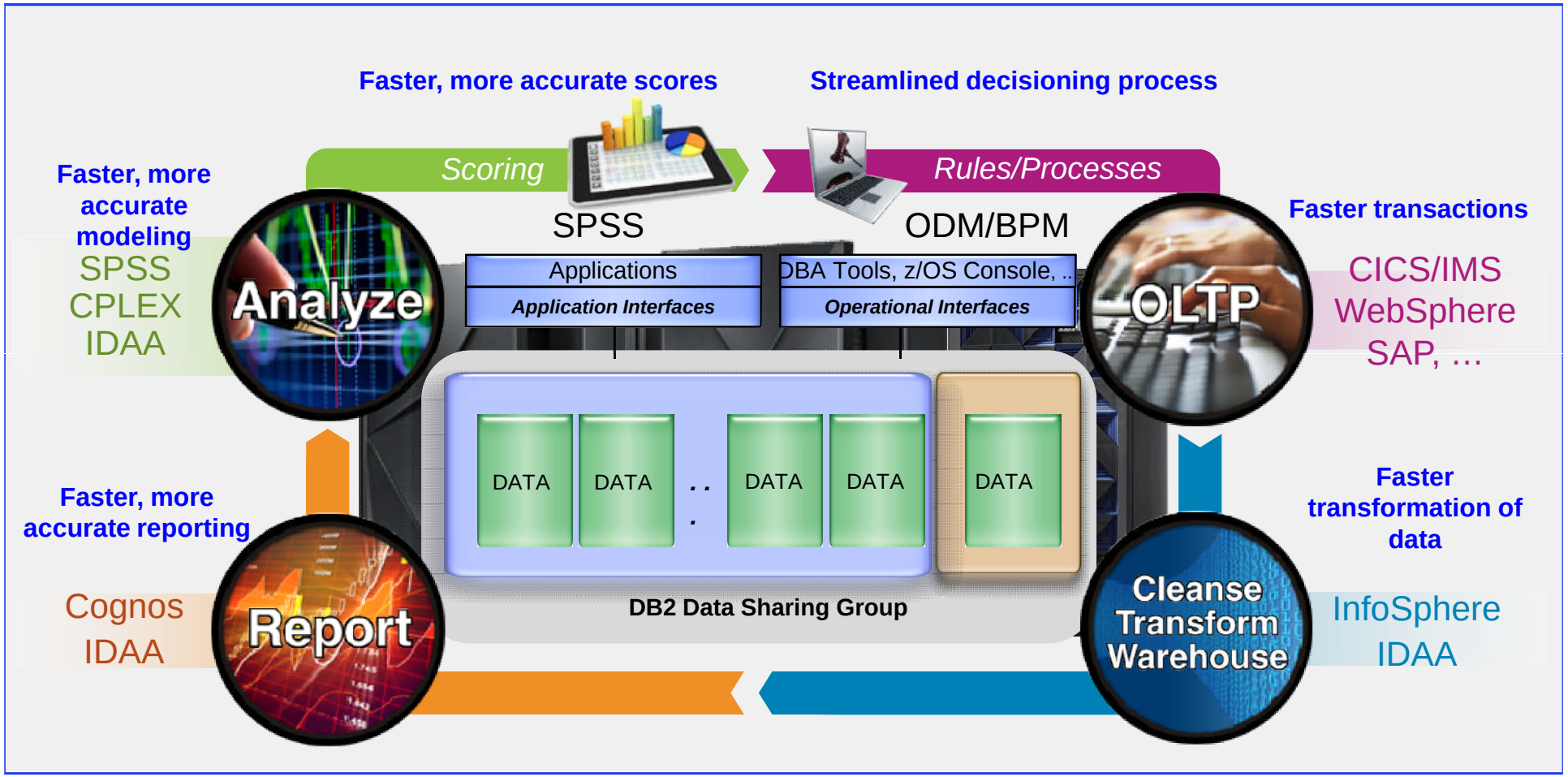
★IBM zEnterprise Smarter Analytics for Banking - fraud & anti-money laundering focus

★IBM Signature Solution – anti-fraud, waste and abuse for Healthcare & Insurance on zEnterprise

★IBM Signature Solution – anti-fraud, waste and abuse for Tax on zEnterprise

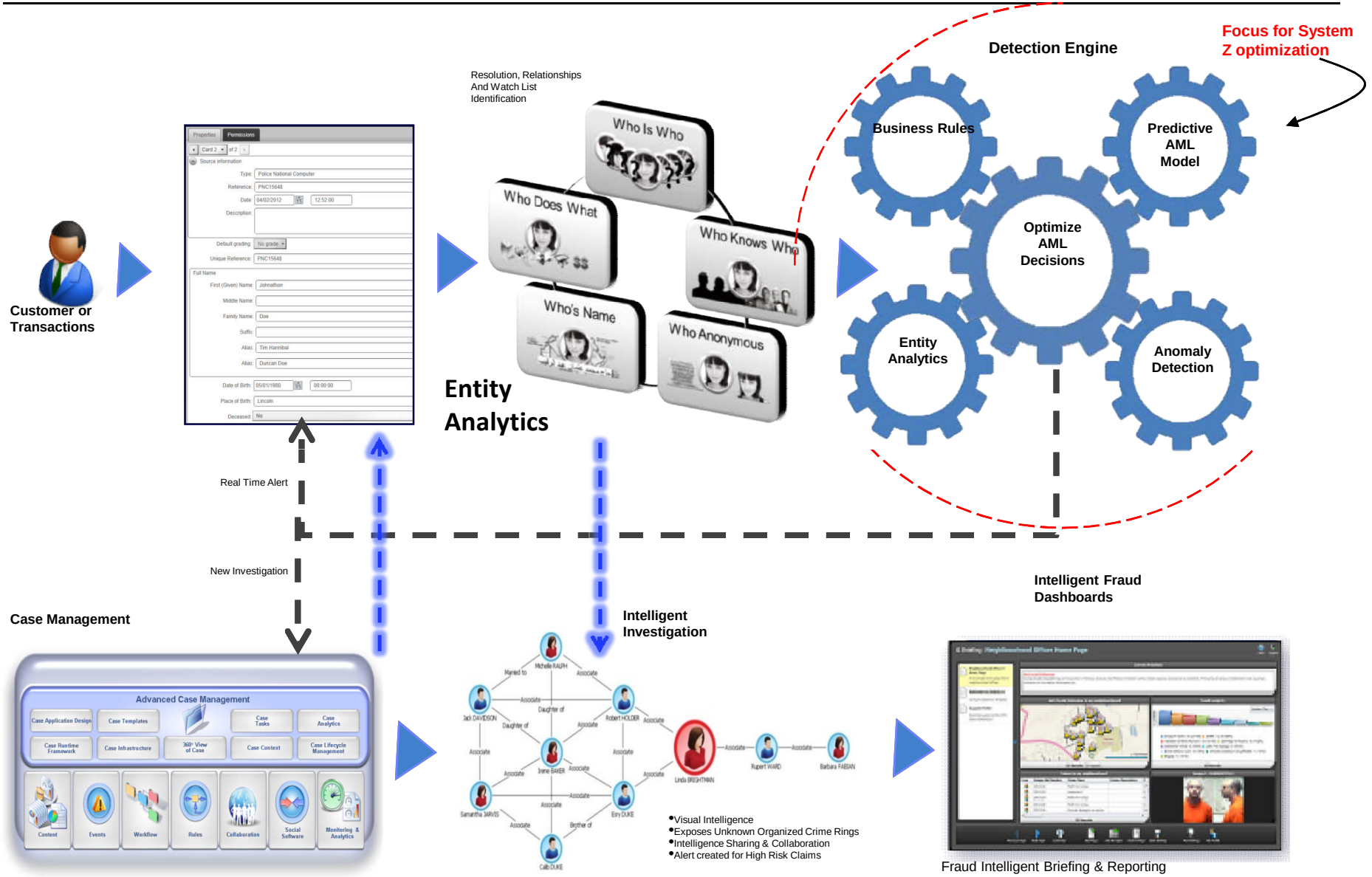
★IBM Signature Solution for Next Best Action on zEnterprise –July 2014

System z: re-inventing the transact-transform-report-analyze cycle around an integrated view of business-critical data

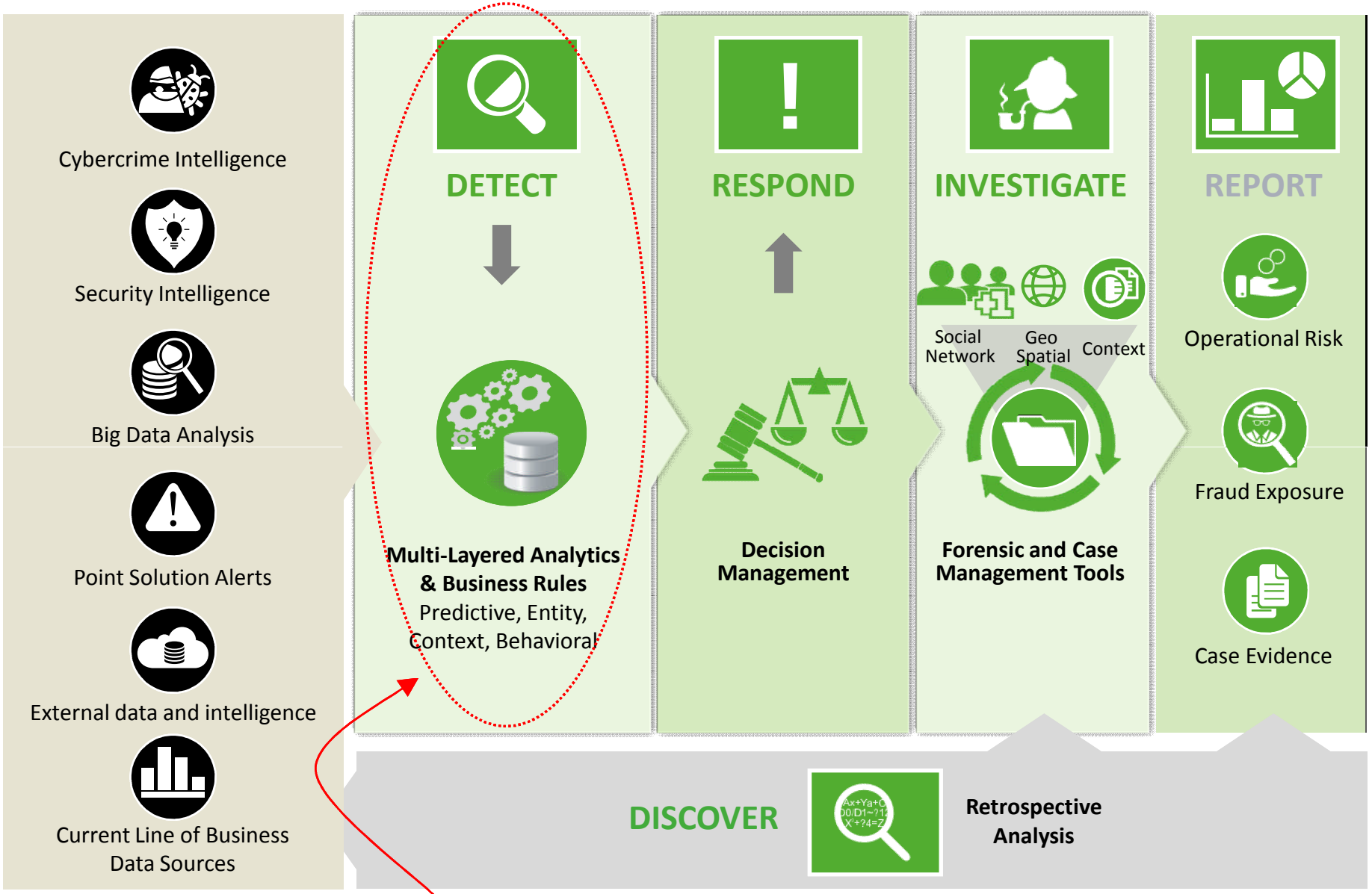


Best of class Data Life Cycle Management for:
Fighting fraud, preventing financial crimes, generating customer insights, …

IBM zEnterprise Focus within Fraud Management



IBM Counter Fraud Management game-changing capabilities



Optimizing IBM Counter Fraud Management
Detect for Performance & Security

Identity Context Analysis
- Resolve identities
- Identify relationships

Business Rules
- Industry specific rules
- Business expertise

Segmentation
- Company
- Fraud
- Region

Predictive Models
- Find patterns and potential fraud in the data

Anomaly Detection
- Compare with normal behavior within a segment
- Association modeling to expose relationships

- Can clients leverage advanced analytics and ***meet demanding SLAs*** for performance & throughput?
- Can the predictive models ***integrate*** large volumes of valuable ***historical data*** with incoming ***transaction data*** for most ***accurate outcomes***?
- Can detection analytics be performed while ensuring ***best of breed security for sensitive data***?

Why is performance important for fraud analytics?

- Banks want to detect fraud, but will not risk transaction SLAs, according to banking SMEs

- Many insurers process huge amounts of claims per day and will receive penalties if they fail to pay on-time

What have clients put in place today?

- Clients forced to detect less than 100% of transactions due to the performance impact of a sub-optimal analytics environment

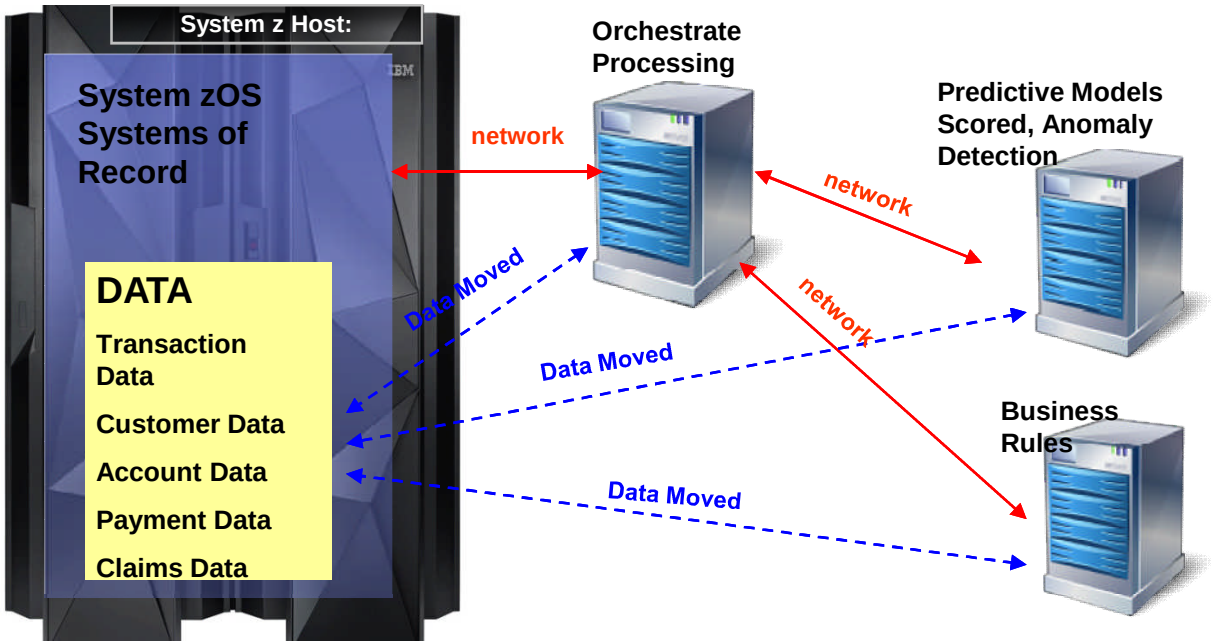
- Clients deploying basic rules for fraud detection instead of predictive models due to performance implications

- Clients using older, ETL data for detection rather than transaction data

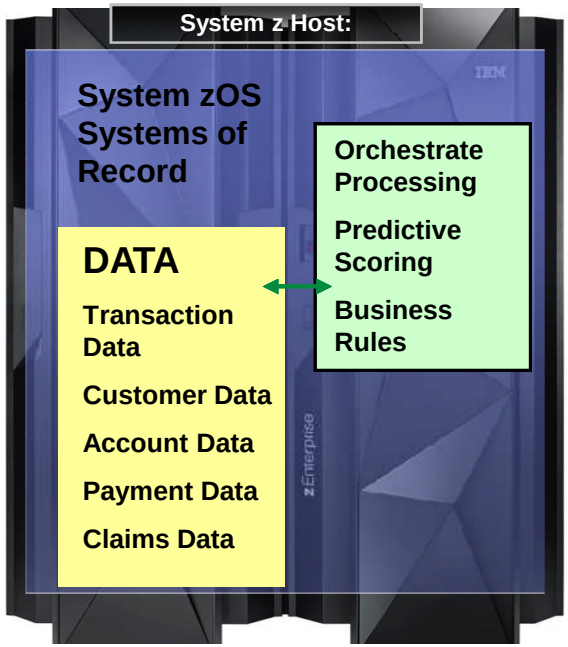
This has resulted in significant fraud / overpayment losses, delayed reaction for money laundering issues, ….

Compare Analytic Scenarios for Customers with System Z Data

Move the data to the analytics



Move the analytics to the data

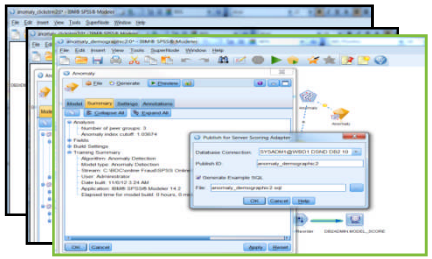


Key Characteristics

- ***Unparalleled, proven performance execution for models and rules, with NO data movement***
- ***Leverage existing best of breed security with System Z infrastructure***
- ***Leverage existing transaction level auditing and logging for governance***
- ***Leverage existing, tested HA / DR capabilities already configured with System Z***

AML Fraud BPM Detection Process with DB2 for z/OS - Deployment View

SPSS Modeler Client



AML / Fraud
Golden Nugget
Model / Publish

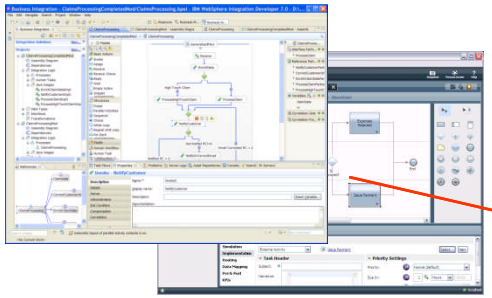
Publish Modeler Stream

DB2 for z/OS

Demographic
Session
Fraud / Anomaly

DB2 z/OS v10 With real time Scoring Adapter

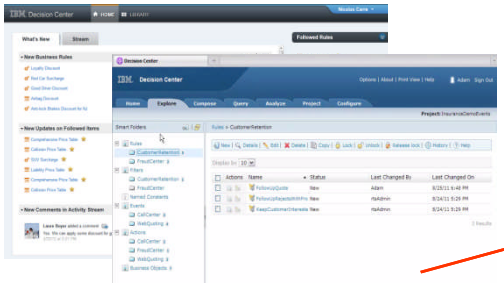
IBM BPM Integration Developer and Process Designer



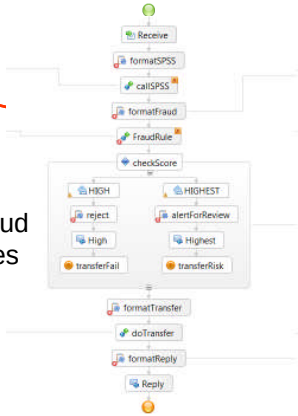
Deploy

SPSS UDF Invoked Inline via normal SQL invocation

Decision Center and Business Rules Designer



BPM Fraud Processes



definitions
set 'originator' to the originator of Transaction ;
set 'benificiary' to the benificiary of Transaction ;
if originator the customer of Bank or benificiary the customer of Bank
then set the rule trigered to "High Risk Geography for Non Customers transaction" and rule score to 30 of ruleScore;

ODM Fraud Rules

WAS ND for z/OS

Process Hub for z/OS

BPM Common API (JMS, WS, Java) S

Other

Automated Processes and Exceptions

Response To Channe

Fraud Monitoring Process

Fraud List Screening

KYC Scoring Process

CF

Business Rules

Real Time Analytics

Staff and Automate Exceptions

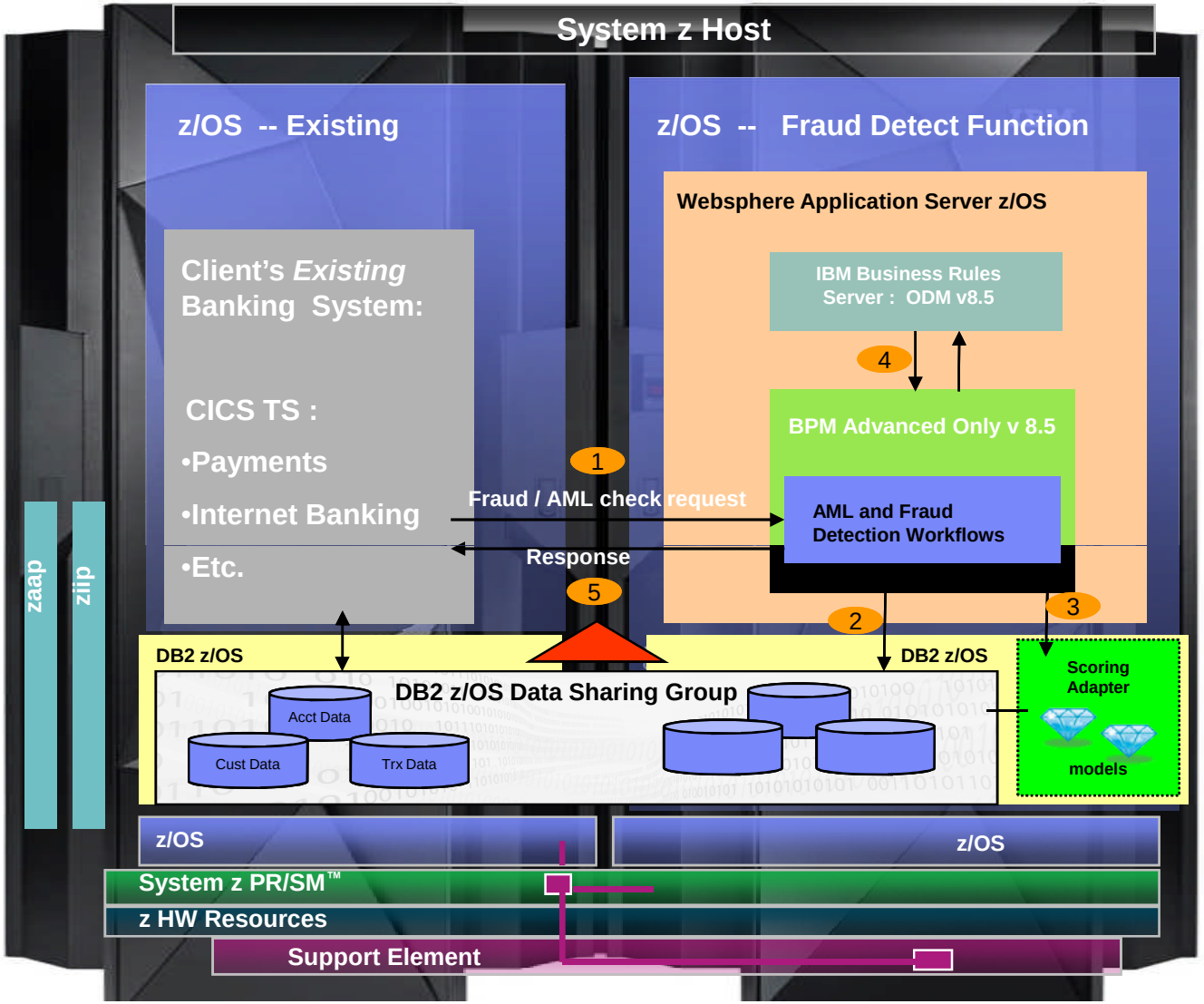
Monitor Events

BPM V8.5 Advanced for z Rich Process SOA Context

z/OS Optimized Local Connectors

DB2 z/OS

Example using CICS banking workload invoking Fraud / AML detect



Notes:

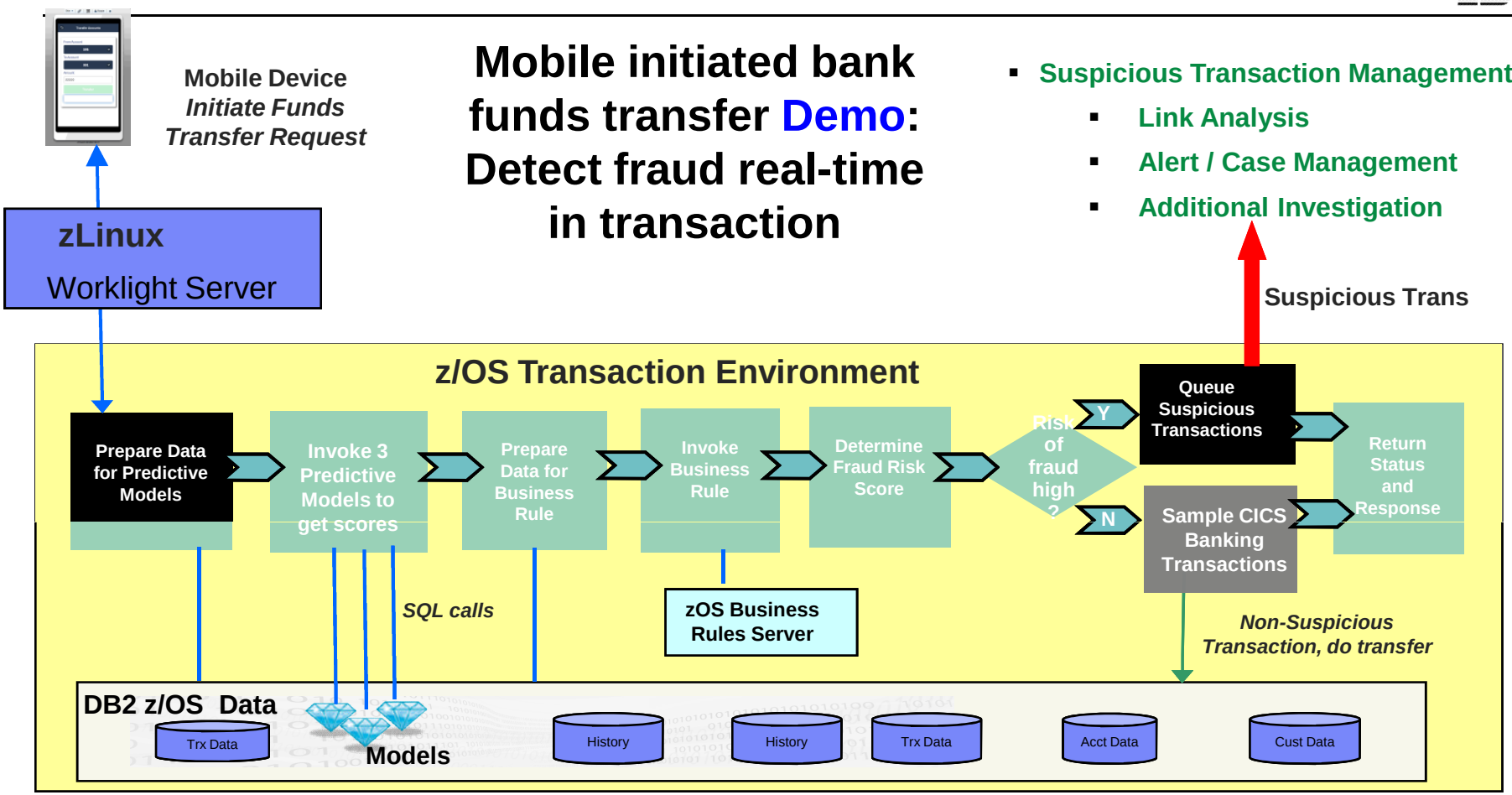
- ***Fraud / AML detection function can be co-located in same LPAR – customer choice***
- ***Orchestration shown is with BPM straight through micro-flows, other options exist***
- ***Example highlights banking transaction, other industry patterns are similar***

Integration Options

1 5

- BPM straight through micro-flows can be invoked from CICS via
  - JMS / MQ – if separate LPARs
  - Websphere Optimized Local Adapter (WOLA) if same LPAR
- Micro-flows process fraud detect request: invoke SPSS models within DB2 (as UDFs via SQL) and invoke business rules in IBM Business Rules Server (ODM) via POJO
- Can leverage DB2 z/OS Datasharing
- Response sent back to CICS either via JMS / MQ or WOLA
- CICS Application can then determine next step based on the accept / reject recommendation
- Fraud / AML detection can be initiated as part of each transaction, in real-time
- Various types of fraud / AML detection workflows can be triggered based on CICS events

Mobile initiated bank funds transfer Demo: Detect fraud real-time in transaction

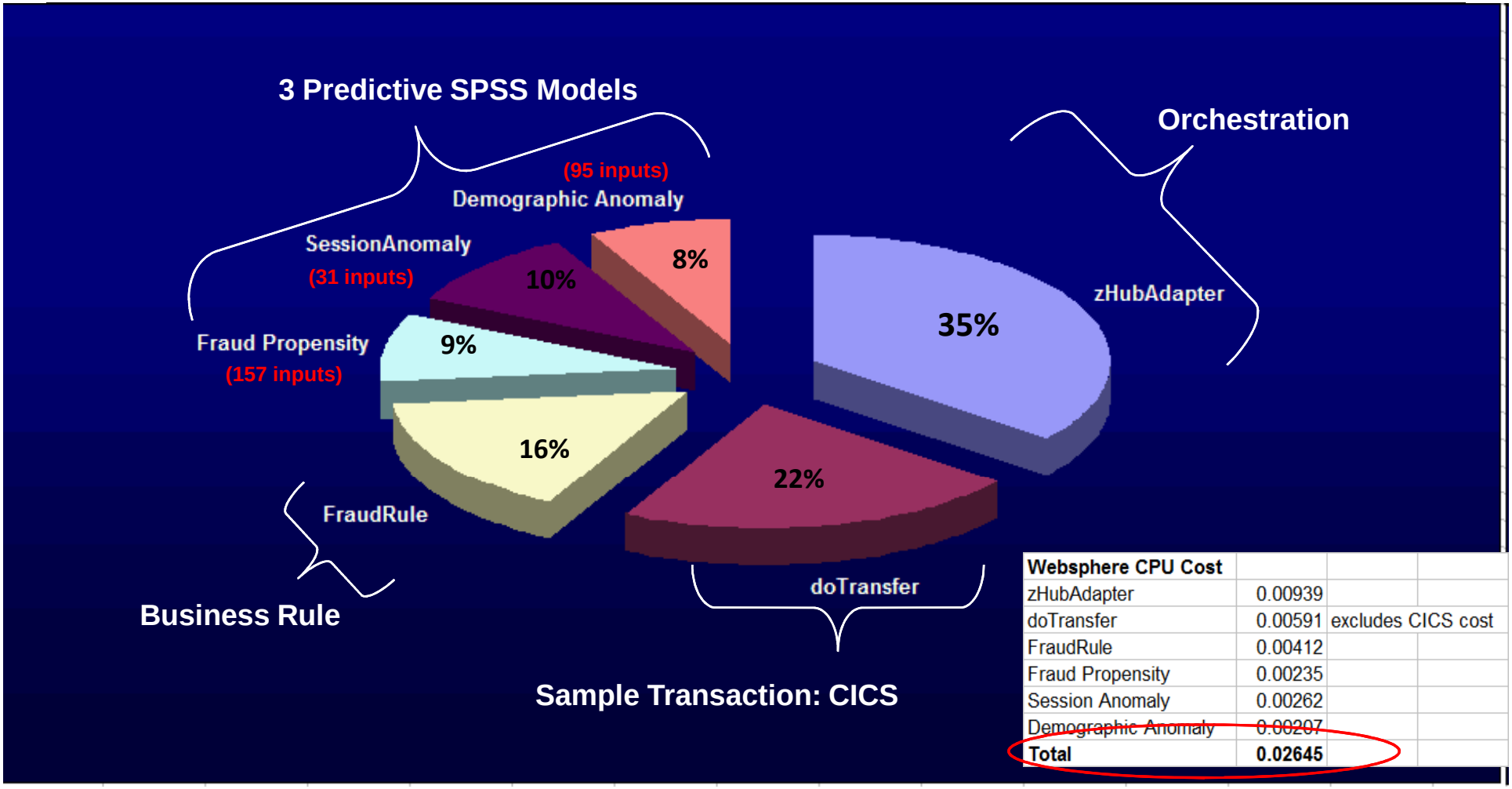


- Suspicious Transaction Management
  - Link Analysis
  - Alert / Case Management
  - Additional Investigation

- Results
  - Showed advanced analytic fraud detection executing at bank transaction speeds
  - Three predictive models with large numbers of inputs (31, 95, 157) executed in real-time
  - Low IT consumption
  - Suspicious transactions queued for additional investigation and processing

Demo

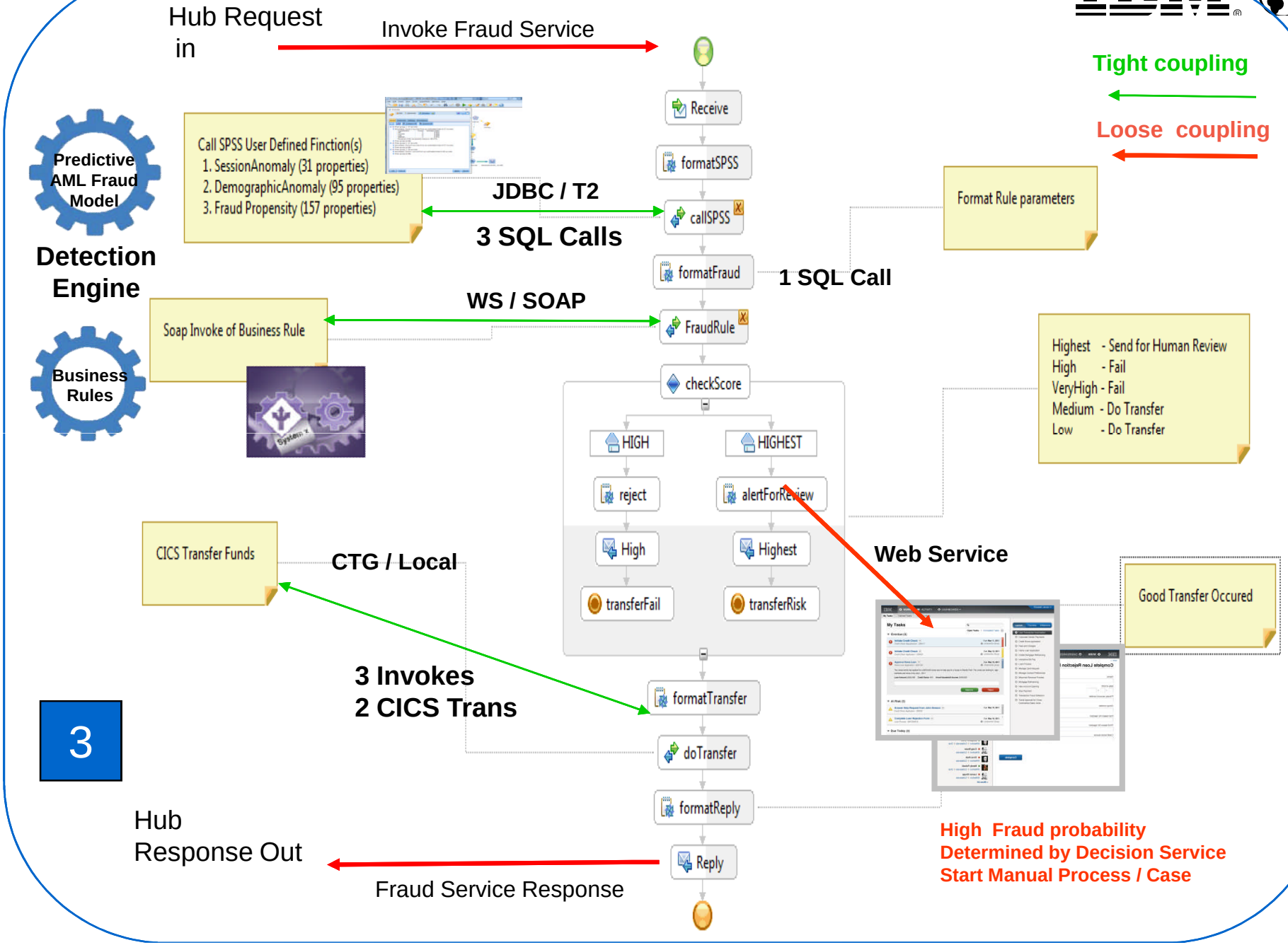
Demo Preliminary Performance findings: End-to-End detection



Websphere CPU Cost		
zHubAdapter	0.00939	
doTransfer	0.00591	excludes CICS cost
FraudRule	0.00412	
Fraud Propensity	0.00235	
Session Anomaly	0.00262	
Demographic Anomaly	0.00207	
Total	**0.02645**	

- Initial performance measures show favorable results (approx. 26.5 msec cpu time, end to end)
- Three advanced SPSS models executed during each transaction with many inputs (39, 101, 152)
- Full authentication run at transaction initiation
- Initial findings show 60%-70% zIIP / zAAP capable processing
- More optimizations still possible: run measures on EC12; more optimized invocation of business rules…

AML Fraud Detection Process



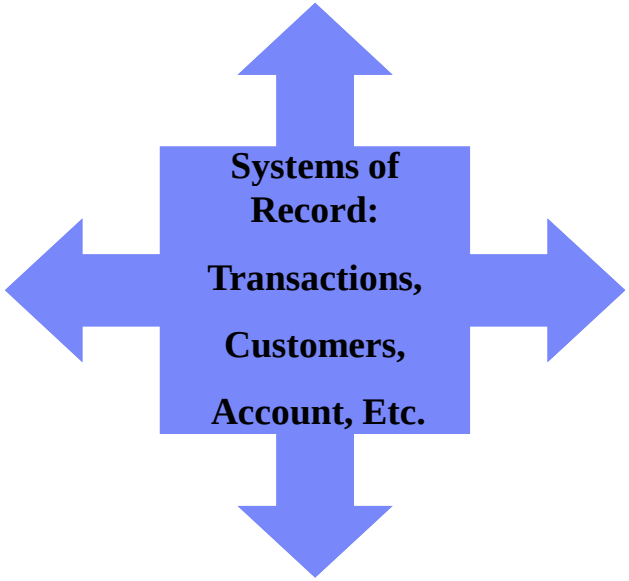
Why Operationalize In-Transaction Analytics on System z?

Performance

- If operational data is on z, then customer can continue to meet SLAs for transactions by running analysis without moving data – if data is moved, clients may not be able to meet SLAs for detection & prevention
- Customer accesses more current data for analysis → leads to improved score results
- Provides value for any performance sensitive business process – real-time, near real-time, batch

Availability

- Leverage existing System z HA / DR infrastructures and extend to fraud detection capabilities
- Option to invoke fraud workflows under banking transaction commit scope or create separate commit scope



Governance / Security

- Avoid data proliferation, preserve tighter data governance and auditability
- Preserve the security envelope of transactions during fraud detection

z Optimizations

- Extend underlying z accounting, metrics, monitoring , workload management infrastructures to fraud
- Extend the use of unique z optimizations to fraud workflows, e.g. IDAA, Hardware Crypto Acceleration, zIIPs, …

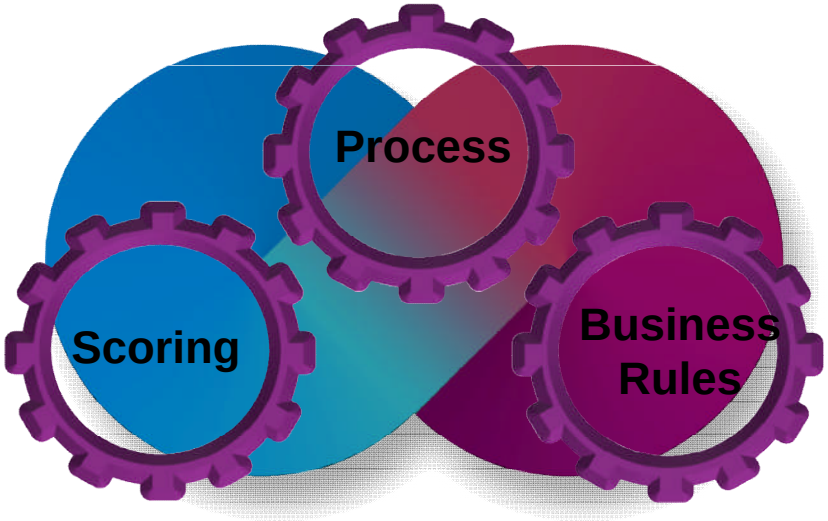
Integrate operational analytics into OLTP with 3 core capabilities

Fast, efficient process orchestration

- Encapsulate interaction with existing OLTP
- Composable based on organizational needs
- Efficiently prepare inputs for and invoke predictive models and rules

Integrate Advanced Analytics

- Predictive insight on each transaction
- Determine likelihood of fraud, likelihood of opportunity to enhance customer value….
- Co-locate with data for performance scale and efficiency

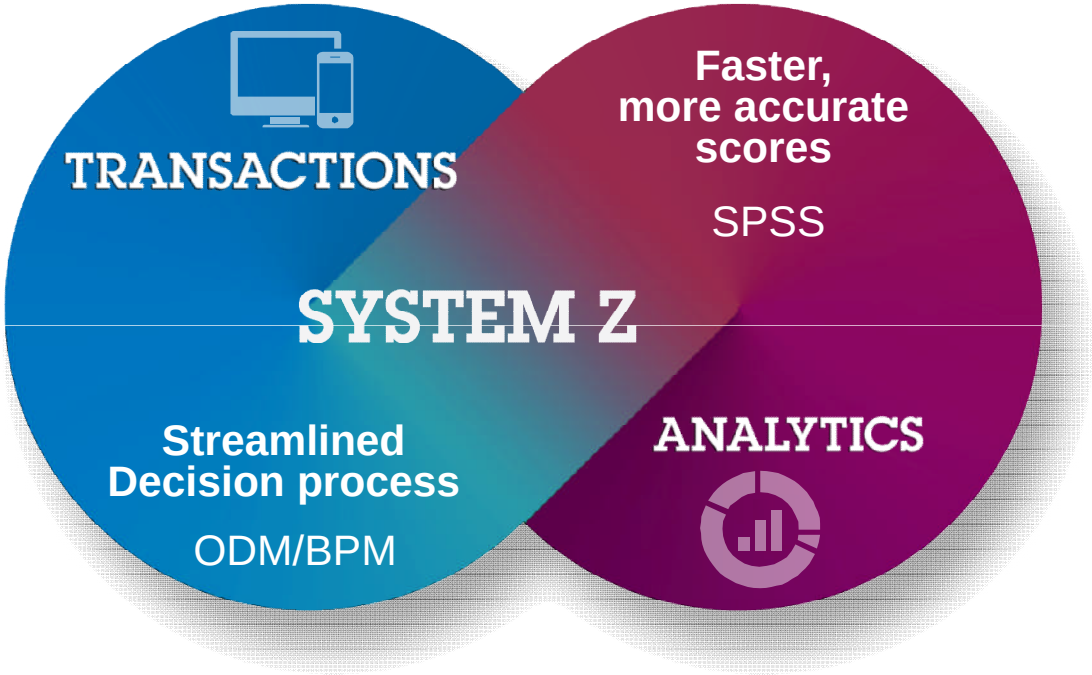


Automate real-time decisions

- Apply organization specific thresholds
- Matrix results from one ore more predictive scores
- Introduce line of business specific parameters in decision process

Faster, more accurate scores ***Streamlined decisioning process***

“In-Transaction Analytics for z/OS” means Insight on every transaction



- The core for operationalizing and integrating analytics with transactions
- Create NEW business opportunities by executing *advanced* analytics in transaction while preserving SLAs
- Transform from rules-only approach to incorporating predictive models
- System z has included “In-Transaction Analytics for z/OS” as part of System z optimized industry solutions

Analytics as part of the flow of business

धन्यवाद
Hindi

多謝
Traditional Chinese

Grazie
Italian

ขอบคุณ
Thai

Gracias
Spanish

Merci
French

Спасибо
Russian

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

多谢
Simplified Chinese

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다
Korean

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