Business Rules and Business Events

- where CEP Helps Decisions

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Abstract

- Decision services are well-established as enforcers of decision rules in managed business applications. However, businesses can now use generic, event-driven decision services, both to identify important business events and to make the necessary required decisions. The techniques and tools to provide this are often classified as “Complex Event Processing” or CEP.
  CEP is subsequently being used increasingly in financial services, logistics, healthcare, telecommunications, energy, and defense applications. We look at the close relationship between events and business rules, using appropriate case studies. What You Will Learn:
- How managed decisions are as relevant to event-driven systems as they are to batch-oriented or people-oriented systems
- Where events fit in the realm of business rules
- How businesses are event-driven, and how event-driven decisions match many business problems

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Introduction

- **Speaker: Paul Vincent, TIBCO Software CEP Group**
  - Co-author and contributor to rule standards (PRR, RIF... DMN)
  - Co-chair EPTS RAWG
  - TIBCO blogger via http://tibcoblogs.com/cep
- **Motivation: identify event processing (/EDA) as a**
  - Useful augmentation / alternative to the default BPM / SOA / decision service regime
  - A closer mapping to the business rules mantra
  - Set of useful business benefits (BAM, OI, ...) too!
- **Disclaimer/caveat: CEP technologies work alongside other (BPM, SOA, BRE) technologies...**

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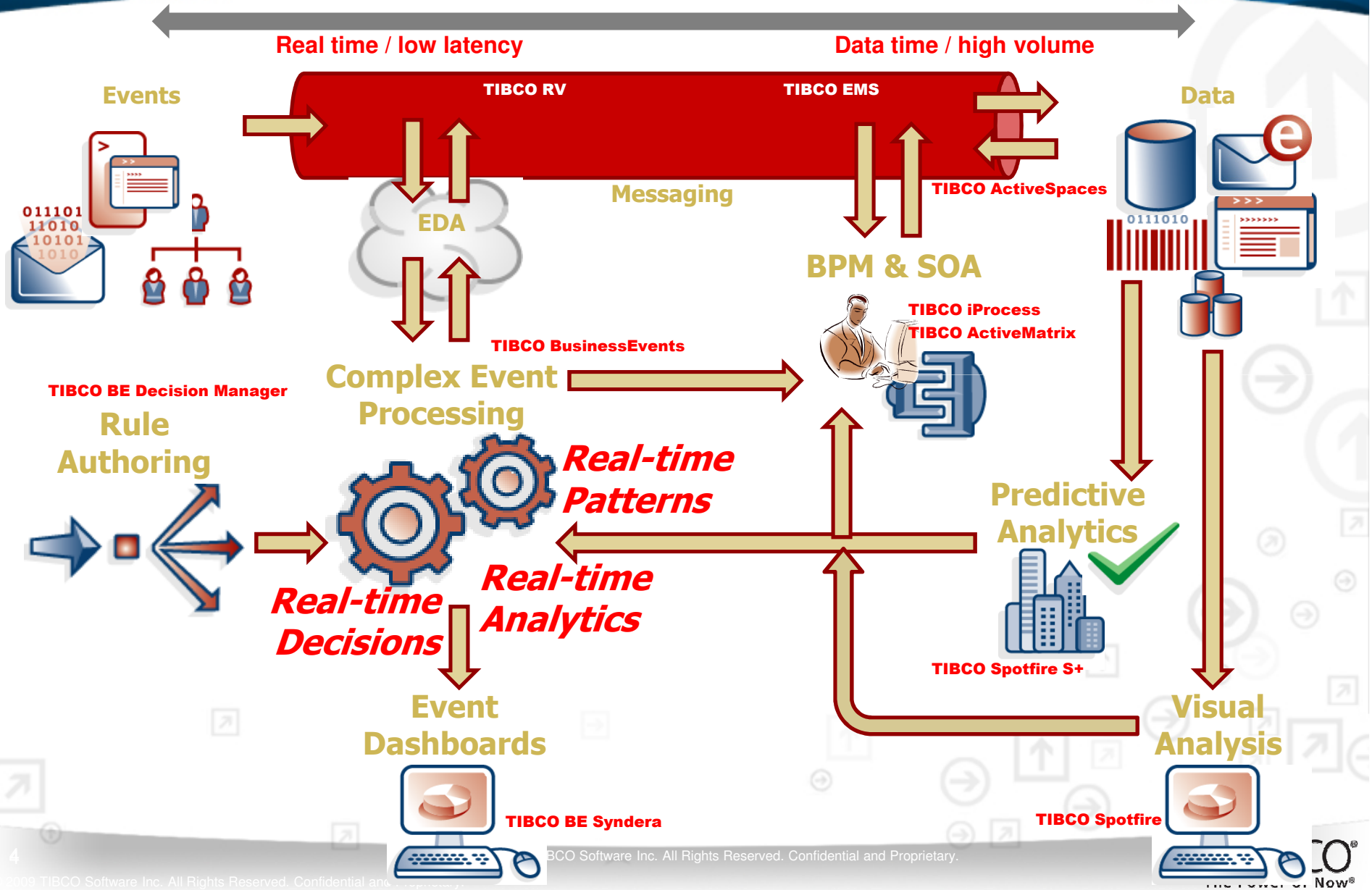

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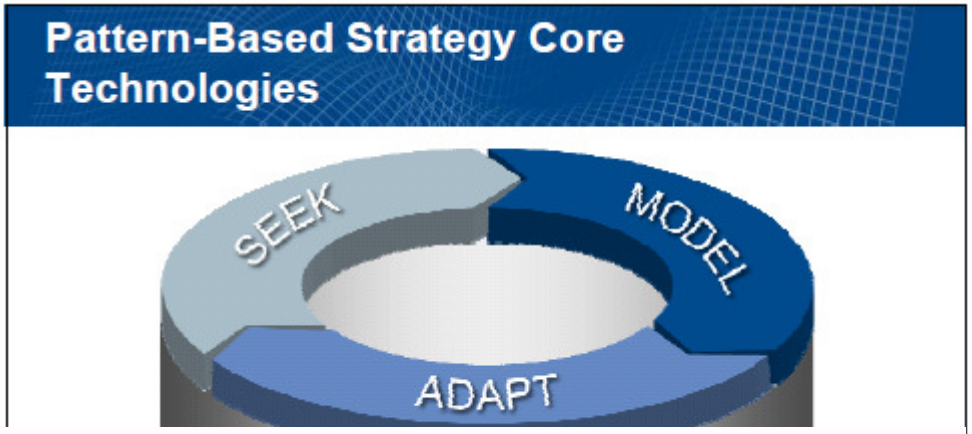
Introduction - CEP



Wednesday | 8:00 AM – 9:00 AM | Breakfast with the Analysts Track

SESSION TITLE

The Difference between Complex Event Processing and Business Rules

SPEAKER(s):

Mike Gualtieri
Senior Analyst

Wednesday | 9:00 AM – 10:00 AM

KEYNOTE PRESENTATION

Keynote: BRMS at a Cross Roads: The Next Five Years

SPEAKER(s):

Stephen D. Hendrick
Group Vice President, Application Development & Deployment Research
IDC

MAIN FOCUS OF PRESENTATION: Business & IT
FAMILIARITY WITH SUBJECT: None

"Saved my 401K by identifying an economic pattern via the metric of counting railway trucks"

"Future of business rules is CEP"

" DM platform needs data preparation and decision refinement and also state ie combining with CEP ... Why not bring them together in active on / always on rule processing? "

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Agenda

1. Business Rules (per BR Concepts, 3rd Ed)
2. Events vs Business Rules
3. Simple Event Processing
4. Complex Event Processing
5. CEP Architecture vs Business Rules

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Business Rules 101

- **Business Rules can be:**
  - Restrictions — **e.g. X must have Y**
  - Guidelines — **e.g. X should have Y**
  - Computations — **e.g. X = f(Y)**
  - Inferences — **e.g. if X infer Y**
  - Timings — **e.g. do X at time T**
  - Triggers — **e.g. when X occurs do Y**

= event dependencies

Can be combined:
when E occurs within time T, if X infer that Y must have Z with value f(Z) ...

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Business Rules 102

- **Business Rules can be:**
  - Restrictions
  - Guidelines
  - Computations
  - Inferences
  - Timings
  - Triggers

Business rules are defined through a business ontology: terms and facts

Some facts may be events (state changes, observations, incidents) e.g.
ht *arrivesAt* Airport

s are enforced as
ev ccur

We want to predict when rules will get broken

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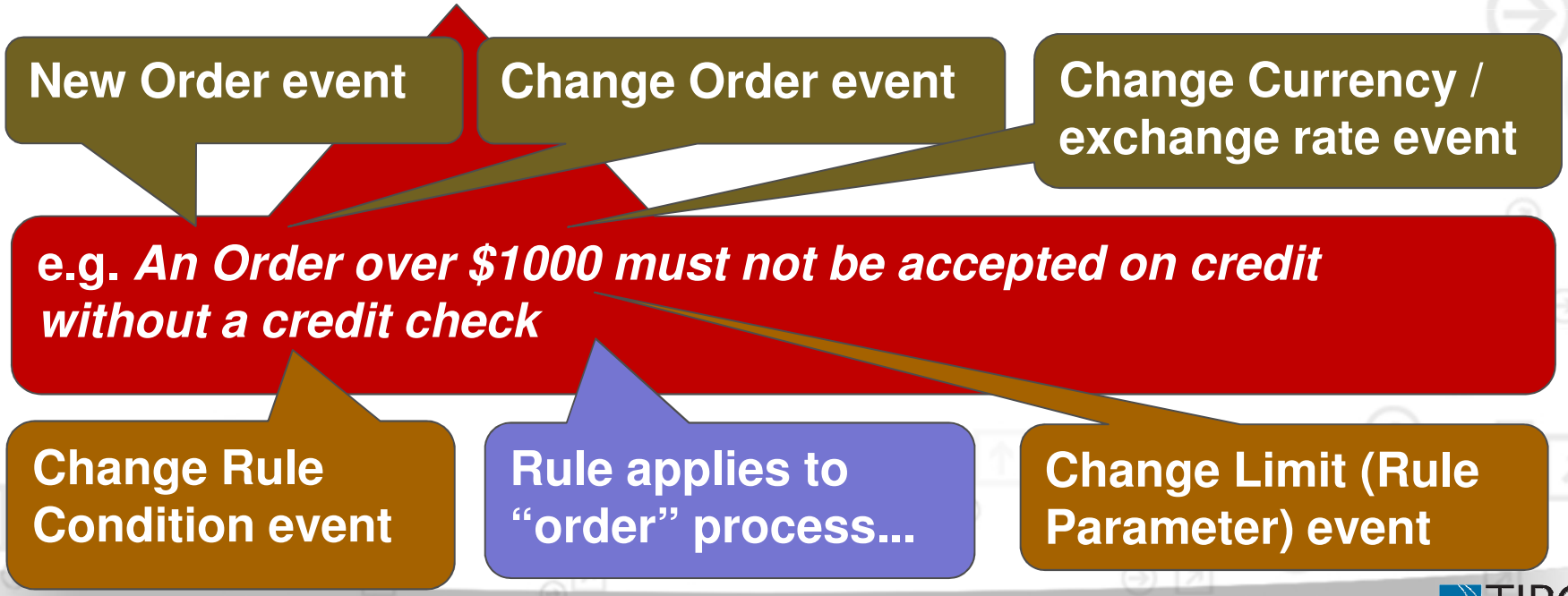
Events are key to business rule enforcement / evaluation

- Business rules drive process definitions
- Business rules drive decisions made in business processes
- Mapping from business rules to processes and decisions is easier from an event perspective



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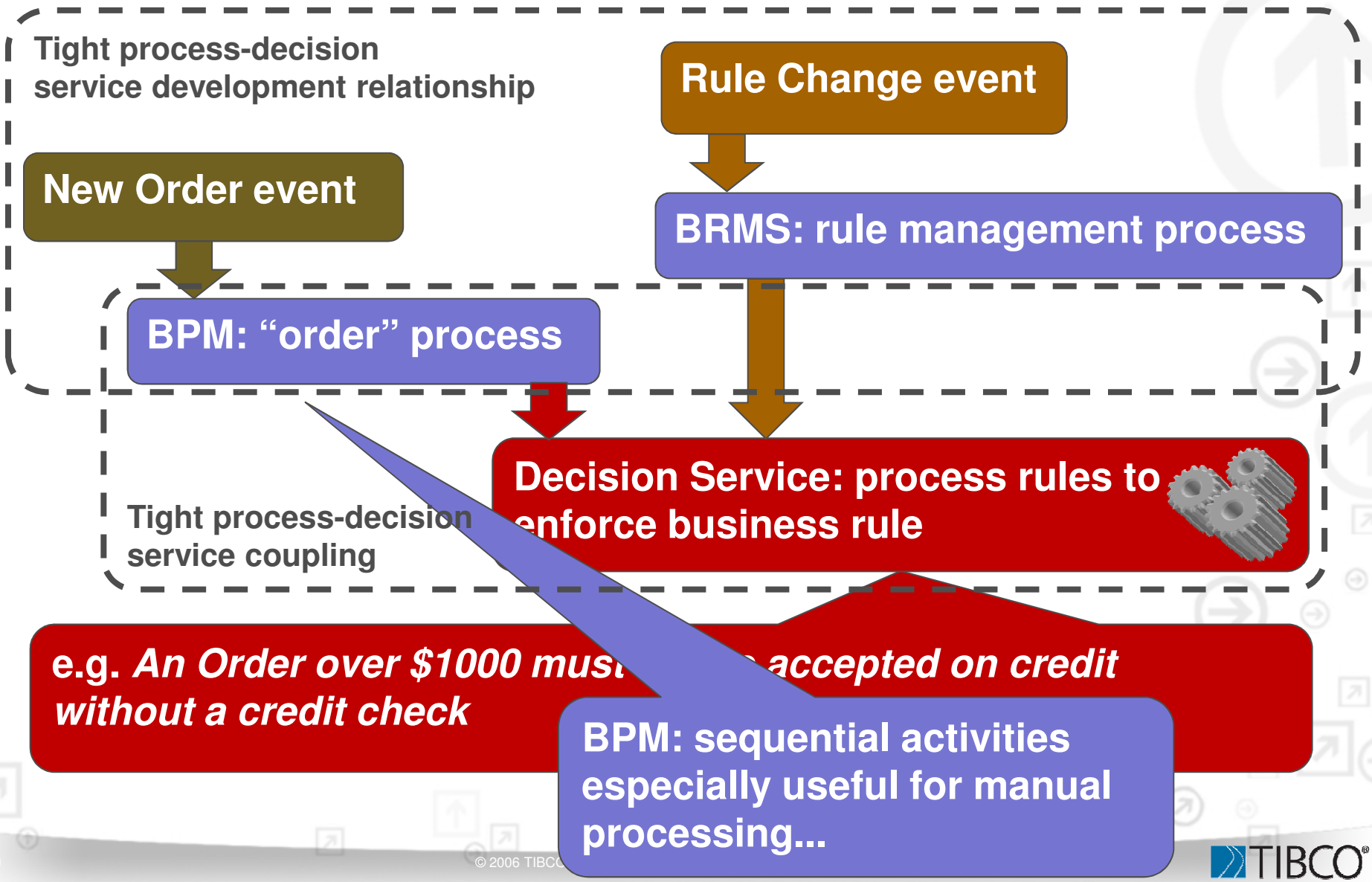
Events in business rule enforcement can be simple...



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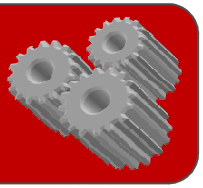
Events in business rule enforcement can also be complex

New fraud event (aggregated from other events)

BPM: “order” process

Decision Service: process rules to enforce business rule



e.g. *An Order over $100 and with a fraud possibility > 45% must not be accepted without a customer identity check*

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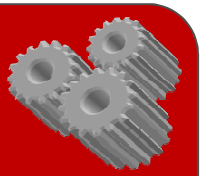
But... Processes are just aggregating events too!

New fraud event (aggregated from other events)

New Order event

EP: “order” state

Event processing rules enforce business rules / decisions



e.g. *Order (new? changed?) value $X and fraud possibility Y% can only be accepted with a customer identity check*

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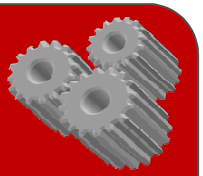
But... Processes are just aggregating events (3)!

New fraud event (aggregated from other events)

New Order event

EP: “order” states: defined, accepted, fulfilled, changed, ...

Event processing rules enforce business rules / decisions
+ progress order state



State change in “order”

e.g. Order (new? changed?) value $X and fraud possibility Y% can only be accepted with a customer identity check

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But... Processes are just aggregating events (4)!

New fraud event (aggregated from other events)

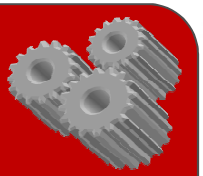
New Order event

EP: “order” state

State set to “suspended”

New event changes fraud to 75% after Order accepted...

Event processing rules enforce business rules / decisions
+ advance order state
+ exceptions



e.g. *An Order over $100 and with a fraud possibility > 45% without a customer identity check that has already been accepted then shipments must be suspended until the fraud possibility is reduced to below 5%*

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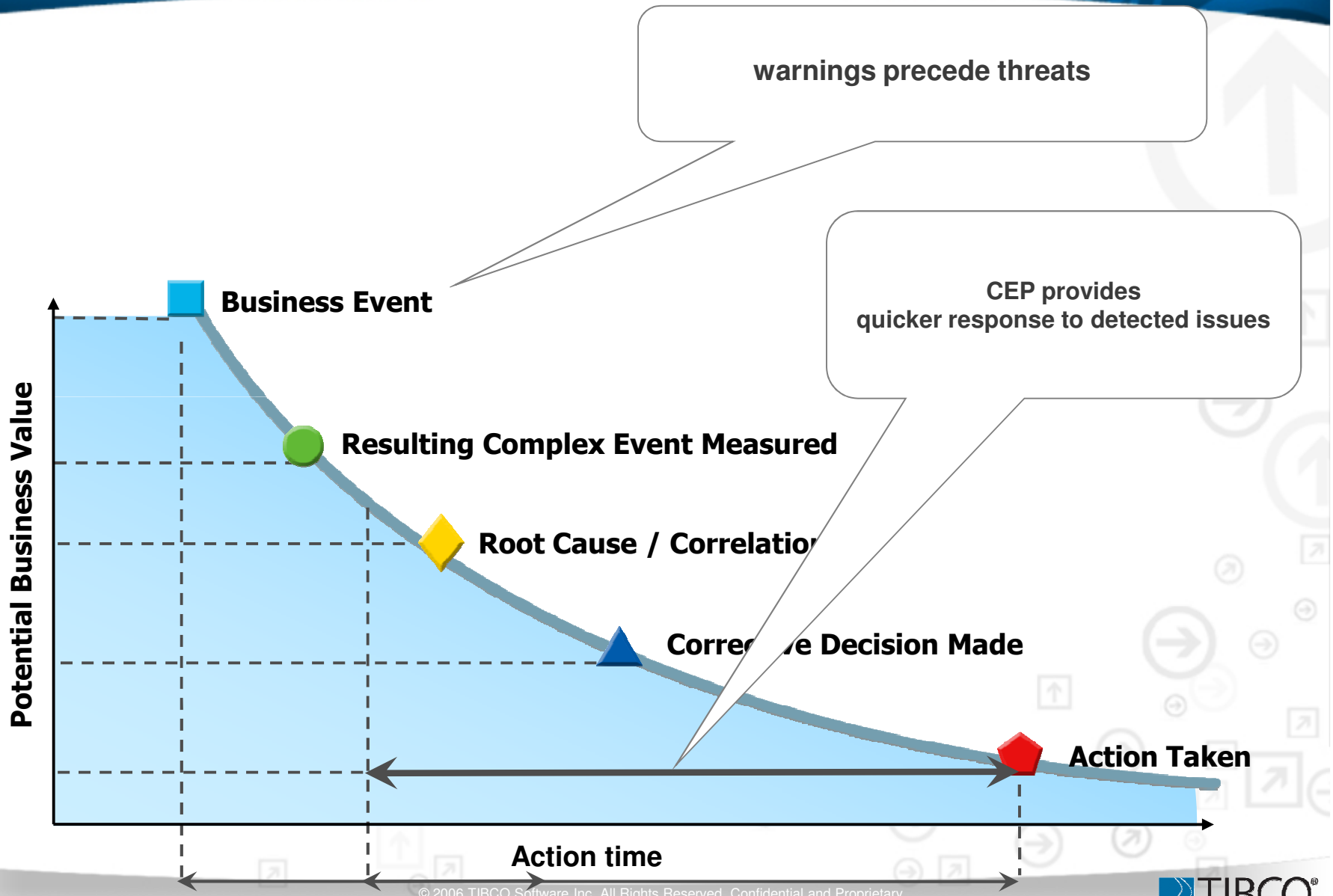
Why Use a CEP Platform for business rule automation?



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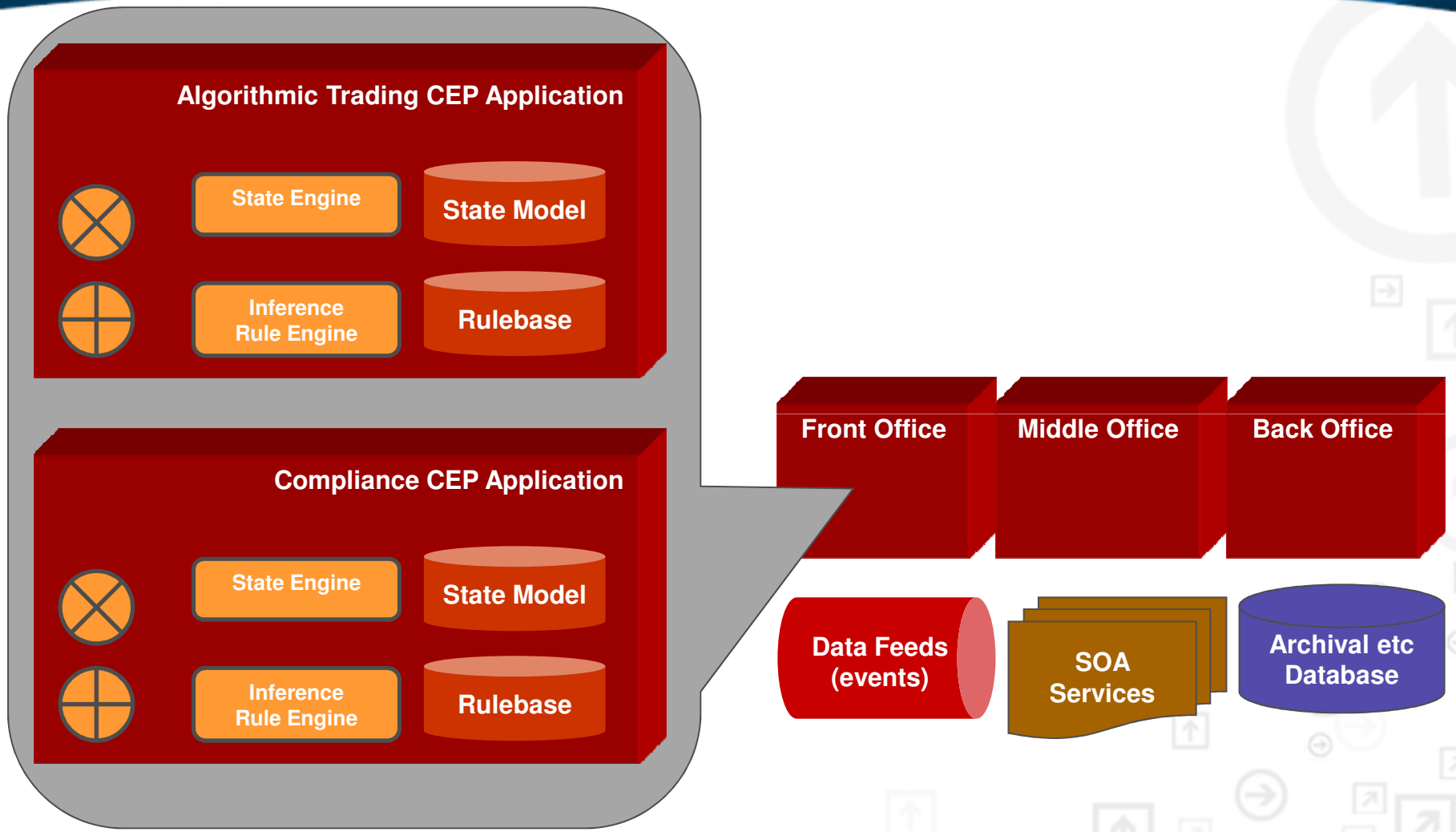
CEP in Action: Investment Banking



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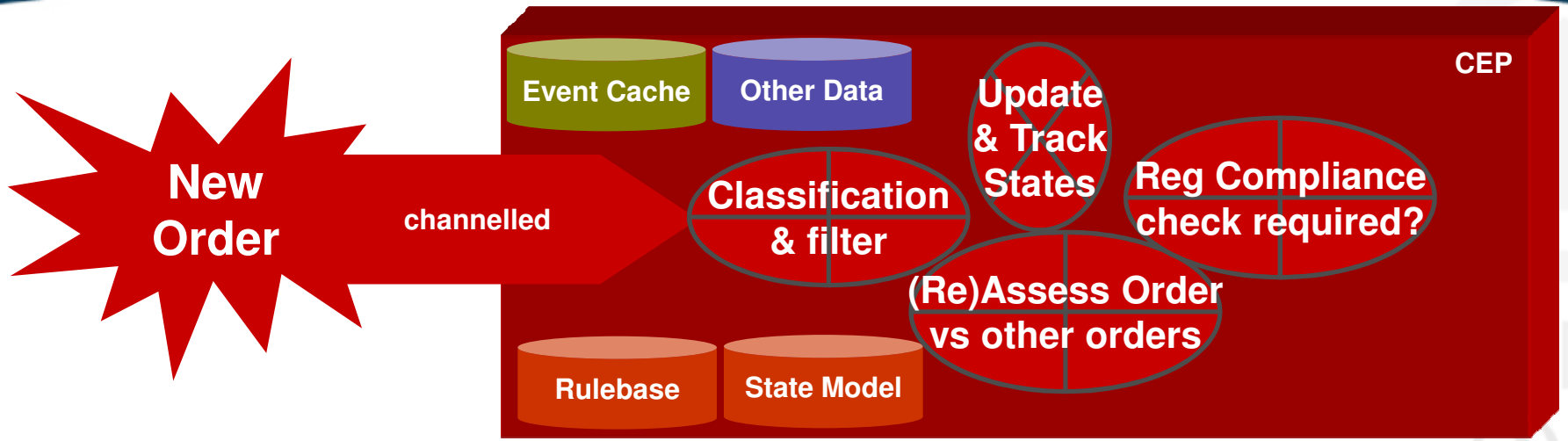
CEP Processing activity is automatic



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Decisions are Event Driven

- **Complex events require monitoring the simple events and decisions**
  - Identify patterns
  - In real-time
- **The decisions share events, data**
  - Credit Card application patterns → Consumer Fraud possibility
  - All about Situation Awareness: business monitoring and insight
- **So why keep the data in a separate system?**
  - Traditional answer: too complex for IT to design and manage decisions and data models in the same system
  - Current solution: CEP technologies combine rules, events and real-time data stores to maximize performance

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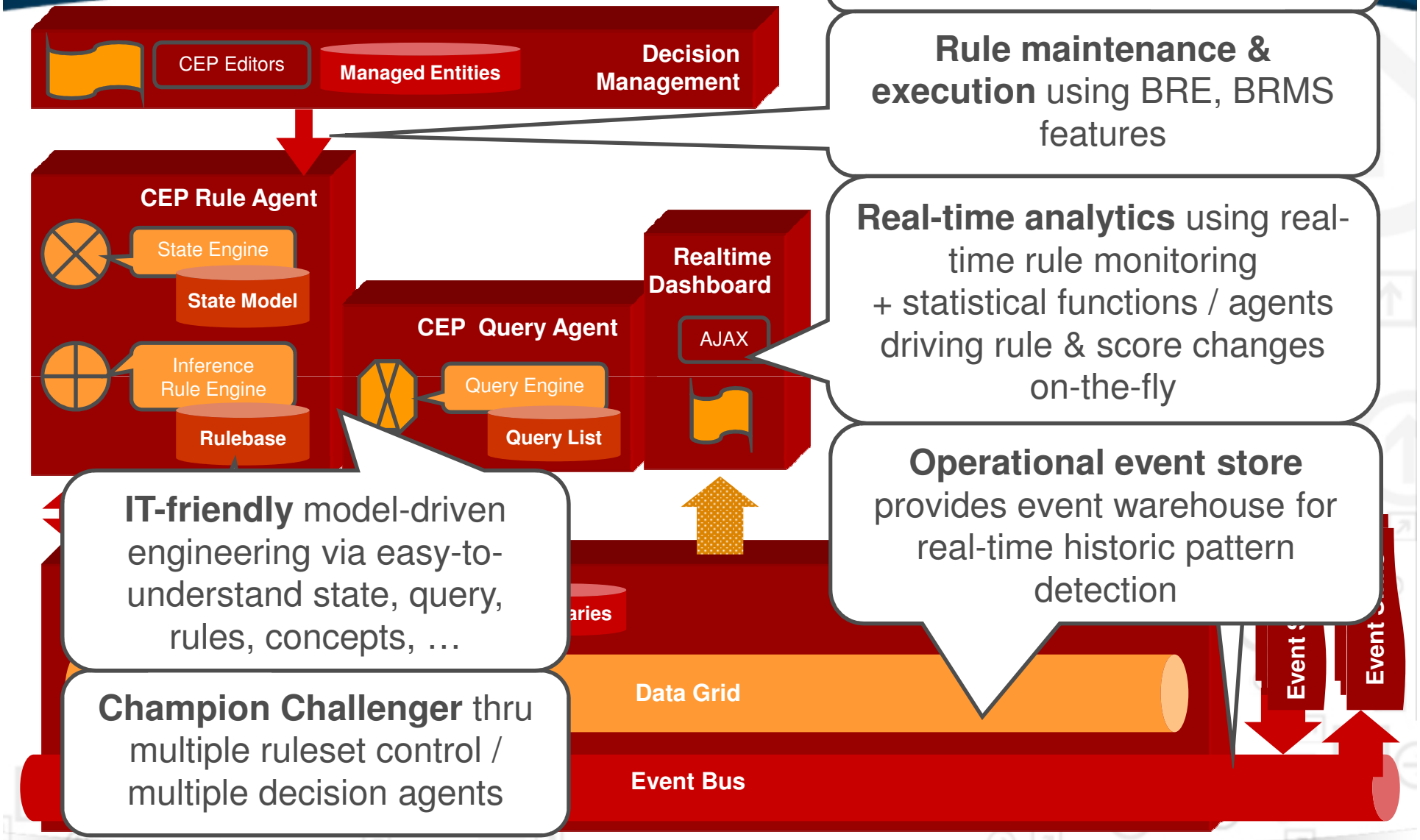
Example Architecture for Real-tim



Business Events drive business rule execution

Rule maintenance & execution using BRE, BRMS features

Real-time analytics using real-time rule monitoring + statistical functions / agents driving rule & score changes on-the-fly

Operational event store provides event warehouse for real-time historic pattern detection

IT-friendly model-driven engineering via easy-to-understand state, query, rules, concepts, …

Champion Challenger thru multiple ruleset control / multiple decision agents

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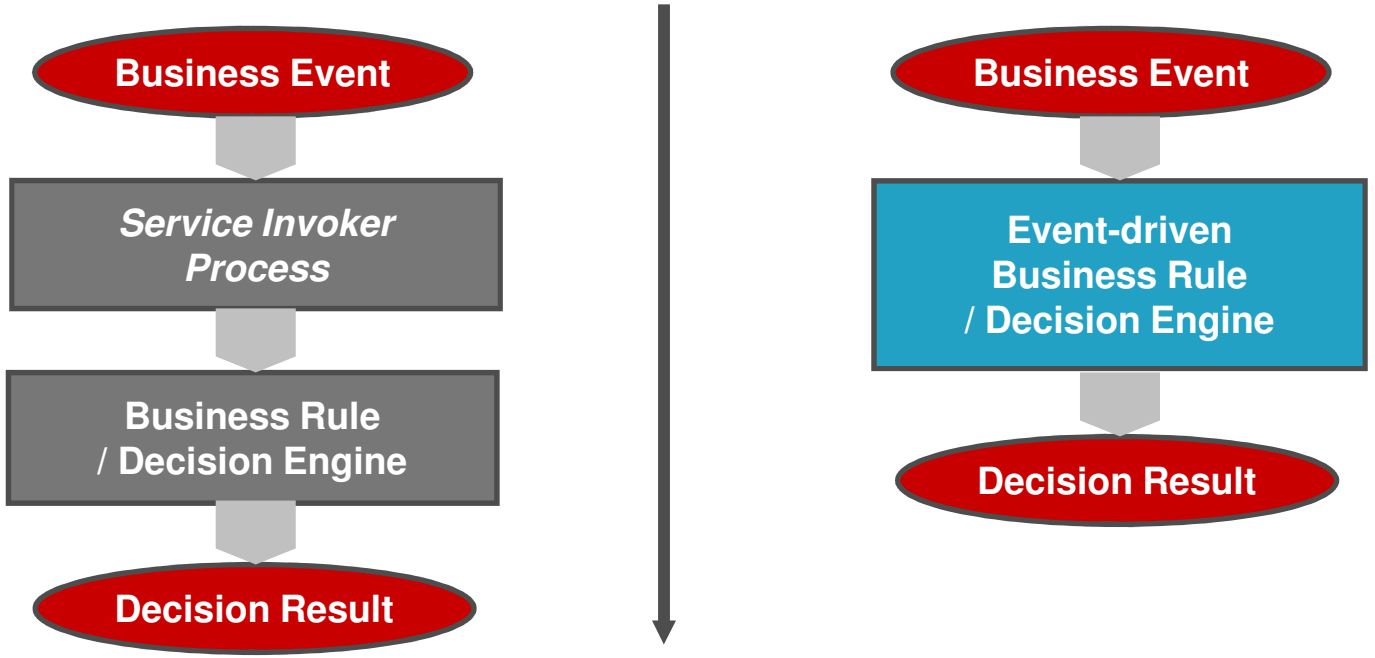
SOA vs EDA patterns for Decision Services



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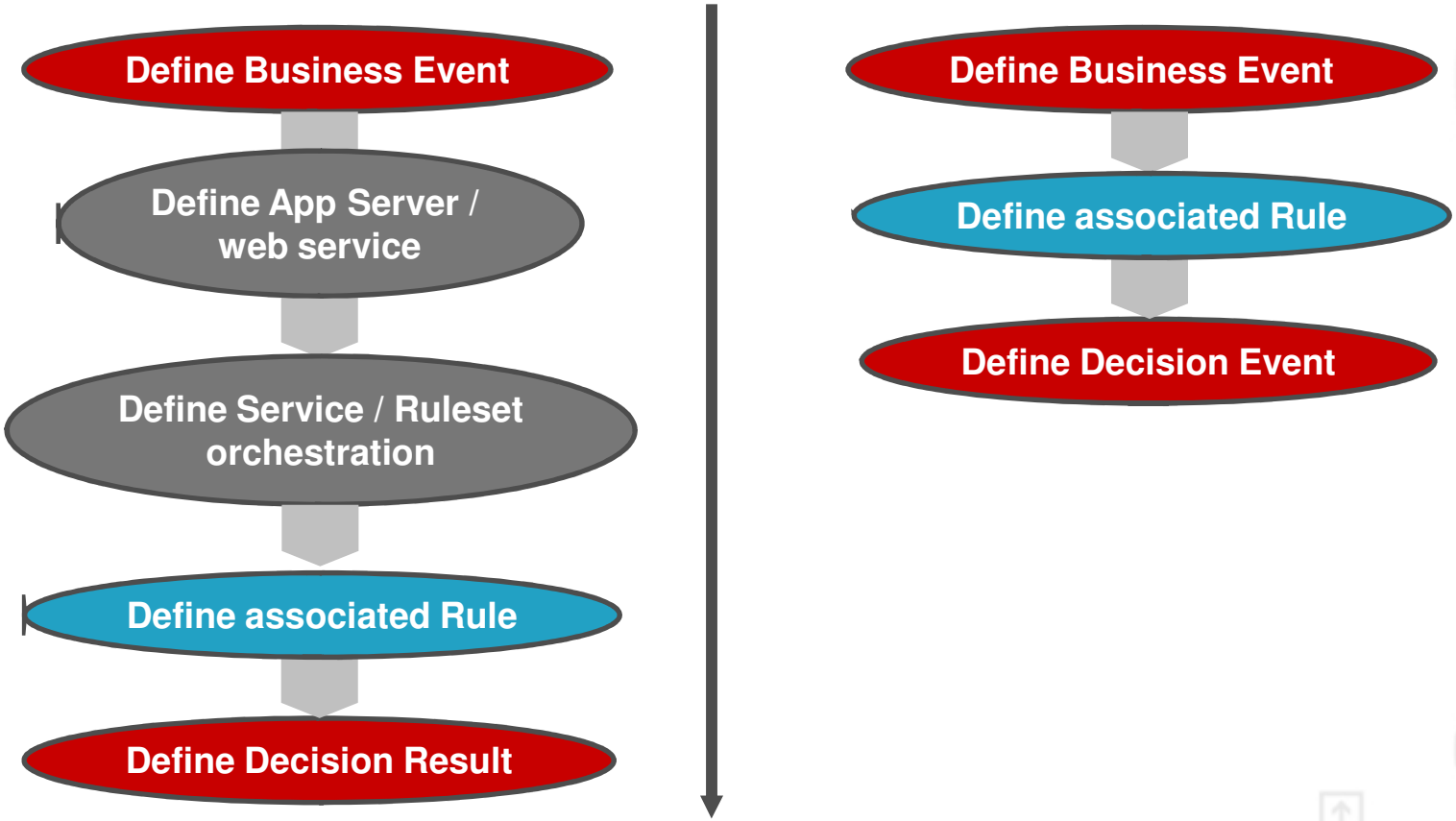

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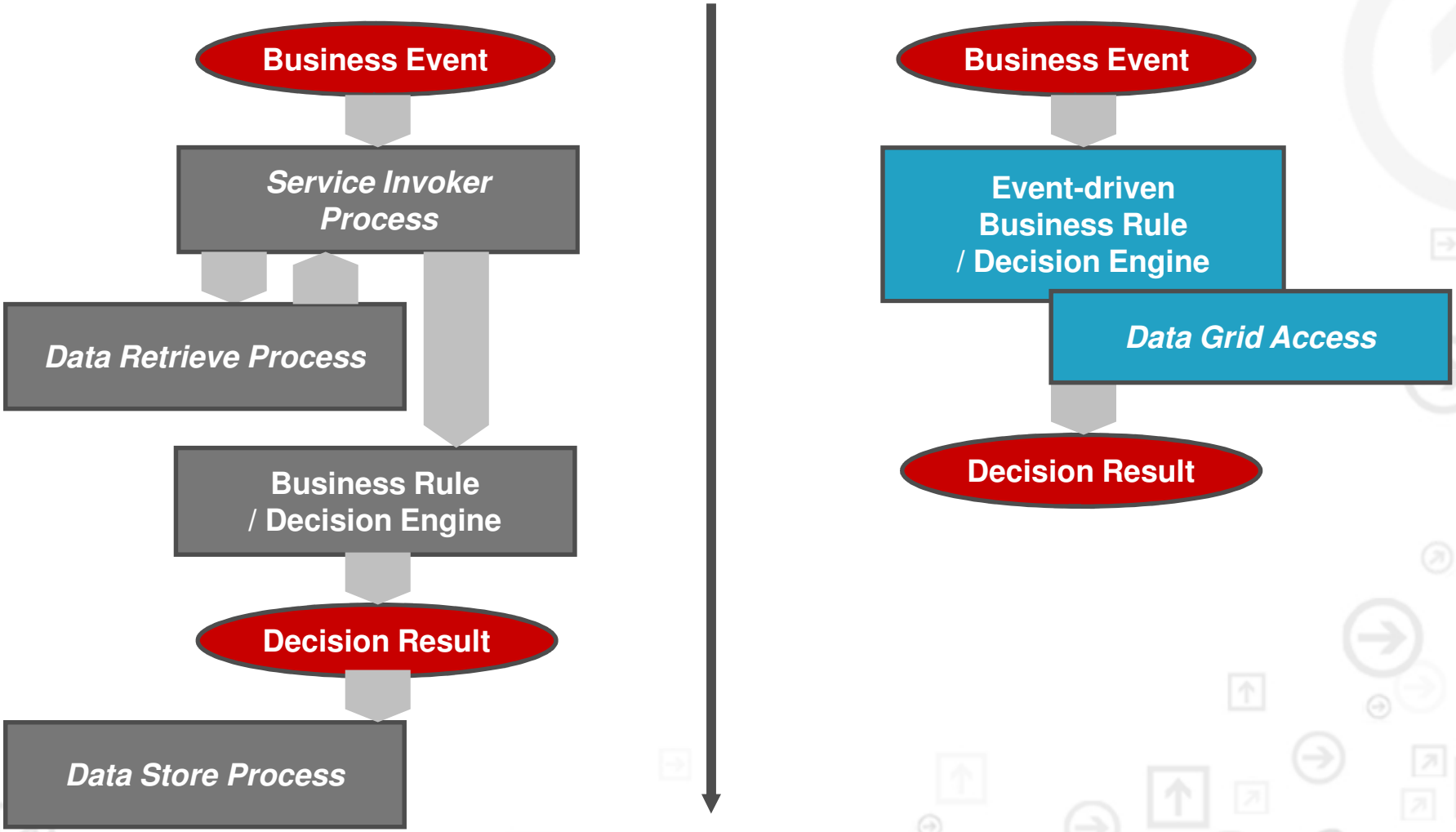
Event and data patterns for Decision Services



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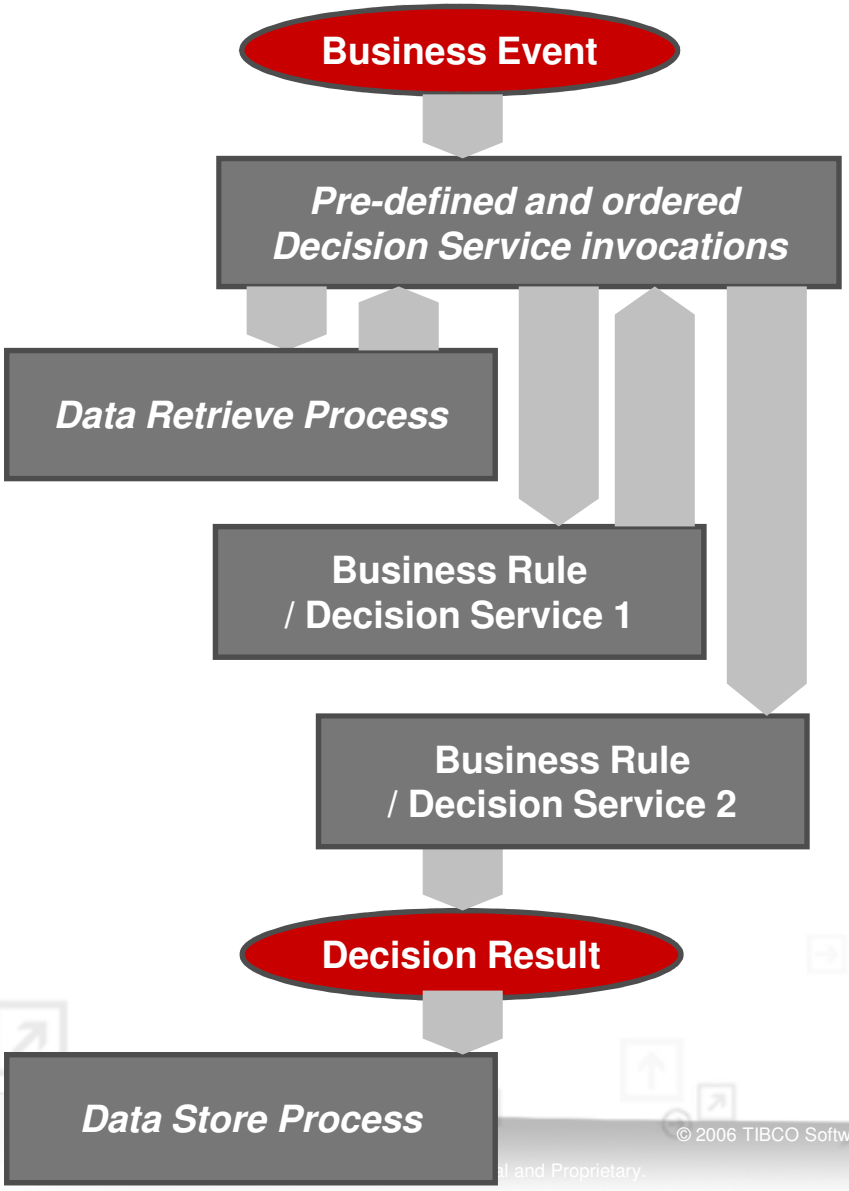
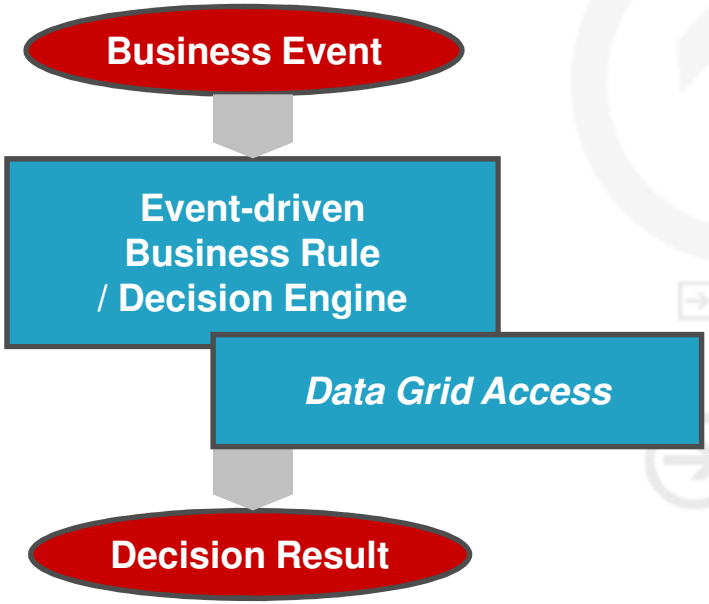
Decision Logic patterns for Decision Services





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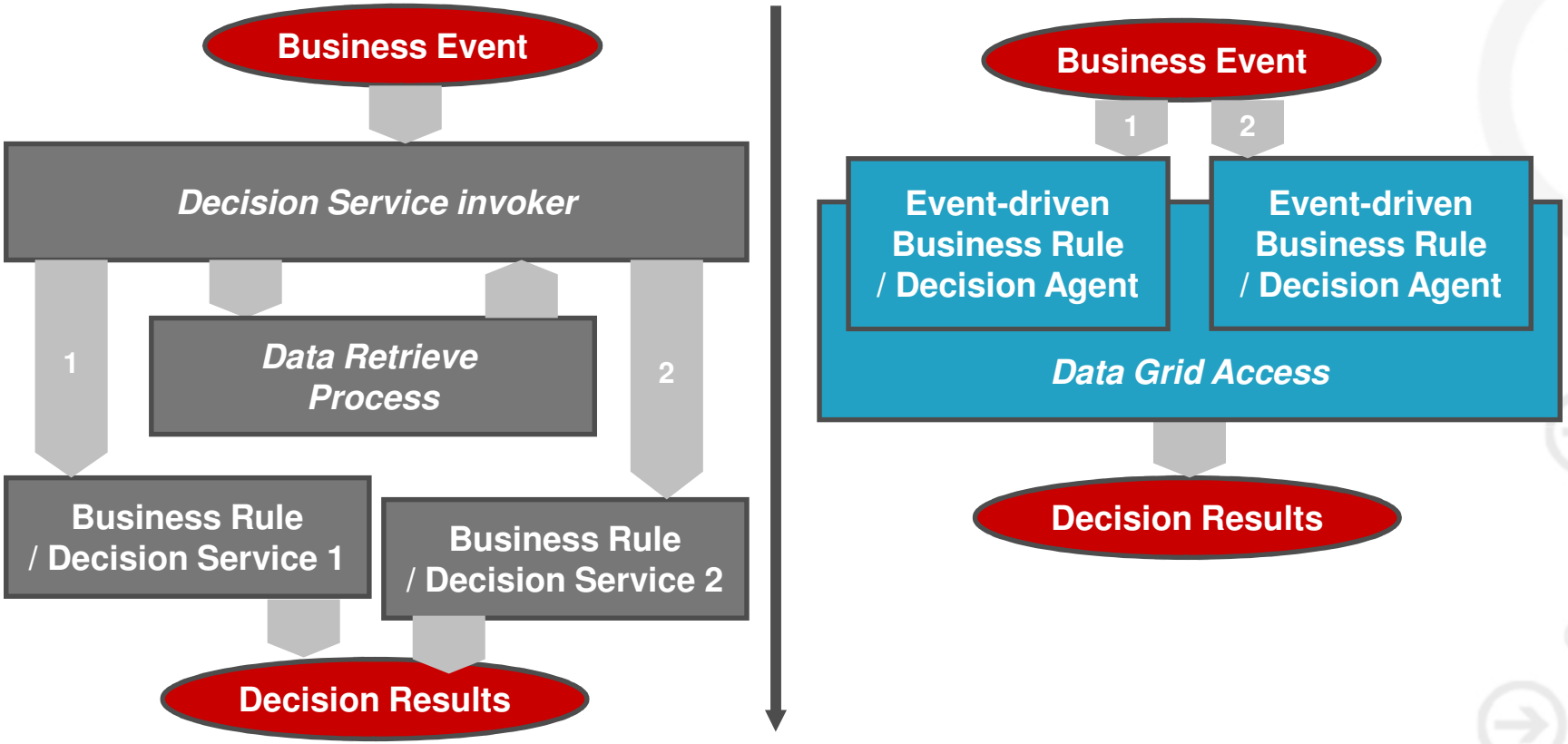
High Scaleability patterns for Decision Services



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CEP and Decisions Summary

- Business rules are used in CEP applications covering
  - Sense & Respond
  - Track & Trace
  - Situation Awareness
- Users should model events independent of infrastructure
  - Flexibility / EDA vs Commonality / SOA

" We need to move from being process centric to more information centric"

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