

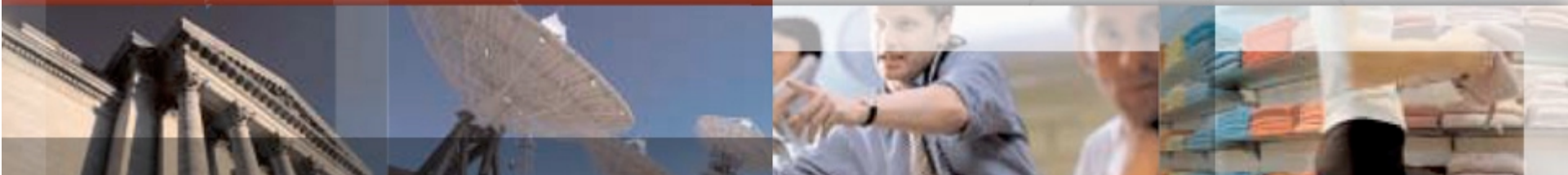


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## Complex Event Processing

*CEP for Business Optimization*

**Joaquim Carvalho**  
*Senior Solution Consultant*



# Focuses on Three Functional Areas

Increase operational **efficiency** and effectiveness.

Business Process Management

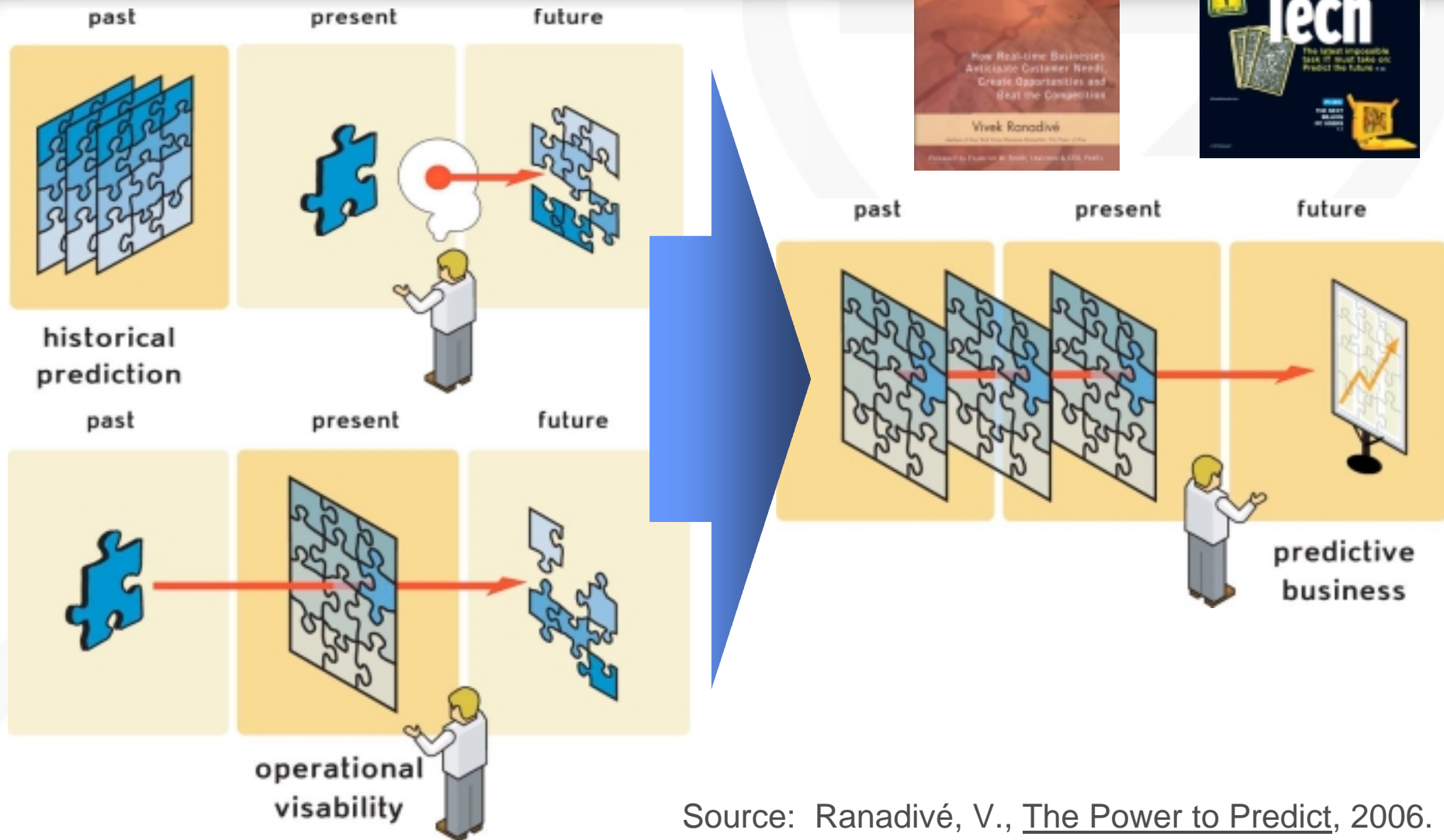
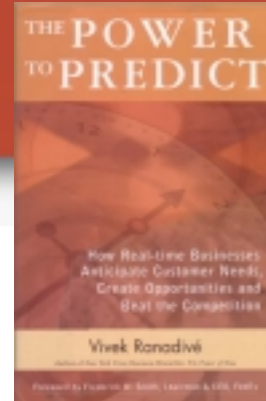
Business Optimization

Improve operational **visibility**, collaboration and ability to be **proactive**

Service-Oriented Architecture

**Accelerate** projects, initiatives, and **go-to-market** cycles

# PredictiveBusiness™



Source: Ranadivé, V., The Power to Predict, 2006.

# Current Challenges

- Business systems today are often an incoherent collection of disparate databases and applications, disconnected and not integrated
- Enterprises need to be able to discover and **make decisions** on business relevant data **in a timely manner**
- This requirement drives demand for data integration technologies, leading toward a **coherent information ecosystem**
- In parallel, businesses also need to optimize their data and information processing to strive for **real-time situational awareness** with dynamic resource allocation, real-time decision management and adaptive operational performance and process management – what TIBCO refers to as **Predictive Business™**

# Video

# Example Business Optimization Scenarios

## ■ Finance

- Program (Opportunistic) Trading and Execution
- Risk Management
- Pricing and Consumer Relationship Management (Citi)
- Fraud and Intrusion Detection

## ■ Business Process Management

- Process Monitoring
- Exception Management and Outage Prediction
- Scheduling

## ■ Sensor Networks

- Reliability of Complex, Distributed Systems
- RFID Applications
- Manufacturing Floor – “Sense and Respond”
- Power Grid Monitoring
- Military

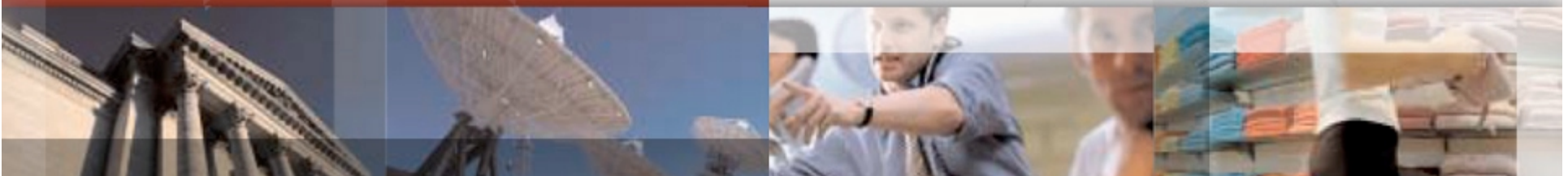
# TIBCO for Business Optimization

- **Intelligent monitoring/processing of real-time data about operations**
  - Long history of messaging and distributed computing leadership ensures availability of data wherever and whenever it's needed
  - Event processing drives recognition of emerging patterns amongst events
- **Choice of user interface platforms/technologies**
  - From AJAX-based Web applications to BAM dashboards to full-featured enterprise portals
- **Highly flexible process management platform for action following alerts**
  - BPM software is designed for maximum flexibility which allows for immediate implementation of corrections and improvement
- **Highly scalable object-oriented rule engine for event processing**
  - BusinessEvents can be used for numerous classes for customer optimization solutions



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**BusinessEvents**



# TIBCO BusinessEvents

## ■ What is it?

- Framework for agent-based, event-driven systems.
- Non Linear processes.
- Rules Driven Reasoning (Forward, Temporal and Spatial).
- State Driven.

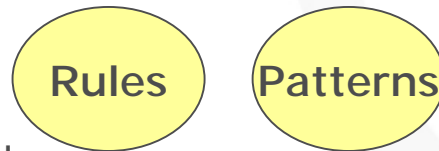
## ■ Why?

- To solve classes of problems that require intelligence and non-linearity in the form of declarative rules, stateful for the purpose of reasoning across time and space. There are plenty of high value problems in every vertical.
- Classic: **Opportunities** and **Threats** Model.
- Classic: **Situational and Operational Awareness** Models.

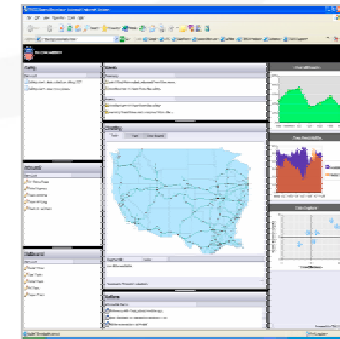
# Bringing it all together

**BE is a framework for messaging based intelligent, distributed agents**

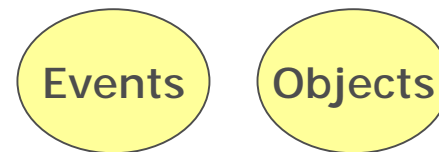
2. **REASON** Define rules of behavior to reason on a pattern of objects, events and time



4. **SITUATION** Visualize

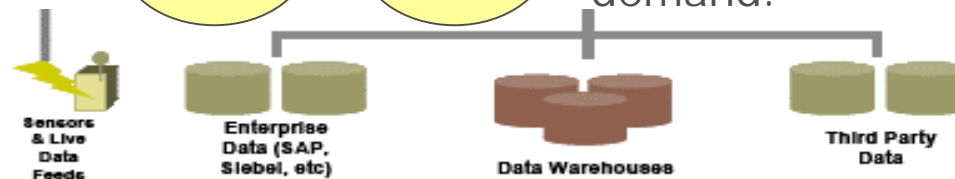


3. **INFER** Actions



1. **SENSE** Ability to listen to events and gather data on demand.

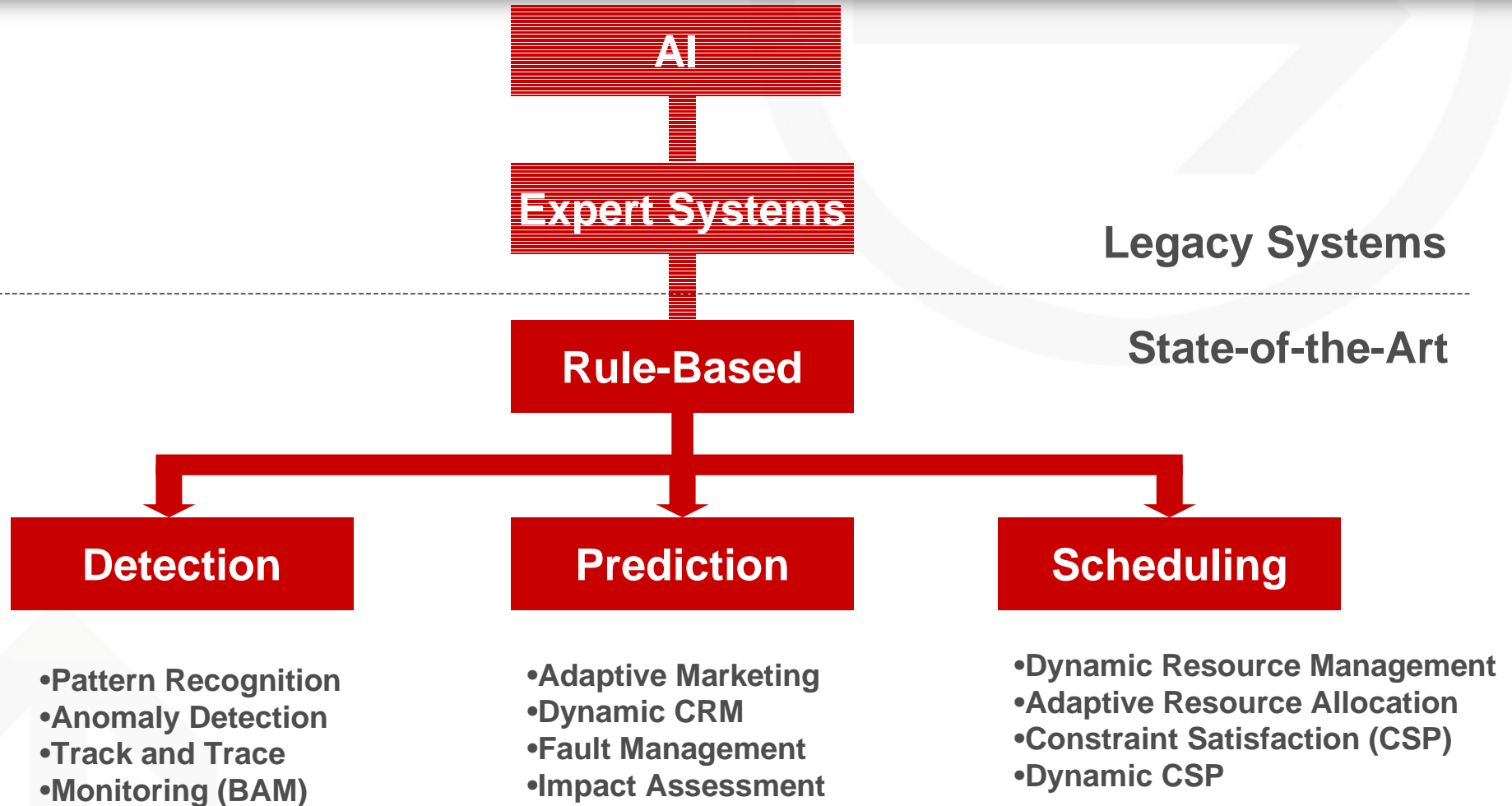
Heterogeneous,  
Distributed  
Data





# An Expert Systems (ES) Perspective

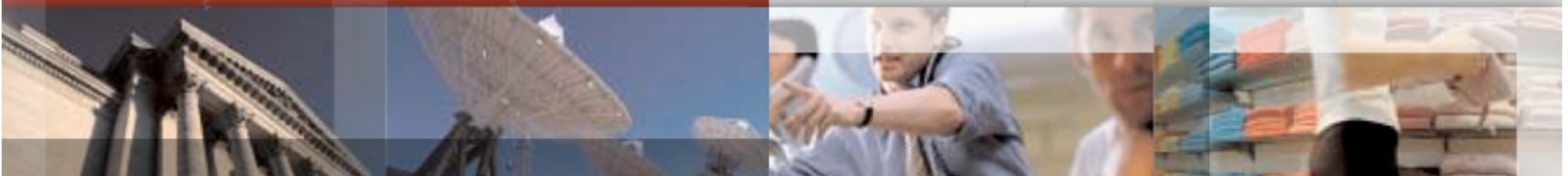
What Classes of Optimization Problems Do Businesses Need to Solve?





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## Samples



# Customer Interaction Management



- To provide relevant (cross-selling) advice to customers while they interact with a company through various channels.
- **Relevant**
  - Requires **knowledge of customer**, current financial status, history of interactions, soft-data (e.g. life events).
  - This information must be readily available either in **real-time** or as batch.
- **Advice**
  - These are really the **promotions/campaigns** that are targeted at a particular customer (e.g. travel insurance promotion, session w/ financial advisor).
- **While they interact ...**
  - Whatever the interaction is (service call or mortgage quote request).
  - Relevant advice must be generated while **the company has the customer's attention**.
  - In **real-time within attention span** (e.g. while customer is on the phone, on-line, etc.).
- **Across multiple channels.**
  - Web, phone, ATM, tablet PC, etc.

# Customer Interaction Management

*Real-Time interaction between CSR Agent and BusinessEvents while communicating with customer.*

The screenshot displays a 'Customer Service' window with two main panes: 'Customer Profile' and 'CSR Assistant'.

**Customer Profile:** Shows account details for Christian Klien. The 'Account' table lists a Credit Card with a balance of -2456.22 and an Investment of 65000. The 'Customer Profile' section includes fields for ID, Name, Address, City, State, Zip, Status, Age, Salary, Owner, Prim Goal, Sec Goal, Student, Traveller, Computer, Fv Sport, and Fv Team.

**CSR Assistant:** Provides recommendations based on the customer's profile. It includes sections for 'Next Question (NQ)', 'Next Likely Products (NLP)', 'Complex Events / Activity', and 'Notifications'.

Product	Score
Money Market Savings	8
Advantage Checking	7
Preferred Rate Savings	5
Online Access	5
Visa Card	4

Event	Count
Cancelled Loan Application	Recent
ATM Withdrawals	1 per day
Sent credit card application via mail	2 - no response

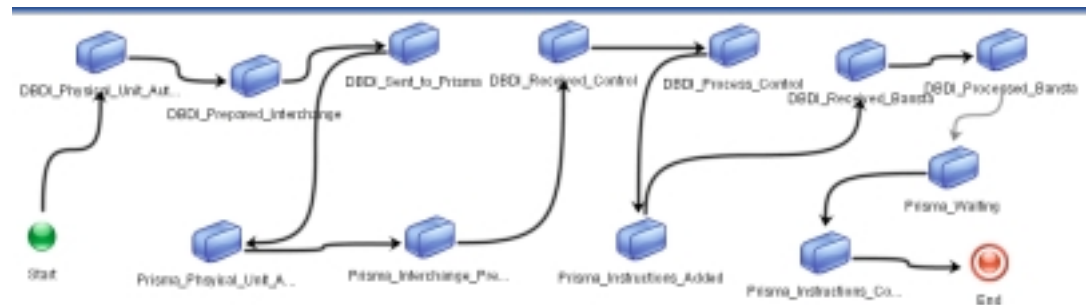
Customer details retrieved successfully.

# Visualization – flexible RIA interfaces (cross-processes)




# Monitorización de transacciones

- **Objetivo: disponer de visión extremo-a-extremo mediante modelos virtuales de ciertos procesos de negocios clave.**
  - Entorno: combinación de procesos automáticos y manuales débilmente acoplados o no acoplados.
  - No todos los procesos de negocio están automatizados extremo a extremo.
  - Controla eventos perdidos, violaciones de SLA, resecuenciación de eventos según contexto.
  - Identifica fallos, re-enruta de acuerdo a reglas de control de proceso

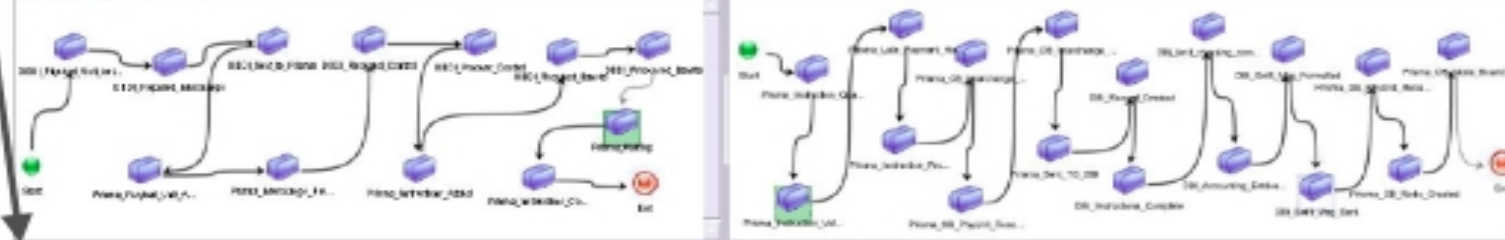


# Monitorización de transacciones - Dashboard

**Master: Payment Physical Unit (PU)**

Deutsche Bank 

State Diagrams



Customer Physical Unit


Seq.	Order No.	Customer Ref.	Domain ID	Order Party	Order Bank	Bank Branch ID	Transaction	Currency	Account No.	Creation Date	Schedule
1	272734434		ptcus	Polska Telefonia Cyfrowa Sp. z o.o.	Deutsche Bank Polska S.A.		2470274	PLN	87411117008045620046	20071219	22-DEC-08

Payment Instructions

Seq.	IBAN Code	IBAN Name	IBAN Account	Trans. Amount	Currency	Payment Status	Bank SWIFT	State 1	State 2	physical_unit_id
1	ADGSKY	Adriety Górkis	30140032280000...14528.27	PLN	PLN	PLN	PLN			801E27F8PU081204_1550
2	GASPAR	Sergiusz Ślika	30140032280000...14404.18	PLN	PLN	PLN	PLN			801E27F8PU081204_1550
3	COLMAN	Soren Anton	30140032280000...1364.00	HUF	HUF	HUF	HUF			801E27F8PU081204_1550
4	PARODZ	Feruz Julia	30140032280000...1250.90	HUF	HUF	HUF	HUF			801E27F8PU081204_1550
5	POBENI	Saverio Andrea	30140032280000...18707.74	EUR	EUR	EUR	EUR			801E27F8PU081204_1564
6	DECLAR	Dafarag Radin	30140032280000...17078.31	EUR	EUR	EUR	EUR			801E27F8PU081204_1560
7	SOLEUC	Soleux Michelle	30140032280000...2288.72	EUR	EUR	EUR	EUR			801E27F8PU081204_1568

Physical Unit Processing History

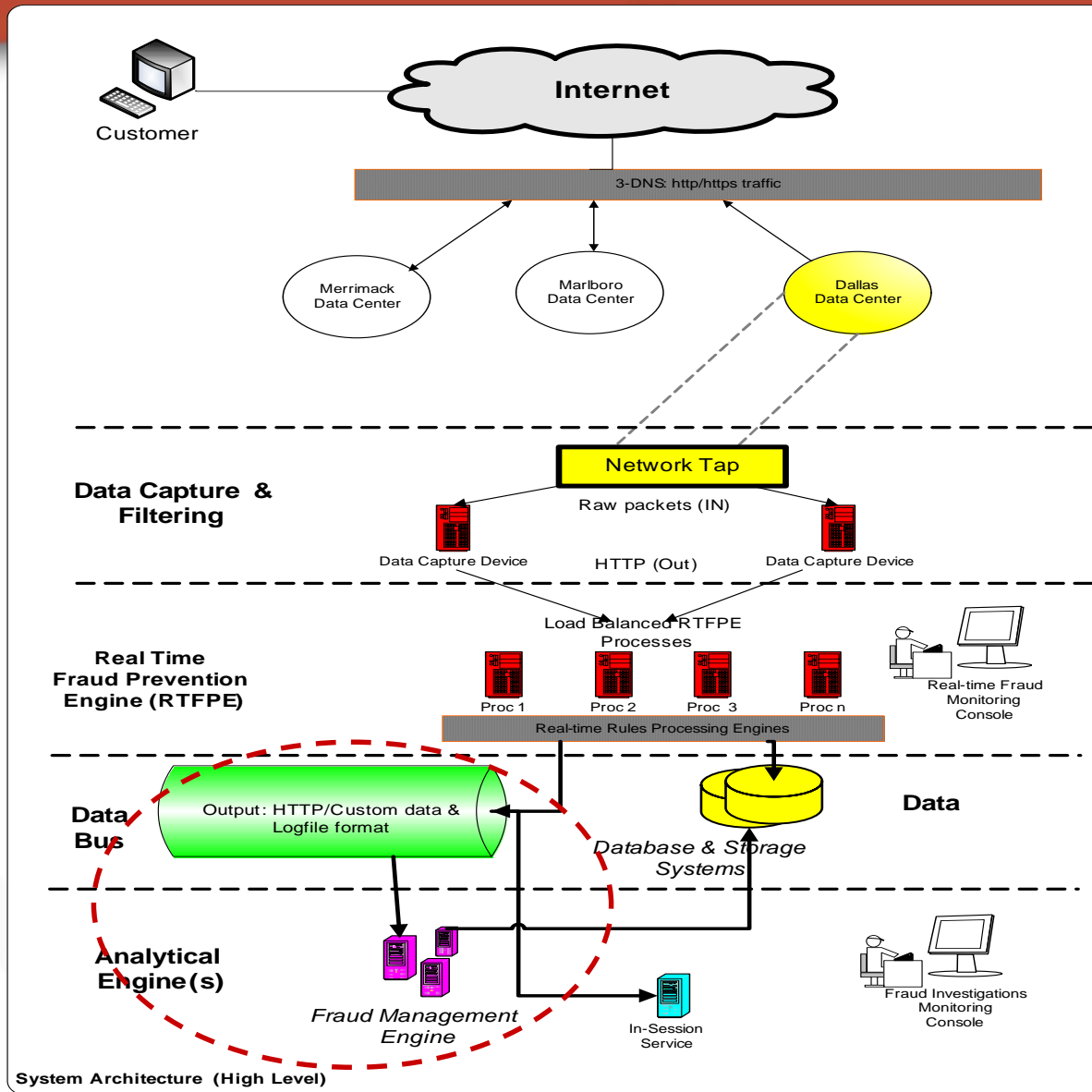
Summary Execution Report



Execution	Duration	Start History
<b>Execution report</b>		
No.	Status	
1	2008-02-19 15:08:06	Released State: D601_Physical_Unit_Authorized
2	2008-02-19 15:08:06	Released State: D601_Received_Intexchange
3	2008-02-19 15:08:06	Released State: D601_Sent_In_Drains
4	2008-02-19 15:08:06	Released State: Bnoma_Physical_Unit_Accepted
5	2008-02-19 15:08:06	Released State: Bnoma_Intexchange_Prepared
6	2008-02-19 15:08:06	Released State: D601_Received_Control
7	2008-02-19 15:08:06	Released State: D601_Process_Control

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# Real-Time Fraud Detection





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**Obrigado!**

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