Decision Management
At the Speed of Events

The power of rules, events, entities and analytics

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Biography

Dan Selman holds a BEng in Civil Engineering with Computing and an MSc in Artificial Intelligence.

He has been developing enterprise business rules engines for BEA Systems, ILOG and IBM since 1998.

Since 2013 he has been Chief Architect for IBM Decision Server Insights, a near real-time platform for situation detection that combines rules, Java and analytics.
Agenda

- Market context
- Decision automation
- Event-based situation detection
  - Decision Server Insights
- Analytics-driven decision automation
- Stream-based situation detection
- Big-data decision automation
Market context
We live in a moment of enormous possibility and digital transformation

- **90%**
  - Of the world’s data created in the last two years.
- **4x**
  - Increase in key business investments in Cloud over 2013.
- **100%**
  - Of LOB apps will be built for mobile-first by 2017.
- **75B**
  - Devices connected to the internet by 2020.

Alone, each of these has immense potential. Together, they can change everything.
Customers hold more power than ever and no one is immune to these changes

2/3 Of credit card fraud alerts resulting in denials that are actually legitimate purchases

84% Of companies believe service is important to their financial performance

59% Of companies say a customer service failure has had a clear, significant financial impact on their company
Decision automation
Empowers business users to automate repeatable day-to-day business decisions and react to emerging situations in real-time

- Codify business policies, practices and regulations in natural language instead of code embedded in applications
- Empowering business people to author and change operational decisions supported by easy-to-use governance of those changes
- Automating decision making at scale, with the fidelity of an expert
- Combined business rule and business event capabilities for a comprehensive decision management platform
Types of decision automation

**Transactional Decisions**
- Invoked in context of a business process or application (request/reply)
- Use data from transactional records
- Stateless decisions
- Interactive or batch

**Situational Decisions**
- Triggered by multi-channel interactions (event-driven)
- Use business event history, business context and analytics
- Stateful decisions over a context built over time
- At the earliest actionable moment (real-time)

**DETECT & DECIDE**

**Decision Server Insights**
- Whatever my next step, you have anticipated my needs

**DECIDE**

**Decision Server Rules**
- Whatever my action, you are ready to respond
Examples

**Transactional Decisions**
- Should this loan be approved?
- What is the appropriate discount rate that should be offered?
- What are the restrictions that apply to this sale?
- What are the documents required by the regulation?

**Situational Decisions**
- When a customer enters the store, if they have made more than 5 purchases in the last 6 months, send a discount
- When a customer logs into their account from their mobile app, if they have a high churn propensity score, offer them a free month of service
- Is this transaction fraudulent given the recent history and geolocation of the customer?
Event-driven situation detection
What...

Find patterns continuously over an event stream and correlated entity data to detect opportunities, risks or threats.

What if...

An airline could optimize the traveler experience to address change and mitigate inconvenience on an individual basis in real-time?

A global financial services firm could make its advisors *always-aware* of client activities and needs?

An investment bank detects when trades go wrong *decides automatically how to fix them*?
Event-driven situation detection
Event-driven situation detection

IBM Operational Decision Manager Advanced
Decision making in context

- Processes
- Social Media
- Systems of Record
- Data Warehouse
- Sensors
- Information Bus
- Systems of Engagement
- Mobile Devices

Business Events

Situation Detection & Action

Sense: what is happening
Build: your context

Act: quickly & consistently
Decide: what to do

Situation Detection
Build and maintain context about those entities

Capture events relating to entities of interest to the business

At the time of interaction

Push actions to the participants, processes and systems most relevant to execute them

Detect patterns and make decisions

Turn insight into action to detect opportunities and identify risks
Context leads to greater understanding and enables personalized interactions

A flexible modeling framework that enables easy representation of the critical aspects of your business

Extensive support for geospatial data and analytics including geo-location, geo-fencing, spatial relationship and more

Easily recognize meaningful patterns and trends in real-time, leveraging long term historical contexts and powerful analytics

Easy to leverage the predictive models that can help you make the difference
Real-time contextual decision making

Events
- Detect patterns of events over the time

Policies
- Applying Enterprise Policies
- Leverage information from System of Record

Analytics
- Leverage Predictive Models and other Analytics

System of Records
- Leverage information from System of Record
Decision Server Insights

An introduction to Decision Server Insights, part of IBM Operational Manager Advanced, which enables situational decision making for turning insights into action.
Decision Server Insights at a glance

Decision Server Insights wraps business rules, events, predictive and real-time analytics in an integrated, easy-to-operate, elastic platform allowing continuous analysis and optimized decisions at the time of interaction leveraging the enterprise’s up-to-date analytics models and business policies.
Insights Core Building Blocks

- **Sense**: what is happening
- **Build**: your context
- **Act**: quickly & consistently
- **Decide**: what to do

**Event**: Message representing something that happened

**Entity**: Some business relevant thing and related information

**Agent**: Business logic that is applied to an incoming event
How the Building Blocks Work Together

1. An event is related to one or more entities. Upon receipt by the system, the event is routed to those entities.

2. An entity stores basic data about the business entity, along with necessary event history.

3. Agents are bound to entities and process specific events.

4. Agents are logic fragments implemented in one of three ways.

5. Agents may emit new events, either internal to the solution to trigger additional event-entity-agent bindings, or external to trigger system actions.
Unified Business-Friendly Language

a customer is a business entity identified by a name.
a customer has a home country.
a customer has a propensity to travel.
a customer has a current location.
a country can be one of: US, France.
a credit card is a business entity named the owner.
a credit card has a credit limit.
a card level can be one of: Standard, Gold, Platinum.
a transaction is a business event time-stamped by a date related to a credit card.
a transaction has an amount (numeric).
a transaction has a location that is a country.
a transaction has a geolocation used as the default geometry.
a credit card activated event is a business event time-stamped by an activation date.
a credit card activated event is related to a credit card.
a customer notification is a business event related to a customer.
a customer notification has a message.
a fraud alert is a customer notification.
a fraud alert has a fraud level.
a fraud level can be one of: Low, Medium, High.
an offer is a customer notification with an offer type.
an offer type can be one of: New Product, Discount, Reward.
when a transaction occurs
  where the location is not the home country of the owner of 'the credit card'
definitions
  set 'out of country transactions' to all transactions
    where the location is not the home country of the owner of 'the credit card' ;
if
  the propensity to travel of the owner of 'the credit card' is less than 0.25
  and
  there are more than 2 transactions in 'out of country transactions' during the last period of 2 days
  and
  the average amount of 'out of country transactions' is more than 500
then
  emit a new fraud alert where
    the customer is the owner of 'the credit card' ,
    the fraud level is Medium ,
    the message is "Out of Country Fraudulent Use" ;
Analytics-driven decision automation
What…

Using analytical techniques to inform the design of automated decisions.

What if…

A retailer applies segmentation analysis to offer tailored promotions to their customers?

An intelligence agency detects security risks in real-time through analysis of passenger manifests?
Analytics-driven decision automation
Analytics-driven decision automation

**SYSTEM OF INSIGHT**

- IBM SPSS Modeller, IBM i2 Intelligence Analysis Platform
- IBM Operational Decision Manager

Data Sources

Application
Stream-based Situation Detection
What …

Analyze data in motion providing sub-millisecond response times. Structured and unstructured data sources.

What if…

A high-street retailer use weather reports and social media streams to decide what to stock in Edinburgh?

An insurer could analyze customer and/or prospect social expressions to identify events, needs & intent?

An airport could monitor the flow of people through check-in to predict delays to flights?
Stream-based situation detection
Stream-based situation detection
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Stream-based situation detection
Big-data decision automation
What…

Using decision automation to analyse large data sets.

What if…

A retailer applies segmentation analysis to offer tailored promotions to their customers?

An intelligence agency detects security risks in real-time through analysis of passenger manifests?
Big data decision automation
Big data decision automation
Big data decision automation
Think big! Scale your business rules solutions up to the world of big data

Build an app that uses Business Rules and IBM Analytics for Hadoop services on IBM Bluemix

Thank you!

Want to know more?
Try the book. …