Proactive and Adaptive Event-Driven Monitoring

IBM – Haifa Research Lab
Proactive event-driven computing is a new paradigm aiming at predicting the occurrence of problems/threats (or opportunities) before they occur, and changing the course of actions to mitigate them (or leverage them).

“Event processing can be used to detect an instance of a predictable situation that requires attention, to identify exceptional threats before they cause problems and to alert users to opportunities that require intervention”.

Gartner #171262, October 2009
What? (another view)

- Event processing (filter, transform, match patterns)
- Behavior prediction (states, events)
- Real-time decision
- Proactive action

Detect / Derive → Predict → Decide → Act
Use Case 1: Personal reschedule

**Detect**
I got out of the house 20 Minutes late; there are three spots of traffic congestion on the way to the office; it is raining; and I have an important meeting in 25 minutes!

**Predict**
I am not going to get to the meeting, not even close!

**Decide**
Check whether there is a qualified person for this meeting that can replace me and has lower priority task for the duration of this meeting and reschedule his/her other obligations; Alternatively, check if there is another time-slot later on the day for which the meeting can be rescheduled and get a decision!

**Act**
Notify all involved on their reschedule.
Use Case 2: Electric car – battery replacement overload

**Background:**
A company leases electric cars that can drive up to 100 miles; it provides both personal and public battery charge spots, and robotic battery replacement service stations as part of the lease.

**Detect**
Tracking the cars driving within a certain area and their battery status.

**Predict**
In 2 hours the service stations in the area will be out of charged batteries.

**Decide**
Whether there are available spare batteries nearby that can be shipped via car, or a helicopter need to be dispatched to ship batteries from the central store.

**Act**
Load batteries on selected means of transportation and start the journey!
Use Case 3: Portfolio tuning

**Detect**
Track corporate actions, news, exchange prices, and rumors about all securities in my portfolio

**Predict**
My portfolio is going to exceed my personal risk limit within 1 hour

**Decide**
Mark the securities to be sold and best timing to sell, find an alternative to buy that retain the risk limit.

**Act**
Buy/Sell orders