European FET-Flagship initiative:

A cross-sectional ICT
"Ubiquitous Complex Event Processing,,
interdisciplinary together with computational socio-geonomics, neuroscience, epigenetics, brain research, epidemic, weather/global catastrophe emergency management etc.

WORKSHOP FET-FLAGSHIP INITIATIVE, Brussels, 9-10 June 2010

Rainer von Ammon / Bernhard Seeger
The forecast of Ubiquitous CEP for the next decades

The forecast of Prof. David Luckham…

... until 2020 and beyond

... we are only at the end of the period of Simple CEP

European Challenges and Flagships 2020 and Beyond – Topics from the ISTAG, to be launched by 2013:
- Understanding life through future ICT
- Anticipation by simulation – Managing complex systems with future ICT
- Future Information Processing Technologies
- The Team Player: Future Problem Solving Technologies
- Robot Companions for Citizen
Ubiquitous CEP - Current domains and their interdependencies:
What we are already going to start and what we will do until 2020 and Beyond

- Smart Intelligence Enhancing
- Smart Brain Research
- Smart Epigenetics
- Smart Bio-Computing
- Smart LHC CERN
- Smart Computational Socio-Geonomics

“smart” means based on U-CEP/ed(B)PM


- Smart Emergency
- Smart Transportation
- Smart City
- Smart Plant
- Smart City Tourism
- Smart Tourism
- Smart Healthcare
- Smart Retail
- Smart Bank
- Smart Insurance

Navigation
The Principle of U-CEP – Reference Model

Integration with other proposals:
e.g. Towards a theory of the evolution of the web (Wendy Hall)

- Monitoring Cockpits
- Process Engine tbd: Process Execution Language
- CEP Engine tbd: Event Processing Language for U-CEP
  - IF
  - AND ...
  - FOLLOWED BY...
  - WITHIN...
  - ACTION

- Which events are important?
- How are events correlated?
- When and how should we react?

Domain specific reference models for event patterns

Event Store

Middleware

Event Modeler

Process Modeler

Event Type Adapters

Low Level Event Streams

Normalized events, build higher level events

Event Processing Model

Process Models

Process Engine tbd: Process Execution Language

CEP Engine tbd: Event Processing Language for U-CEP

Analyse history…

"unus mundus" - Internet services and their events

"unus mundus" - Internet services and their events
Computational Socio-Geonomics / Social Simulation / e.g. 10 Billion Agents

“Emergences” of the Computational Socio-Geonomics discipline correspond to “Complex Events” of the U-CEP discipline

Integration with other proposals:
e.g. Live-Ecology, S-Gaia, FuturIcT, Socionome Metalogier

Event Store

Agents Based Modelers

Monitor / Analyze / Act

Computational Socio-Geonomics and Social Simulation (Complex Systems)

Build higher level events

Low Level Event Streams

Event Type Adapters

e.g. JMS pub/sub

e.g. GPS-signal

e.g. Traffic Message Controls

e.g. Weather Forecast

e.g. RFID...

Agents Activity Monitoring

Agents Based Models

Process Engine

tbd: Process Execution Language

CEP Engine

tbd: Event Processing Language for U-CEP

IF
AND ...
FOLLOWED BY...
WITHIN ...
ACTION

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„unus mundus“ - Internet services and their events

Computational Socio-Geonomics and Social Simulation (Complex Systems)

Analyse history...
Enhancing human intelligence and cognitive or physical abilities connect humans to more events of the universe (resp. Internet services)

Integration with other proposals:
e.g. - Ray Kurzweil: Singularity is Near / Henry Markram Blue Brain /
- Bruce H. Lipton: Epigenetics – Intelligent cells /
- Karlheinz Meier: Design, construction and Operation of a Neuromorphic Computation facility
- Plamen Simeonov Integral Biomathics,
- Francois Képès, Marc Schoenauer : Using Evolution to compute
- Kevin Warwick: Brain Computer Interface - Cyborg

- unus mundus - Internet services and their events

Low Level Event Streams

Adapters
- e.g. JMS pub/sub
- e.g. GPS-signal
- e.g. Traffic Message Controls
- e.g. Weather Forecast
- e.g. RFID ...

Event Modeler

Monitor / Analyze / Act

Intracellular effectors = Event Processing Agents

Protein machinery

Extracellular receptors = event adapters

Which events are important?
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NeuroColumn

“unus mundus” - Internet services and their events
DNA-based Biocomputers / Quantum Computing
the obviously appropriate computer technology for U-CEP because of massive parallel processing

Integration with other proposals:
e.g. Peter Zoller ICT beyond limits

“ unus mundus” - Internet services and their events

Event Store
analyse history…

Event Type Adapters
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e.g. GPS-signal
e.g. Traffic Message Controls
e.g. Weather Forecast
e.g. RFID …

Monitor / Analyze / Act

Agents Based Modelers

Agents Based Models

Agents Activity Monitoring

CPE Engine
tbd: Event Processing Language for U-CEP
IF … AND … FOLLOWED BY… WITHIN … ACTION

CEP Engine
tbd: Process Execution Language

Process Engine

• Which events are important?
• How are events correlated?
• When and how should we react?

Low Level Event Streams
Robot Companions for Citizen – driven by Event Processing

Integration with other proposals:
e.g. Paolo Dario Robot companions for citizens

Process Modeler

Event Modeler

Event Store

Event Type
Adapters

Low Level Event Streams

„unus mundus“
- Internet services and their events

CEP Engine
tbd: Event Processing Language for U-CEP

IF ...
AND ...
FOLLOWED BY...
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Process Engine
tbd: Process Execution Language

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analyse history…

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