

Self-Management: Beyond Business Processes Automation

SASO-Biz Workshop

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TELEFÓNICA I+D

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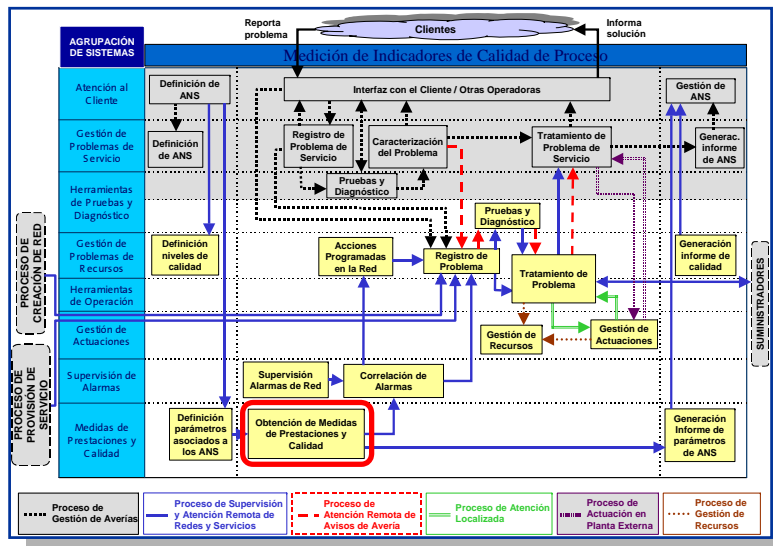
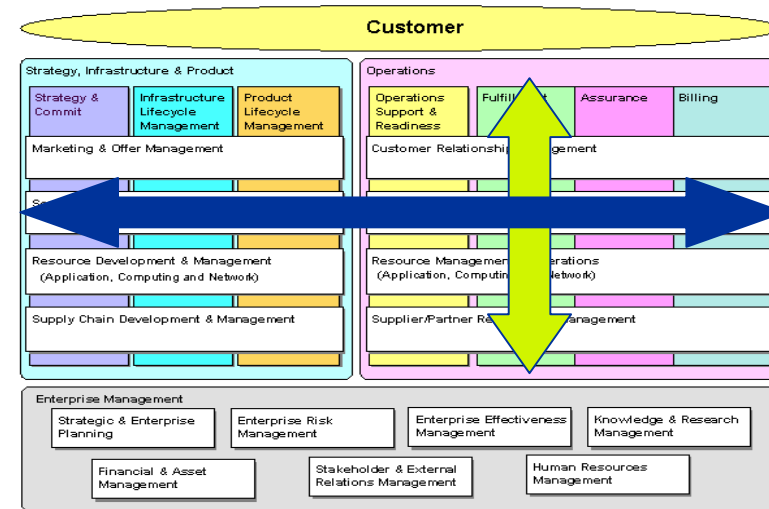
- From a infrastructure management point of view

04 Conclusion

Beyond Wired Automation

What do Telcos use the systems for?

- Telecom companies have been very successful in automating vertical business processes
 - Now, automating the horizontal ones ...



— ... But in a static way

Introduction

Why do we have to change?

- Our systems have been designed for a static scenario but the scenario has changed
 - Competence (Internal and external)
 - Value chain is broken and it is more complex
 - Long tail services vs massive services
 - Digital convergence
 - Regulation
- Traditionally, the lack of flexibility and adaptability of the systems was provided by human being
 - But the complexity of ubiquitous and pervasive communications and information services is becoming a barrier for business
- We need to design systems to work in a more changeable and less controlled environment

Introduction

An Example: Digital Home

■ Telco Infrastructure

- Telefonica Spain Transport Network
 - 25.000 nodes
- Homogeneous nodes
- Exhaustive control of changes



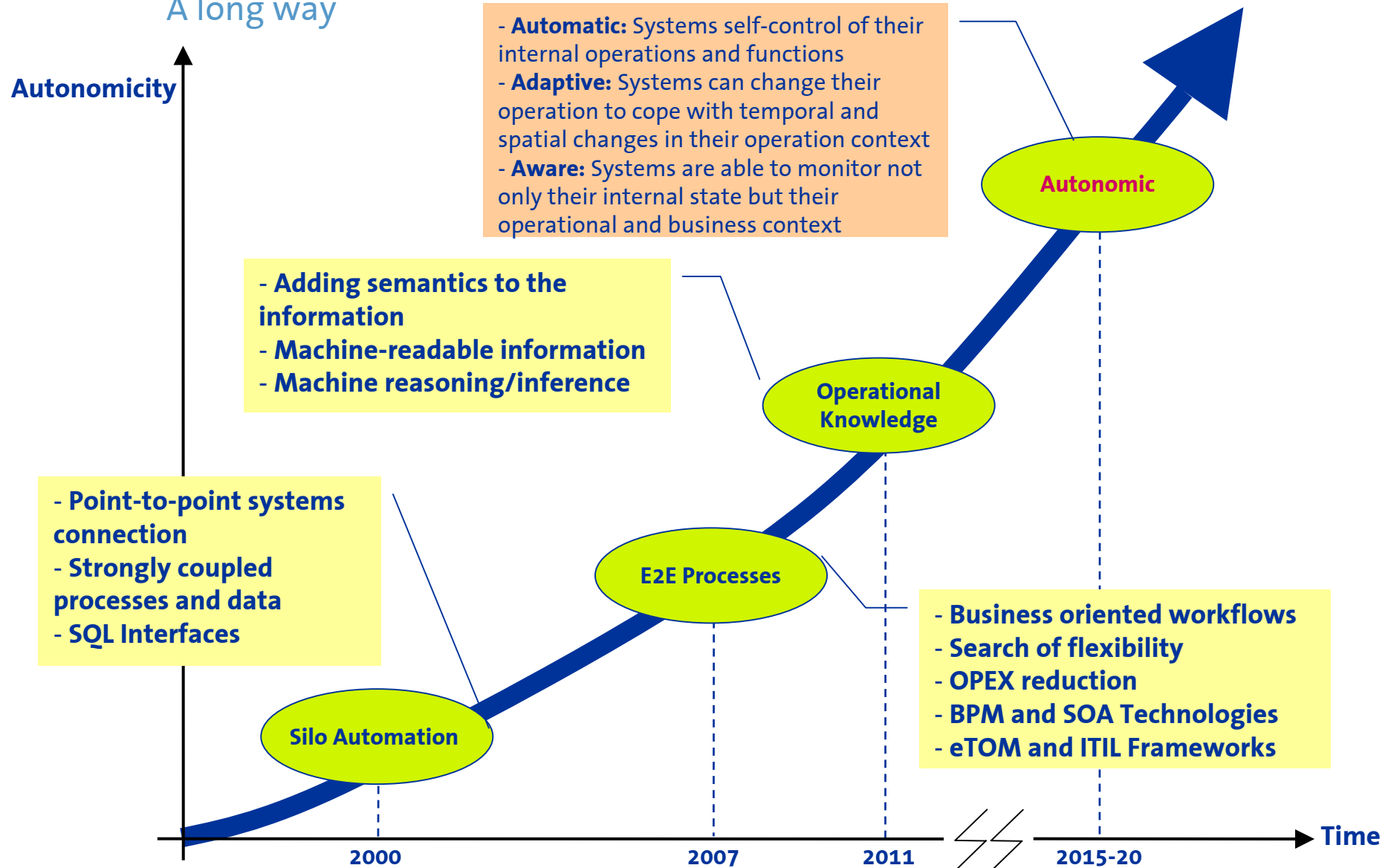
■ Home Digital Infrastructure

- 12.000.000 homes
- Each home is different
- Heterogeneous devices
- User can plug and remove, switch on/off devices





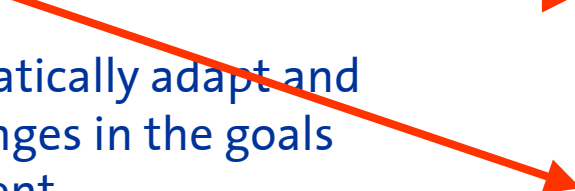
Introduction

A long way



Beyond Wired Automation

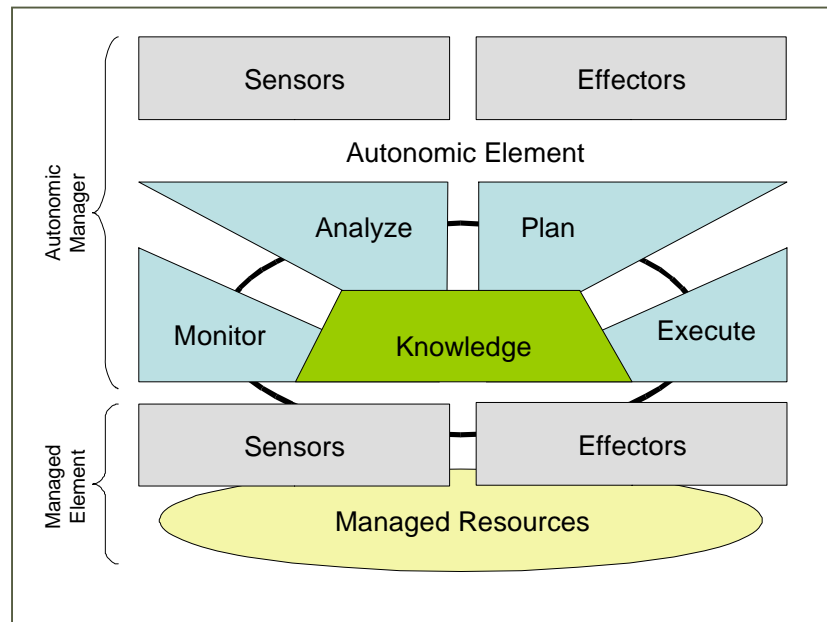
Autonomic Infrastructure

- Self-management  ■ OPEX Reduction
 - System capability to administer itself automatically
- Self-adaptive  ■ CAPEX Reduction
 - Able to automatically adapt and cope with changes in the goals and environment
 - Implies flexibility but also evolvability
- It is not only to improve technology but use technology in a different way

Beyond Wired Automation

Ontologies and Inference Engine

- SOA claims to be flexible enough to drive business processes but ...
 - SOA focuses at the systems integration but systems are statically designed
 - Systems are not business driven but functionality driven
 - It maintain the human in the loop
- Ontologies and inference to get “wireless automation”
 - Policies: business goals
 - Rules: behaviour
 - Inference engine: to obtain new relations
- Changing from functions to behaviour

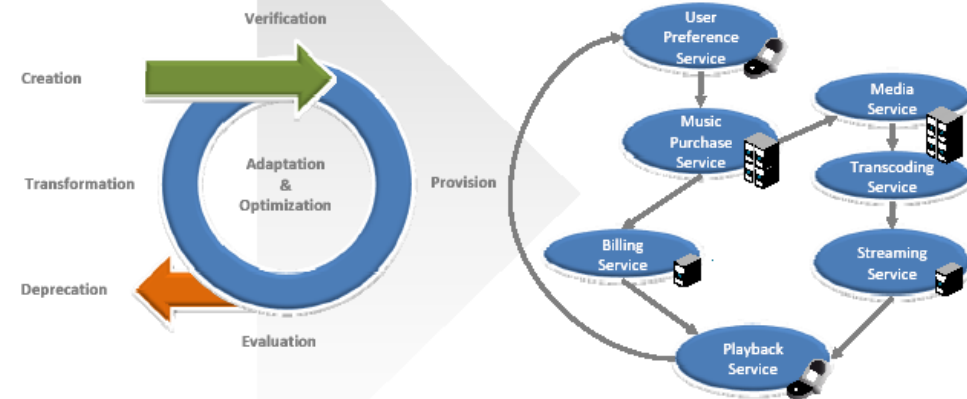


Beyond Wired Automation

Dynamic SOA

- Autonomic Services Composition
 - Self-organizing
 - Adapting to context changes
 - Self- evolving
- Design of autonomic service composition requires mechanisms that enable composite services to dynamically and automatically adapt to changes in their environment or performance shifts of their components

Autonomic Service Composition



Autonomic Service Composition is a powerful means for *generating added-value with minimal development effort*. Continuous *monitoring and optimization methods* help maintaining composed services across different physical systems, service domains and vendors.


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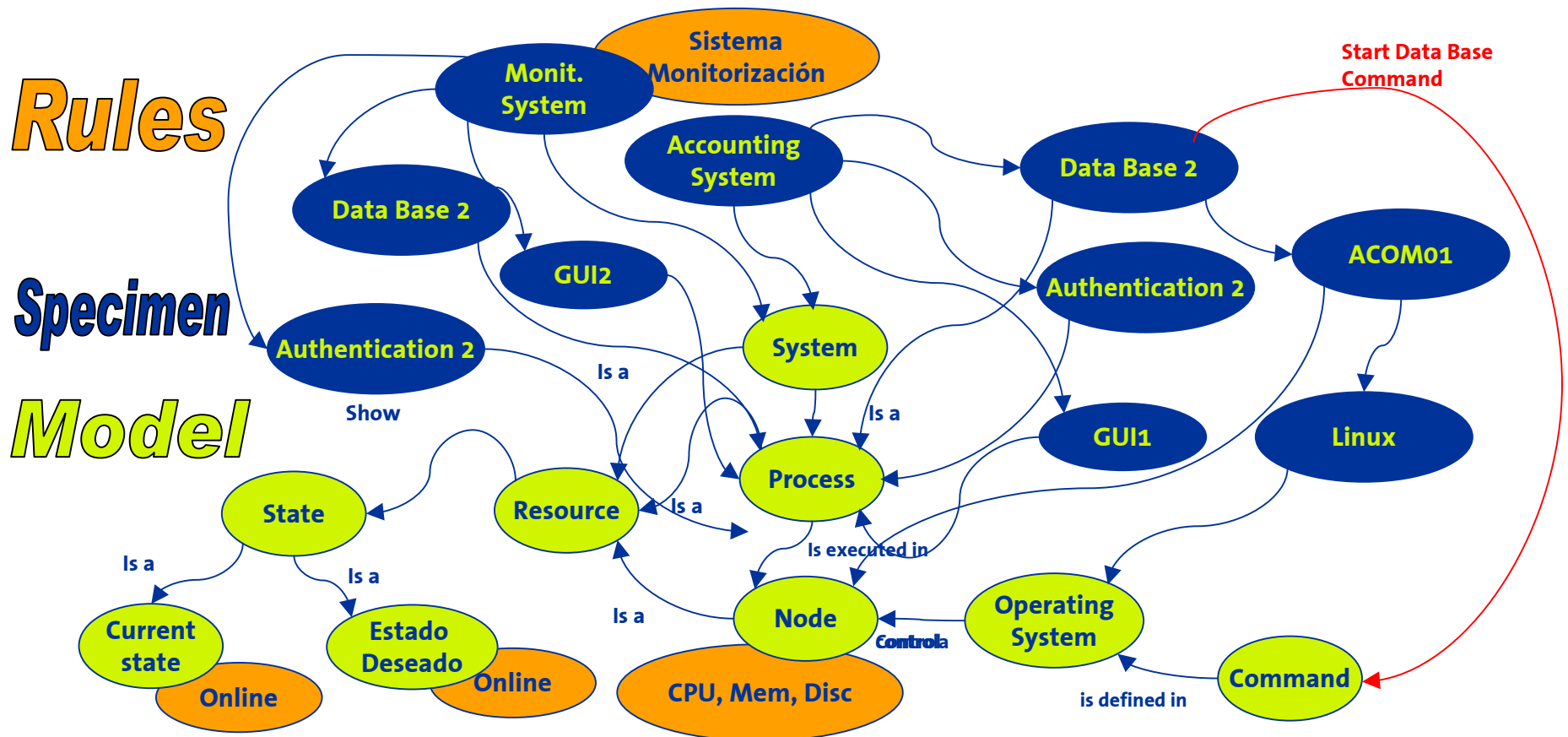
Courtesy of **Heiko Pfeffer**
Towards Services Ecosystems for the mobile Web 3.0: Autonomic Services Composition



Beyond Wired Automation

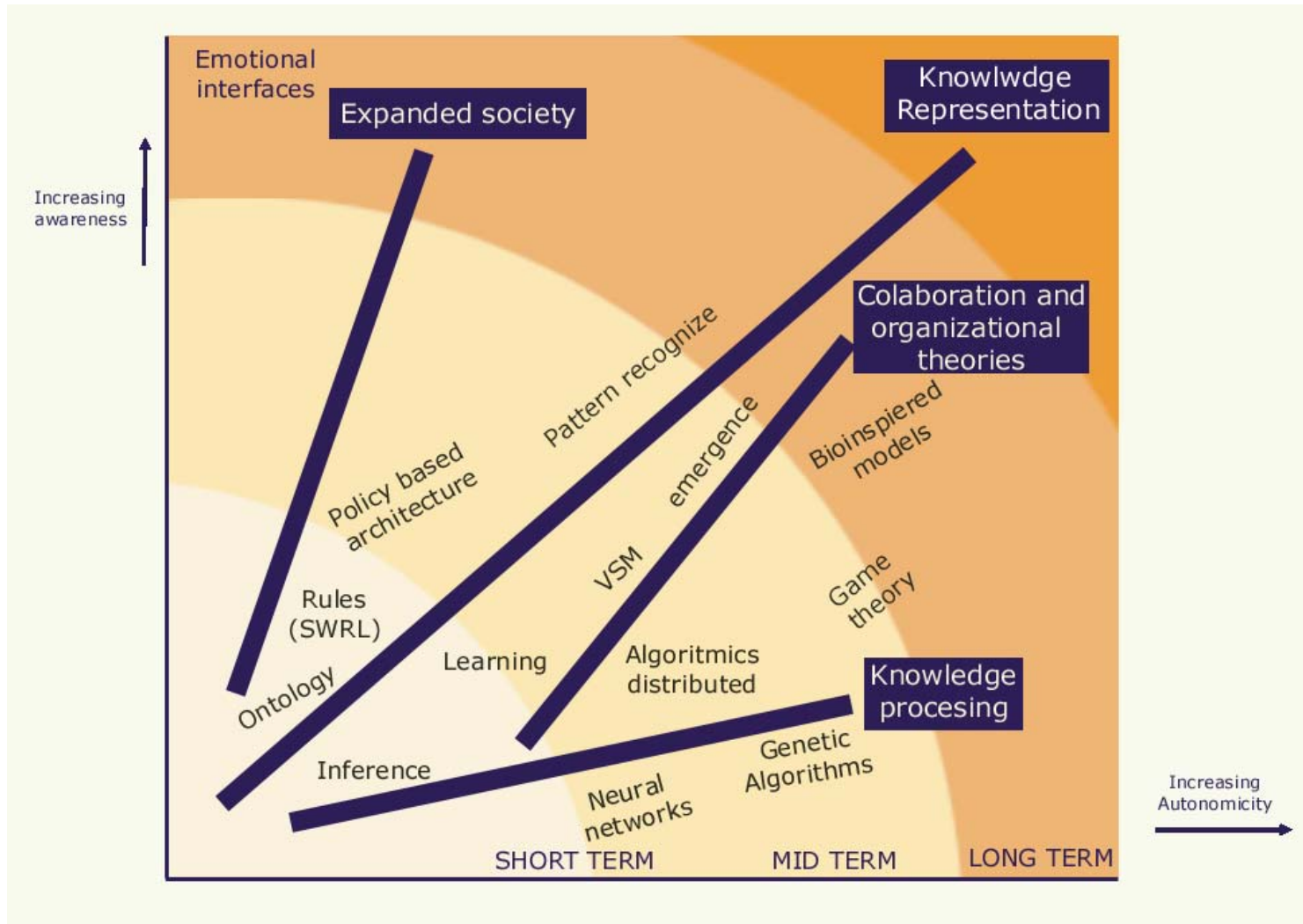
Adaptability

- Moving from “programatic systems” to “declarative behaviour systems”
 - Systems behave according “business context”



Beyond Wired Automation

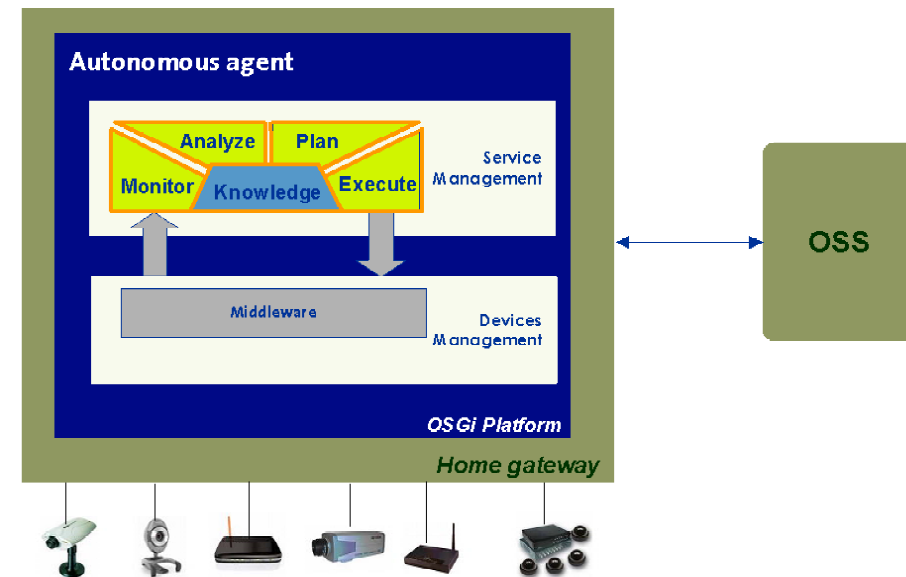
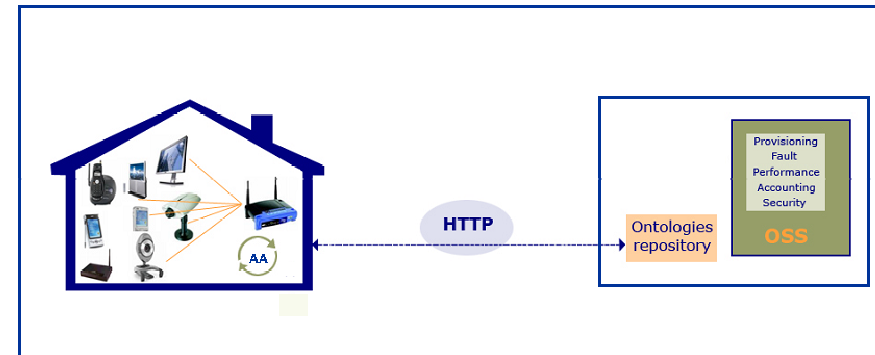
There is not an Autonomic Technology



Some experiences with Autonomic Systems

Autonomic Digital Home Agent: Proof of concept I

- Some policies (SWRL) sources
 - Service providers
 - End user
- Knowledge implemented using
 - A service ontology (OWL)
 - An inference engine
- Local functions
 - Service dynamic provisioning
 - Status monitoring
 - Diagnosis



Some experiences with Autonomic Systems

Systems Administration: Proof of concept II

- Systems administration is difficult to automate as it is very dependent of the specific system
 - Usually, it is solved after system design
- We have created a semantic model (based on an IBM model) for systems administration and we translated the “System Administration Guide” of the systems to this model
- Systems administrator will use a “Administration Console” to define policies and goals and to command the infrastructure
- Behaviour is inferred not programmed
 - Adding a new system implies only to feed its semantic description to the inference engine



Conclusion

- Research initiatives, not industrial deployment yet
 - Technologies not mature enough
 - Lack of standards
- A shift of paradigm is needed
 - From programmatic systems to declarative ones
 - Not only technological, but mental (Trusting in the infrastructure)
- Ontologies and inference look key pieces for “wireless automation”
 - Poor performance of inference engines
- We have to use technology in a different way, as we need different things

Telefonica
