Service oriented software engineering
Trends and motivation

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- Vision
- Software engineering crises
- Service ecosystem architecture
- Properties of SOSE
- Learning goals
In future, enterprises and individuals expect to

- easily compose new services/collaborations from open service markets, and
- manage these constructs respecting regulation and autonomy of partners.
Types of collaborations and business networks

- Social network of friends
  - Contents (e.g. Flickr)
- **Expert nets**
  - Scientific society
  - Standardisation
- Broadcasting
  - News, entertainment
  - Net of newsagens
- **Business networks**
- **Virtual organisations**
  - Roles, gains, responsibilities
Software engineering crises and ability to compose and control?

- How the customer explained it
- How the Project Leader understood it
- How the Analyst designed it
- How the Programmer wrote it
- How the Business Consultant described it
- How the project was documented
- What operations installed
- How the customer was billed
- How it was supported
- What the customer really needed
Software engineering crises

Service science

Service-oriented architecture and computing

Requirements
design
Implementation
Maintenance

Evolution aspects? Feedback?
Composability?
Interoperability?
Nonfunctional properties?

Business issues? Marketability?
User-orientation? User involvement? Usability?
Best business practices?
Software-based services

Properties of a service?
- user interaction / modalities
- adaptation or context awareness
- composability, collaboration ability
- interoperability, reputation
- usage cost vs properties
- qualities like nonrepudiation, transactionality

Challenges for the software!
Transition from traditional SE towards SOSE

- System design
- Business network model
- Service description
- Peer services in collaboration
- EContract mngmt

Social sciences, economy, legislations

User experience
Adaptivity, personalisation
Context awareness

Monitoring reporting, reputation

Metrics and methods of measurement
Transition from traditional SE towards SOSE

- Computer Science
- social sciences, economy, legislations
- platforms
  - WS
  - CORBA
  - J2EE
- software processes and tools
  - MDE
  - UML
- software engineering
- system design
- business network model
- service description
- service implementation
- User experience
  - Adavity, personalisation
  - Context awareness
- eContract mngmt
- peer services in collaboration
- Metrics and methods of measurement
- Monitoring, reputation
CINCO group vision:
Open service ecosystem

Open service market

Regulations
Services from Providers
Collaboration models
Collaboration models
Private knowledge
Private knowledge
Public knowledge
Public knowledge

Ecosystem improvement

Collaboration establishment
- goals
- roles
- interoperability
- trust
Agreement process
- level of automation
- distributed control
- quality of agreement

Collaboration enactment and control
- interoperability levels
- equality
- subjective control
- NFAs
- expectations on computing platforms to be minimised

Collaboration evaluation
- metrics on success and disappointments
- trust, reputation, ...
- feedback for BPR, service improvement

Ecosystem supporting global infrastructure

Service discovery and selection

eContracts
rules
Experiences

Vocabulary
Business network patterns/models

Experiences

Properties produced by SOSE

- **Service availability from open ecosystem**
  - Tool support for ensuring dependability and suitability
  - Shared vocabulary on service negotiation and management
  - Reusability and replaceability of services

- **Composition of added-value services**
  - Interoperability: pragmatic, semantic
  - Contract breach and recovery
  - QoS and NFP (nonfunctional props) as part of the contract

- **Service management facilities even for the user**
  - Multichannel services
  - Self-controlled services: adaptation, context-awareness
Service quality aspects in the ecosystem

Traditional

• Software implementation view
  – Internal quality measures
  – Missing features

• Production process maturity
  – Collection of feedback from all steps of process

• Organisation
  – Controlled by one organisation
  – “Factory”, product family

Service oriented

• Service usage view
  – External quality measures
  – Goals
  – Not only software measures

• Maturity and multifacetness of processes of production, composition, control and usage
  – The operational environment is instrumented for collecting feedback
  – Operational environment has effect on the use and behaviour of the software; control of services

• Organisation
  – Federated, ecosystem; no single controller
  – Shared knowledge bases support evolution
  – Also the business cases / models get iterated for better validity
Learning goals

- **Skills and knowledge for architecture work that becomes increasingly critical**
  - Enterprise architecture
  - Business network architecture

- **Routine of following and assessing new developments on processes, tools and infrastructure services that build SOSE environment**

- **New concepts and architectures**
  - Current environment for design, existing systems, company maturity

- **Tools developed to support previous phase concepts**
Learning goals

- Principles in service ecosystem
  - SOA/SOC, infrastructure services, service lifecycle

- SOSE process and products
  - Services, models, patterns
  - Requirements for composability and interoperability
  - Process, supportint tools
  - Producing required service quality

- Models
  - Role of models in the ecosystem
  - Modeling technique and tools for various artefacts
  - Understanding transformations
    - Impact in heterogeneity and evolution management
    - Techniques within tools; quality of products
CINCO
Collaborative and interoperable computing

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