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Advanced IT support for configuring services: principles and demonstration

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Outline

- Can services be modeled as configurable products?
- Services and configurators
- Four-worlds model
- Configurator & WeCoTin big picture
- ConSerWe 4-worlds implementation
- Four-worlds telecommunications models
- Demonstration
- Conclusions

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Can services be modeled as configurable products?

- Experimented modeling & configuration with WeCoTin configurator
  - B2C broadband and mobile subscriptions, maintenance contracts, and insurance policies
- Modeling and configuration of contract-based service offerings was possible
  - The customer, other stakeholders and/or related equipment, environment (or their properties) often had to be modeled
  - A conceptual mismatch: service elements as components → 4 WM

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Can services be modeled as configurable products? (2)

- Several prices needed in telecommunications, maybe in maintenance
- Recommendations, warnings, and possibly optimization needed
  - Soft constraints warned afterwards when recommendations not satisfied – no proactive support
- Supporting reconfiguration is important, especially in telco
➔ Yes, possible to model case offerings as configurable products with concepts & relationships designed for physical products
  ➔ Normal configurators can be used
  ➔ But: more advanced modeling support would be beneficial

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Four-worlds model

- **Objects-of-service world:** describe the service recipient (often includes the customer, can be persons or physical systems) and its environment

- **Needs world:** describe the reasons *why* a customer would want to buy the service

- **Service solutions world:** *what* is to be delivered; agreement or contract options

- **Process world:** describes the delivery process and resources used in it; *how* and *with what* the service is put into practice

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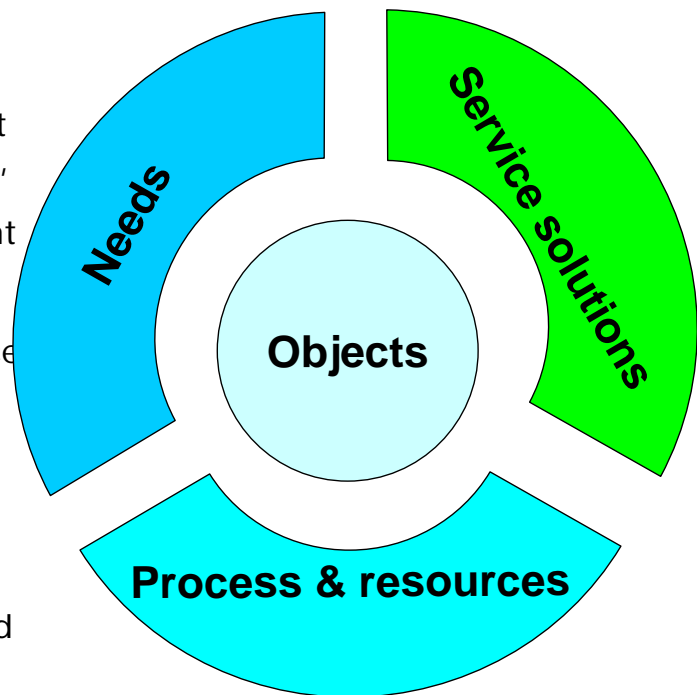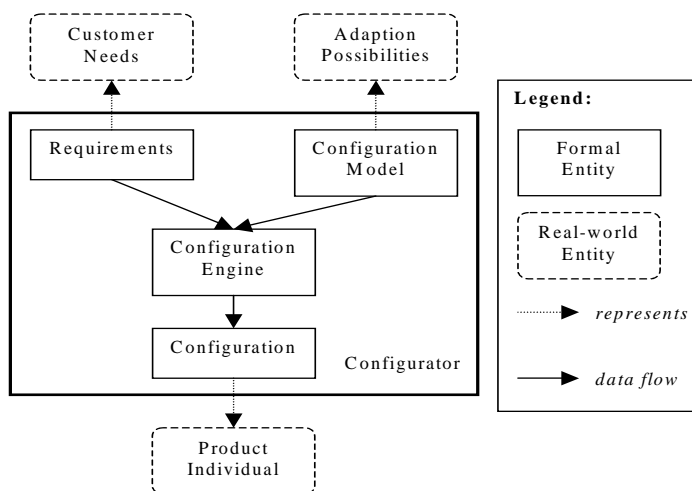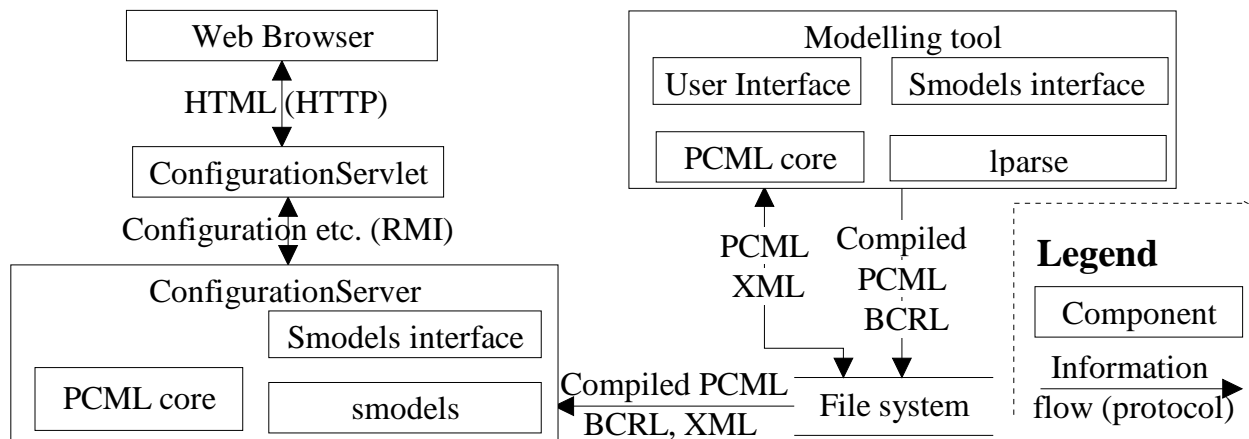
Configurator

- Create and manage configuration models
  - Elements & how they can be combined
- Support the configuration task
- ➔ A specification of a product individual that meets the given customer requirements and complies with the configuration model

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Figure: Anderson 2005
(adapted From Soininen 2000)

WeCoTin Architecture

WeCoTin Configuration Tool   WeCoTin Modelling Tool

Web Browser

HTML (HTTP)

ConfigurationServlet

Configuration etc. (RMI)

ConfigurationServer

Smodels interface

PCML core   smodels

Modelling tool

User Interface   Smodels interface

PCML core   lparse

PCML XML   Compiled PCML BCRL

Compiled PCML BCRL, XML   File system

Legend

Component

Information flow (protocol)

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4-worlds model configurator implementation

- Specified 4-worlds model to a more detailed level
  - E.g. defaults, constraint language, what is a complete configuration, etc.
  - Conceptualisation underlying WeCoTin supports these
- Defined a service configuration modelling language
- Implementation that translates service configuration models to modelling language of WeCoTin
- WeCoTin can configure services modelled with the 4-worlds configuration modelling language
- ~ 15 000 lines of Java Code + 9000 lines of comments
- M.Sc. project of Andreas Anderson

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ConSerWe 4-worlds model implementation architecture is a SCML to PCML Translator

SCML Configuration Model → SCML Model Loader

ConSerWe

Configuration Core Objects → SCML to PCML Translator

WeCoTin

Service Configuration ← WeCoTin Configuration Tool ← PCML Configuration Model

Legend:

Subsystem	Component	Data	data flow

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Translator is invoked via command line interface
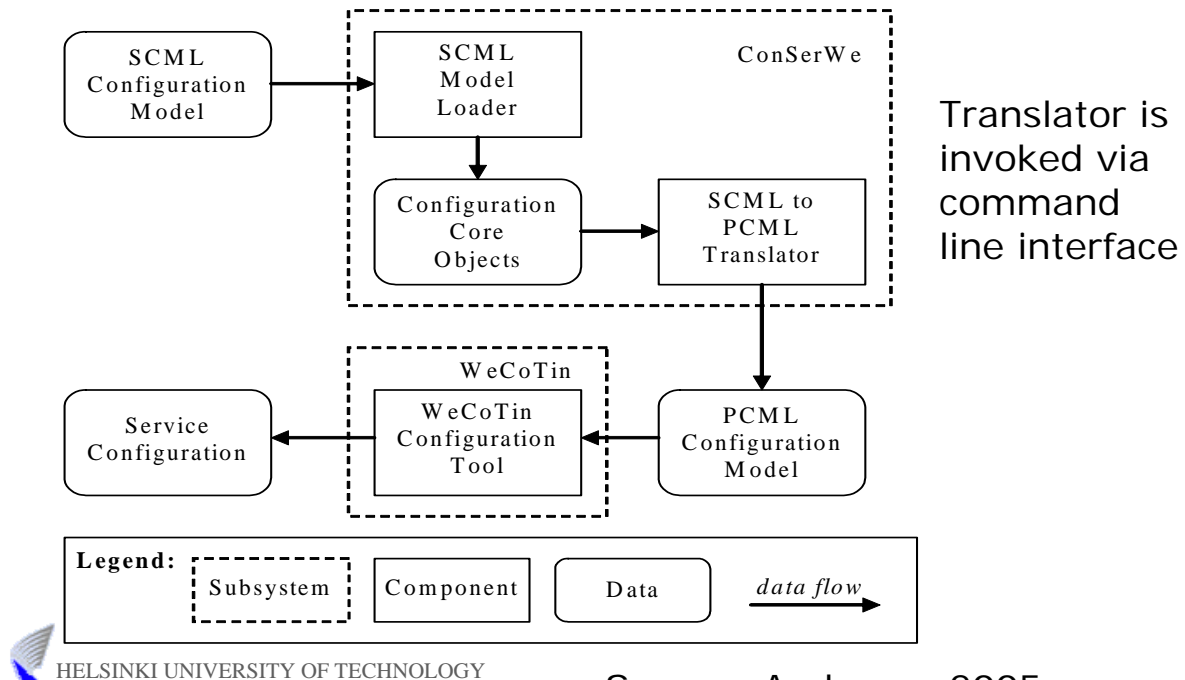
Source: Anderson 2005

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Design of a 4 WM user interface

- New UI component designed: comparison table for configurations
  - 2 cases as basis
- Most relevant relationships between objects (customer), needs and offering in one view
  - Recommendations (relationships)
  - Some object and need data to facilitate comparison
- Grouping of similar variants (same recommendations)
  - Reduces complexity
- Prices and estimated (yearly) total cost for customer shown
- Seems applicable for many kinds of configurable offerings
- M.Sc project of Teemu Talja

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Broadband & mobile configuration models

- Broadband: based on public TeliaSonera Finland broadband offering from web (10-11/2005)
  - Detailed modeling, a large model
  - covers what was available on the web
  - more details could be added
  - pricing was excluded from modeling
  - All 4 worlds
- Mobile: based on public Elisa 3G mobile package offering in spring 2006 & their subscription recommender tool observation
  - covers roughly what was available on the web
  - more details (e.g. recommendations) could be added
  - pricing was included
- Recommendations generate many (mostly soft) constraints (service objects → needs, service objects → service solutions, needs → service solutions, solutions →process
- "technical compatibility" of the solution itself does not generate many constraints (types & inheritance & refinement avoid this)

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Conclusions

- 4-worlds model can be used for modeling at least some complex offerings
  - A complex offering along with related objects of service, needs and processes was successfully modeled
  - It was natural for the modeler to use the 4-worlds way of modeling (but: author bias)
  - The 4-worlds model matches well the modeling needs
  - The broadband model mixes customer view with provider view
- ConSerWe has provided an implementation that makes it possible to configure on basis of the 4-worlds model
- Consultative selling could benefit significantly from IT support provided
  - IT support can take care of many details and make it less likely that some factors are forgotten
- Ideas for further work have been identified
  - Modelling of process resources need references (not replicated each time)
  - More active recommendations instead of post-mortem warnings are needed
  - Develop recommender technology to suit configurable offerings, and integrate
  - User interface of WeCoTin should offer better support for the 4-worlds model
    - Place elements from different worlds near each other
    - Manage process configuration in a more natural way

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