A Scenario-View Based Approach for Supporting Mediated Web Service Interactions

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Content

- Background and Motivation
- Logical Steps for Proposed Research
- Conclusion
Background and Motivation (1)

- **Web Service interaction: the core of SOA**

- **Autonomy, heterogeneity →**
  mismatches normally exist among Web services →
  data and process mediators are needed →
  mediated Web service interaction

- **Behavioral aspect is our focus**
Compatibility analysis: to check whether business processes can interact properly beforehand

Shortcomings of current compatibility:
- Do not allow mismatches among business processes
- Aim at direct service interactions
- Results in a binary or ternary answer
Process Mediation: to facilitate service interactions at runtime

Shortcomings of current process mediators:
- Design-time mediation: specific adapters for specific mismatch patterns
- Consider control-flow only, and ignore data-flow almost
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Logical Steps for Our Research

- Scenarios and Views for describing business processes

- Compatibility analysis for business processes. A degree of compatibility, rather than a binary or ternary answer

- Process mediator (**in-progress**)
Scenario and view generation (1)

- **Scenario**: a scenario is a possible execution of a business process

![Diagram showing a scenario of a business process with steps including Start, R: Toy Items, R: Customer Information, S: Price, Message, pay, End, S: Delivery, R: Payment, R: Cancel, and Failure. Two additional scenarios, Sce-1 and Sce-2, are also shown with similar steps.]
Scenario and view generation (2)

- **Reduction rules:**
  - **Sequence:**
    - ![Diagram of Sequence](image)
  
  - **And-Block:**
    - (a) ![Diagram of And-Split and Join](image)
    - (b) ![Diagram of And-Split with Parallel Actions](image)
Scenario and view generation (3)

- **Reduction rules:**
  - **Loop-Block:**

![Diagram](image_url)
- A view for a scenario using reduction rules:

The view for Sce-1
Compatibility Analysis

View-1

View-2

... ...

View-n

Scenario-1

Scenario-2

... ...

Scenario-n

Business Process

Compatibility at a view level

Compatibility at a process level
Compatibility Analysis

- A degree of compatibility

\[
\text{Compatibility}(p_1, p_2) = \frac{\sum_{i=1}^{n_1} \text{comp}(v_i \mid p_2)}{n_1}
\]

Types of Compatibility

- No compatibility if \( \text{Compatibility}(p_1, p_2) = 0 \).
- Partial compatibility if \( 0 < \text{Compatibility}(p_1, p_2) < 1 \).
- Full compatibility if \( \text{Compatibility}(p_1, p_2) = 1 \).
Background and Motivation
Logical Steps for Proposed Research
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Conclusion

- Compatibility analysis and process mediator are needed for mediated service interactions

- Proposed approach
  - Scenarios and Views can be generated to describe business processes
  - The degree of compatibility for business processes can be computed based on pairwise compatibility of their view
  - Process mediator, need to deal with mismatches at runtime

- Current Status
  - Scenario and views generation is done
  - Compatibility analysis is almost done
  - Process mediator is in-progress
Thanks and Questions!

Thanks a million!

Questions?