SOLÜBTHA: A Flexible Business Transaction Model

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Outline

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Business Transaction (BT)

- Series of collaborative activities
  - Distributed across multiple partners
  - Performed in a flexible manner by accomplishing the commitments agreed upon by the partners.
- Business transaction is long-running
  - More risk-prone to abortion than short-lived transactions.
- Flexible to prevent abortion
  - Flexibility is an important requirement for business transactions.
- A business transaction model supports defining the structure and operational (behaviour) of business transactions.

Problem Statement

- In order to support flexible business transactions, a model should be built on techniques or properties that support defining non-atomic operations.
- Many current business transaction models still rely on strict atomic principle.
- Some advanced models are built on techniques including compensation and savepoint that support implementing non-atomic principles
  - Techniques are not sufficient for flexible business transactions

Business Transaction Failure

- Business Related Fault
  - Process Related Fault
  - Communication Related Fault
  - System Related Fault

Business Related Fault Model

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Process Related Fault Model

Communication Related Fault Model

System Related Fault Model

Business Transaction - Problem

SOLÚBTHA Business Transaction Model

- Models **structure** and **behavioral property** of business transaction
- Goal is to Support:
  - Modeling transactional business processes by correlating real-world business entities with core transaction functions
  - Defining highly flexible business transactions
- SOLÚBTHA incorporates a list of business entities to support modeling business transaction
- SOLÚBTHA correlates business entities with transaction functions.

SOLÚBTHA Business Transaction Model

- In order to support the definition of a flexible business transaction, SOLÚBTHA
  - Relies on a non-atomic principle called “**eventual failure atomicity**”.
  - Provides a set of recovery patterns that recovers business transactions from failure for faults and thus, prevents business transaction abortions
  - Offers property that control behavior of business transaction
Modelling Behavioural Properties of Business Transaction

- Eventual failure atomicity is the fundamental principle that drives the non-atomic behaviour of abstract transaction fragments within business transactions. 
  \((TV = (ATF_1 \circ ATF_2 \circ \ldots \circ ATF_n)) \rightarrow S_1 \sqcup S_2\) where, \(S_1\) and \(S_2\) denotes states successful and aborted.
- Solúbtha supports defining non-vital activity whose failure will be ignored.
  \((\exists_{ATF} \rightarrow \text{failed}) \rightarrow \text{Ignored}\)

Conclusion and Future Work

- Solúbtha supports modeling business transaction for service based applications that underpin end-to-end business processes.
- The model facilitates defining a transaction from business perspective which governs operations at runtime.
- The model supports defining flexible properties for business transaction.
- In addition, it supports defining recovery actions that prevent abortion of business transaction and thus flexibility is achieved.
- We are currently validating the Business Model
- Solúbtha needs a language support

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Publications from this research


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