

A Unified Test Assertion Model?

Comparisons with UML

DRAFT 1.0

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Parallels with UML

⇒ Predicative

- Artefacts
- Properties

⇒ Class Diagram

- Classes
- Properties

⇒ Event Behaviour

⇒ Activity Diagrams

⇒ Modules

- Profiles
- Pre-conditions

⇒ Packages

- Name-spaces
- Notes

⇒ Prose sections

⇒ Prose sections

Predicative

⇒ Artefacts

- How similar is an artefact to a class?
 - They both can consist of further artefacts/classes via associations, containment, etc.
 - They both are expected to exist in the implementation without necessarily doing something
 - Artefact could be a class or object when implemented

⇒ Properties

- An artefact can be required to possess properties and these could be the properties of a class

Event Behaviour

- ➔ Maybe an predicate is a special form of an event-behaviour
- ➔ Or the event-behaviour could include a predicate just as an activity diagram can contain one or more classes or sets of classes
- ➔ Events and behaviours can reference and describe artefacts and their properties

Contrasts

- ⇒ The parallels are there but UML relates to OO whereas the TA might be a lot broader than that
- ⇒ The final use of the TA might be different to that of a UML diagram
 - If a TA expressed as many points in one statement as a UML diagram contains classes, actors or actions then it might be less useful
 - References to and from each point in TA
 - A test may need to point to a single TA
- ⇒ Groups of TAs under common pre-conditions
 - Groupings at various levels may be needed

Prose

Both UML and TA models have in common the need to be supplemented with prose expressions

Lessons from UML Comparison

- ⇒ Simplicity
- ⇒ Extensibility
- ⇒ Grey areas
- ⇒ Allow prose
- ⇒ Linked

Simplicity

- ➔ a suspicion that test assertions need to be far simpler than UML in order to be usable

Extensibility

- ➔ a suspicion that there are likely to be design features in specifications which require more than just the two types of model

Grey Areas / Overlaps

- ⇒ One model type can include another
 - Example: An event may require that there exist an artefact with certain properties
 - Example: A property might change during an event in a certain way
- ⇒ One type might make reference to elements of another
 - Example: An event might involve a change to a property of TA expressed as a predicative
- ⇒ A TA of one type might share in common pre-conditions with a TA of another type

Prose may suffice for some TA requirements

⇒ Prose

- Clear
- Succinct
- May be better when lots of artefacts have to be linked
- Sometimes require very little explanation in prose format even though complex

⇒ Models

- Sometimes cloud the meaning
- Verbose at times
- Structure of models sometimes inadequate or inappropriate
- Require expertise not always available

Links between TA and UML - 1

Maybe a TA will sometimes
include UML elements

But: there needs to be
provision equally for other design disciplines
for which UML may not itself have to cater

Links between TA and UML - 2

- ⇒ How might UML artefacts be represented in a TA model ?
- ⇒ e.g. Say in a UML contract
 - Class and associations without operations
 - Predicative model ?
 - class A has property B with datatype C
 - class A is associated with class C
 - Class with operations, activities,
 - Predicative model for structural aspects as above ?
 - Predicative: class A has operation B
 - Events and behaviours for operations ?
 - Operation, cross-references, pre-conditions, post-conditions or behaviours
- ⇒ Notes, semantics, etc represented in
process

Links between TA and UML - 3

Parallels in XML, SOA and Semantics

- ➔ How might other artefacts be represented in a TA model ?
 - XML Schema Elements and Types
 - Predicative model ?
 - type A has an attribute B with datatype C
 - type A has an element B with complexType C
 - SOA
 - Predicative model for structural aspects as above ?
 - Events and behaviours for operations, etc ?
 - Operation, cross-references, pre-conditions, post-conditions or behaviours
 - Semantics, business rules, etc represented in prose and / or with an association to another syntax such as RuleML, RDF or OWL

Optimisations

- ➔ Statics: Might the predicative aspect of the TA model be optimised to cater for structures such as classes and schemas ?
- ➔ Dynamics: Might event-behaviours be optimised to cater for operations, workflows, collaborations and activities ?
- ➔ Semantics: Might associators to prose and other syntaxes such as RuleML, RDF or OWL be provided and optimised to cater for semantics ?

Summary

- ⇒ Statics: Predicatives to say what structures and classes are defined
 - Like the class aspects of UML artefacts
- ⇒ Dynamics: Event-behaviours to say what classes and operations do and don't do
 - Like the activity and contract aspects of OOD
- ⇒ Semantics: Associations and inclusions of to prose and other syntaxes say what classes and operations mean and how they are to be used