

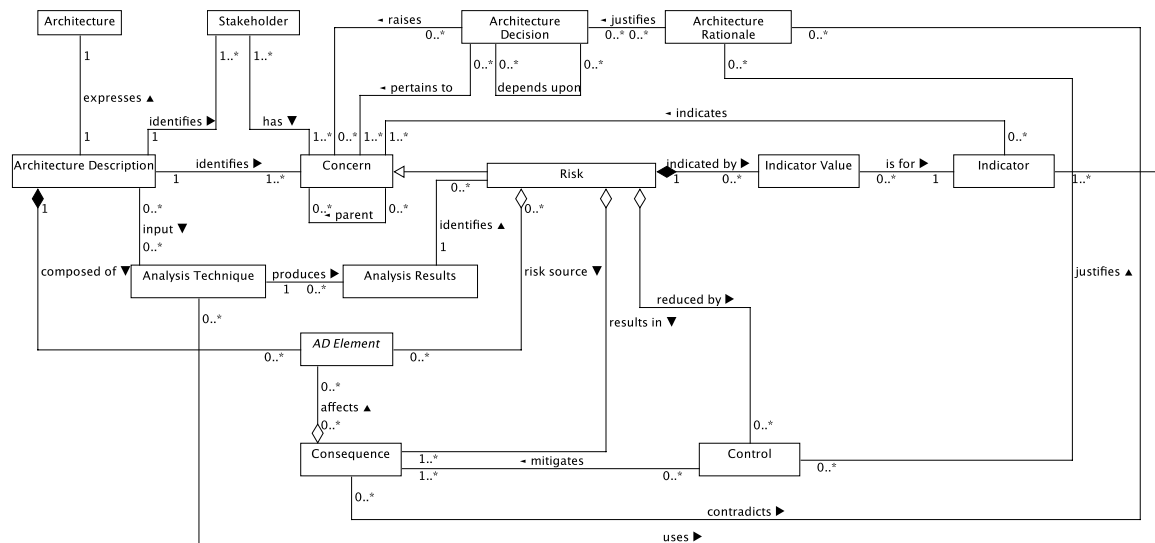
Architecture Risk Model Research Questionnaire

Section 1 – Participant Experience & Background

1. How many years of experience do you have in commercial software intensive systems engineering?
2. How many years of experience do you have in commercial software development?
3. How many years of enterprise architecture experience do you have?
4. How many years of solution architecture experience do you have?
5. How many years of technical architecture experience do you have?
6. How many years of SysML experience do you have?
7. How many years of UML experience do you have?
8. How many projects have you worked on that have involved a SysML or UML model?
9. How many years do you have working with waterfall development?
10. How many years do you have working with agile (e.g. Scrum & SAFe) development?

Part 2 – Approach Background

The research is evaluating whether risks could be described using the following model that extends ISO 42010 – Architecture Descriptions:



ISO 42010 Concept	ISO 42010 Definition (ISO/IEC/IEEE, 42010 Systems and Software Engineering–Architecture Description, pp. 1-46, Geneva, 2011)
AD element	“any construct in an architecture description.” (p. 7)
Architecture	“fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution.” (p.8)
Architecture Decision	“pertain to system concerns; however, there is often no simple mapping between the two. A decision can affect the architecture in several ways.” (p. 7)
Architecture Description	“work product used to express an architecture.” (p. 2)
Architecture Model	“uses modelling conventions appropriate to the concerns to be addressed.” (p. 6)
Architecture Rationale	“records explanation, justification or reasoning about architecture decisions that have been made.” (p. 7)
Architecture View	“work product expressing the architecture of a system from the perspective of specific system concerns.” (p. 2)
Architecture Viewpoint	“work product establishing the conventions for the construction, interpretation and use of architecture views to frame specific system concerns.” (p. 2)
Concern	“interest in a system relevant to one or more of its stakeholders.” (p. 2)
Correspondence	“defines a relation between AD elements.” (p. 7)
Correspondence Rule	“enforce relations within an architecture description (or between architecture descriptions).” (p. 7)
Model Kind	“conventions for a type of modelling.” (p. 2)
Stakeholder	“individual, team, organization, or classes thereof, having an interest in a system.” (p. 2)
System-of-interest	“systems that are man-made and may be configured with one or more of the following: hardware, software, data, humans, processes (e.g., processes for providing service to users), procedures (e.g. operator instructions), facilities, materials and naturally occurring entities.” (p. 3)
Extension Concept	Extension Definition
Risk	Sub type of Concern that represents a Risk , e.g. error-proneness or security vulnerability.
Indicator	Indicates the relative risk of a Risk . An Indicator could be a quantitative software engineering metric such as a coupling measure or a qualitative assessment by an architect.
Indicator Value	The value of a particular Indicator for a particular Risk .
Consequence	Represents a potential consequence of a Risk being left untreated.
Control	Represents an action that could be taken to reduce the potential Impact of a Risk .
Analysis Technique	Identifies the architecture analysis technique used to for a risk analysis.
Analysis Results	Encapsulates the results of a risk analysis performed using an analysis technique.

Part 3 – Approach Examples

Example 1 - Excessive Change Propagation

Text Risk Description

Title: Excessive change propagation

Details: Complex concrete sub-classes have emerged from the diverse use cases the lists had to support. E.g. SystemList needs “deleted record processing” whereas PropertyList does not. This causes conflicts between abstract class code and concrete sub-class code. This could be considered an unhealthy inheritance tree. There are also some common complex routines that are not always abstracted so when bugs have to be fixed sometimes many List sub-classes had to be changed.

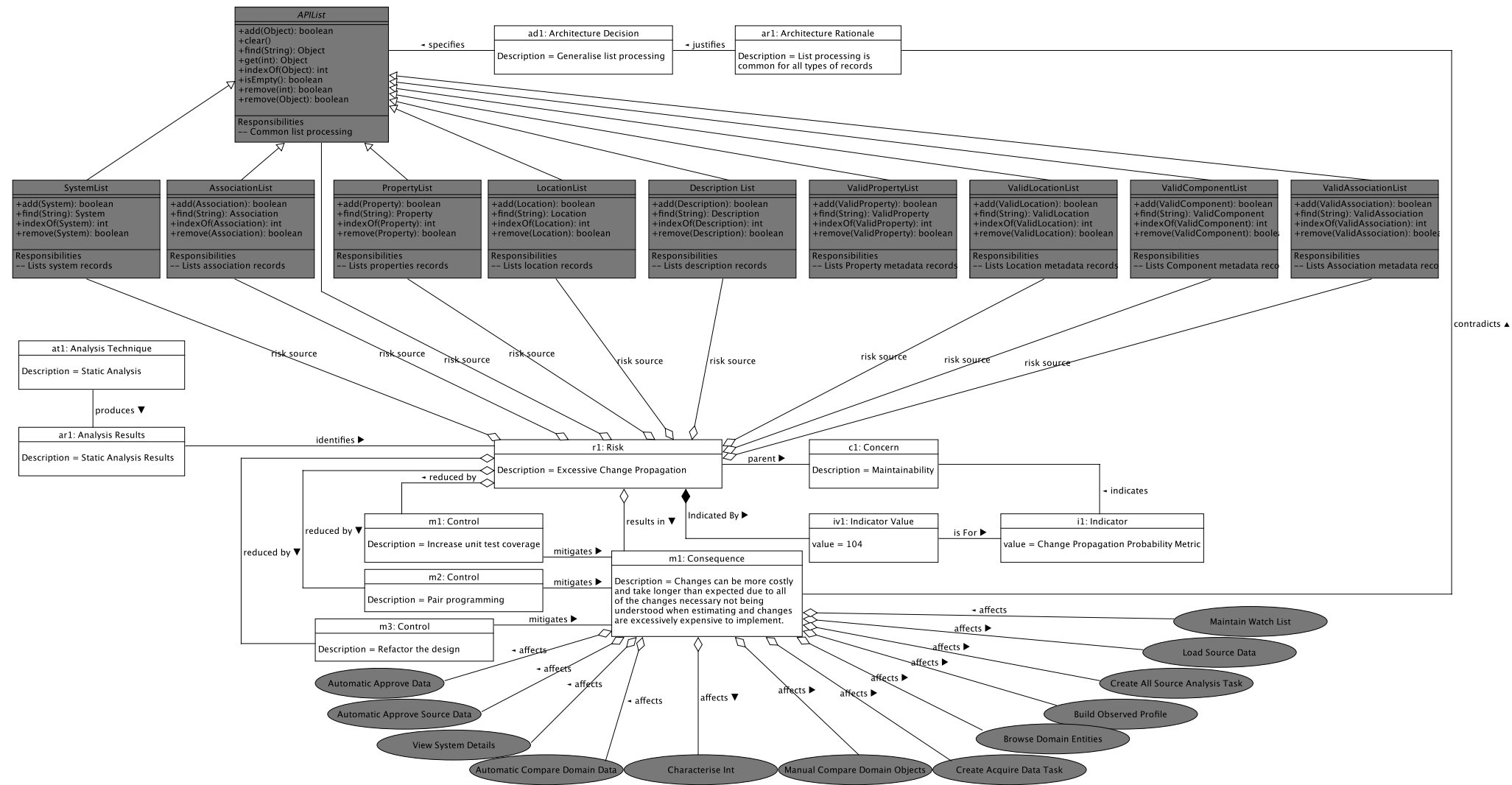
Consequence: Changes can be more costly and take longer than expected due to all of the changes necessary not being understood when estimating and changes are excessively expensive to implement.

Controls: Increase test coverage, pair programming, refactor the design

Risk Model Representation

Notes:

- Grey background elements indicate elements from the design model;
- White background elements are elements added from the proposed risk model;
- Grey ovals are the use cases;
- Grey boxes are classes (modules) the design is composed of.



Example 2 - 3rd Party Interface Changes outside of MASS control

Text Risk Description

Title: Low code framework Interface Changes outside of MASS control

Details: Oracle Data Integrator (ODI) has changed its interface specification. This will require MASS code to be reworked if ODI has to be upgraded.

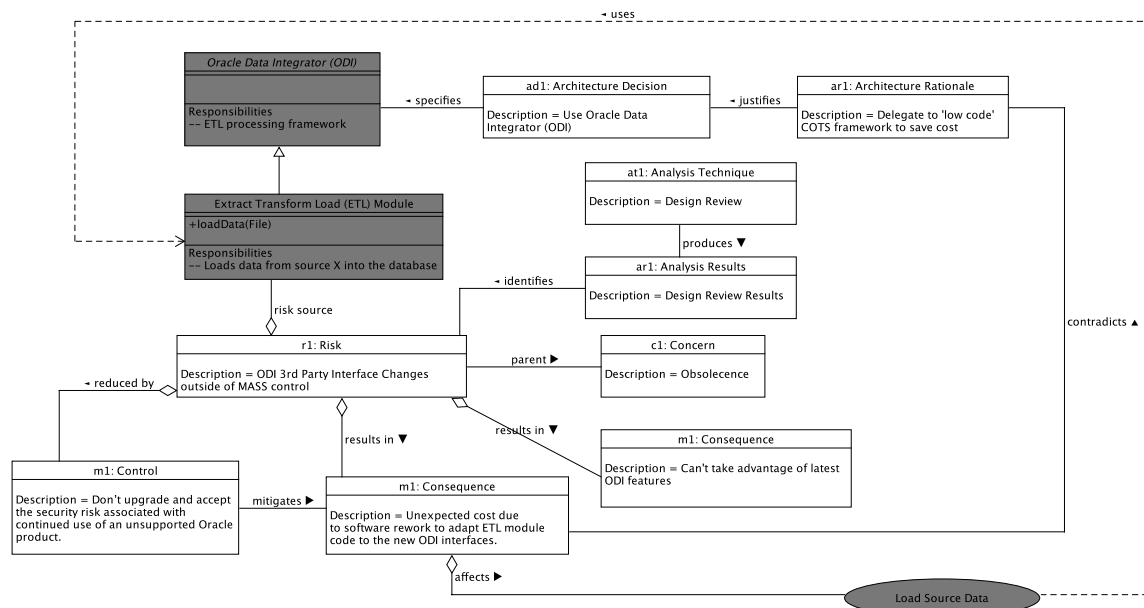
Consequence: Unexpected cost due to software rework to adapt ETL module code to the new ODI interfaces. Can't take advantage of latest ODI features.

Control: Don't upgrade and accept the security risk associated with continued use of an unsupported Oracle product.

Risk Model Representation

Notes:

- Grey background elements indicate elements from the design model;
- White background elements are elements added from the proposed risk model.



Part 4 – Risk Model Evaluation Questions

#	Question	Answer (Delete Y / N / Not Sure as appropriate)			Comments – Please include any qualifying statements
		Waterfall	Agile e.g. Scrum	Scaled Agile e.g. SAgE	
11.	Do you think the proposed risk model would help design reviews?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
12.	Do you think the proposed risk model could help to identify risks?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
13.	Do you think the proposed risk model could help the analysis of identified risks?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
14.	Do you think the proposed risk model could help with the assessment of analysed risks?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
15.	Do you think the proposed risk model could help the mitigation of assessed risks?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
16.	Do you think the proposed risk model could help monitoring of ongoing risks?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	
17.	Do you think the proposed risk model could be useful when a design model doesn't exist?	Y / N / Not Sure	Y / N / Not Sure	Y / N / Not Sure	

#	Question	Answer – Please justify your answer with a brief explanation
18.	What do you think might be the advantages and disadvantages of modelling the risk in this way?	
19.	Which approach (textural description or the proposed risk model) do you prefer and why?	
20.	Do you think any of the entities or associations in the proposed model are unnecessary or overkill, if so which ones?	
21.	Can you think of any entities or associations that are missing from the proposed risk model?	
22.	Do you have any other feedback about the proposed risk model or its usage?	