

Architecture Risk Model Research Questionnaire

Section 1 – Participant Experience & Background

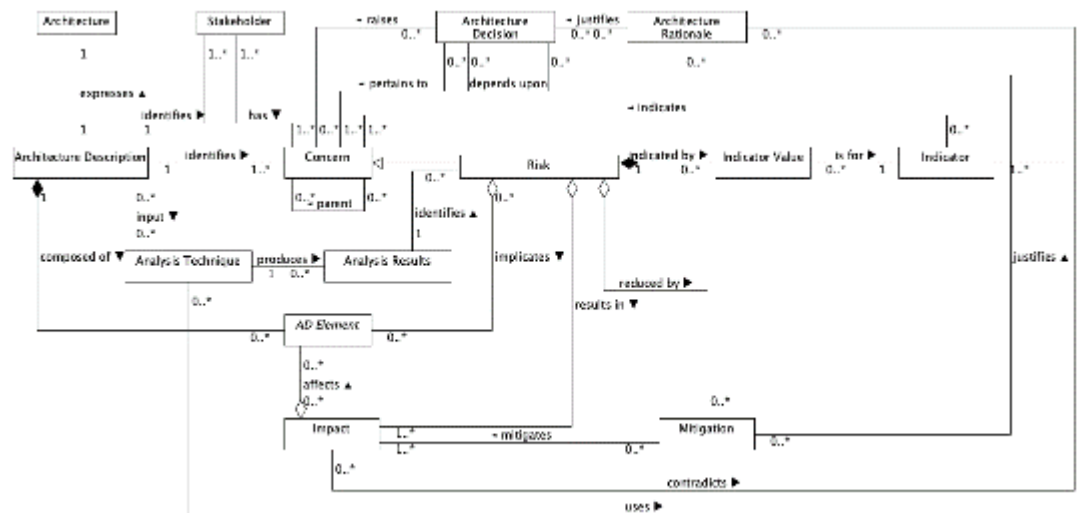
1. How many years of experience do you have in commercial software intensive systems engineering?
17
2. How many years of experience do you have in commercial software development?
15
3. How many years of enterprise architecture experience do you have?
15
4. How many years of solution architecture experience do you have?
20
5. How many years of technical architecture experience do you have?
20
6. How many years of SysML experience do you have?
10
7. How many years of UML experience do you have?
10
8. How many projects have you worked on that have involved a SysML or UML model?
Over 10
9. How many years do you have working with waterfall development?
15

10. How many years do you have working with agile (e.g. Scrum & SAFe) development?

3

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
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 .
Impact	Represents a potential consequence of a Risk being left untreated.
Mitigation	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

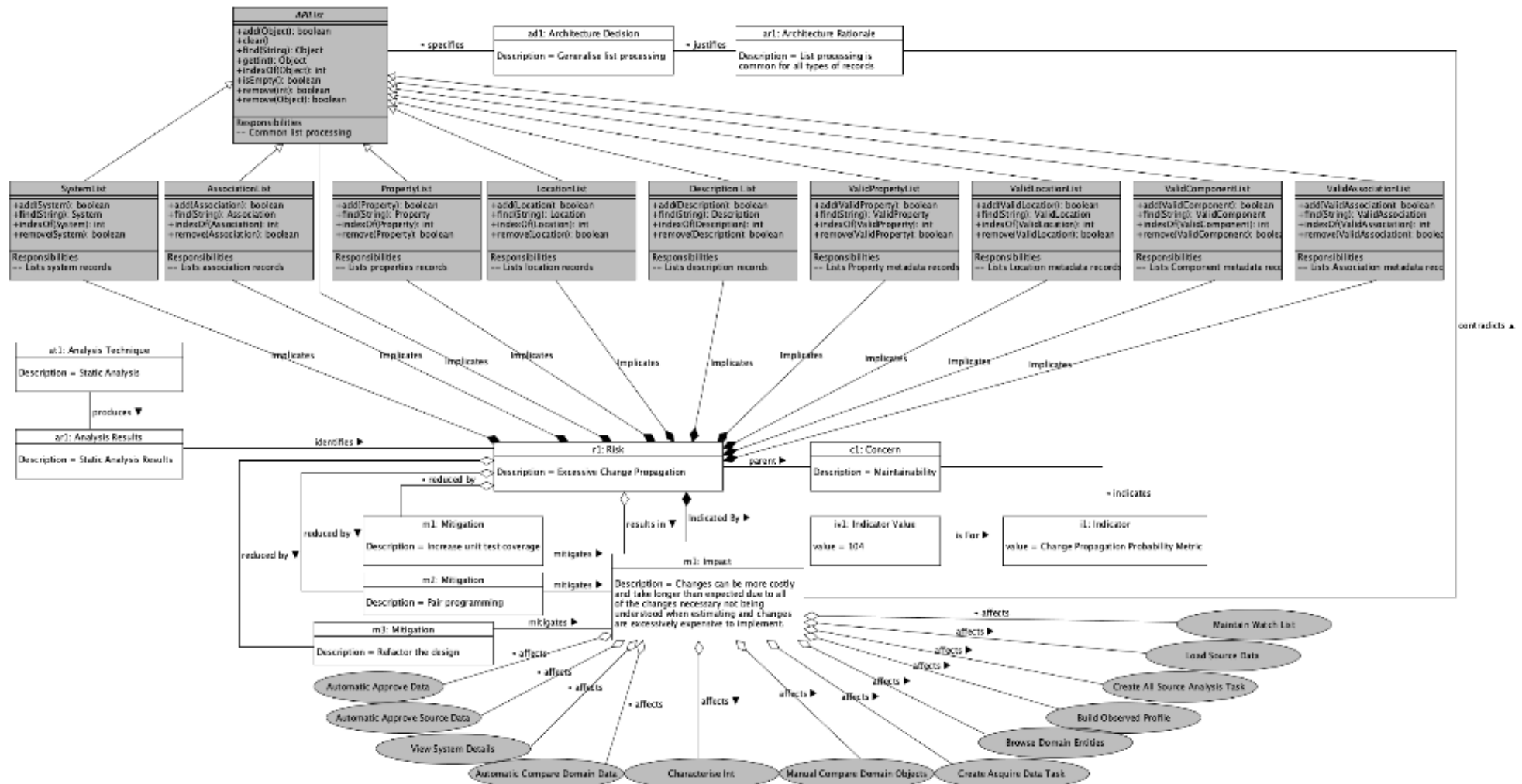
Text Risk Description

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.
Impact:	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.
Mitigations:	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.



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

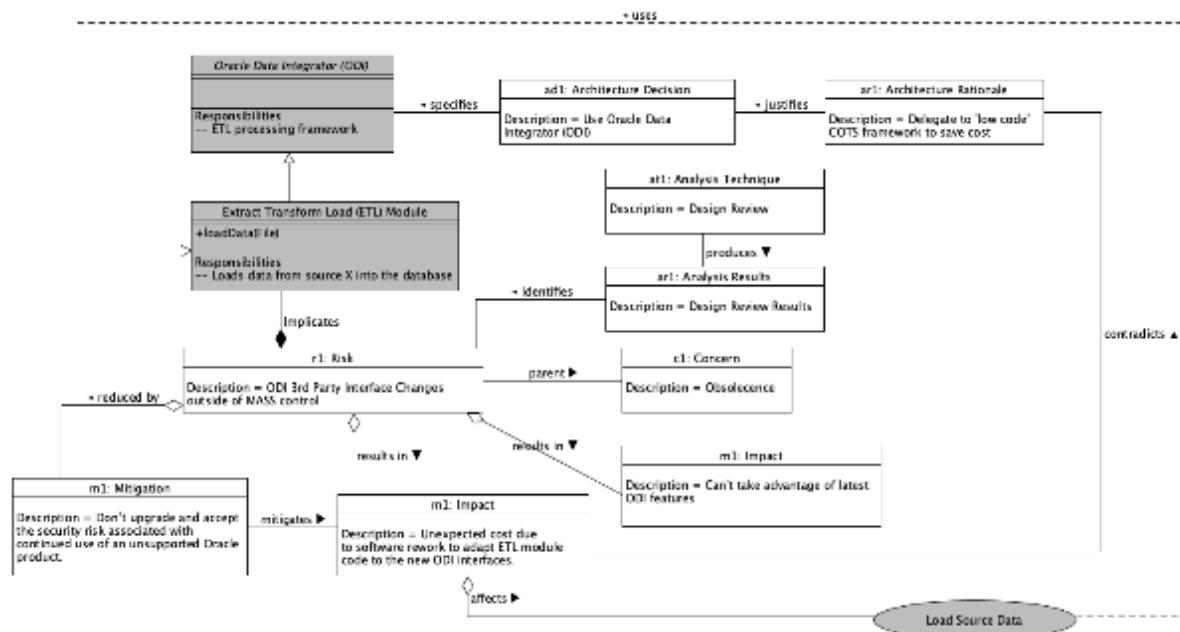
Text Risk Description

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.
Impact: Unexpected cost due to software rework to adapt ETL module code to the new ODI interfaces. Can't take advantage of latest ODI features.
Mitigation: 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. SAFe	
11.	Do you think the proposed risk model would help design reviews?	Y	N	Not Sure	Main comment is that the ISO in question defines requirements on the description of the architecture. In agile these are less bounded, and the risk lies in the requirements being well understood to develop the model.
12.	Do you think the proposed risk model could help to identify risks?	Y	N	Not Sure	The requirements/concerns are where the risk lies, these drive the architectural view/s with 1 or more concerns each has a viewpoint with 1 or more concerns. Therefore, if the requirement is misunderstood/ambiguous it may drive additional views which may identify the risk areas that could then be mitigated. Helpful in sub-system design requirements derivation.
13.	Do you think the proposed risk model could help the analysis of identified risks?	Y	N	Not Sure	Believe it would be of most benefit in reviewing SOR's and deriving subsystem requirements at bid stage in large architectural programs
14.	Do you think the proposed risk model could help with the assessment of analysed risks?	Y	N	Not Sure	Help with the assessment of where risk may be reduced in acceptance of requirements
15.	Do you think the proposed risk model could help the mitigation of assessed risks?	Y	N	Not Sure	If risks are assessed at the outset, then these may be reassessed as requirements(concerns)/design changes and the potential impact
16.	Do you think the proposed risk model could help monitoring of ongoing risks?	Y	N	Not Sure	As architectural descriptions are detailed from requirements/concerns then in a waterfall delivery this would be of benefit to manage change not sure how helpful it would be in a SAFe delivery
17.	Do you think the proposed	N	N	N	No as I believe this would be best used in early design or

	risk model could be useful when a design model doesn't exist?				managing architectural change through additional requirements/concerns
#	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?				Advantages – identifies high risk areas in delivering against requirements/concerns and managing change once accepted. Disadvantages is being able to handle ever changing requirements/concerns in agile delivery and whether risk should just be accepted as a consequence of flexibility
19.	Which approach (textural description or the proposed risk model) do you prefer and why?				Neither as both have advantages/disadvantages and should be used where appropriate
20.	Do you think any of the entities or associations in the proposed model are unnecessary or overkill, if so which ones?				This would have to be exercised to see if any are overkill
21.	Can you think of any entities or associations that are missing from the proposed risk model?				No
22.	Do you have any other feedback about the proposed risk model or its usage?				No