Requirements Validation

Lectures 7, DAT230, Requirements Engineering
Robert Feldt, 2010-09-14

Notes about course

- Individual assignment 2:
  - Deadline 16/9 09:00
  - If SEMAT says nothing and Ivar said something then take his view as SEMAT's view
    - Use link to Fire from course home page, none other!
- Don't be late to exercises or lectures!
  - Rude to teacher!
  - Rude to other students!
  - We will have to lock if you don't shape up

Notes about course

- Group assignment:
  - Groups have been assigned (randomly): on course home page
  - 1st elicitation meeting have been booked for each group
  - If you must change YOU contact another group directly and switch
    - More info on assignment on Fridays lecture
    - Plan to meet on Friday after lecture to plan prep & elicitation
- Course questions emailed to Ali Shahrokni
  - not Robert!
  - not All students!

Notes about course

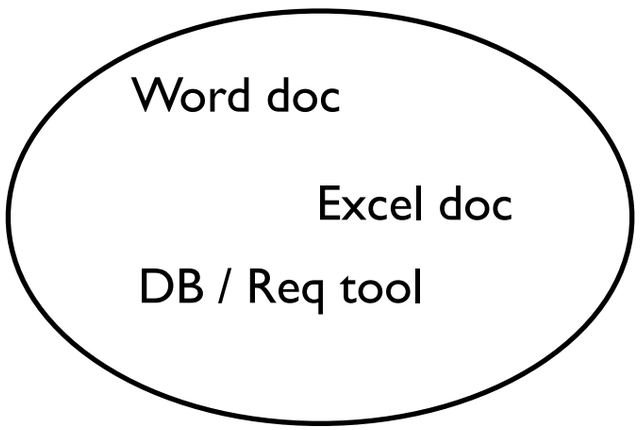
- This weeks exercise, I* and BDD examples
  - I*: **Either** Wed 13:15 in EB **OR** Wed 15:15 in EB
    - Not BOTH, they are the same since you are many
  - BDD: **Either** Thu 13:15 in HA2 **OR** Thu 15:15 in HA2
    - Not BOTH, they are the same since you are many

Recap from last lecture

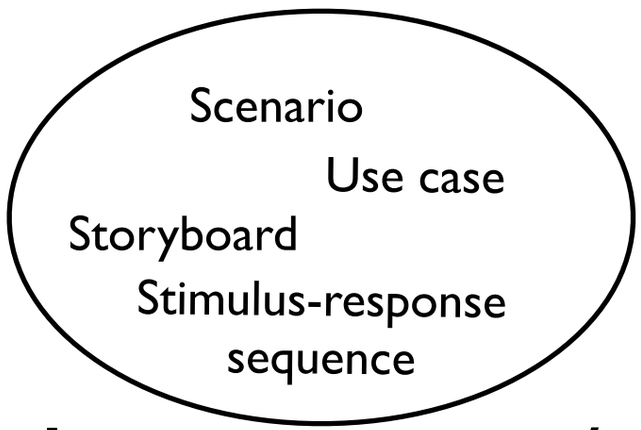
Recap

- Specification to refine/specify reqs and reduce risks
- SRS is primarily a communication device
  - Also drives development and is baseline for releases
- Modeling for specific situations and reqs
- Many different specification techniques
  - Text, Sequence- and state-based models are key
  - Use cases, scenarios also quite common
  - Formal approaches less used; user communication harder
- IEEE 830 gives basic and common structure

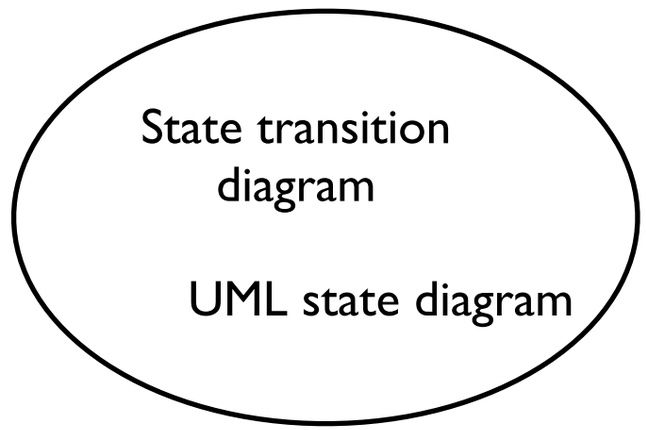
Specification Techniques



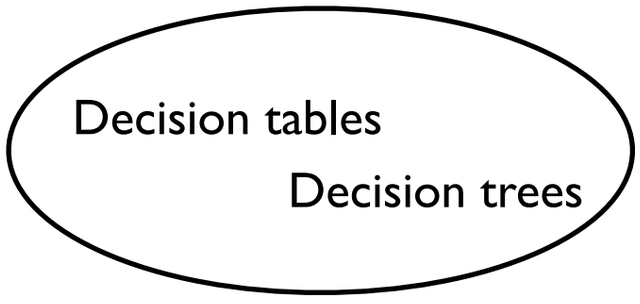
Text



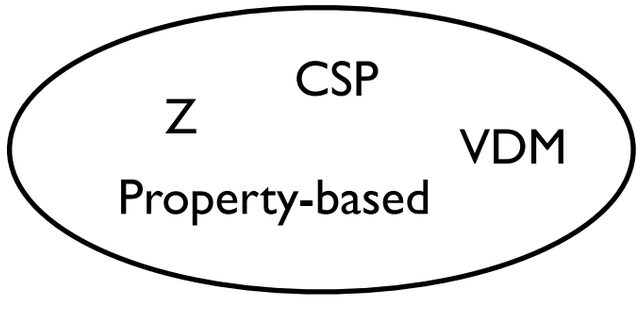
Interaction- / Sequence-based



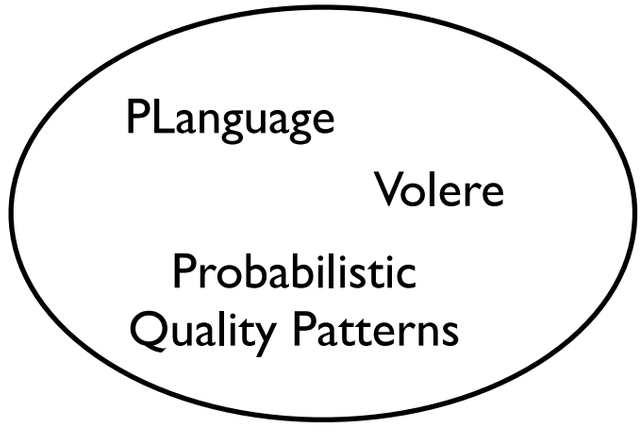
State-based



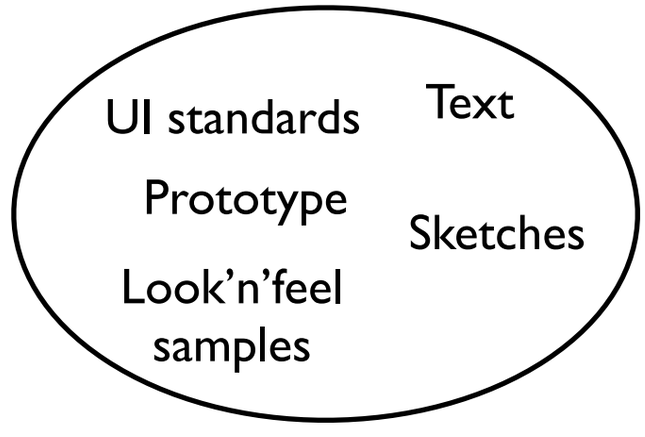
Decision-based



Formal



Quality Requirements



User Interfaces

Why validation?

"If temperature is higher than 70 and less than 100, then output should be 3000 watts"

Why validation?

"If temperature is higher than 70 and less than 100, then output should be 3000 watts"

- What if <70?

Why validation?

"If temperature is higher than 70 and less than 100, then output should be 3000 watts"

- What if <70?
- What if >100

Why validation?

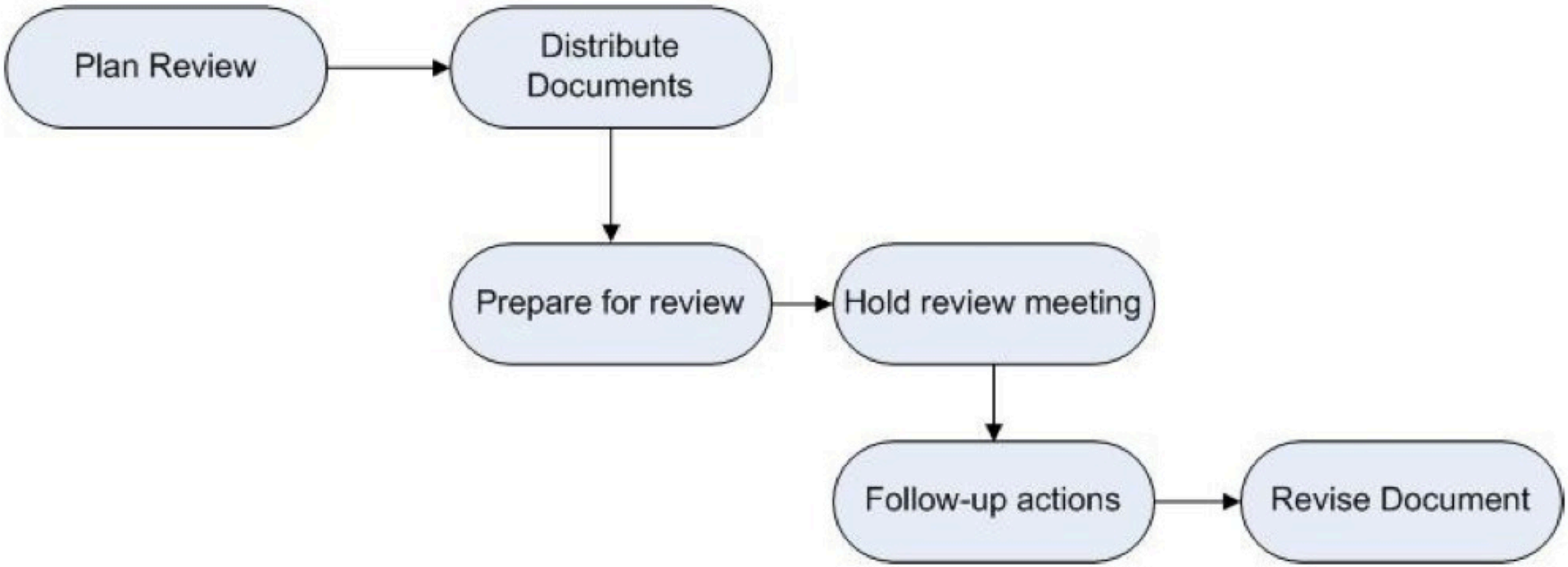
"If temperature is higher than 70 and less than 100, then output should be 3000 watts"

- What if <70?
- What if >100
- 70 and 100 are in C or F?

Validation Techniques

1. Requirements Pre-Reviews
2. Requirements Reviews
    - 2.1 Requirements Inspections
        - 2.1.1 Test-Case Driven Inspection
    - 2.2 Reading Techniques
        - 2.2.1 Ad-hoc based Reading
        - 2.2.2 Check-list based Reading
        - 2.2.3 Perspective based Reading
3. Requirements Prototyping
    - 3.1 Throwaway Prototyping
    - 3.2 Evolutionary Prototyping
4. Model-based requirements validation
    - 4.1 Data-flow Models
    - 4.2 Compositional Models
    - 4.3 Classification Models
    - 4.4 Stimulus Response Models
    - 4.5 Process Models
    - 4.6 Simulation Models
5. Testing-based requirements validation
6. Viewpoint-oriented requirements validation

Req Review


Plan Review
Distribute Documents
Prepare for review
Hold review meeting
Follow-up actions
Revise Document

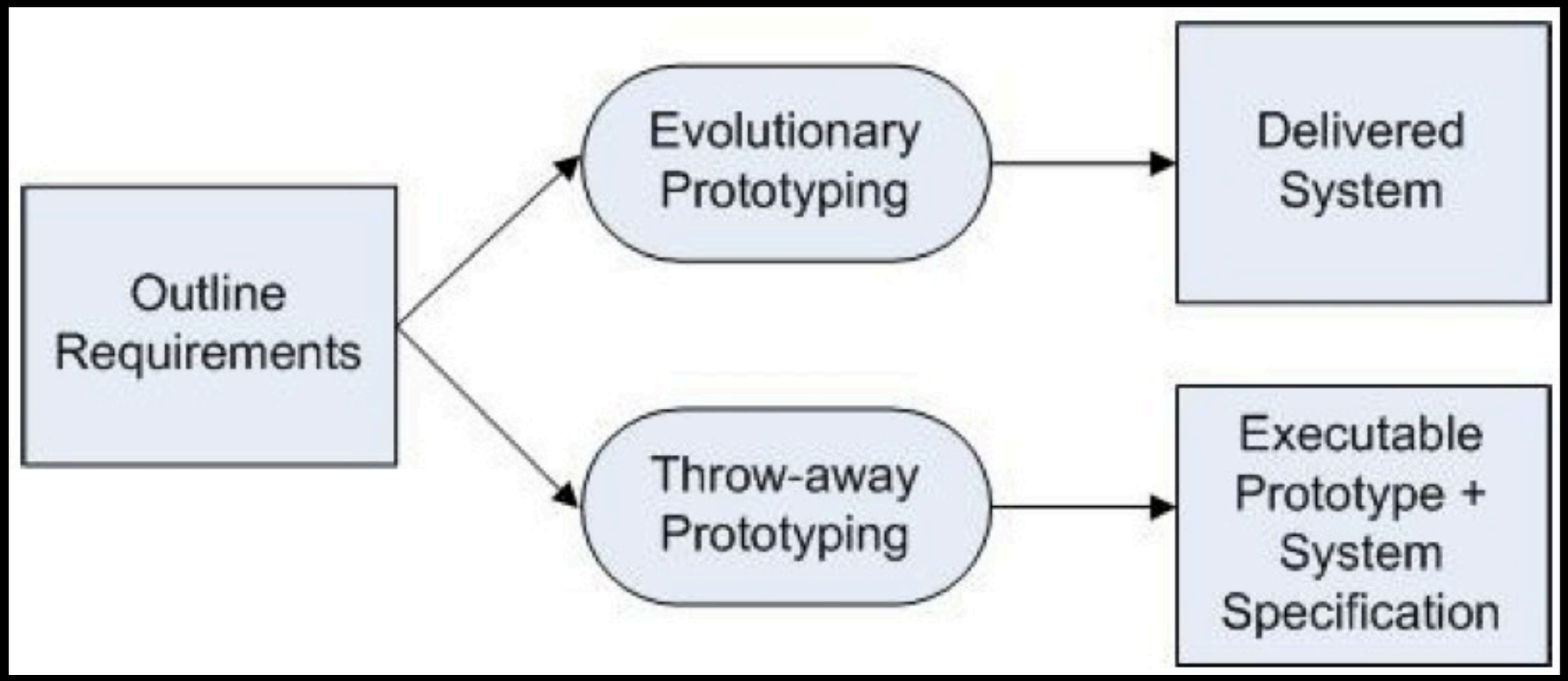
Review/Reading Styles

- Test-Case Driven Review
  - Tester does review to find reqs that are not testable
- Reading techniques
  - Ad hoc (most common, focused on experience)
  - Check-list based
  - Perspective-based (different stakeholders or user types)

Checklist example

Checklist Questions	Quality Attribute
Is each requirements is easily Identified?	Traceability, conformance to the standard
Are specified terms are defined in the glossary	Understandability
Do individual requirements use the same term in different ways?	Ambiguity
If a requirement makes references to some other facilities; are these described elsewhere in the document?	Completeness
Are related requirements group together?	Organization
Are there any contradictions in the requirement?	Redundancy
Do you have to examine other requirements to understand what it means?	Completeness

Prototyping



Prototyping

	Throw-away	Evolutionary
Development Approach	Quick	Precisely developed (takes time)
What to build first	Difficult parts	Build understood part first
Goal	Throw it away	Evolve it

What do industry use?

Country	Sweden			Pakistan		
Companies RVTs…	Company X	Company Y	Company Z	Company A	Company B	Company C
Reviews	*	*	*	*	*	*
Prototyping	*	*	*	*	*	*
Testing Based RVTs		*			*	*
Model Based RVTs	*					*

4 companies used checklist-based and 2 ad hoc review reading

6 used throwaway prototypes, 2 also evolutionary

Who do industry involve in reviews?

Companies	Personnel Involved in Review Activities
Company X	System Manager, Design Coordinator (Representative of defected designs), Quality Assurance Person, and System Expert.
Company Y	Project Manager, Technical Architect, Software Engineer, and Quality Assurance Person
Company Z	Software Architect, Requirements coordinator, developers, System Engineer, Functional Group leader, and Quality Assurance Person
Company A	Customer, Quality Assurance person, Developer, and Project Manager
Company B	Project Manager, team leader, and Customer
Company C	Project Manager, Senior Architect and Team Lead

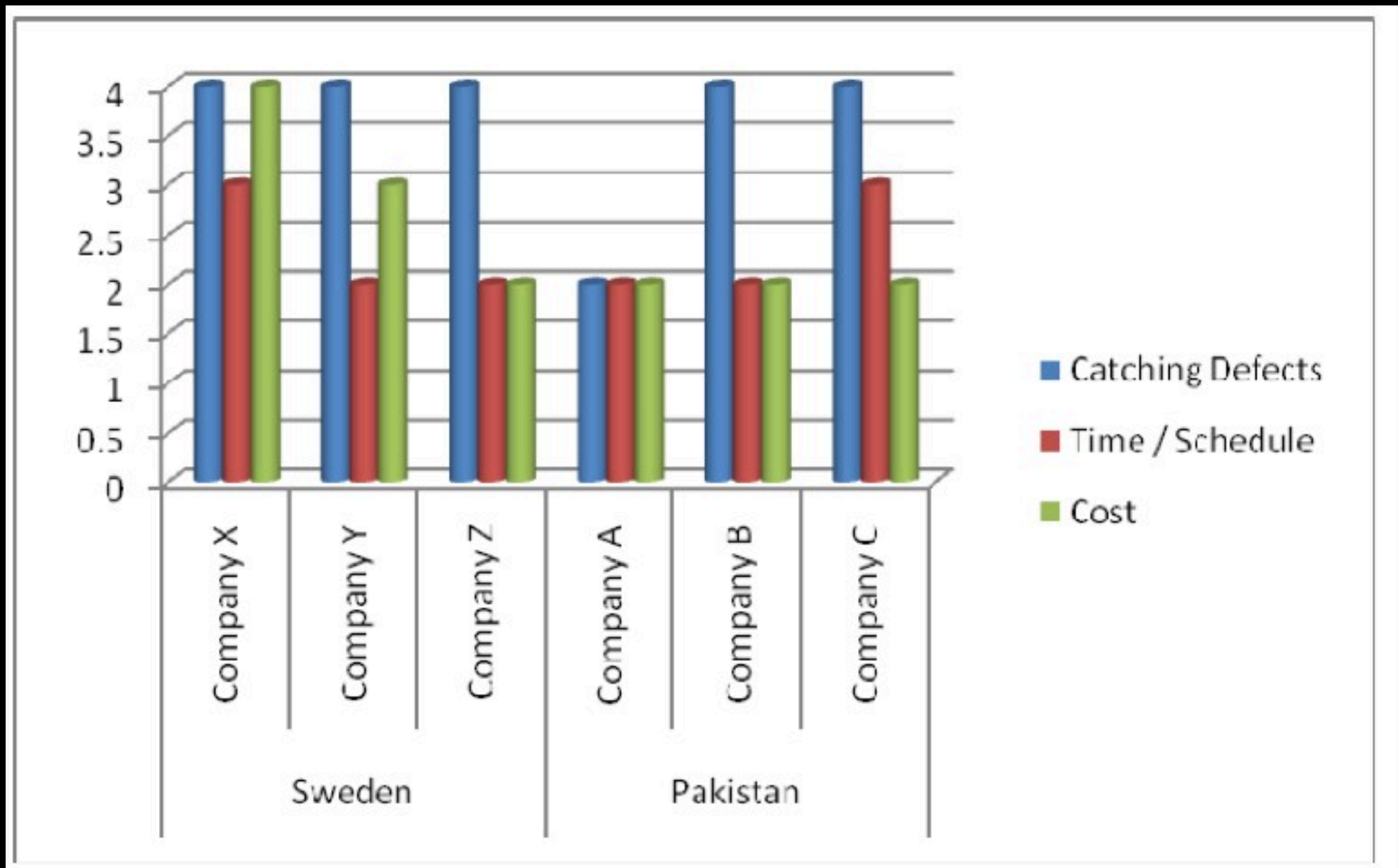
Pros/Cons of Reviews?

Companies	Pros of Reviews as RVTs	Cons of Reviews as RVTs
Company X	Reviews helps to Remove Defects, and also Remove Ambiguity in the requirements	Time Required for preparation, requirements written only in text without diagrams/maps is negative, resource unavailability
Company Y	Easy to Remove defects, Educational	Resource unavailability (Time to time put overload and strain), Risks with Reviews,
Company Z	Consistency, Better Quality Estimates, Detailed Time Schedule , requirements clarity people from different backgrounds together, give clear view of the requirements and have different perspective	Time Consuming, resource unavailability, checklist, Too much required for preparation and lengthy process. difficult to prioritize the exact activities
Company A	Removes assumptions , and Reduce Rework	Time Consuming, lengthy process, resources unavailability
Company B	Completeness, and Reduce Rework,	Lengthy process and time consuming, client do not take ownership. Too much documentation kills the effectiveness of reviews.
Company C	Real Requirements from customers, resolve conflicts and removes assumptions	Time Consuming, Resource usage

Improvements to Reviews?

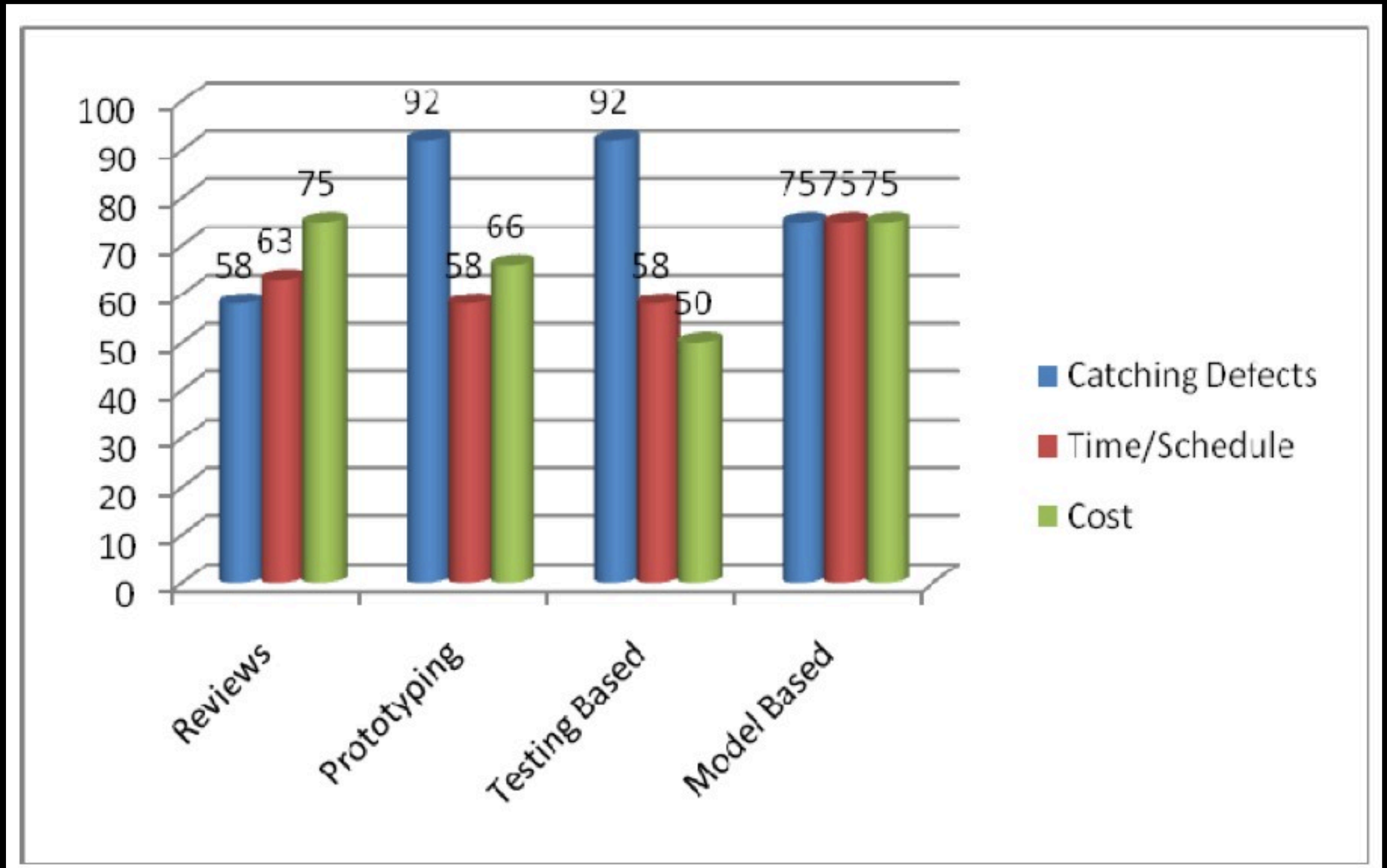
Companies	Suggested Improvements in Reviews as RVT
Company X	Focus should not be set only on functionality because customer needs other things as well, understand the non-functional requirements, and reviews never get to time-plans
Company Y	More time required for requirements reviews and more focus required during reviews
Company Z	Allocation of time to people who are involved in review meetings and it should be spread, checklist should be known, proper preparation of review meeting before actual meetings
Company A	As we have too much generalized checklist, it will be better if we customize check list before review meeting, instant feedback required from the customers.
Company B	More time is required, customer participation is not good because they do not want to take responsibility, and feedback required from the customers.
Company C	Pre-reviews preparation is helpful, participation of stakeholders having different backgrounds is helpful to find different perspectives of the requirements, and feedback on proposed changes from customer is required.

Satisfaction with Prototyping?



Graph 2 - Satisfaction Level of Prototyping

Comparison of Techniques



Graph 5 - Comparison of different RVTs