ENGR 301 *Project Management*

Lecture 4 — Project and Requirements

James Quilty

School of Engineering and Computer Science
Victoria University of Wellington

Data Recorder Project

Overall objectives:

An open-source open-hardware data recorder suitable for use by NZ Regional Councils

Integrate with existing monitoring infrastructure

`https://graphs.gw.govt.nz/`

Team Formation

The groups are large and organisation is important:

> *"Organisations which design systems. . . are constrained to produce designs which are copies of the communication structures of these organisations. . . The larger an organisation is, the less flexibility it has and the more pronounced the phenomenon."*

— Conway's Law

https://itrevolution.com/articles/conways-law/

Team Formation

Team composition and size is important:

- Homogeneous teams should have odd numbers of members

- Heterogeneous teams can have even numbers of members

Reference: Menon *et al.*, *Getting Even or Being at Odds? Cohesion in Even- and Odd-Sized Small Groups*, Organization Science **22**, 738 (2011)
https://doi.org/10.1287/orsc.1100.0535

Requirements Gathering

PMBOK Perspective:

1. **Elicitation:** Discovering the client, or other stakeholder's, requirements.

2. **Analysis and collation:** Understanding what can often be unclear or uncertain requirement; Often involves requirement conflict resolution.

3. **Specifications generation:** Documents the requirements which will fulfil the scope (also, often, informs scope).

4. **Validation of Requirements:** Verification with the client and stakeholders that the specifications and requirements fulfil the client's needs and/or wants.

Tools and Techniques include: Interviews; Focus groups; Facilitated Workshops.
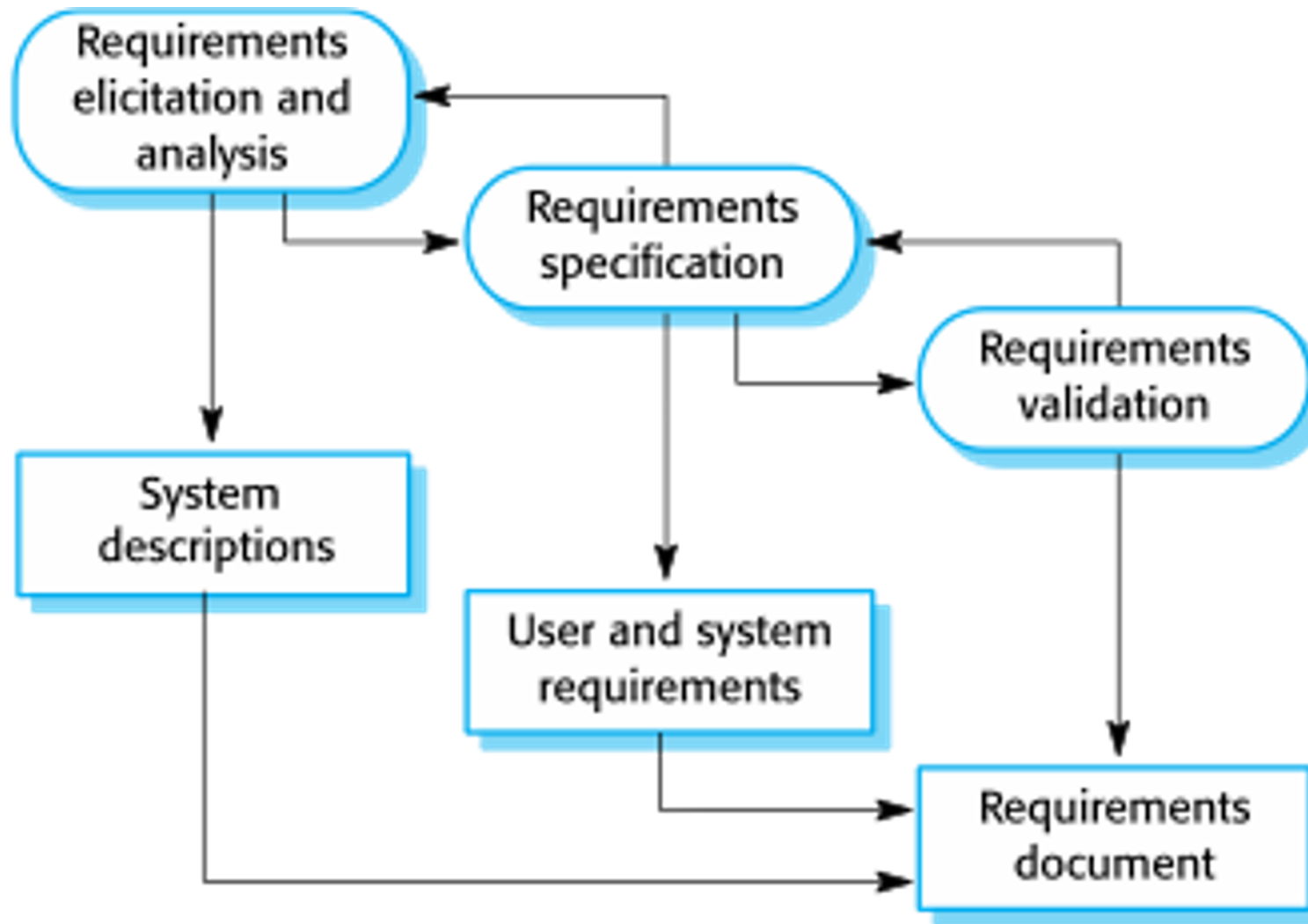
Requirements Gathering

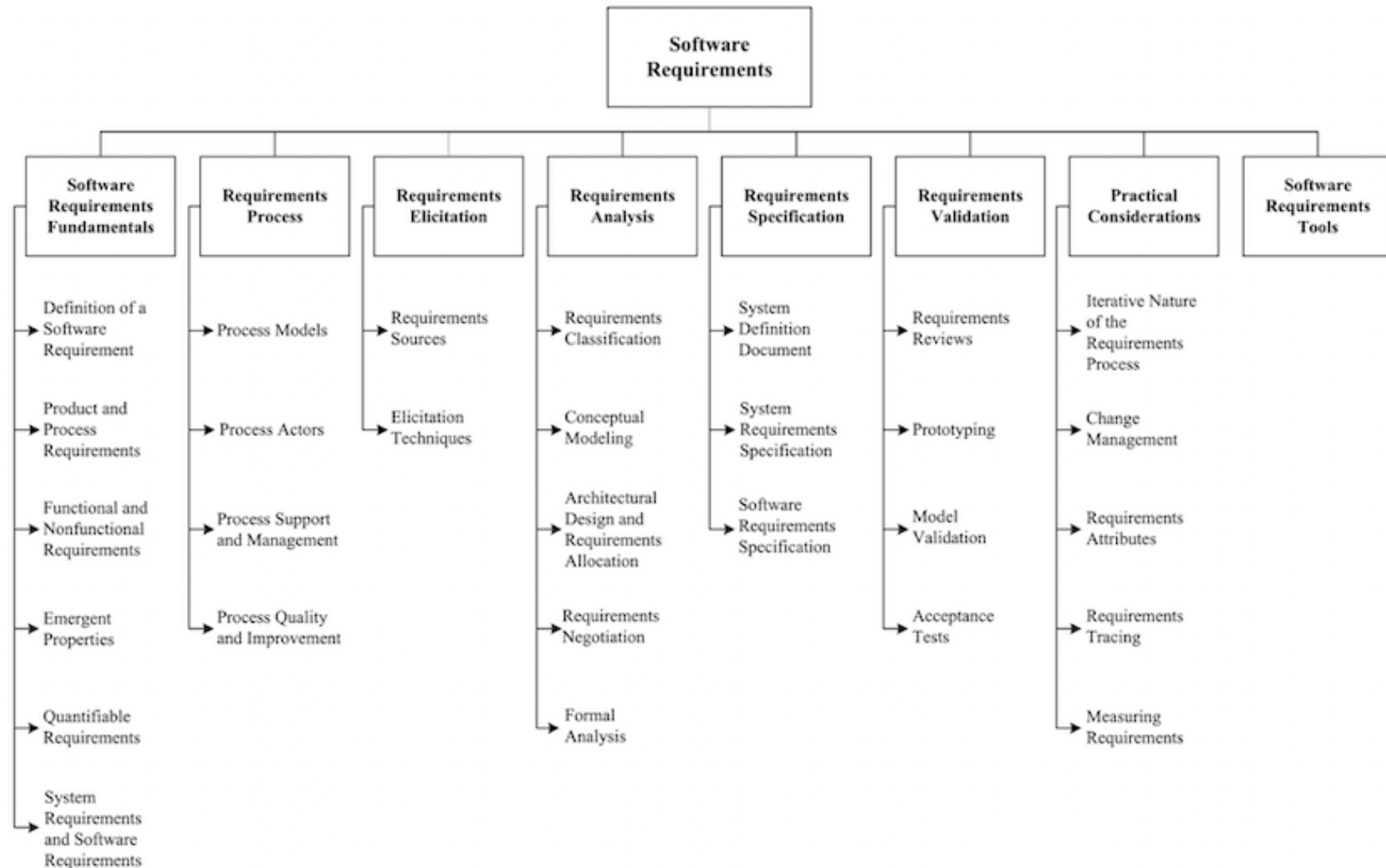Figure from Ian Somerville, Software Engineering, 10th ed, 2014.

SWEBOK

Figure 1.1. Breakdown of Topics for the Software Requirements KA

Requirements Gathering

Requirement "Smells"

- Superlatives ('best', 'most')
- Subjective language ('user friendly', 'easy to use', 'cost effective')
- Vague pronouns ('it', 'this', 'that')
- Ambiguous adverbs and adjectives ('almost always', 'significant', 'minimal')
- Open-ended, non-verifiable terms ('provide support', 'but not limited to', 'as a minimum')
- Comparatives ('better than', 'higher quality')
- Loopholes ('if possible', 'as appropriate', 'as applicable')
- Incomplete references
- Negative statements (what not to do)

Requirements Gathering

Desirable characteristics of requirements

Correct the requirements represent the client's view

Consistent no requirements that contradict each other

Unambiguous requirements can only be interpreted in one way

Complete all possible scenarios, in which the system can be used, are described

Feasible can be implemented and delivered

Relevant relevant to customer needs

Testable suggest acceptance tests to demonstrate the product meets the requirements

Traceable each system behaviour can be traced to a set of functional requirements