CHAPTER 3

Software Requirement Analysis

Requirements Engineering

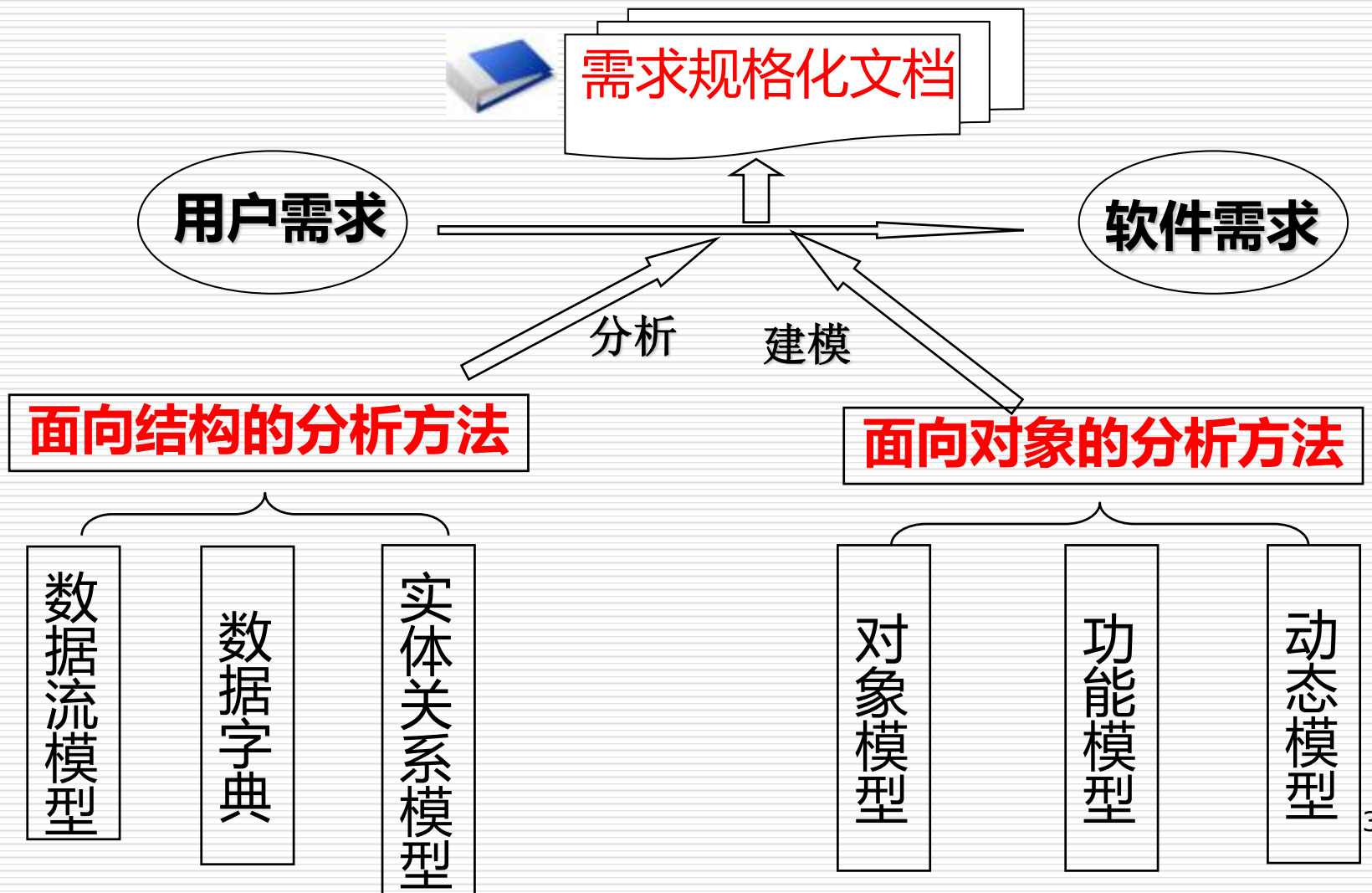**Part 1- Analysis**

Part 2- Specification

需求分析的内容

需求规格化文档

用户需求 ←→ 软件需求

分析　　　建模

面向结构的分析方法

- 数据流模型
- 数据字典
- 实体关系模型

面向对象的分析方法

- 对象模型
- 功能模型
- 动态模型

3

Requirements Specification 目的

- To provide a representation of the software for the customer's review and approval

- Developed as a joint effort between the developer and the customer

- Serve as basis for review for both customer and developer

- Direct software design and development

- Culmination of requirements analysis

Quality of Requirements Specification

(1) unambiguous

(2) complete

(3) verifiable

(4) consistent

(5) modifiable

(6) traceable

方法

☐ 可混合使用的模型

 ✓ **DFD, ERD, DD,…**

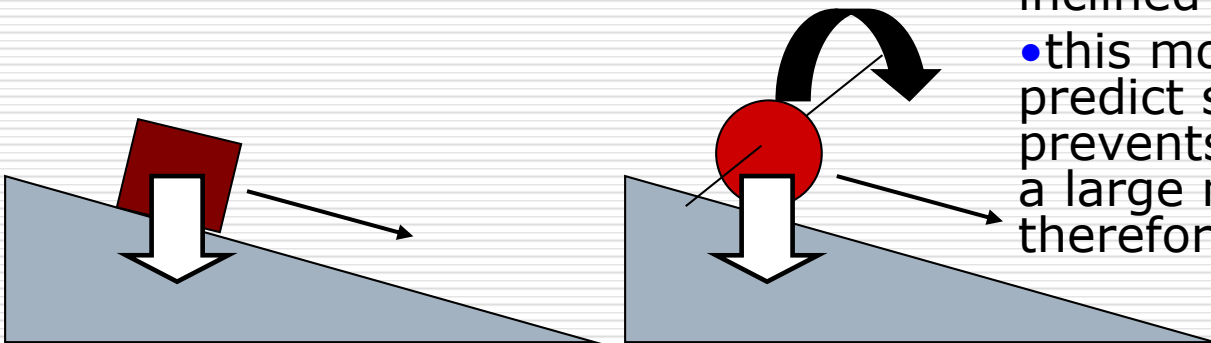 ✓ **Use case, Class Diagram, Sequence Diagram,……**

 ✓ 其它模型

☐ 使用但不限于面向结构，面向对象方法

Use other models

mathematical models

- many mathematical models are used in engineering or physics
- usually very abstract
- for example: a person who is the passenger in a lift may be abstracted to just their mass
  when analysing the load in the lift for lift acceleration, braking, motor power, building structural strength

- rolling inertia or friction may be ignored when modelling objects on a slopes as blocks sliding on inclined planes.
- this model will be inadequate to predict speed and time if friction prevents slipping and the object has a large moment of inertia and therefore will roll more slowly
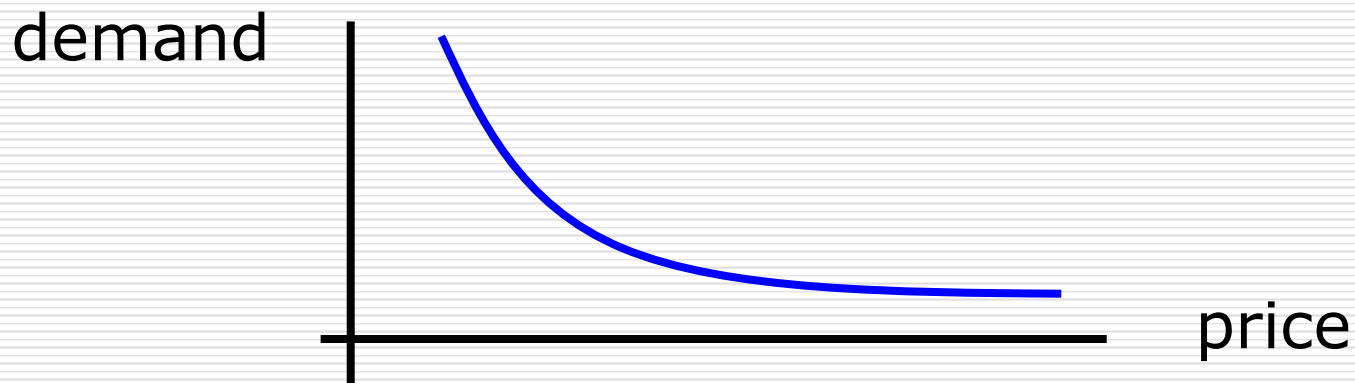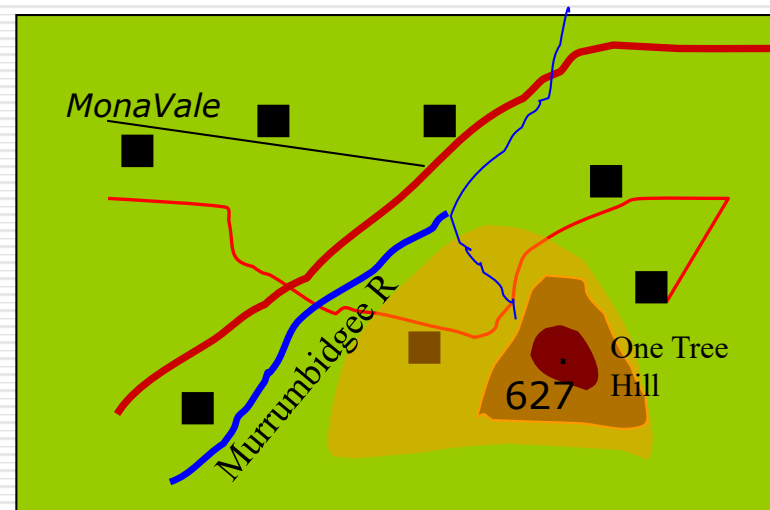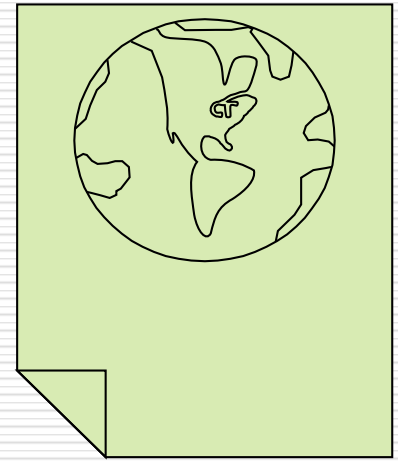
Use other models

- ☐ **economics models**
- ☐ price versus demand curve
- ☐ many assumptions to simplify the market – time, season, fashion, whether the product is an unsubstitutable necessity or a choice

demand

price

Use other models

geographical models

- a map is a model that represents some abstracted aspect of the real world in a diagram: borders of land and sea, political borders, routes of roads (and their intended traffic carrying capacity), heights and vegetation, geology, temperatures

MonaVale

Murrumbidgee R

One Tree Hill

627

Use other models

Page 58-60

Warnier Diagram

IPO Diagram

Specification 书写模板

1. Introduction

2. Current system

3. Proposed system

3.1 Overview

3.2 Functional requirements

3.3 Nonfunctional requirements
    3.3.1 Usability
    3.3.2 Reliability
    3.3.3 Performance
    3.3.4 Supportability
    3.3.5 Implementation
    3.3.6 Interface
    3.3.7 Packaging
    3.3.8 Legal

3.4 System models
   3.4.1 Scenarios
   3.4.2 Use case model
   3.4.3 Object model
   3.4.4 Dynamic model
   3.4.5 User interface—navigational paths and screen mock-ups

4. Glossary

中文需求规格说明书—书写模板

（4） An example project

When to stop requirement analysis

✓ requirement specification document finished

✓ audit, check

✓ change ratio of requirement < a pre-defined value

Course Project　　2024-10-14

利用**Rational Rose** 工具, 完成需求描述的**UML**分析建模

(1)共享单车手机APP的需求描述

学号 <= 2251022

(2)手机私家车拼车软件系统的需求描述

251024 <= 学号 <=2251753

(3)手机公园导游软件系统的需要描述

2251762 <= 学号 <= 2252537

(4)城市公交车无人驾驶系统的需求描述

2252538 <= 学号 <= 2253331

（5）智能衣服电子系统的需求描述

2253334 <= 学号 <2299999