Waterfall­ 完成上一个再下一个， 要求明细，一旦设定不能更改 不会回到上一步改

V shape 以v完成 每个开发阶段 对应 测试阶段。 高度严格，上阶段完成下阶段才能开始

RAD 快速开发应用 较小的强调计划 更多强调过程 适合UI开发

Incremental 需求 设计 coding test 确认大纲 每个人做自己的部分 最后合并 不断增加直到程序完成

Spiral ：Requirements are too complex or evolving • Medium to high risk projects • New technology or proof of concept only • See system early on – How many loops? • Ex: aerospace (Mars rover), defense apps, engineering projects

Agile：XP 两个人不停的编程 先做test’软件 再coding 收取feedback 客户需求不断变化 一直改进

Scrum 增加效率缩短时间5-9人 天天见面 有manager

Are you my friend

**Waterfall**

Allows departmentalization and control, the product can be separate by phases, and each phases can set deadline, and complete them one by one.

Advantage:

Simple easy

Easy to manage

Works well for small project

Easy to arrange work

Well documentation

Disadvantage

High risk

Can not change

Need: well understand and stable requirements upfront

Easy to plan and staff

Iteration are costly

**V-­‐Shaped**

Need: well understand and stable requirements uptront

Strong emphasis on verification and validation 强调验证和确认

Good for systems requiring high reliability 适用于需要高可靠性的系统 bank NASA

Every developing phase associate with testing phase highly-disciplined model 高度严格模型

Advantage

Suited for Restricted Projects:

Ideal for Time Management

Lacks Adaptability

**Rapid Prototyping**

Rapid application development (RAD)

Incremental

Spiral

**RAD**

Quick time-60 days

Users involved in all phases

Heavy dependence on：

Code genetators

Screen generators

Productivity tools

More work for planning and decision

When use：

Requirement are well understand

Low risk， reliability are not an issue

Short develop time

High end user involvement ：To optimize product for user, not user adapted for product

Automated tools available

Ex. Information system

Advantage

Reduce time, save time

Disadvantage

Strong team, good skill programmer and designer

Cost high

Incremental

Not allowed iteration

Prioritize important part

Advantage

More flexible, cost little to change

Customer can response each built

Easy to manage risk

low initial delivery cost

disadvantage

need good design and planning

cost more than waterfall

**spiral**

more emphasis placed on risk analysis.

The spiral model has four phases: Planning, Risk Analysis, Engineering and Evaluation. A software project repeatedly passes through these phases in iterations (called Spirals in this model).

Similar as incremental

Advantage

High risk

Strong approval and documentation control.

Additional Functionality can be added at a later date.

Disadvantage

High cost

Risk analysis need high skill people

Not for small project

When use

When risk analysis needed

For medium to high-risk projects

Users are unsure of their needs

Requirements are complex

New product line

Significant changes are expected (research and exploration)

Agile

Lightweight project

No need PM

Such as scrum, extreme programming(xp)