信息系统分析与设计
## 项目管理

信息系统系　刘冠男

▪ **Project**

  – a [temporary] sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by specific time, within budget, and according to specification.

▪ **Project manager**

  - the person responsible for supervising a systems project from initiation to conclusion

- **项目的甲方和乙方**
    - 甲方：项目的需求方、所有者
    - 乙方：项目的承担者、完成者

- **甲方单位立项**

- **甲方启动招标流程**

- **甲方评标、确定中标单位**

- **签订合同**

- **乙方项目执行**

- **乙方项目交付**

- **甲方进行项目验收**
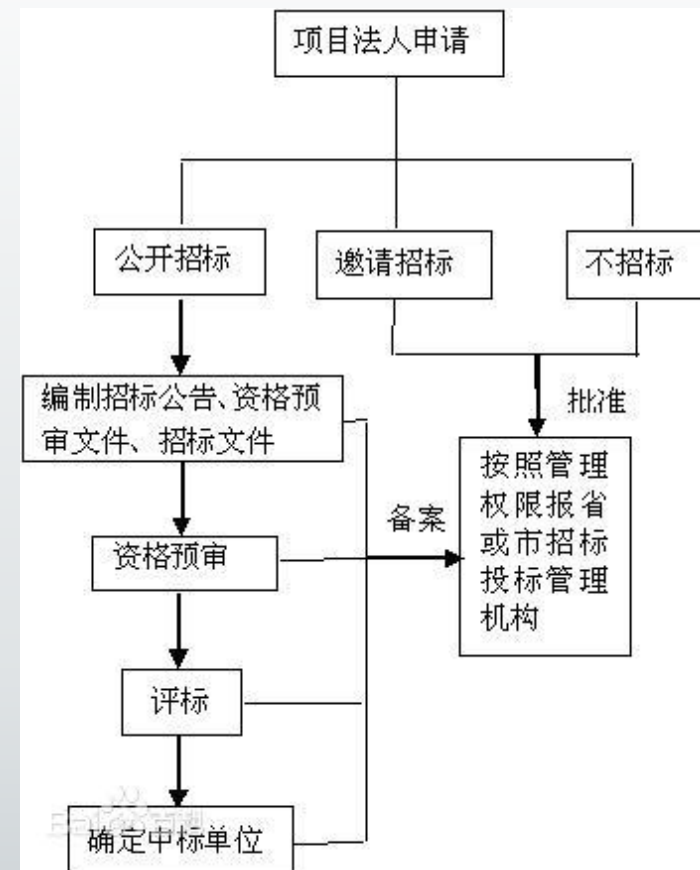
▪ **Project management**

— the process of scoping, planning, staffing, organizing, directing, and controlling the development of an acceptable system at a minimum cost within a specified time frame.

▪ **Process management**

— the activity of documenting, managing, and continually improving the process of systems development.

信息系统项目成功的要素

- **The resulting information system is acceptable to the customer.**
- **The system was delivered "on time."**
- **The system was delivered "within budget."**
- **The system development process had a minimal impact on ongoing business operations.**

- **Failure to establish upper-management commitment to the project**

- **Lack of organization's commitment to the methodology**

- **Taking shortcuts through or around the methodology**

- **Poor expectations management**

  - **Feature creep**– uncontrolled addition of technical features to a system.

  - **Scope creep** – unexpected and gradual growth of requirements during an information systems project.

- **Premature commitment to a fixed budget and schedule**

- **Poor estimating techniques**

- **Overoptimism**

- **The mythical man-month (Brooks, 1975)**

- **Inadequate people management skills**

- **Failure to adapt to business change**

- **Insufficient resources**

- **Failure to "manage to the plan"**
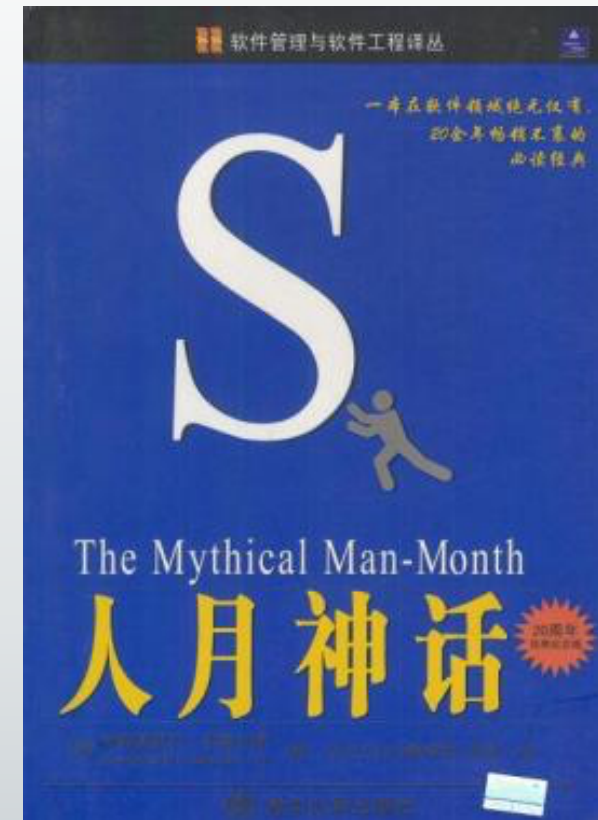
项目经理应具备的素质

业务能力
- Business awareness
- Business partner orientation
- Commitment to quality

问题解决能力
- Initiative
- Information gathering
- Analytical thinking
- Conceptual thinking

影响能力
- Interpersonal awareness
- Organizational awareness
- Anticipation of impact
- Resourceful use of influence

管理能力
- Motivating others
- Communication skills
- Developing others
- Monitoring and controlling

自我管理能力
- Self-confidence
- Stress management
- Concern for credibility
- Flexibility

(Adapted from Wysocki, Beck, and Crane, *Effective Project Management: How to Plan, Manage, and Deliver Projects on Time and within Budget.*)

Project Management Functions

- **Scoping** – setting the boundaries of the project

- **Planning** – identifying the tasks required to complete the project

- **Estimating** – identifying the resources required to complete the project

- **Scheduling** – developing the plan to complete the project

- **Organizing** – making sure members understand their roles and responsibilities

- **Directing** – coordinating the project

- **Controlling** – monitoring progress
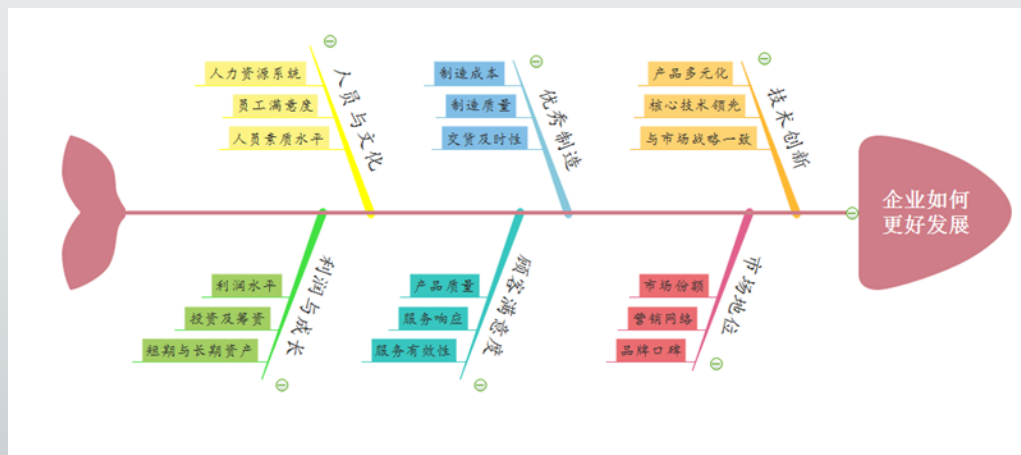
- **Closing** – assessing success and failure

所有任务的完成都有赖于顺畅的人际交流！

- **项目立项是因为出现了问题**
  - 组织变革需要对业务进行改进→业务流程再造
- **问题暴露的形式**
  - 过程问题：输出、太多错误、无进展
  - 员工行为的变化：缺勤率高、离职率高
  - 外部的反馈：投诉、建议、销售额下降
- **鱼骨图**

A、整理问题型鱼骨图（各要素与特性值间不存在原因关系，而是结构构成关系）

B、原因型鱼骨图（鱼头在右，特性值通常以"为什么"来写）

C、对策型鱼骨图（鱼头在左，特性值通常以"如何解决"来写）

案例背景

Catherine's Catering是一家为商务和社交活动(诸如午宴和婚宴)提供便餐、招待会和宴会的小企业。 它受Catherine's对烹饪热爱及其对制作美食的天赋所激励。 起初它是一家小公司,有几名员工经营着一些小项目。Catherine与客户见面以确定人数、膳食类型和其他所需的信息。 随着公司制作丰盛的食物的声誉和服务质量开始上升,他们饮食业务也开始上升。 新会议中心的建造以及城市商业社区日益兴旺,也增加了饮食业务量。

Catherine 能够用电子表格软件和字处理软件来管理业务,但发现很难跟踪没完没了的电话,诸如有什么类型的膳食、参加宴会的客人数量有变化以及专用食品(诸如严格素食者食品、素食者食品、低脂肪食品、低碳水化合物、无麸质食品等的可供应性。Catherine雇用了许多兼职雇员来烹饪和提供饮食,这意味着人员调度的复杂性对新任人力资源经理有压力。

Catherine's catering存在的问题

- (1) 大厨(**master chef**)为每次酒席从供应商那里订购食品(农产品,肉等)。如果一次性为给定时间范围内进行的所有酒席订购更大的食品量,供应商会提供一定的折扣。

- (2) 客户经常打电话来说酒席的客人数有变化,一些变化是在酒席开始前一两天才发生的。

- (3) **Catherine** 和她的职员处理每次酒席申请太耗时,有60%产生合同的电话。

- (4) 雇员调度冲突时有发生,一些酒席所需的人员不够。 有关服务及时性的投诉越来越频繁。

- (5) **Catherine** 没有关于酒席数量和饮食类型的任何汇总信息。 拥有趋势信息是有益的,它可以帮助指导客户选择饮食。

- (6) 酒席通常在酒店或其他会议厅里举行,它们提供了坐着吃饭所需的桌椅设备。有没有足够的侍者以及客人数的变化是问题。

根据案例背景和访谈发现的问题，画出该餐厅的鱼骨图分析，并且提出可能的信息系统的解决方案。

选择项目

- **项目是否能解决问题？解决什么问题？**
  - 从系统角度对预期的项目进行审查
  - 组织的各个子系统相互关联、相互依赖，一个子系统的更改可能影响其他子系统

- **项目选择考虑的特定问题**
  - 是否能得到管理层的支持？
  - 执行时间安排是否合理？
  - 是否能提高战略性组织目标的达成？
  - 系统分析员和组织所用的资源是否切合实际？
  - 与组织能够以其他方式投入资源相比，这是不是一个值得做的项目？
    - 加快流程，改善效率，减少冗余

- **确定项目是否与企业的目标一致**

- **技术可行性**
  - 当前技术资源情况下，是否可以开发新系统？
  - 有没有相关的技术人员？是否需要外包？

- **经济可行性**
  - 时间
  - 投资价值

- **运营可行性**
  - 项目可用的人力资源
  - 系统交付后是否可以立即投入运行使用
  - 用户对新系统的接受

确定硬件和软件需求

- **盘点计算机硬件**
  - 组织中具有哪些硬件，建立硬件清单
    - 确定哪些可用

- **评估计算机硬件采购**
  - 了解硬件的优缺点
  - 考虑满足设计需求且可得的设备种类：从供应商得到备选的系统和系统配置
  - 需考虑的硬件性能标准
    - 平均事务处理时间
    - 系统总容量
    - CPU、网络的空闲时间
    - 内存大小

租用云计算/云服务

- **Cloud Computing**
  - On-demand delivery of IT resource via the Internet
  - 可以提供：算力、存储、数据库
  - 用于：数据备份、大数据分析
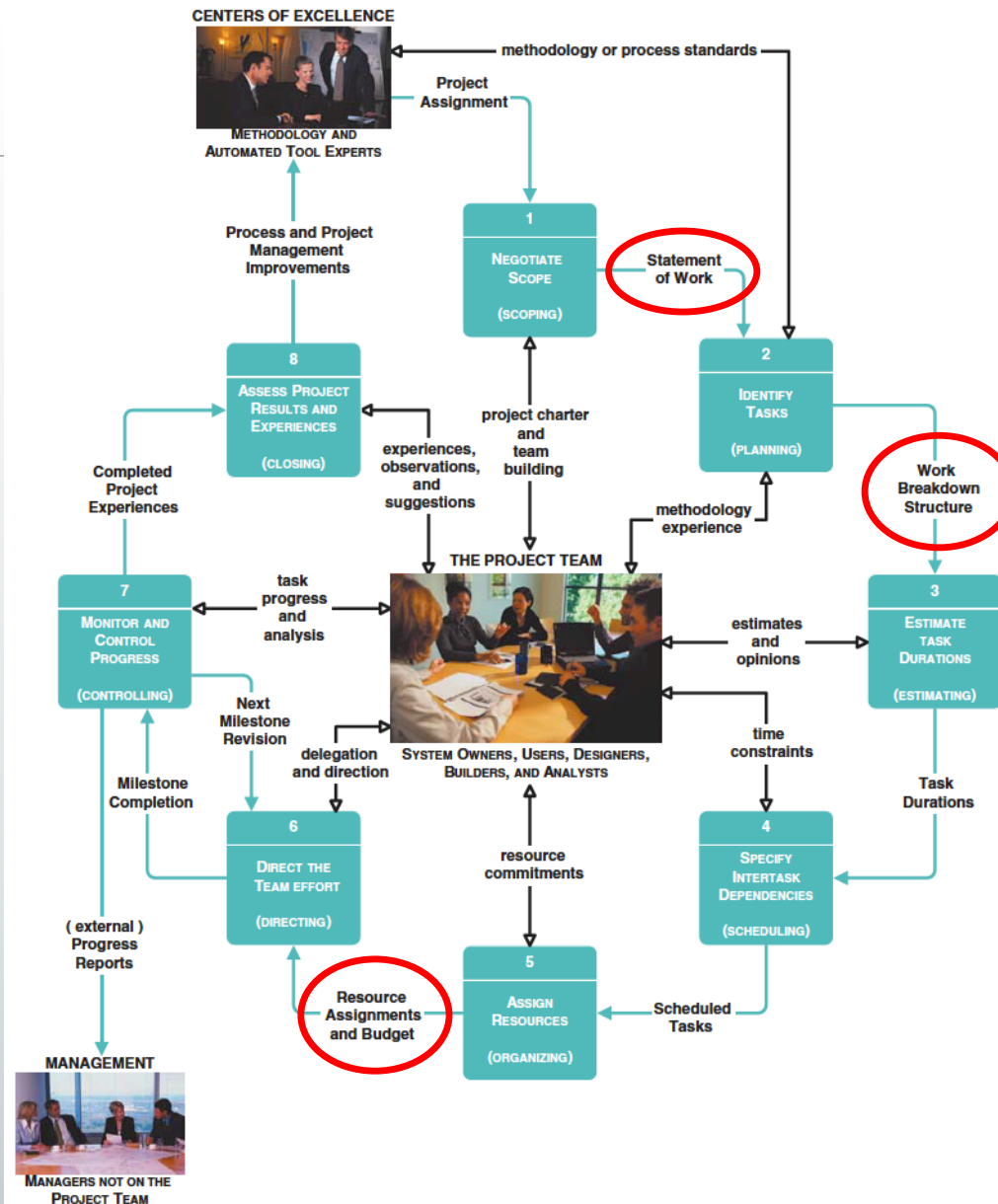
云计算的类型

- 软件即服务 Software as a Service, SaaS

- 架构即服务 Infrastructure as a Service, IaaS

- 平台即服务 Platform as a Service, PaaS

项目管理的生命周期

项目管理的生命周期

Scope – the boundaries of a project – the areas of a business that a project may (or may not) address. Includes answers to five basic questions:

- **Product**
- **Quality**
- **Time**
- **Cost**
- **Resources**

Statement of work – a narrative description of the work to be performed as part of a project. Common synonyms include *scope statement, project definition, project overview*, and *document of understanding*.

Statement of Work

I.   **Purpose**
II.   **Background**
           A. Problem, opportunity, or directive statement
           B. History leading to project request
           C. Project goal and objectives
           D. Product description
III.   **Scope**
           A. Stakeholders
           B. Data
           C. Processes
           D. Locations
IV.   **Project Approach**
           A. Route
           B. Deliverables
V.   **Managerial Approach**
           A. Team building considerations
           B. Manager and experience
           C. Training requirements

Notice the use of information system building blocks

(continued)

Statement of Work (concluded)

V.   **Managerial Approach (continued)**
        D. Meeting schedules
        E. Reporting methods and frequency
        F. Conflict management
        G. Scope management
VI.   **Constraints**
        A. Start date
        B. Deadlines
        C. Budget
        D. Technology
VII.   **Ballpark Estimates**
        A. Schedule
   B. Budget
VIII.   **Conditions of Satisfaction**
        A. Success criteria
        B. Assumptions
        C. Risks
IX. **Appendices**

- **将项目分解成更小的任务**

- **工作分解结构，Work Breakdown Structure (WBS)**
  - 每个任务或活动包含该活动一个可交付产品或有形成果
  - 每个任务可分配给一个人或一个小组
  - 每个任务有一个负责人负责监督和控制性能

- **将大的想法分解成可管理的活动**
  - 面向产品的：功能导向，考虑一个完整产品的组成部分
  - 面向过程的：系统开发生命周期中的每个阶段

- **里程碑 Milestone**
  - **an event signifying the completion of a major project deliverable.**
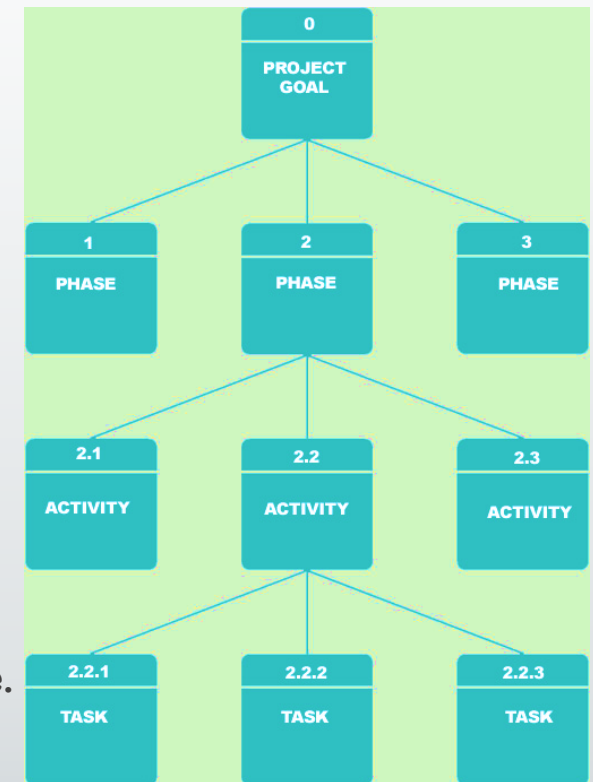
- **Elapsed time takes into consideration:**
  - **Efficiency** - no worker performs at 100% efficiency
    - Coffee breaks, lunch, e-mail, etc.
    - Estimate of 75% is common
  - **Interruptions**
    - Phone calls, visitors, etc.
    - 10-50%

1. Estimate the minimum amount of time it would take to perform the task – the optimistic duration (OD).
2. Estimate the maximum amount of time it would take to perform the task – the pessimistic duration (PD).
3. Estimate the expected duration (ED) that will be needed to perform the task.
4. Calculate a weighted average of the most likely duration (D) as follows:

$$D = \frac{1 \times OD + 4 \times ED + PD}{6}$$

- **Finish-to-start (FS)**
  - The finish of one task triggers the start of another task.
- **Start-to-start (SS)**
  - The start of one task triggers the start of another task.
- **Finish-to-finish (FF)**
  - Two tasks must finish at the same time.
- **Start-to-finish (SF)**
  - The start of one task signifies the finish of another task.

任务排程策略 Scheduling Strategies

❑ **Forward scheduling** – a project scheduling approach that establishes a project start date and then schedules forward from that date.

❑ **Reverse scheduling** – a project scheduling strategy that establishes a project deadline and then schedules backward from that date.

活动5—分配资源

- **People** – includes all system owners, users, analysts, designers, builders, external agents, and clerical help involved in the project in any way.

- **Services** – includes services such as a quality review that may be charged on a per use basis.

- **Facilities and equipment** – includes all rooms and technology that will be needed to complete the project.

- **Supplies and materials** – everything from pencils, paper, notebooks to toner cartridges, and so on.

- **Money** – includes a translation of all of the above into budgeted dollars!

为项目找到合适的人

- Recruit talented, highly motivated people

- Select the best task for each person

- Promote team harmony

- Plan for the future

- Keep the team size small

资源平衡 resource leveling
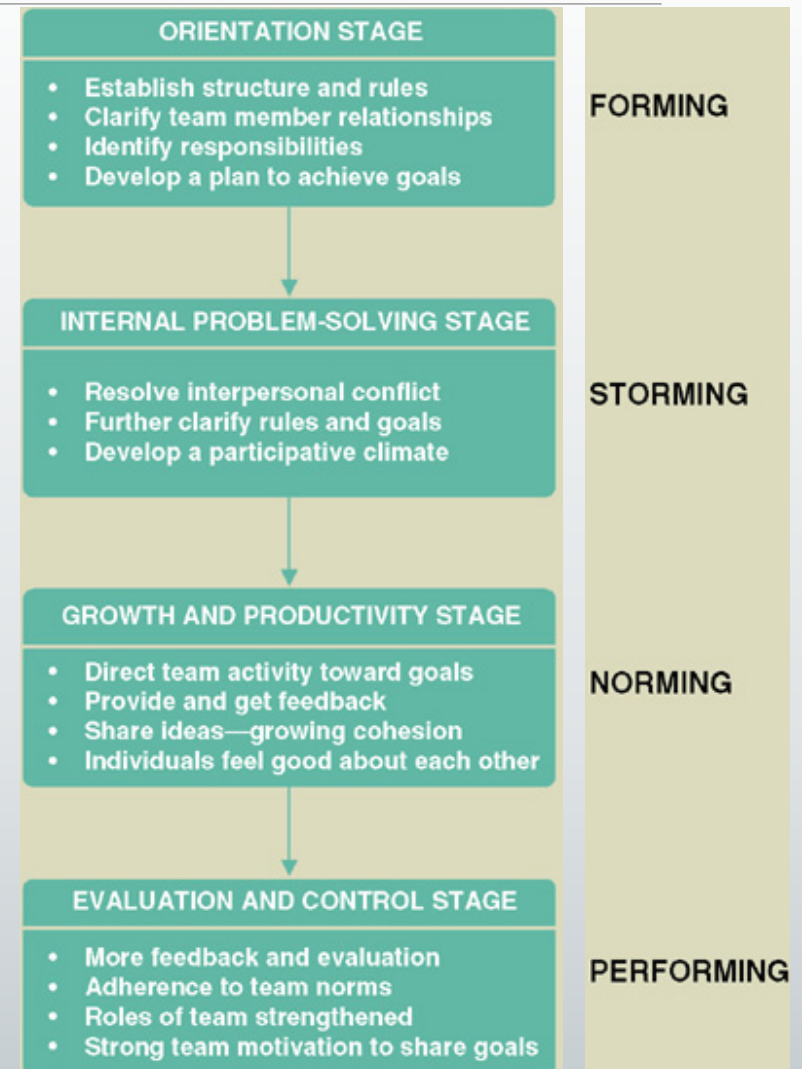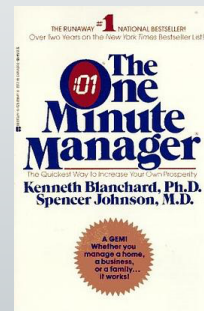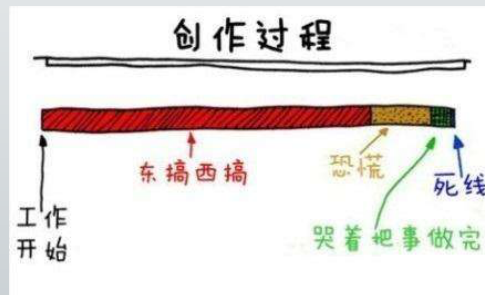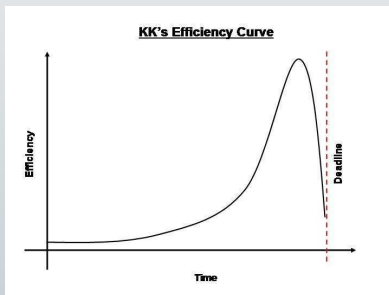
- **Resource leveling – a strategy for correcting resource over-allocations.**
  - 避免资源的过度分配

- **Two techniques for resource leveling:**
  - task delaying
  - task splitting

- **Critical path – the sequence of dependent tasks that determines the earliest possible completion date of the project.**
  - Tasks on the critical path cannot be delayed without delaying the entire project. Critical tasks can only be split.

- **Slack time – the amount of delay that can be tolerated between the starting time and completion time of a task without causing a delay in the completion date of the entire project.**
  - Tasks that have slack time can be delayed to achieve resource leveling

- **Supervision resources**
  - 《The Deadline: A Novel about Project Management》
  - 最困难的就是人员管理！
  - 《The One Minute Manager》
  - 猴子管理规则

- **Stages of Team Maturity (see figure to the right)**

KK's Efficiency Curve

创作过程
东搞西搞　恐慌　死线
工作开始　哭着把事做完

THE RUNAWAY #1 NATIONAL BESTSELLER!
Over Two Years on the New York Times Bestseller List!
The One Minute Manager
The Quickest Way to Increase Your Own Prosperity
Kenneth Blanchard, Ph.D.
Spencer Johnson, M.D.
A GEM! Whether you manage a home, a business, or a family... It works!

ORIENTATION STAGE
- Establish structure and rules
- Clarify team member relationships
- Identify responsibilities
- Develop a plan to achieve goals

FORMING

INTERNAL PROBLEM-SOLVING STAGE
- Resolve interpersonal conflict
- Further clarify rules and goals
- Develop a participative climate

STORMING

GROWTH AND PRODUCTIVITY STAGE
- Direct team activity toward goals
- Provide and get feedback
- Share ideas—growing cohesion
- Individuals feel good about each other

NORMING

EVALUATION AND CONTROL STAGE
- More feedback and evaluation
- Adherence to team norms
- Roles of team strengthened
- Strong team motivation to share goals

PERFORMING

项目领导力的十大原则

1. **Be Consistent.**

2. **Provide Support.**

3. **Don't Make Promises You Can't Keep.**

4. **Praise in Public; Criticize in Private.**

5. **Be Aware of Morale Danger Points.**

6. **Set Realistic Deadlines.**

7. **Set Perceivable Targets.**

8. **Explain and Show, Rather Than Do.**

9. **Don't Rely on Just Status Reports.**

10. **Encourage a Good Team Spirit.**

- Progress reporting

- Change management

- Expectations management

- Schedule adjustments—critical path analysis (CPA)

项目进展报告模板

- **封面页**
  - 项目名称、项目经理、日期
- **进展总结**
  - A. 进度分析
  - B. 预算分析
  - C. 范围分析
  - D. 过程分析
- **任务分析**
  - 已完成的任务
  - 目前的任务和交付物
  - 未来短期任务和交付物

- **之前存在的问题**
  - 存在的问题内容
  - 解决方案，解决的Deadline
- **新问题**
  - 实际存在或预期的问题
  - 可能的解决方案
    - 推荐的方案
    - 任务分配与预期ddl
- **附件**

変更管理 Change management

Change management – a formal strategy in which a process is established to facilitate changes that occur during a project.

Changes can be the result of various events and factors including:

- An omission in defining initial scope
- A misunderstanding of the initial scope
- An external event such as government regulations that create new requirements
- Organizational changes
- Availability of better technology
- Shifts in planned technology that force changes to the business organization, culture, and/or processes
- Management's desire to have the system do more
- Reduced funding for project or imposition of an earlier deadline.

预期管理 Expectation Management

- **管理谁的预期？**
  - 项目的甲方：客户、系统的所有者和用户
  - 项目的乙方：各个层面的系统参与者

- **现实项目中的痛点：**
  - 各利益方目标不一致
  - 预期过高过低的客户或合作伙伴
  - 突然加入的利益方

- **预期管理的因素：**
  - 事项目标
  - 产出价值
  - 风险性、不可控性和应对策略
  - 关键时间节点，前后关联性

通过完整掌握事项/项目关联人物的**心理预期全视图**，在合适的时间对必要的人进行预期管理，最大化避免不必要沟通成本的一种能力

关键角色	关键因素	关键因素状态	可能走向	可能性评估
上级，合作方，XX团队	目标	达成XXX（需要管理）	根据目前资源评估可能达成率在80%	大概率发生
上级，XX利益方	上线时间	XXX时间	根据目前进展来看，按时上线可能性较大	大概率发生

1. **Using intertask dependencies, determine every possible path through the project.**

2. **For each path, sum the durations of all tasks in the path.**

3. **The path with the longest total duration is the critical path.**
   - The **critical path** is the sequence of tasks with the largest sum of *most likely durations*. The critical path determines the earliest completion date of the project.
   - The **slack time** for any non-critical task is the amount of delay that can be tolerated between starting and completion time of a task without causing a delay in the entire project.
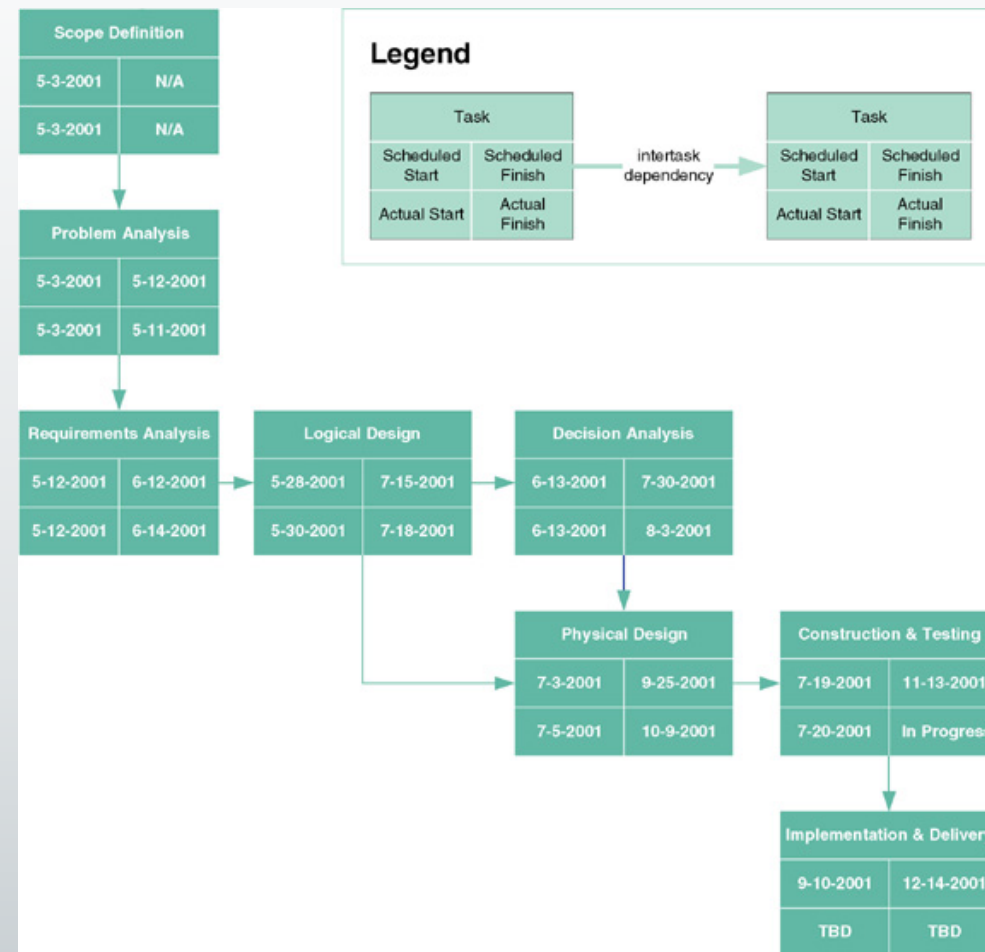
- **Did the final product meet or exceed user expectations?**
  - Why or why not?

- **Did the project come in on schedule?**
  - Why or why not?

- **Did the project come in under budget?**
  - Why or why not?

项目管理技术和工具简介

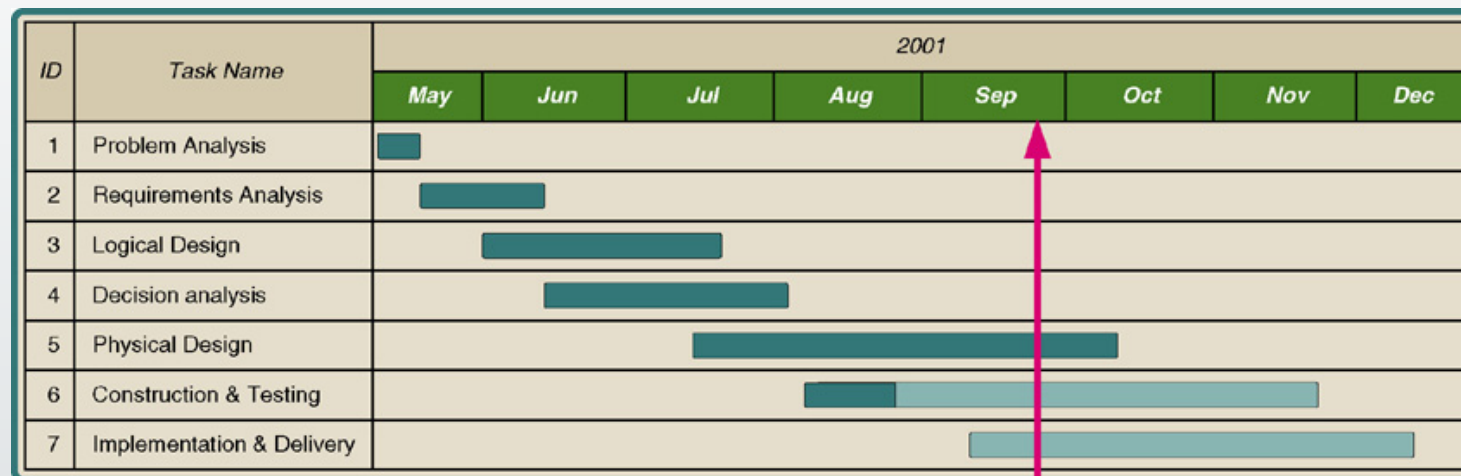PERT chart – a graphical network model used to depict the interdependencies between a project's tasks.

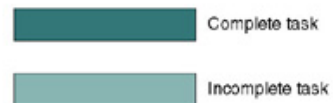Gantt chart – a bar chart used to depict project tasks against a calendar.
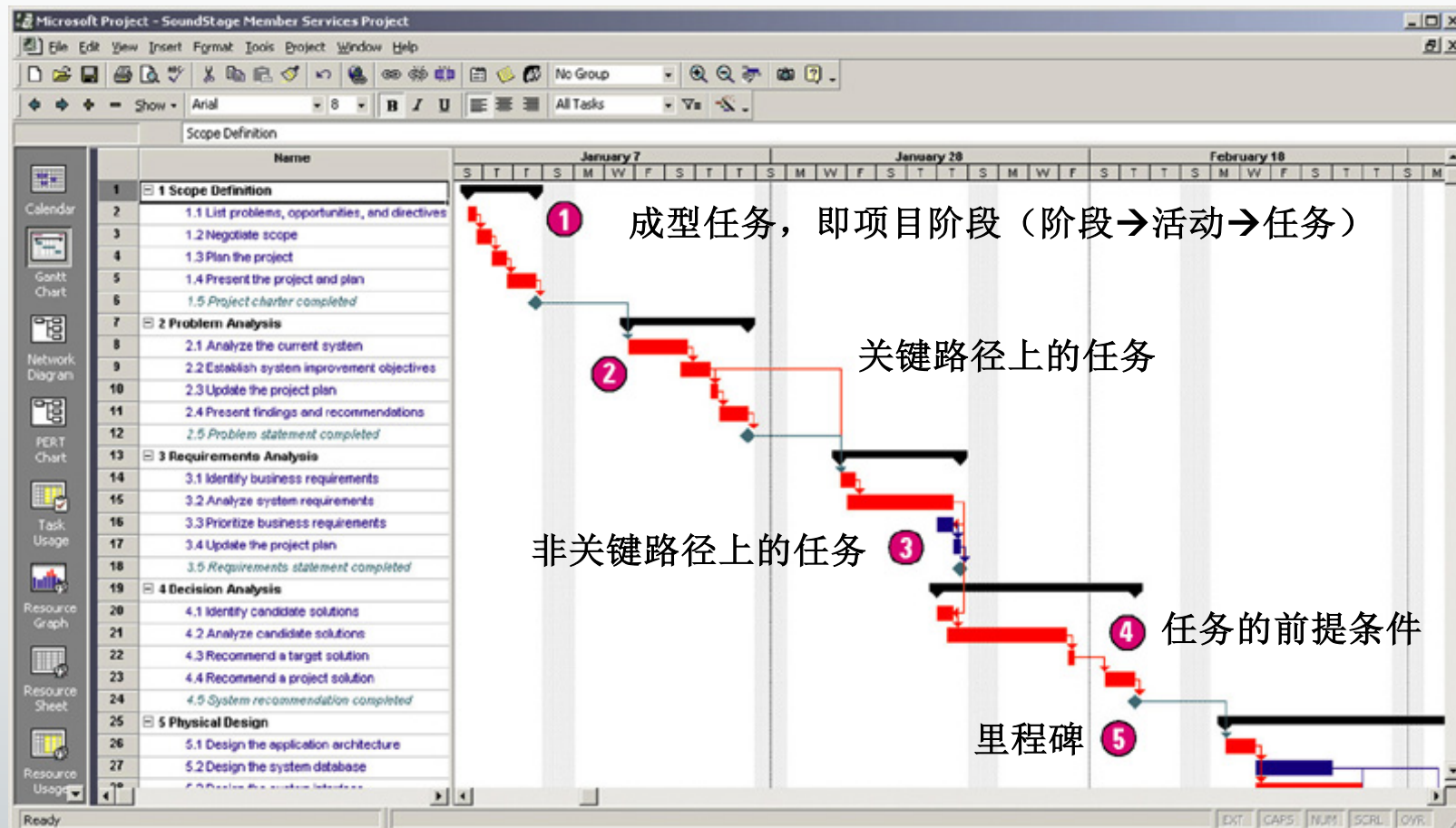
PERT Chart

Gantt Chart

ID	Task Name	2001							
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Problem Analysis								
2	Requirements Analysis								
3	Logical Design								
4	Decision analysis								
5	Physical Design								
6	Construction & Testing								
7	Implementation & Delivery								

Today

Legend
Complete task
Incomplete task
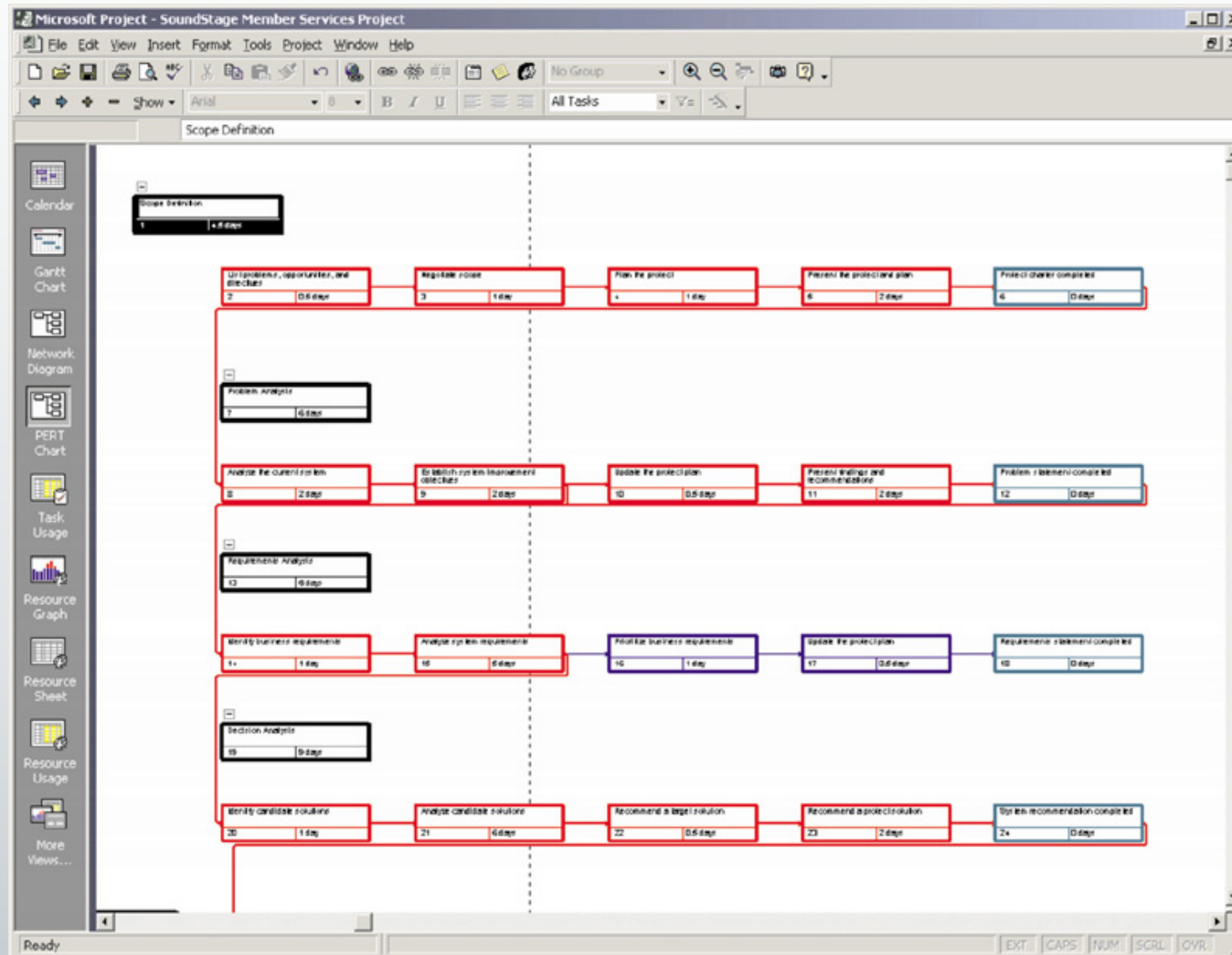
Microsoft Project Gantt Chart

Microsoft Project PERT Chart

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RESEARCH CENTER FOR
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