Lecture Note 6

2024年3月8日 11:16

Ch.6 Human Aspects of Software Engineering

6.1 Characteristics Of A Software Engineer

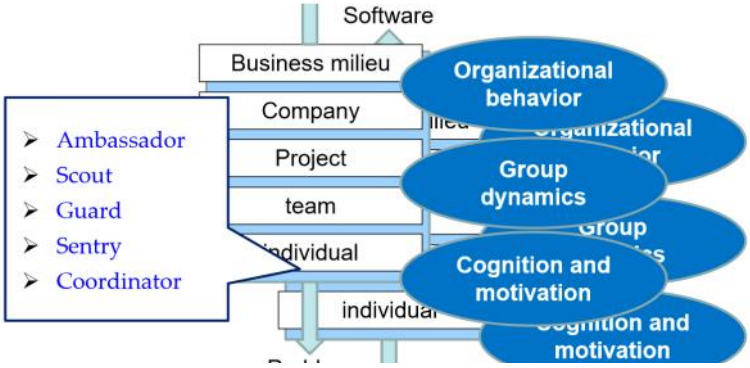
- Traits of Successful Software Engineers

- Sense of individual responsibility（责任心）
- Acutely aware of the needs of team members and stakeholders （理解用户）
- Brutally honest about design flaws and offers constructive criticism（勇于承认错误，建设性意见）
- Resilient under pressure （抗压）
- Heightened sense of fairness（公正）
- Attention to detail （细度）
- Pragmatic（实在）

2

6.2 The Psychology Of Software Engineering

- Behavioral Model for Software Engineering
- Boundary Spanning Team Roles



软件工程心理学

行为模型

层次：

1、商业环境：组织化行为学进行管理

2、团体：组织化行为学

3、项目：能动性

4、团队：能动性

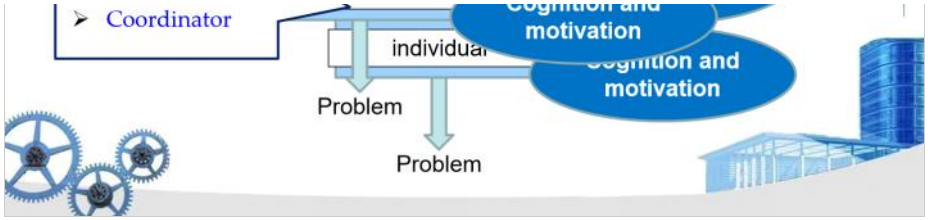
5、个人：认知能力

不同团队之间存在鸿沟，需要沟通

守护员（信息保密）

安检员（流言控制）

协调员（谈判）



安检员（流言控制）
协调员（谈判）

6.3 The Software Team

- Effective Software Team Attributes
  - Sense of purpose
  - Sense of involvement
  - Sense of trust
  - Sense of improvement
  - Diversity of team member skill sets
- Avoid Team "Toxicity"
  - A frenzied work atmosphere in which team members waste energy and lose focus on the objectives of the work to be performed.
  - High frustration caused by personal, business, or technological factors that cause friction among team members.
  - "Fragmented or poorly coordinated procedures" or a poorly defined or improperly chosen process model affecting accomplishment.
  - Unclear definition of roles resulting in a lack of accountability and resultant finger-pointing.
  - "Continuous and repeated exposure to failure" that leads to a loss of confidence and a lowering of morale.

有效率的团队的特征：
1、目标意识
2、投入意识
3、信任意识
4、改进意识
5、技能相互补充

目标混乱、氛围凝固
矛盾重重、高度沮丧
管理不善、协同困难
分工不明、相互指责
连续失败、信心缺失

6.4 Team Structures

- Organizational Paradigms
  - Closed paradigm —structures a team along a traditional hierarchy of authority
  - Random paradigm —structures a team loosely and depends on individual initiative of the team members
  - Open paradigm —attempts to structure a team in a manner that achieves some of the controls associated with the closed paradigm but also much of the innovation that occurs when using the random paradigm
  - Synchronous paradigm —relies on the natural compartmentalization of a problem and organizes team members to work on pieces of the problem with little active communication among themselves

组织行为学
层级范式：有架构

随机式架构：比较民主

混合式架构：兼顾上面两个

同步范式：按问题的自然分解划分团队

6.4 Team Structures

- Factors Affecting Team Structure
  - the difficulty of the problem to be solved
  - the size of the resultant program(s) in lines of code or function points
  - the time that the team will stay together (team lifetime)
  - the degree to which the problem can be modularized
  - the required quality and reliability of the system to be built
  - the rigidity of the delivery date

影响架构的因素
1、难度
2、规模
3、在一起的时间
4、模块化程度
5、质量、可靠性
...

- the degree to which the problem can be modularized
- the required quality and reliability of the system to be built
- the rigidity of the delivery date
- the degree of sociability (communication) required for the project

6

5、质量、可靠性
...

6.5 Agile Teams

- Generic Agile Teams
  - Stress individual competency coupled with group collaboration as critical success factors
  - People trump process and politics can trump people
  - Agile teams as self-organizing and have many structures
    - An adaptive team structure
    - Uses elements of Constantine's random, open, and synchronous structures
    - Significant autonomy
  - Planning is kept to a minimum and constrained only by business requirements and organizational standards

7

敏捷团队
假设：
1、个人能力和团队协作同样重要
2、人比过程重要，策略比人更重要
3、自组织，根据不同问题选择不同的人
4、计划最小化

6.5 Agile Teams

- XP Team Values
  - Communication – close informal verbal communication among team members and stakeholders and establishing meaning for metaphors as part of continuous feedback
  - Simplicity – design for immediate needs nor future needs
  - Feedback – derives from the implemented software, the customer, and other team members
  - Courage – the discipline to resist pressure to design for unspecified future requirements
  - Respect – among team members and stakeholders

8

极限编程团队
1、沟通
2、简单化
3、反馈
4、勇气
5、尊重

6.6 Impact of Social Media

- Blogs – can be used share information with team members and customers
- Microblogs – allow posting of real-time messages to individuals following the poster (e.g. Twitter)

社交媒体的手段来实现沟通
1、技术博客
2、在线论坛
3、社交网络
4、朋友圈共享资料

customers

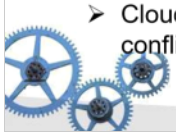
- Microblogs – allow posting of real-time messages to individuals following the poster (e.g. Twitter)
- Targeted on-line forums – allow participants to post questions or opinions and collect answers
- Social networking sites– allows connections among software developers for the purpose of sharing information (e.g. Facebook, LinkedIn)
- Social book marking– allow developers to keep track of and share web-based resources (e.g. Delicious, Stumble, CiteULike)

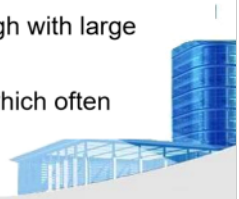
9

2、在线论坛
3、社交网络
4、朋友圈共享资料

6.7 Software Engineering using the Cloud

- Benefits
  - Provides access to all software engineering work products
  - Removes device dependencies and available every where
  - Provides avenues for distributing and testing software
  - Allows software engineering information developed by one member to be available to all team members
- Concerns
  - Dispersing cloud services outside the control of the software team may present reliability and security risks
  - Potential for interoperability problems becomes high with large number of services distributed on the cloud
  - Cloud services stress usability and performance which often conflicts with security, privacy, and reliability





10

云计算
有利：
1、随时随地访问文档
2、不需要做太多维护，做在线测试
缺点
1、可靠性问题
2、安全性问题
3、性能问题
4、互操作更复杂

6.8 Collaboration Tools

- Services of collaborative development environments(CDEs)
  - Namespace that allows secure, private storage or work products
  - Calendar for coordinating project events
  - Templates that allow team members to create artifacts that have common look and feel
  - Metrics support to allow quantitative assessment of each team member's contributions
  - Communication analysis to track messages and isolates patterns that may imply issues to resolve
  - Artifact clustering showing work product dependencies

11

协同开发环境
1、提供域名空间存储，有权限设置
2、有日历看ddl
3、模板
4、度量的支持
5、对交流过程跟踪
6、对产出聚类，发现关联关系

6.9 Global Teams

6.9 Global Teams

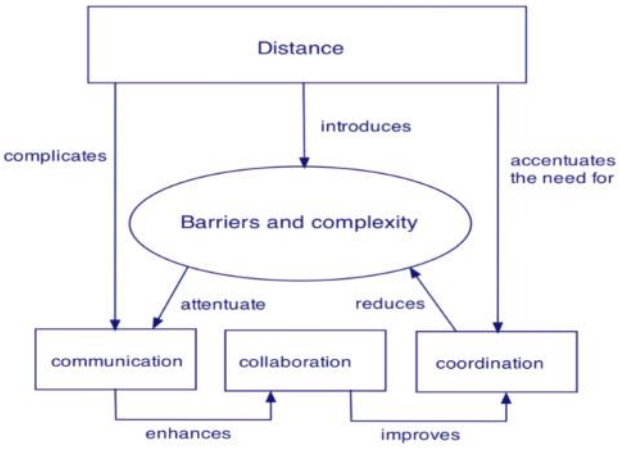
- Team Decisions Making Complications
  - Problem complexity
  - Uncertainty and risk associated with the decision
  - Work associated with decision has unintended effect on another project object (law of unintended consequences)
  - Different views of the problem lead to different conclusions about the way forward
  - Global software teams face additional challenges associated with collaboration, coordination, and coordination difficulties

12

团队分散在世界各地
带来更复杂的问题
决策的不确定性和风险

6.9 Global Teams

- Factors Affecting Global Software Development Team



13

沟通 / 障碍复杂性 / 协调性问题