建立世界級的軟體研發中心

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Essence of Software Development You May Not Know

- Requirements
- Planning
- Design
- Quality Assurance
- Human Factor
- Documentation
Requirements – What to build?

- Requirement need to support your business model.
- What features need to be included?
- When the features need to be needed?
- Do you need to consider the backward/forward compatibility?
Planning - When to do what?

• Why is planning important?
  ▪ Predictability
  ▪ Running the project smooth / efficiency

• Feasibility study/ prototyping

• Scheduling and task estimation

• How do you go running this project/ team formation?
Design – How to build it?

- Architecture
- Future expandability
- Performance impact
- Maintainability
- Module reuse
- Design review / alternatives
You know more than I do!

Still -----

- Code review
- Comments
- Simple is beauty
- Unit testing
- Top down / pseudo code
Quality Assurance – Did we do it right?

- The confusion over quality assurance vs. quality control vs. testing
- Test plan/ test cases
- Systematic
- Test automation
- Simulation
Why?
Memory fades as time goes & people do come and go!

- Software need to be reproducible
- Communication among different team members
- Necessary for product sustain
• Psychology / user behavior / learning curve (training cost, service cost)
• Know your users : usability study
• Culture/ user knowledge background/ Localization
Software Quality Assurance

• QA ensure the product build fits the requirements; SQA ensure the product is build in the right way.

• What’s the right way?
  ▪ Predictable
  ▪ Reproducible
  ▪ Development process improvement need to be efficient and effective
Service Engineering

• Take care product after-release life cycle
  - Bug fixes
  - Hot fixes/ patches
  - Product problem resolution
Organizational Options (1)

- Functional oriented
  - Each function has its functional managers
  - Managers focus on its functional disciplines
  - Project lead act as coordinator for different function
Organizational Options (2)

• Project oriented
  ▪ A project team consist all functions necessary to conduct the project
  ▪ Functional Manager only provide discipline and training when people are off the project
  ▪ Project lead has full authority to make decisions, but not only project coordination.
• **Matrix**
  - Functional managers make functional decisions and Project Lead make the project decisions.
  - Variations in who make the final call and reporting line.
Systematic Innovation – Vitality of a Software Company

* Currency converted to US dollars, 10-01-2002
Systematic Innovation – Vitality of a Software Company

• Architect research team is the central place
  ▪ Prototyping, feasibility study etc

• Input comes from marketing, technology research, suggestions from Trenders, etc.

• Technology roadmap defines the areas of interest
  ▪ Technology roadmap vs. product roadmap
  ▪ Example: wireless security

• Not everything has to be built from within

• Incentive program for patent applications
Software Engineering Career

- Management track v.s. technical track (professional track)
- Progression: Module -> subsystem -> product -> product line
- Depth first, then broad