2003 NTU Seminar

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

Implementation

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

Documentation

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

Human Factor – First impression is everything

- Psychology / user behavior / learning curve (training cost, service cost)
- Know your users : usability study
- Culture/ user knowledge background/ Localization

Software Quality Assurance

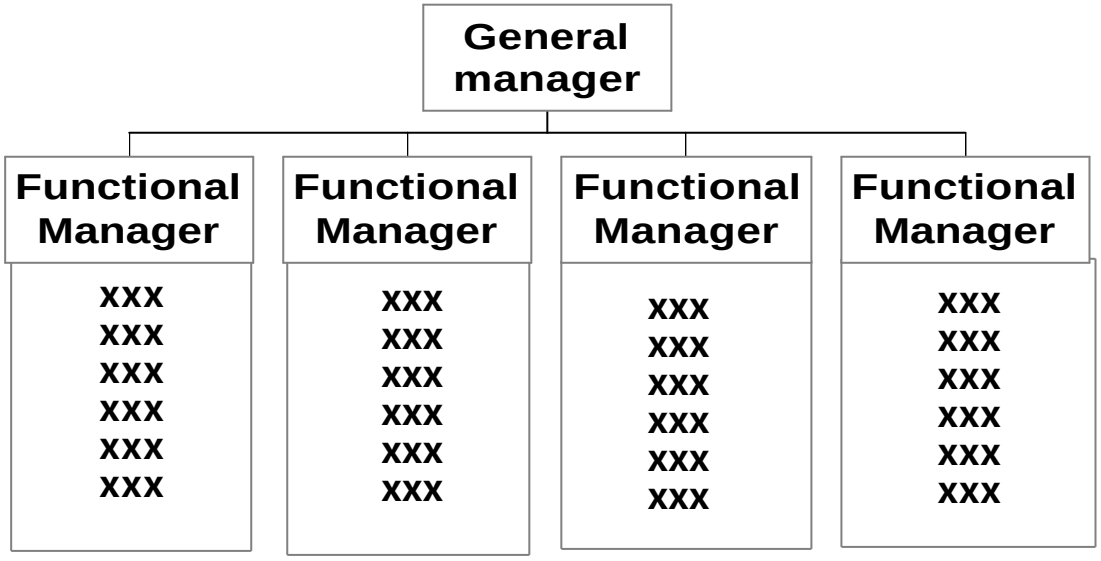
- QA ensure the product build fits the requirements; SQA ensure the product is build in the right way.
- What's the right way?
  - Predictable
  - Reproducible
  - Development process improvement need to be efficient and effective

Service Engineering

- Take care product after-release life cycle
  - Bug fixes
  - Hot fixes/ patches
  - Product problem resolution

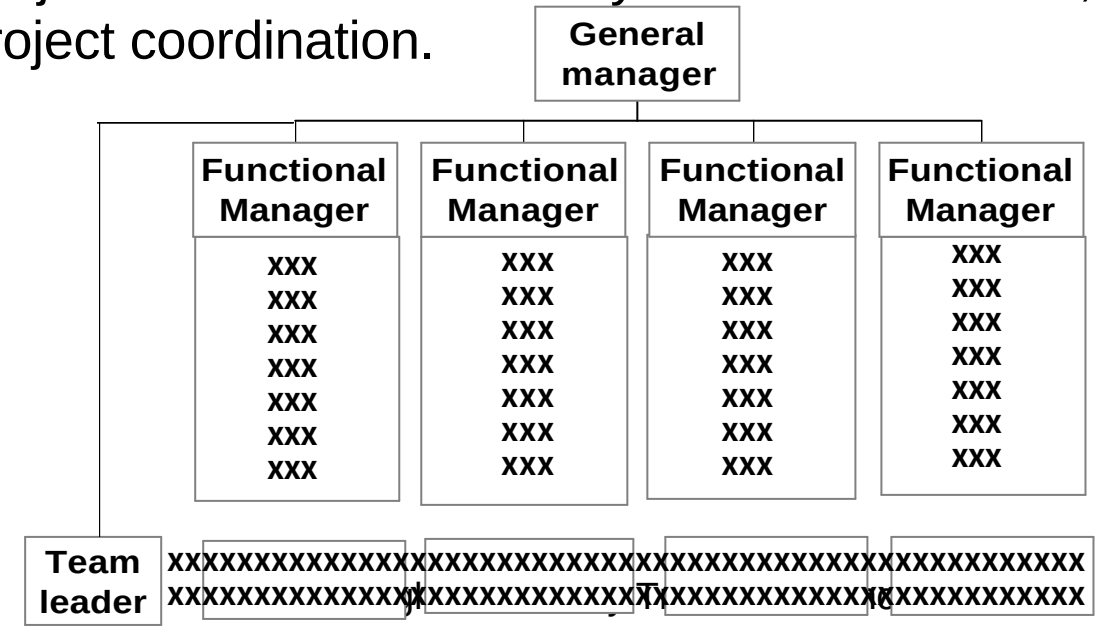
Organizational Options (1)

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



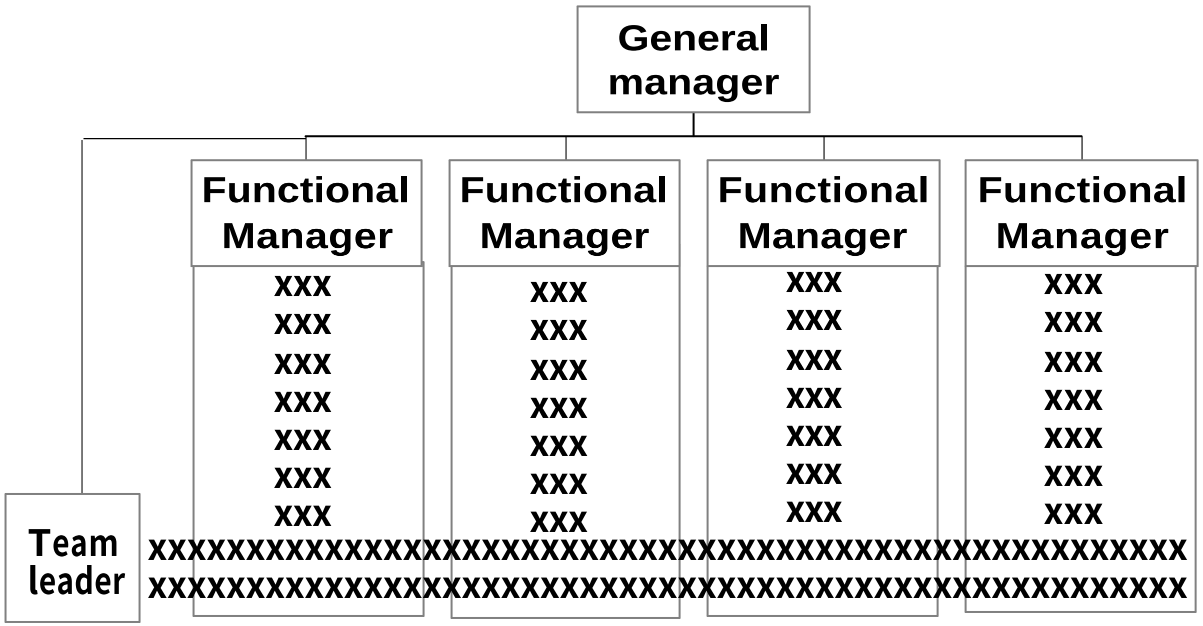
Organizational Options (2)

- 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.

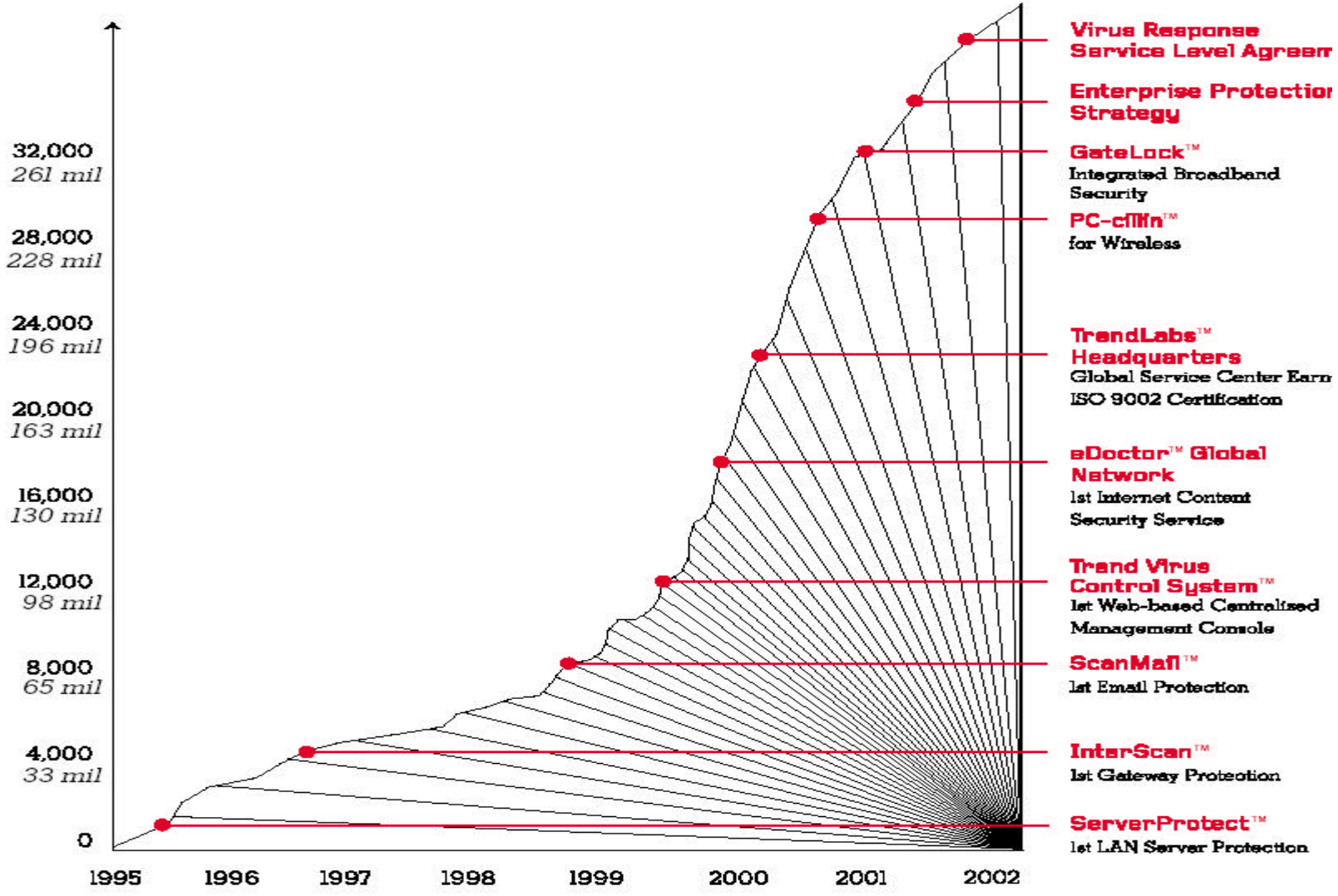


Organizational Options (3)

- 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