Chapter 27: How Program Size Affects Construction

- Things don't scale linearly
    o 10x project
    o 25x construction
    o 40x architecture
    o 15x errors

Communication and Size

- Two person project has one path of communication
- 5 person path has 10 paths
- 10 person has 45 paths
- Need to streamline communication
    o Instead of 10 people talking to each other, everyone documents

Ranges of Project Sizes

- Employees per Project
    o 1-3 = 25%
    o 4-10 = 30%
    o 11-25 = 20%
    o 26-50 – 15%
    o 50+ = 10%
- Team size – percentage of programmers
    o 1-3 = 5%
    o 4-10 = 10%
    o 11-25 = 15%
    o 26-50 = 20%
    o 50+ = 50%
        ▪ Aka big projects have half the employees, even though theres very few of them

Effect of Project Size on Errors

- The larger the project, the larger percentage of errors can be attributed to requirements and design
- On small projects, 75% of errors are construction errors
- The larger the project, the more errors defects per lines of code too

Effect of Project Size on Productivity

- On small projects, skill is the biggest indicator of productivity
- On larger projects, team size and organization become the main factors

Effect of Project Size on Development Activities

Activity Proportions and Size

- As project size increases and the need for formal communications increase, the kinds of activities the project needs change dramatically
- Construction – scale proportionally
    o Detailed design
    o Coding
    o Debugging
    o Unit testing
- Activities that grow greater than linearly
    o Communication
    o Planning
    o Management
    o Requirements development
    o System functional design
    o Interface design and specification
    o Architecture
    o Integration
    o Defect removal
    o System testing
    o Document production

Methodology and Size

- On small projects, methodologies tend to be casual and instinctive
- On large projects, they tend to be rigorous and carefully planned
- **Formal approaches aren't always fun**
    o **And if misapplied, their overhead gobbles up other savings**
    o **Building a skyscraper is different than a dog house**
    o **Judge the appetite and setting the same way you would judge what to wear to a social event**
        ▪ **Formal vs casual**
    o **Also start with lightweight then scale up instead of going overboard and dialing back**