**Chapter 27: How Program Size Affects Construction**

* Things don’t scale linearly
  + 10x project
  + 25x construction
  + 40x architecture
  + 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
  + Instead of 10 people talking to each other, everyone documents

**Ranges of Project Sizes**

* Employees per Project
  + 1-3 = 25%
  + 4-10 = 30%
  + 11-25 = 20%
  + 26-50 – 15%
  + 50+ = 10%
* Team size – percentage of programmers
  + 1-3 = 5%
  + 4-10 = 10%
  + 11-25 = 15%
  + 26-50 = 20%
  + 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
  + Detailed design
  + Coding
  + Debugging
  + Unit testing
* Activities that grow greater than linearly
  + Communication
  + Planning
  + Management
  + Requirements development
  + System functional design
  + Interface design and specification
  + Architecture
  + Integration
  + Defect removal
  + System testing
  + 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**
  + **And if misapplied, their overhead gobbles up other savings**
  + **Building a skyscraper is different than a dog house**
  + **Judge the appetite and setting the same way you would judge what to wear to a social event**
    - **Formal vs casual**
  + **Also start with lightweight then scale up instead of going overboard and dialing back**