25 April 2014 Software Design Lecture Notes

**Next Week**: Going over Modularization 1 and Modularization 2 from Paper

**Characteristics of Metrics**

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| -ilities | Focus |
| Performance | * Time-based element behavior * Shared Resources * Frequency and Volume of Communications |
| Availability | * Redundancy in Components * Redundancy among Components * System Response to a Fault |
| Testability | * On Each Element * Element State Observable and Controllable * Understand the Emergent Behavior of Components Working Together * Behavioral Envelope of Elements and System Behavior |
| Usability | * Isolate User Interface and Elements Responsible for User Experience |
| Safety | * Behavioral Envelope of System |
| Interoperability | * Responsible Elements for Coordination Between Components and With Other Systems * Ability to Control those Interactions |

See Book **chapter 4.6** for what guides Quality Design Decisions

Design Time Build Time Runtime by System Dynamics Runtime by Users

**Variation –** The ability of a core asset to adapt to different usages in the different product contexts/environments that are within the product line’s scope (planned).

**Data Flow Model vs. Object-Oriented Model**

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| **Data Flow Model** | **Object-Oriented Model** |
| Functions or Procedures | Hides information in a module from all other modules |
| Abstracts Functions or Actions or Procedures | Abstracts Data |
| Viewed as more efficient code in terms of resource usage and allocation | Supports increased Changeability as a result of hiding internals from outside eyes |
|  | Optimized compilers can result in machine code as efficient as that of the data flow model |