Chapter II

Building on Structured Design Techniques in the Object Oriented Environment

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Introduction

The term structured methods refers to a philosophy of software development which emphasizes an adherence to a set of consistent rules or methods throughout a project (Yourdon, 1989). These methods include broad programs such as Systems Development Lifecycles and Methods and Information Engineering as well as individual techniques such as structured programming, data flow diagramming, data modeling, and Object Oriented methodologies. Perhaps the newest, most visible, but least understood of these methodologies are the Object Oriented methods. The specific set of rules or methods that organizations use can come from a variety of sources. Organizations often implement their own methodologies for software development,
using tools and techniques borrowed from a variety of formalized methodologies. Commercially produced methodologies are also widely used, usually obtained from software vendors and consultants.

The primary objectives of traditional structured methodologies can be summarized as follows: (Martin and McClure, 1988)

- Achieve high-quality programs of predictable behavior
- Achieve programs that are easily modifiable (maintainable)
- Simplify the development process
- Control the development process
- Speed up system development
- Lower the cost of system development

Structured methodologies seek to attain these objectives through the decomposition of complex problems and constructs into simpler ones, the use of modeling and diagramming techniques, achievement of code clarity and readability, improved communication with end users, improved documentation, and earlier error detection (Chapin, 1979; Topper et al., 1994). Some methodologies also provide for repositories and libraries of code and modules which encourage reuse (Banker and Kauffman, 1991).

Graham (1994) summarizes the benefits of Object Oriented (OO) methodologies as:

- reuse
- higher quality due to reuse of tested objects and modules
- flexibility
- more naturalistic applications
- ease of maintenance
- ability to reverse engineer and trace requirements

The focus of traditional structured methods is function and procedure with data shared by functions or processes (Bordoloi and Lee, 1994). In OO methodologies, data and procedure are encapsulated within the object. Therefore, the primary focus is on data modeling rather than process modeling. This difference in focus does not require that all of the knowledge gained through the use of traditional structured methods be put aside when adopting OO languages and methodologies. Rather, a need exists to map traditional methods that
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