STRUCTURE CHARTS

Elements and Definitions
Software System Design

• translates SRS into a

  ==> software system architecture:

  – system’s static structure
  – system’s possible dynamic behaviour
  – data structures
  – user interface design
Structured Analysis and Design

- prepare and analyse a **Data Flow Diagram - DFD**

- derive from the DFD a **Structure Chart**
Structure Chart

- supports the system and module design phase
- diagramming technique with annotations
- hierarchy of modules
- control (invocation) is explicitly modelled
- data flows follow control hierarchy
- decomposition is shown in the control hierarchy
- software / computer oriented
- derived from the DFD and further refined
System Structure - Control Hierarchy

S

I1 → I11, I12 → I21 → C11 → O11, O12
Complete SC Design

- Structure Chart Diagram
- Data Dictionary (e.g. BNF)
- Module Specifications (e.g. PDL)

 ===> consistent with DFD!
Structure Charts - Module

- process / subroutine / task
- unit of execution
- accepts parameters as inputs
- produces parameters as outputs
- parameters: data or control
- can be invoked and can invoke
- label: verb
- linked to module specification
Structure Charts - Special Modules

- predefined (reused) module
- highly useful

“macro” module
- avoid

multi-entry module
- avoid
Structure Charts - Invocation / Call

- call of subordinate module
- connector element
- NOT a data flow
- one specific form of control flow
- has a direction
- no split or join
- NO label
Structure Charts - Invocation / Jump to Address

- call jumps INTO invoked module
- assembler type of programming
- modification at run-time
- avoid
Structure Charts - Sequence of Execution

• sequence of subordinate modules in the diagram is not reflecting a binding sequence of invocation

• sequence of invocation is defined in the specification of the super-ordinate module

• module specification is the decisive element
Structure Charts - Conditional Execution

- call of subordinate module depends on a condition
- no label
- condition is defined in the module specification
- module specification is the decisive element
Structure Charts - Loops in the Execution

- call of subordinate modules runs in a loop
- no label or condition
- loop (and its condition) is defined in the module specification
- module specification is the decisive element
Structure Charts - Data Flow

- flow of information
- data transfer
- bound to invocation
- has a direction
- no splits or joins
- label: noun
- specified in data-dictionary
Structure Charts - Control Flow

- flow of control (<> invocation)
- control execution path of targeted module
- bound to invocation
- has a direction
- no splits or joins
- label: flag, decision, condition
- specified in data-dictionary
Structure Charts - Data Store

- storage for permanent data
- database / file
- passive; no activity beyond basic retrieval capacity
- serviced by a module
- label: noun
- specified in data-dictionary and/or with an ER-diagram
Structure Charts - Devices / Interfaces

- provides connection to peripheral devices
- origin / destination of external data flows (controls)
- not part of the software to be developed
- label: noun
- specified in data-dictionary
Structure Charts - SW Infrastructure

- provides connection to external systems, databases, operating system, etc.
- origin / destination of external data flows (controls)
- not part of the software to be developed
- label: noun
- specified in data-dictionary