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

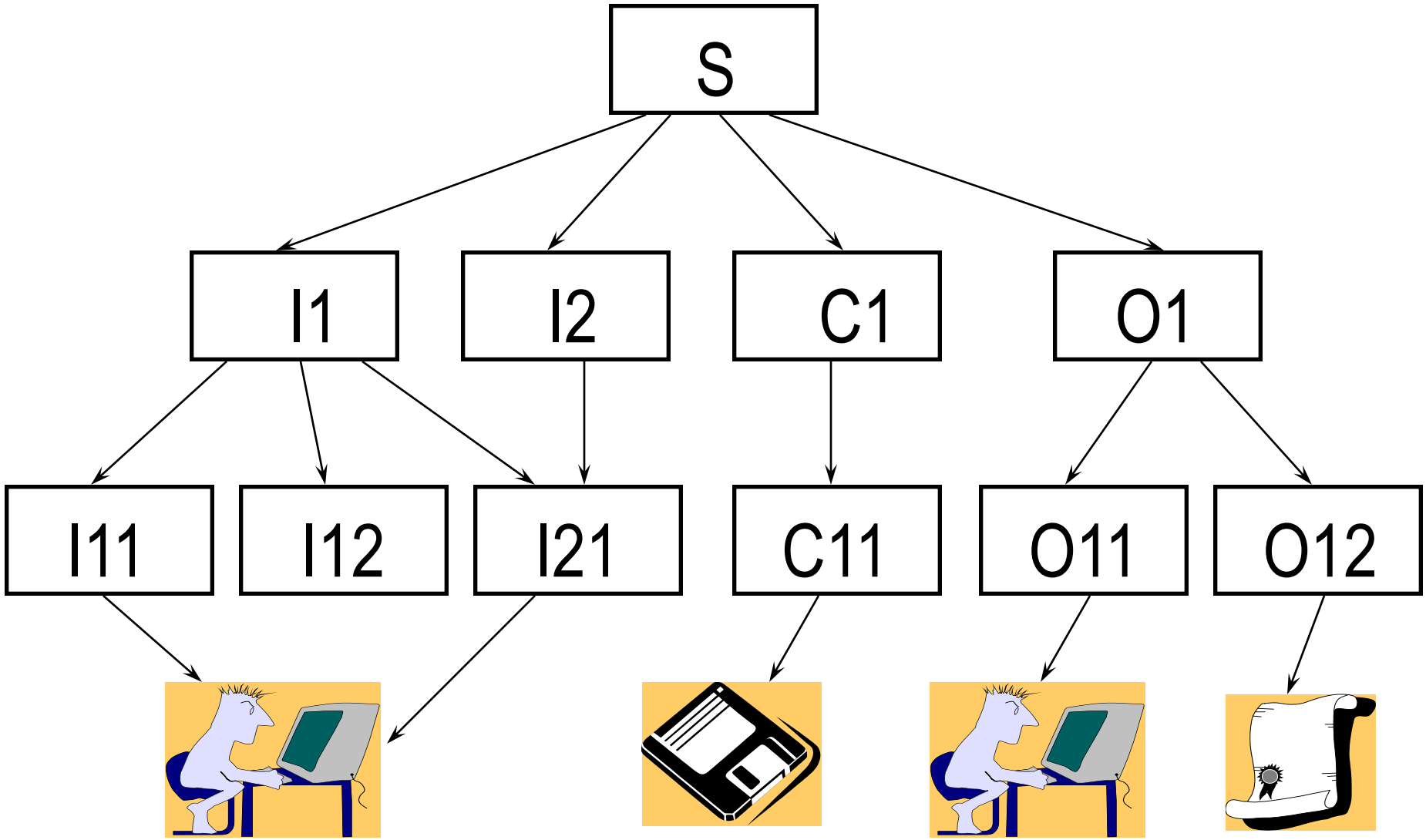
- derive from the DFD a

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

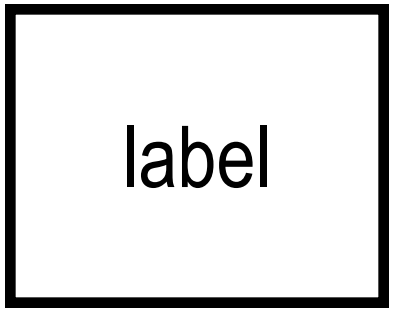


Complete SC Design

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

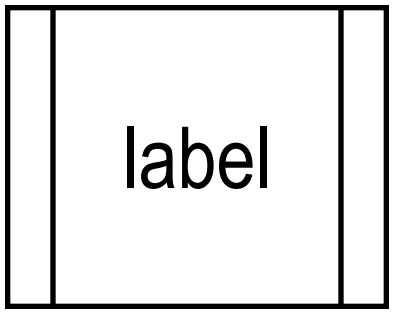
===> consistent with DFD!

Structure Charts - Module

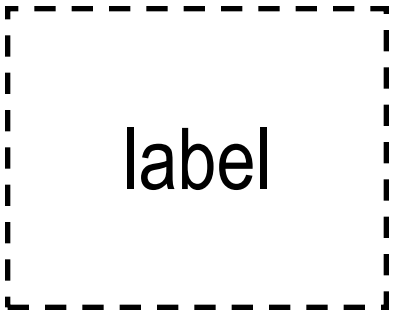


- process / subroutine / task
- unit of execution
- accepts parameters as inputs
- produces parameters as outputs
- parameters: data or control
- can be invoked and can invoke
- label: verb
- linked to module specification

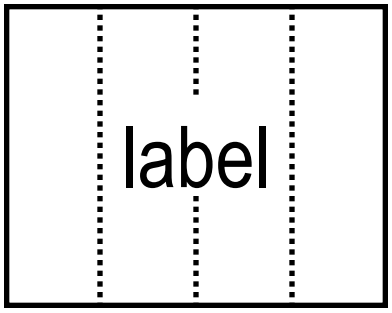
Structure Charts - Special Modules



- predefined (reused) module
- highly useful

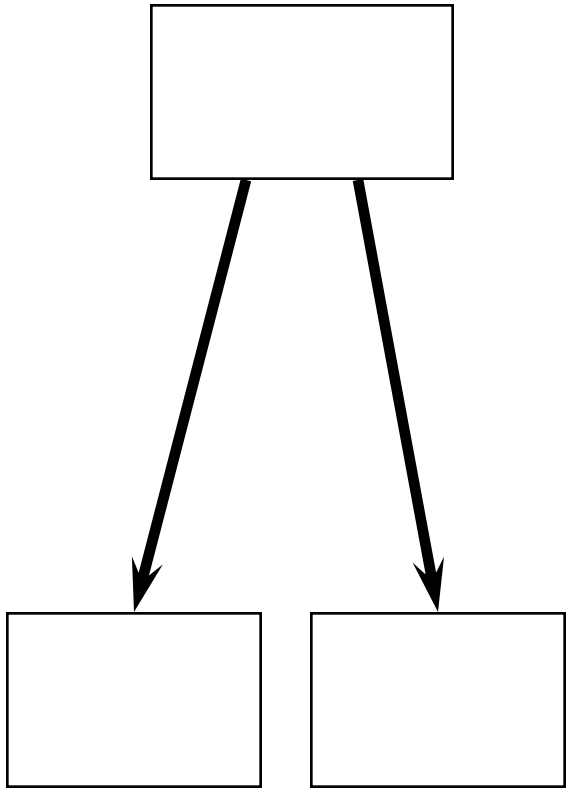


- “macro” module
- avoid



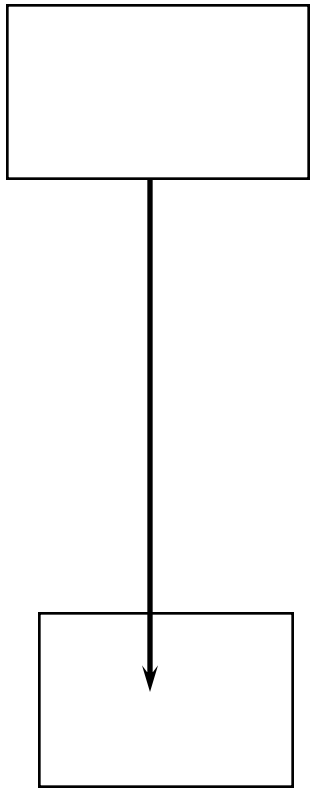
- multi-entry module
- avoid

Structure Charts - Invocation / Call



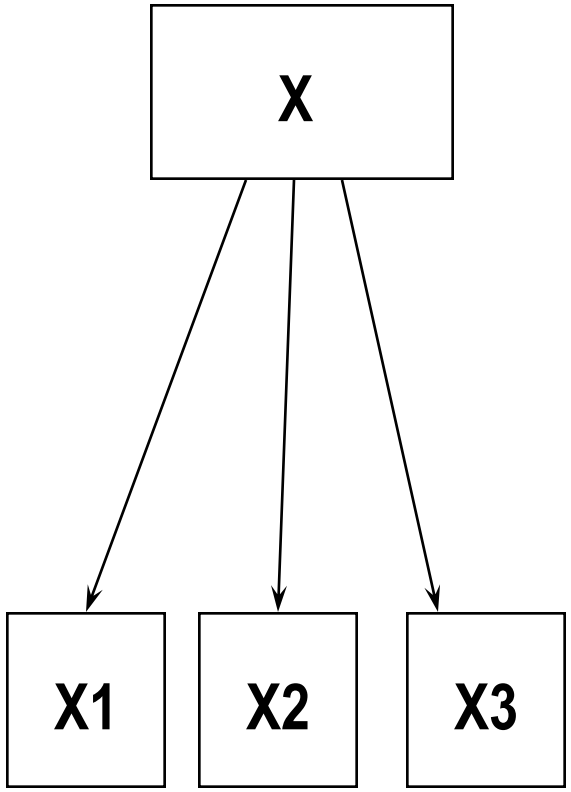
- call of subordinate module
- connector element
- NOT a data flow
- one specific form of control flow
- has a direction
- no split or join
- NO label

Structure Charts - Invocation / Jump to Address



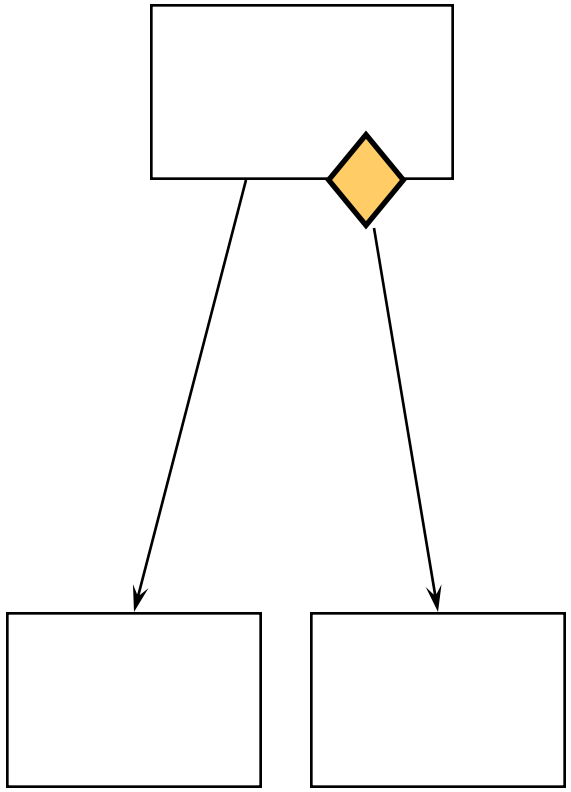
- call jumps INTO invoked module
- assembler type of programming
- modification at run-time
- avoid

Structure Charts - Sequence of Execution



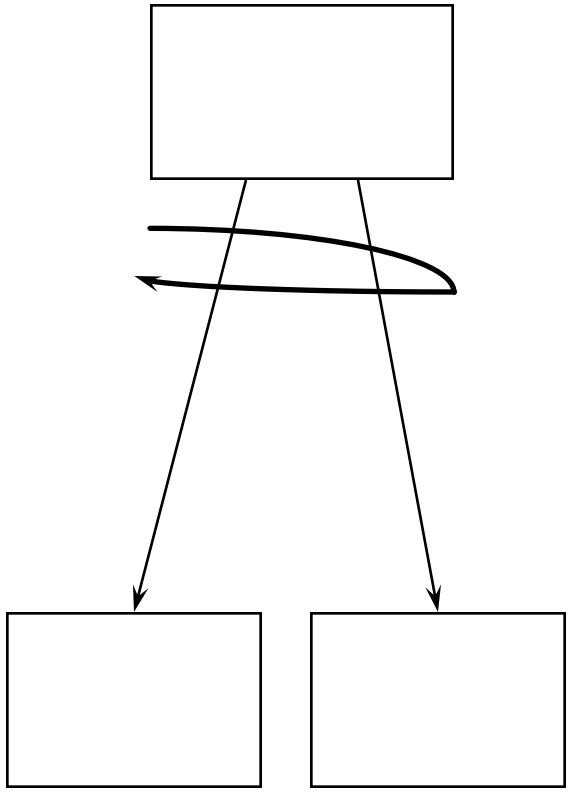
- sequence of subordinate modules in the diagram is not reflecting a binding sequence of invocation
- sequence of invocation is defined in the specification of the super-ordinate module
- module specification is the decisive element

Structure Charts - Conditional Execution



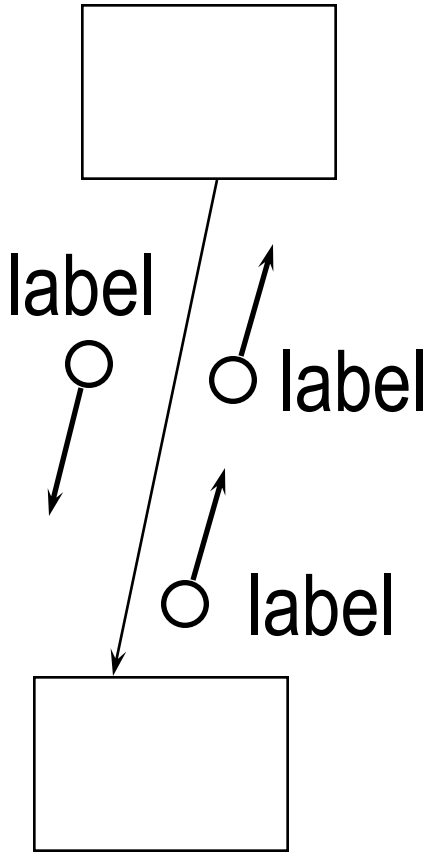
- call of subordinate module depends on a condition
- no label
- condition is defined in the module specification
- module specification is the decisive element

Structure Charts - Loops in the Execution



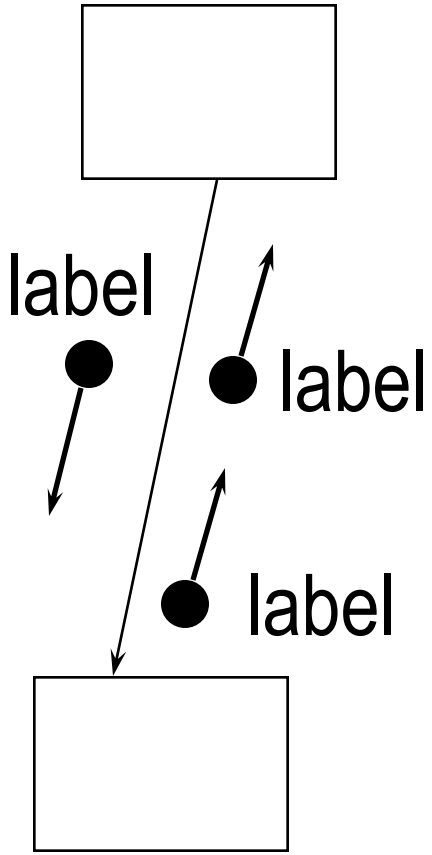
- call of subordinate modules runs in a loop
- no label or condition
- loop (and its condition) is defined in the module specification
- module specification is the decisive element

Structure Charts - Data Flow



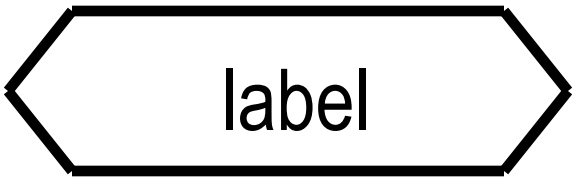
- flow of information
- data transfer
- bound to invocation
- has a direction
- no splits or joins
- label: noun
- specified in data-dictionary

Structure Charts - Control Flow



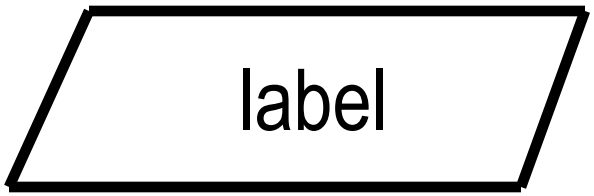
- flow of control (<> invocation)
  ==> control execution path
  of targeted module
- bound to invocation
- has a direction
- no splits or joins
- label: flag, decision, condition
- specified in data-dictionary

Structure Charts - Data Store



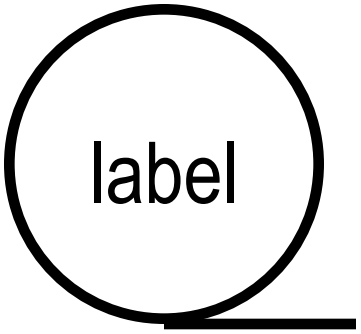
- storage for permanent data
- database / file
- passive; no activity beyond basic retrieval capacity
- serviced by a module
- label: noun
- specified in data-dictionary and/or with an ER-diagram

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