



# PROTOTYPING MODEL

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# SYSTEM PROTOTYPING

- Prototyping is the rapid development of a system
- In the past, the developed system was normally thought of as inferior in some way to the required system so further development was required
- Now, the boundary between prototyping and normal system development is blurred and many systems are developed using an evolutionary approach



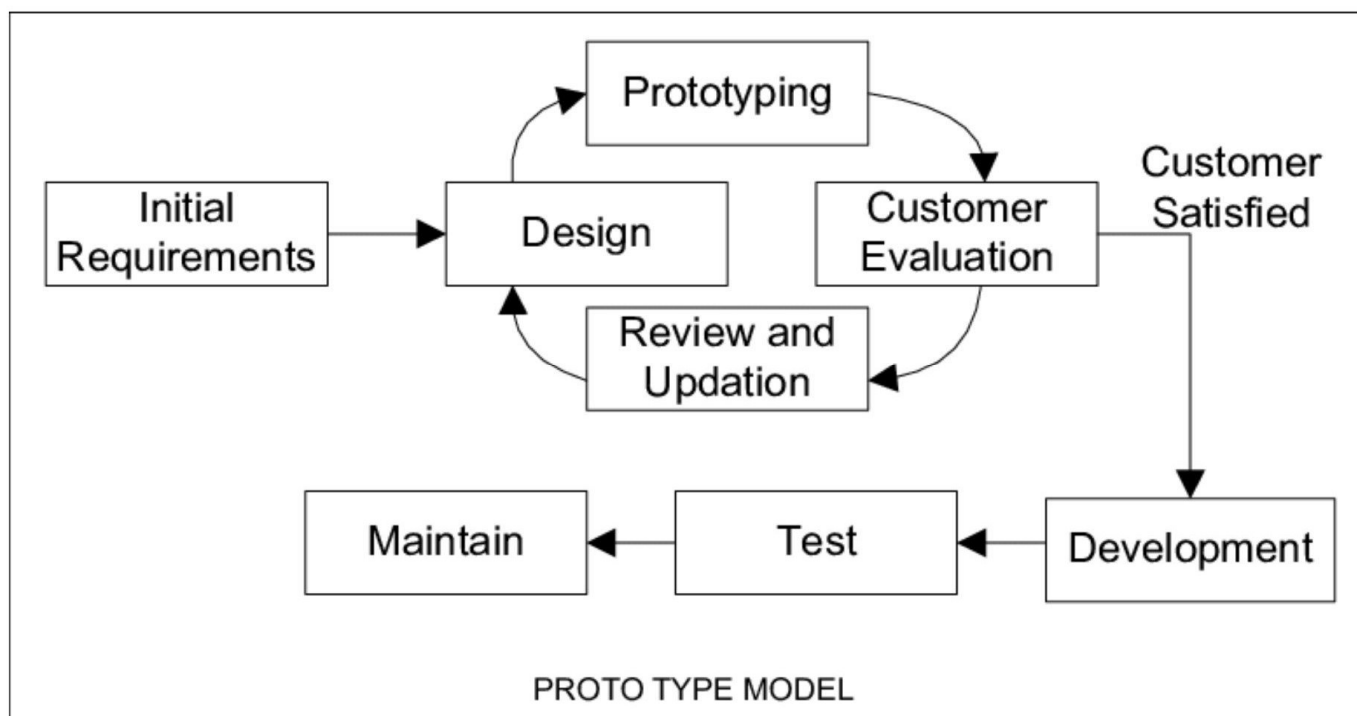
# USES OF SYSTEM PROTOTYPES

- The principal use is to help customers and developers understand the requirements for the system
  - Requirements elicitation. Users can experiment with a prototype to see how the system supports their work
  - Requirements validation. The prototype can reveal errors and omissions in the requirements
- Prototyping can be considered as a risk reduction activity which reduces requirements risks



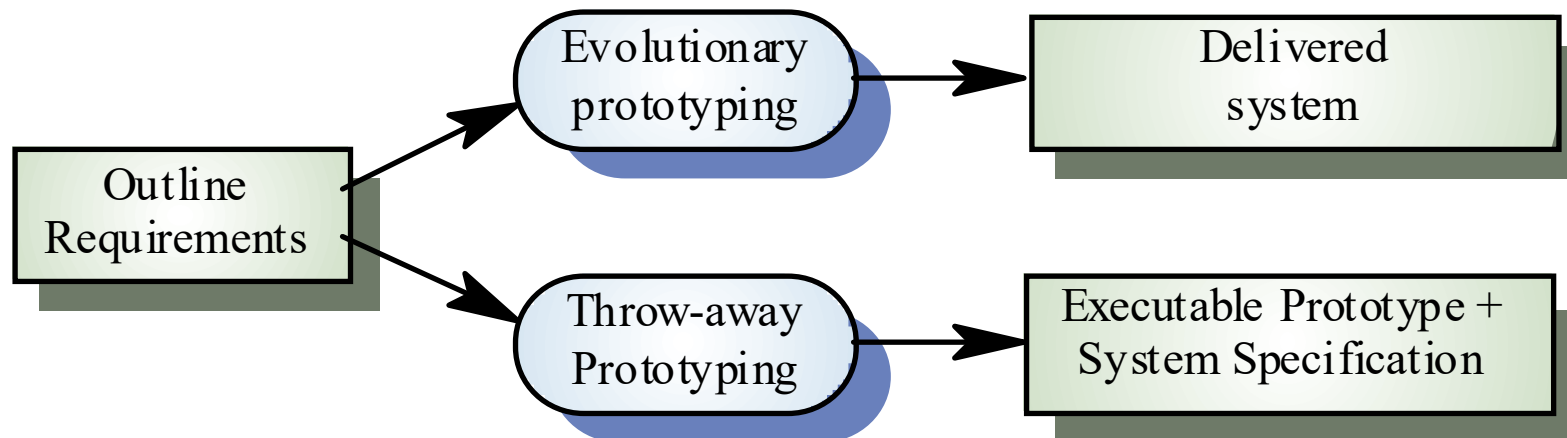
# PROTOTYPING BENEFITS

- Misunderstandings between software users and developers are exposed
- Missing services may be detected and confusing services may be identified
- A working system is available early in the process
- The prototype may serve as a basis for deriving a system specification
- The system can support user training and system testing





# APPROACHES TO PROTOTYPING





# PROTOTYPING IN THE SOFTWARE PROCESS

- Evolutionary prototyping
  - An approach to system development where an **initial prototype is produced and refined through a number of stages** to the final system
- Throw-away prototyping
  - A prototype which is usually a **practical implementation of the system is produced to help discover requirements** problems and then discarded. The system is then developed using some other development process



# PROTOTYPING OBJECTIVES

- The objective of *evolutionary prototyping* is to deliver a working system to end-users. The development starts with those requirements which are best understood.
- The objective of *throw-away prototyping* is to validate or derive the system requirements. The prototyping process starts with those requirements which are poorly understood



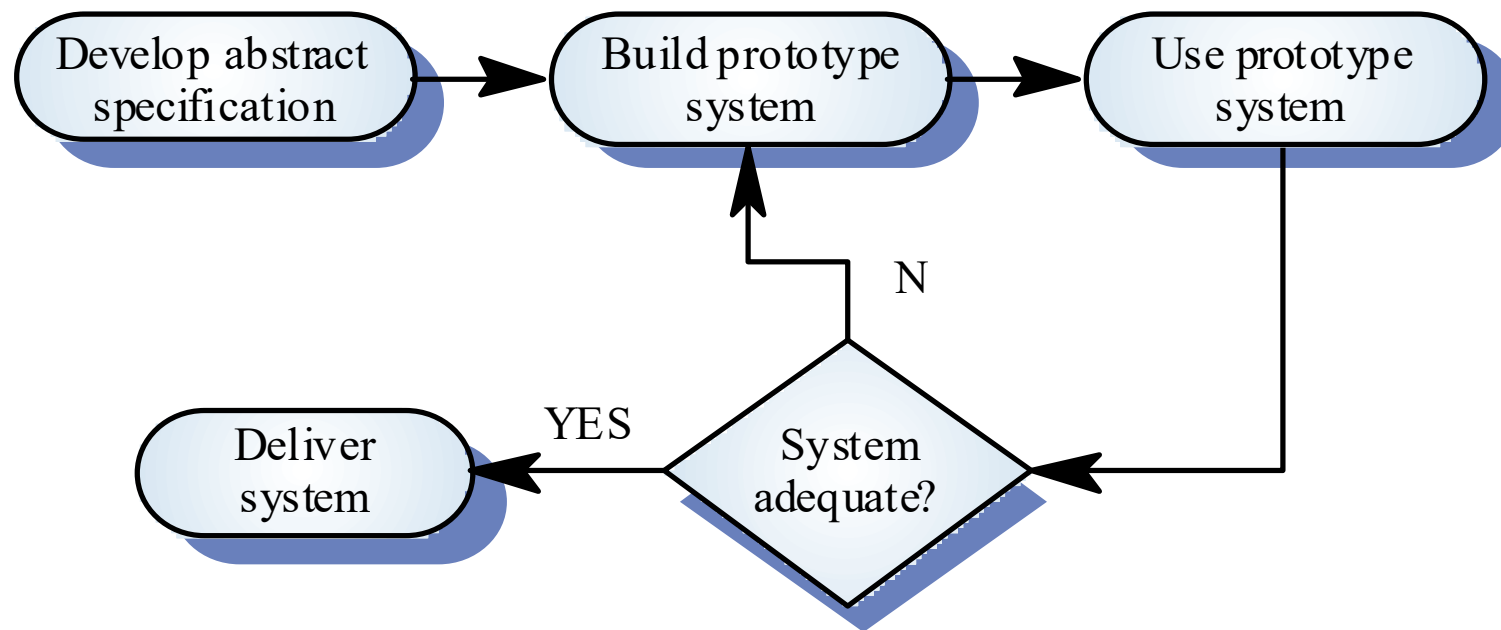


# EVOLUTIONARY PROTOTYPING

- Must be used for systems where the specification cannot be developed in advance e.g. AI systems and user interface systems
- Based on techniques which allow rapid system iterations
- Verification is impossible as there is no specification. Validation means demonstrating the adequacy of the system



# EVOLUTIONARY PROTOTYPING



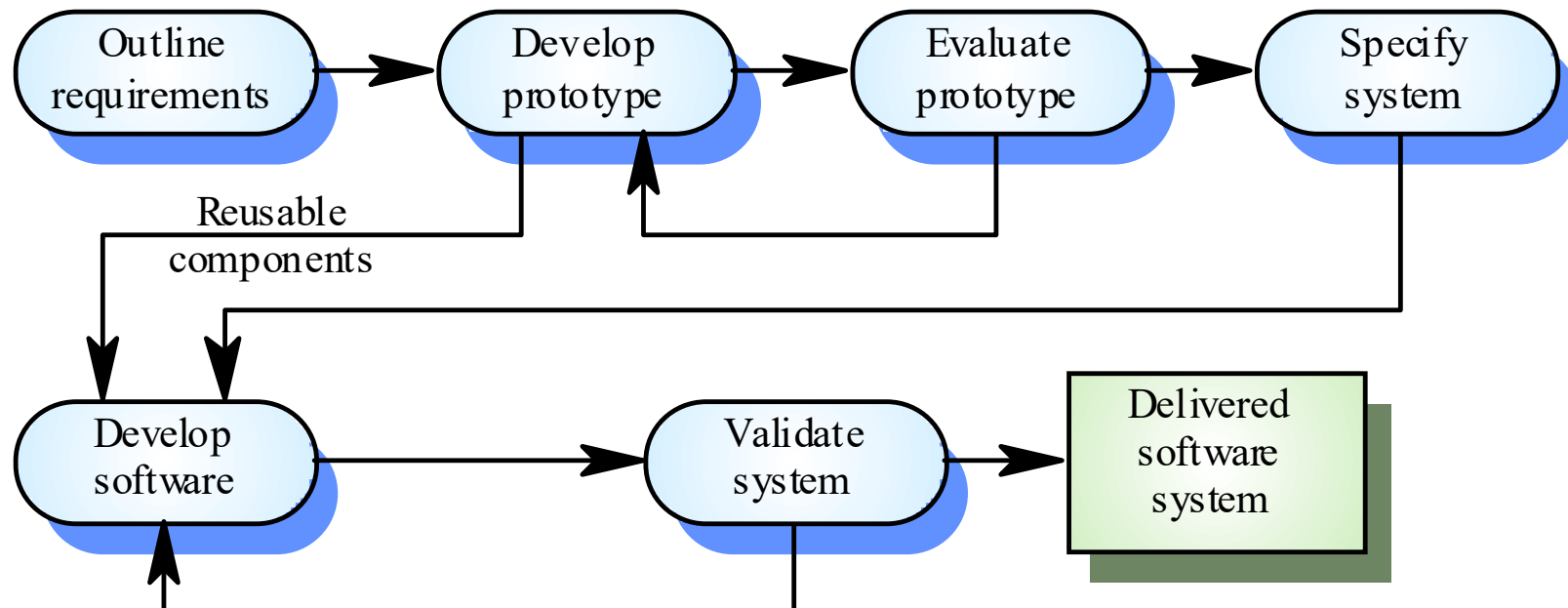


# THROW-AWAY PROTOTYPING

- Used to reduce requirements risk
- The prototype is developed from an initial specification, delivered for experiment then discarded
- The throw-away prototype should NOT be considered as a final system
  - Some system characteristics may have been left out
  - There is no specification for long-term maintenance
  - The system will be poorly structured and difficult to maintain



# THROW-AWAY PROTOTYPING





# ASSESSMENT

## MATCH THE FOLLOWING

Match

- |                             |                            |
|-----------------------------|----------------------------|
| a. Evolutionary Prototyping | Discover Requirements      |
| b. Throw away Prototyping   | Verification Not possible  |
| c. Evolutionary Prototyping | Rapid delivery             |
| d. Prototyping              | Final after several stages |



## Reference

*Software Engineering 6<sup>th</sup> Edition Ian Sommerville*

Thank You

