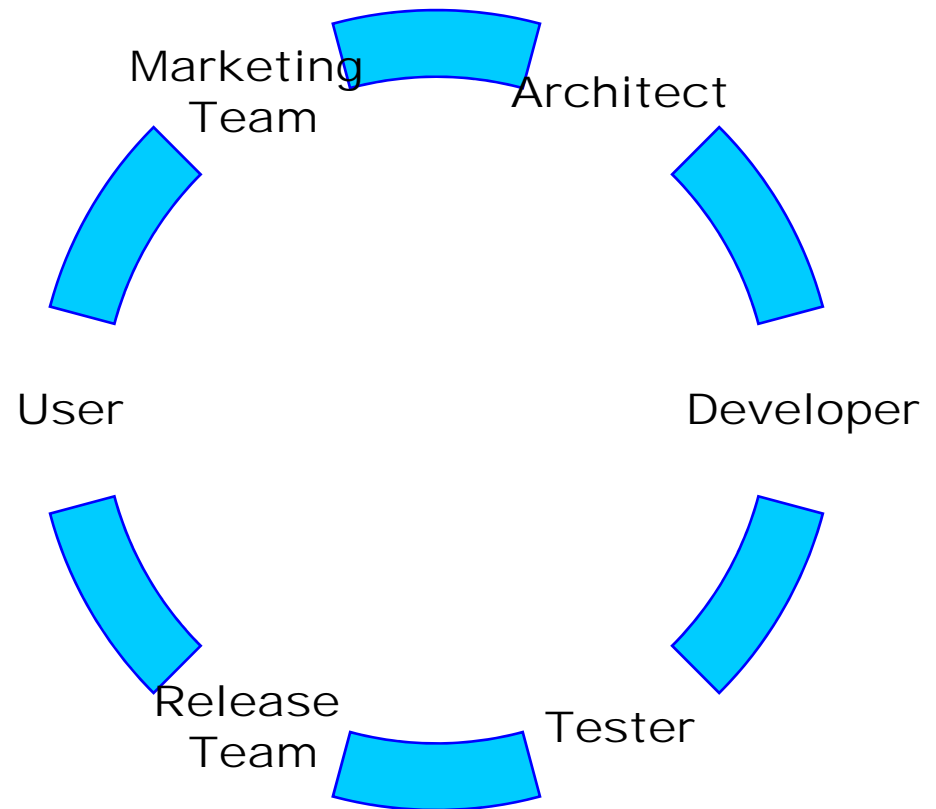


# Specification Productivity

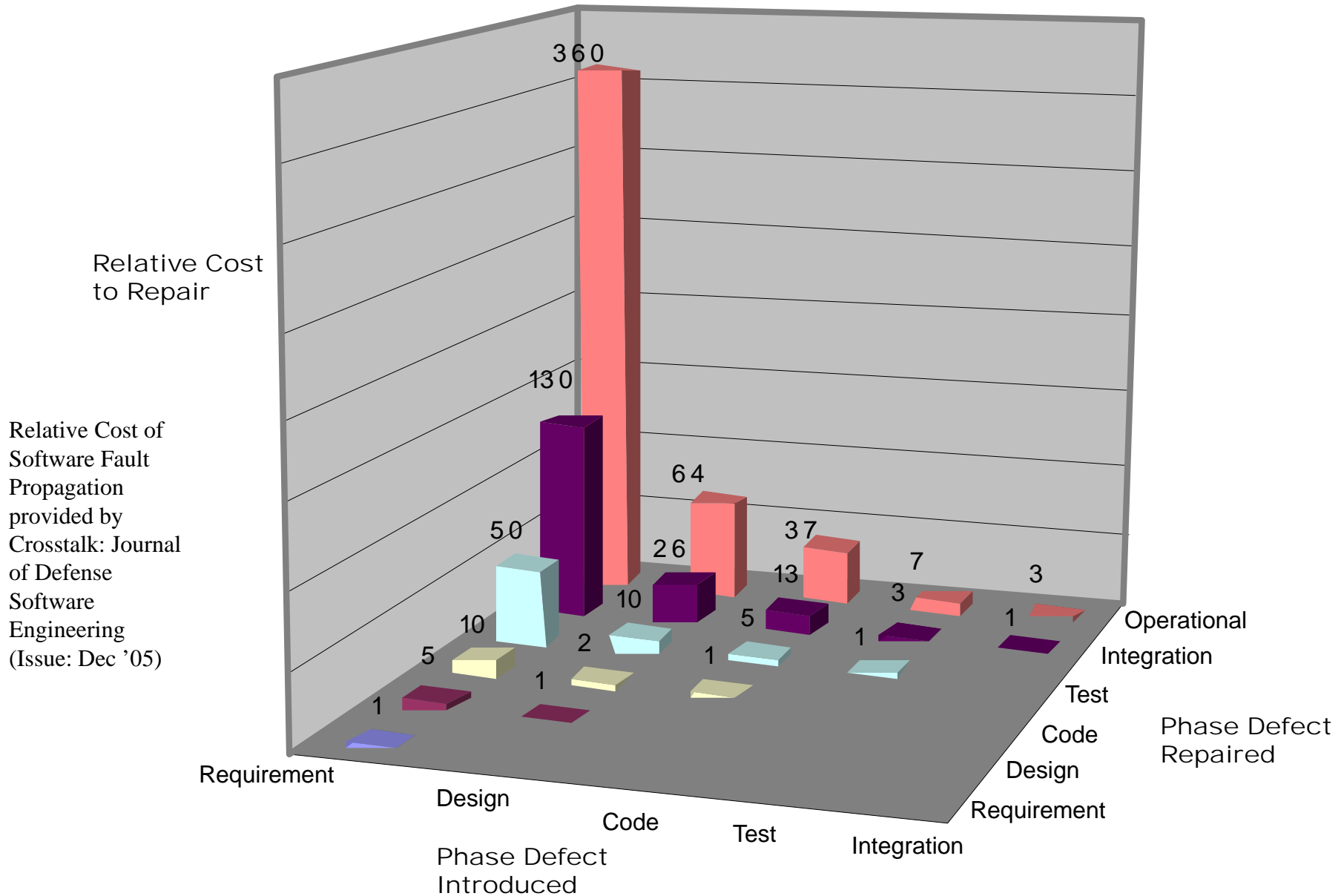
Ankit Jain, James Ansley,  
and Ravi Shankar

# AIM

- Develop a methodology to create
  - Executable Specifications
  - Prevent “Lost in Translation” situations
- There should be clear communication between all involved parties

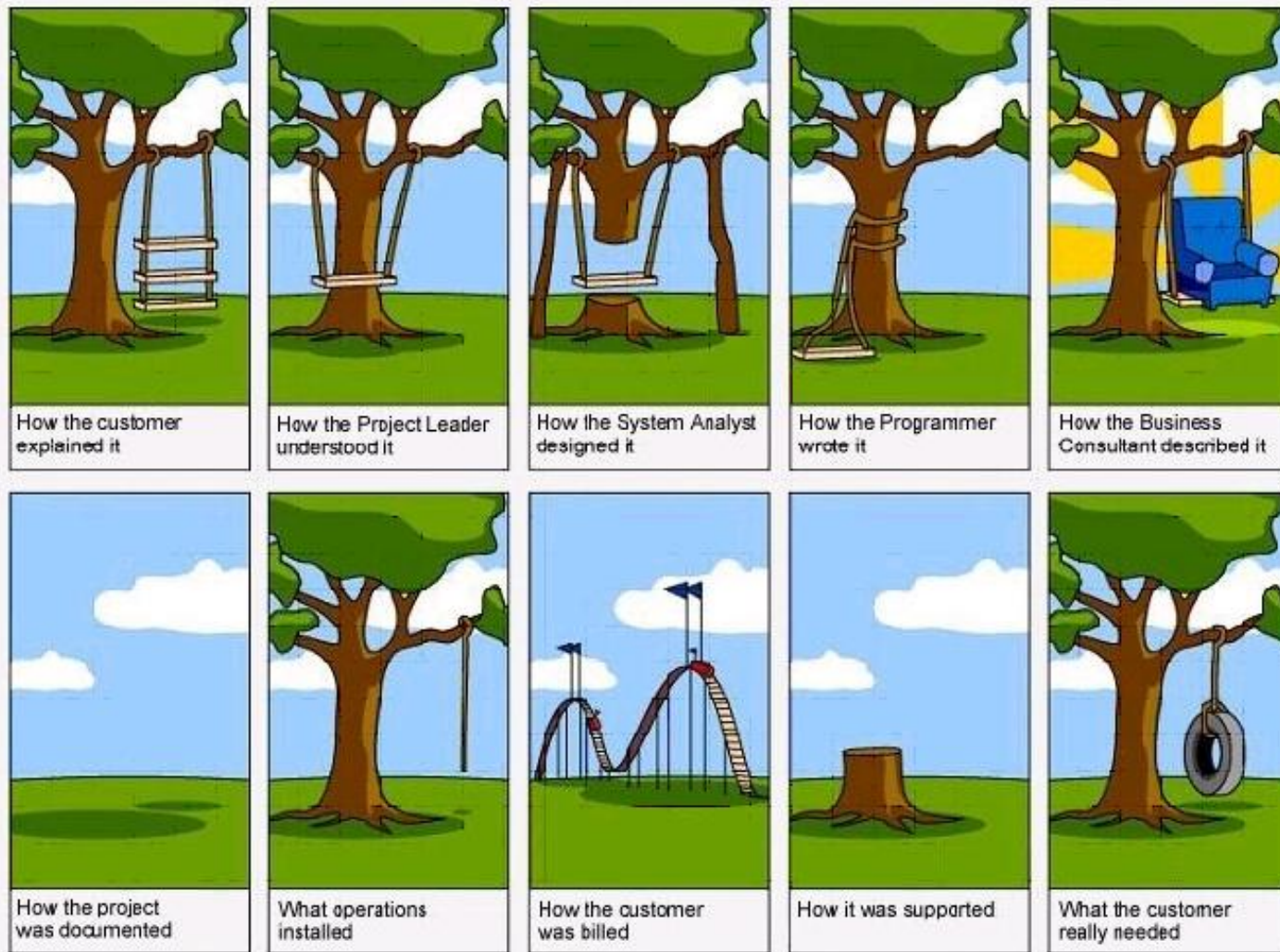


# Importance of Fixing defects in Requirements Phase



# Need

- Globalization of Product Development
- Grammar barrier:
  - A developer in China might understand product requirements written in English differently than the person who wrote them in US.
  - A C program written by a US developer is interpreted correctly by the developer in China.
  - Develop a standard for Requirements Communication between different departments.
- Ensure product in development always conforms 100% to user requirements.
- Reduce product development cost by eliminating errors in requirement phase



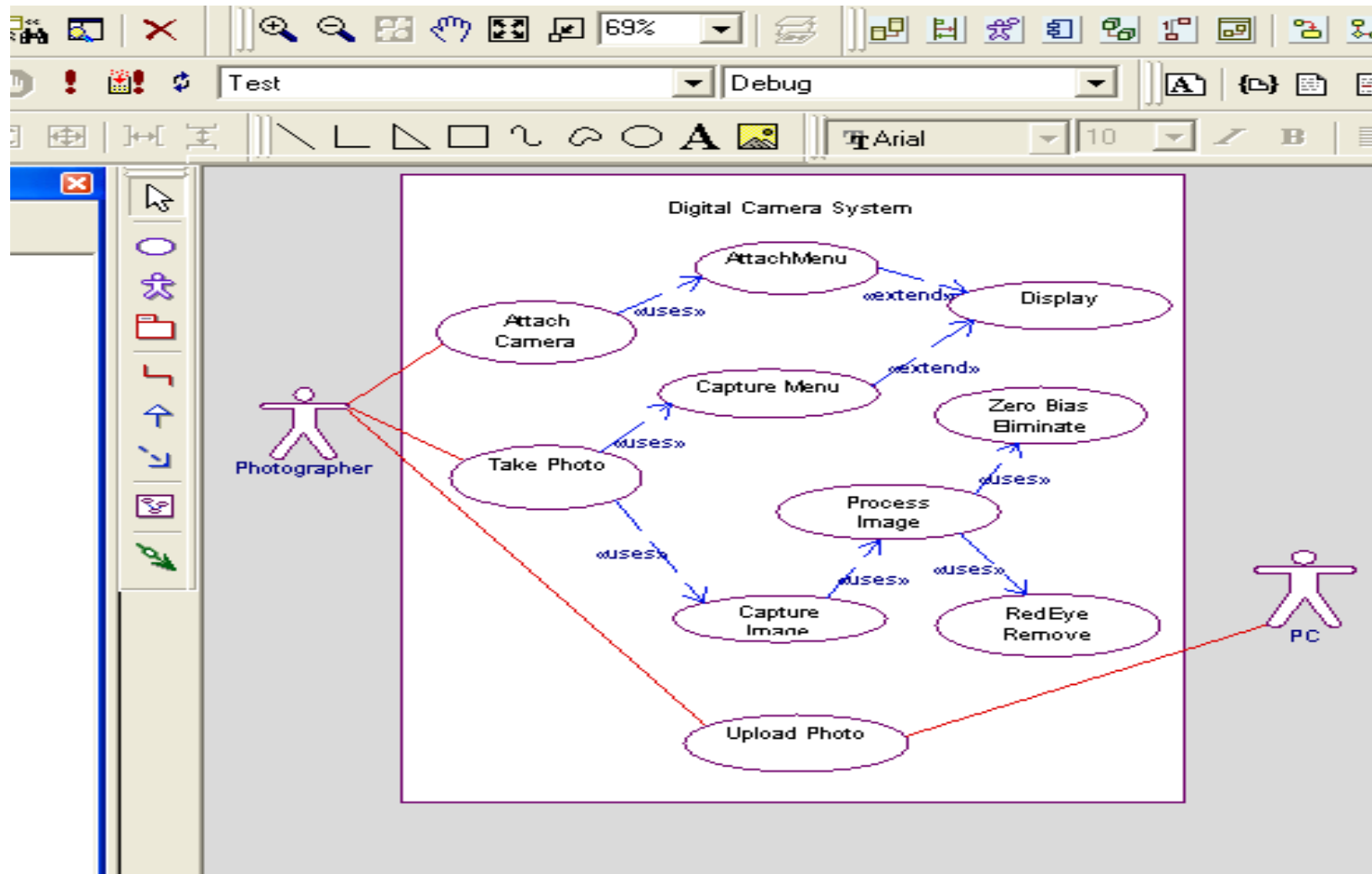
According to the Standish Group, CHAOS Report, 2000 74% of software projects failed! (Failure includes failure to complete on time and/or failure to meet client requirements fully).

# Marketing Team Involvement

- Gather High Level User Requirements. Ask user detail-oriented questions to help generate detail requirements.
- Develop detailed and use-case based Marketing Requirement Document (MRD).
- Provide the Architect with the Text-Based MRD.

# Architect Involvement

- Design UML based Use-Case on basis of the MRD

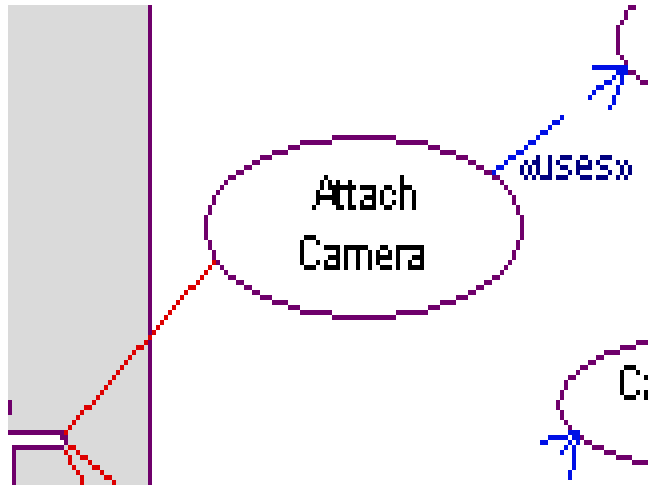


# UML → XMI Translation

- UML based Use-Case is translated into XML based XMI Document.
  - Allows departments to work with a UML tool that is designed to work better for their modeling needs
  - Allows them to be able to pass that model between other tools to test the system behavior before the final design and implementation
  - Allows animated behavior models to be passed into test systems

# XMI Interpretation

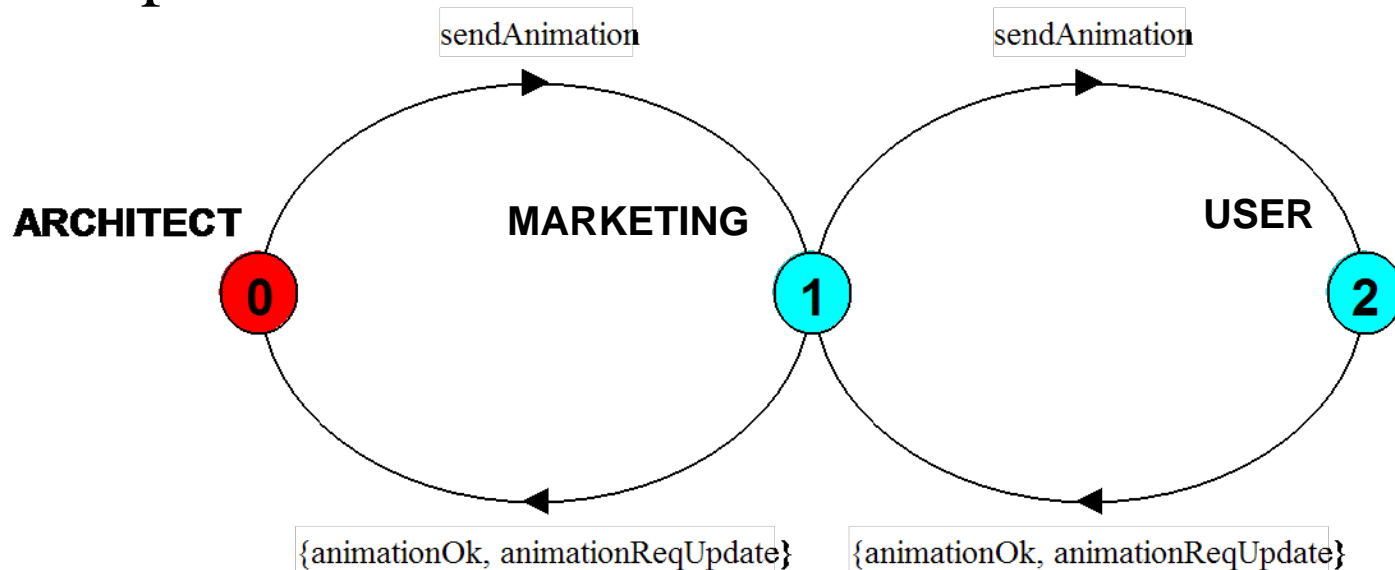
- XMI Document is parsed to create Animation using a Java based Parser.



```
<UML:UseCase
xmi.id="_69"
name="Attach
Camera"
visibility="public"
presentation="_70"
namespace="_8"
associationEnd="_71
_72"/>
```

# XMI → Java Animation

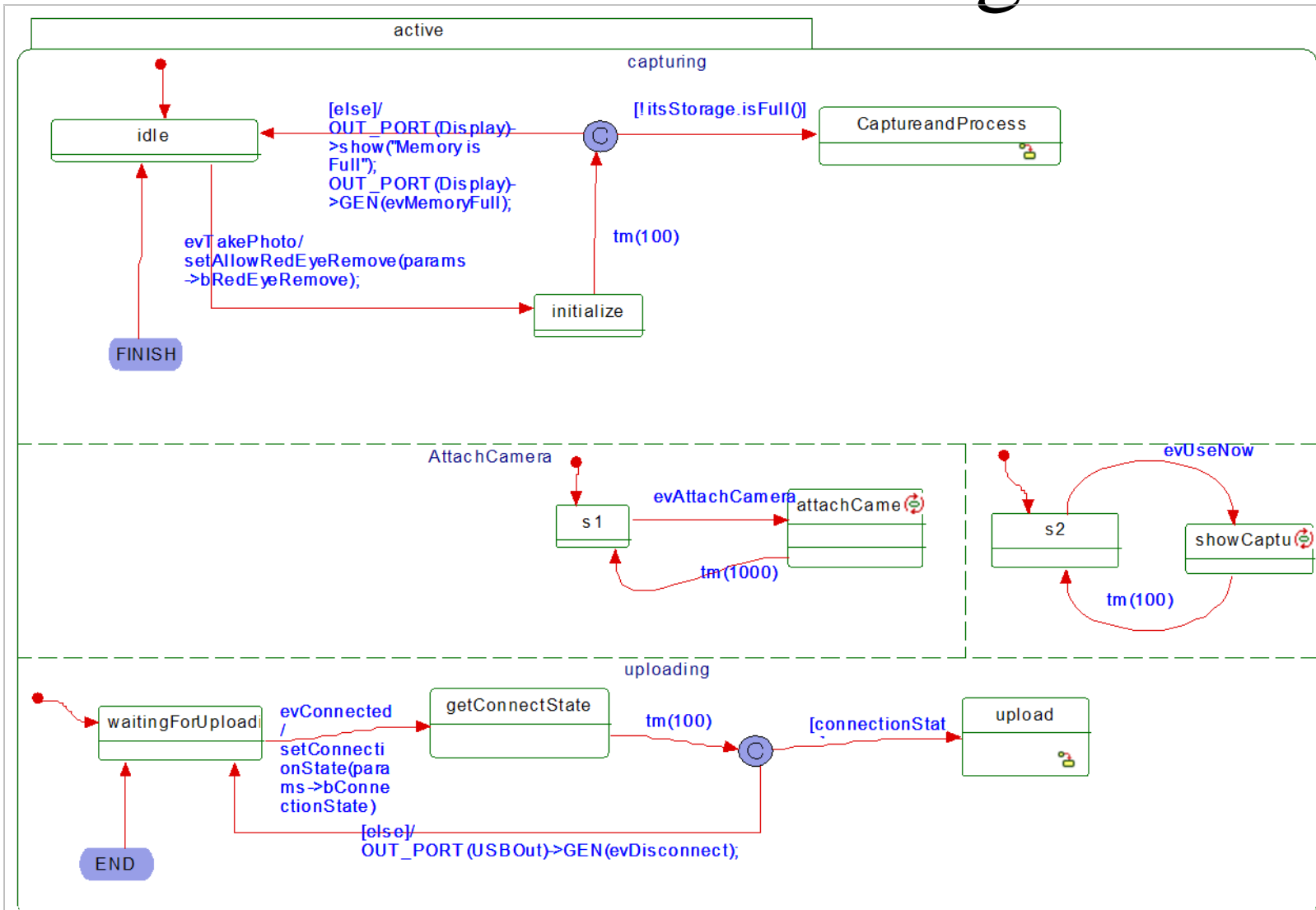
- Interactive Animation represents Product expected behavior.
  - QoS details are not included, as this is intended for initial verification
- The Animation is shared using following protocol:



# Develop UML Blocks

- UML is a modeling language used to create different models of a system. i.e.
  - Model Management diagrams. (packages)
  - Structural diagrams. (class diagram/object model)
  - Behavioral diagrams. (state chart/sequence diagram)
- Easy to understand models for all involved fields.
  - Designed to be understood by professionals in many differing fields.
  - Maintain structure and cohesion (less ambiguity, less interpretation errors).

# UML Behavioral Diagram



State Chart for Digital Camera

(For more detail on Digital Camera example please refer to Software Decomposition Poster by Ankit Jain and Ravi Shankar)

# QoS-Driven Animation

- Performance cost estimates\* for the components modeled using UML are attached to the Animation.
- The Architect can provide multiple animations (based on different software and hardware architecture) to share multiple product views.
- User evaluates multiple product and chooses the one most suited to his budget and needs.

\**Performance cost estimates* are obtained as per methods described in ‘Component Design Poster’ by Ankit Jain and Ravi Shankar.

# Generating Specification Documents

- After selection of appropriate product requirements, Architect generates automated Designer Specification Document.
- Software Requirement Specification is derived on the basis of UML based Use Cases and Behavioral Diagrams

# Conclusion

- A methodology to help translate user requirements accurately to development level specification documents is developed here.
  - Supports Model Driven Development
  - Decreases production time
  - Decreases interpretation errors
  - Increases first design success
  - Reduce cost by eliminating errors in requirement phase