SENG321: Requirements Engineering

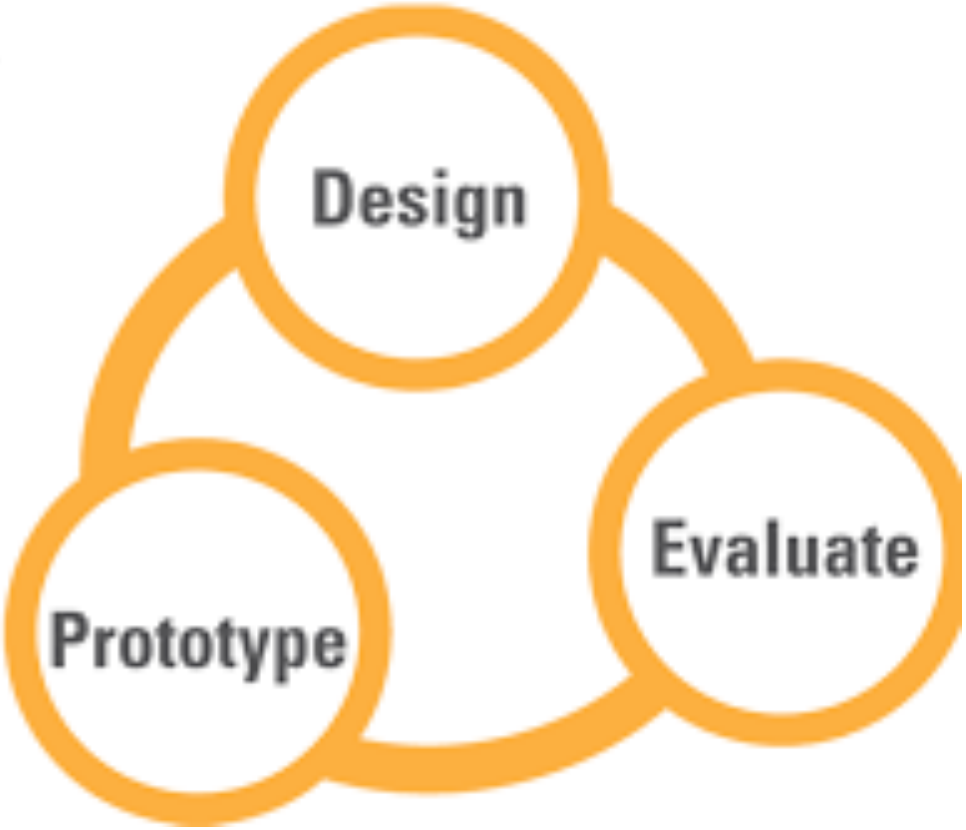
REQUIREMENTS — UI MODELING

Dr. Daniela Damian

thesegalgroup.org

danielad@uvic.ca

Iterative Design

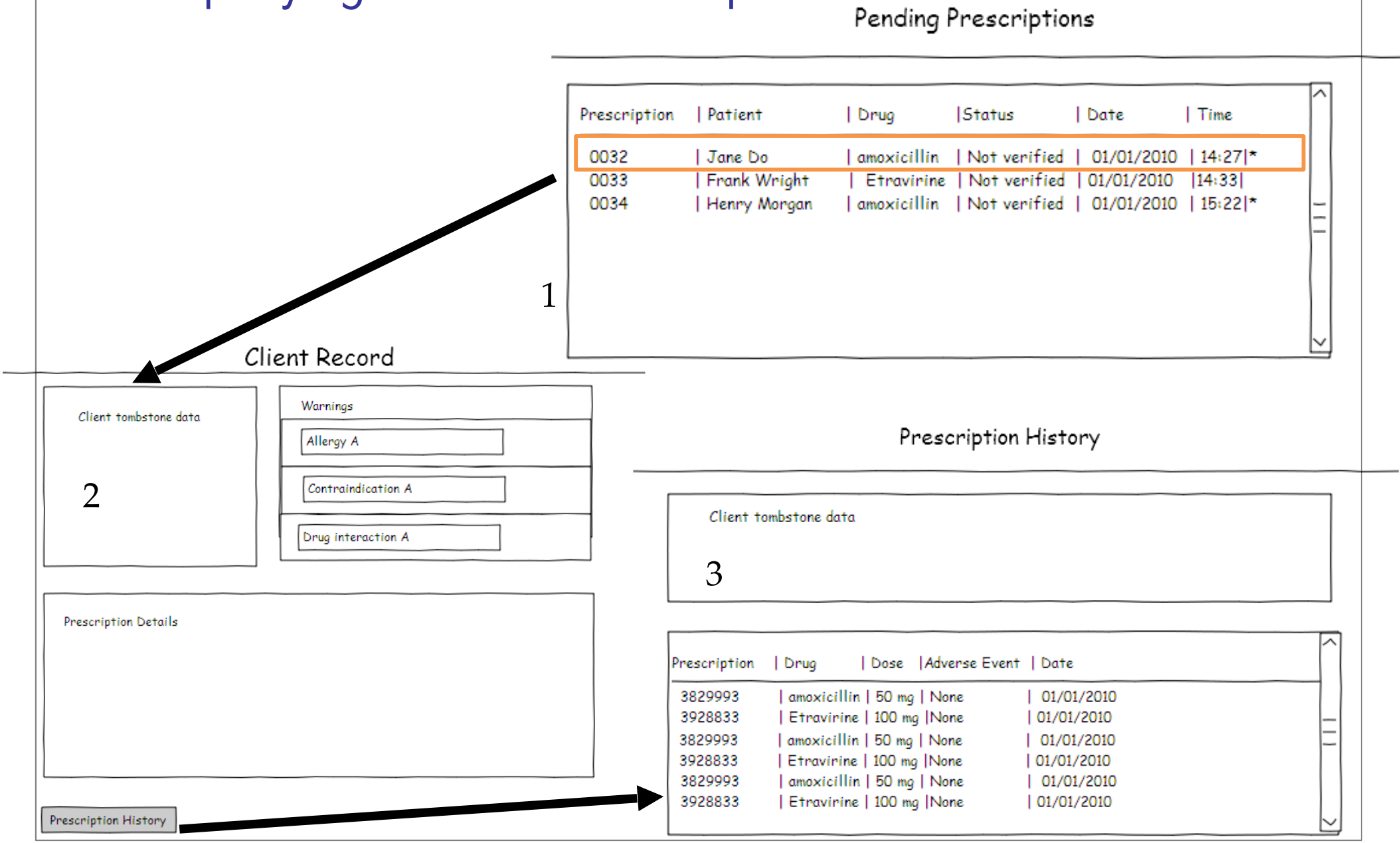


Scenario example

From example use case 'Approve Prescription from a list of Pending Prescriptions':

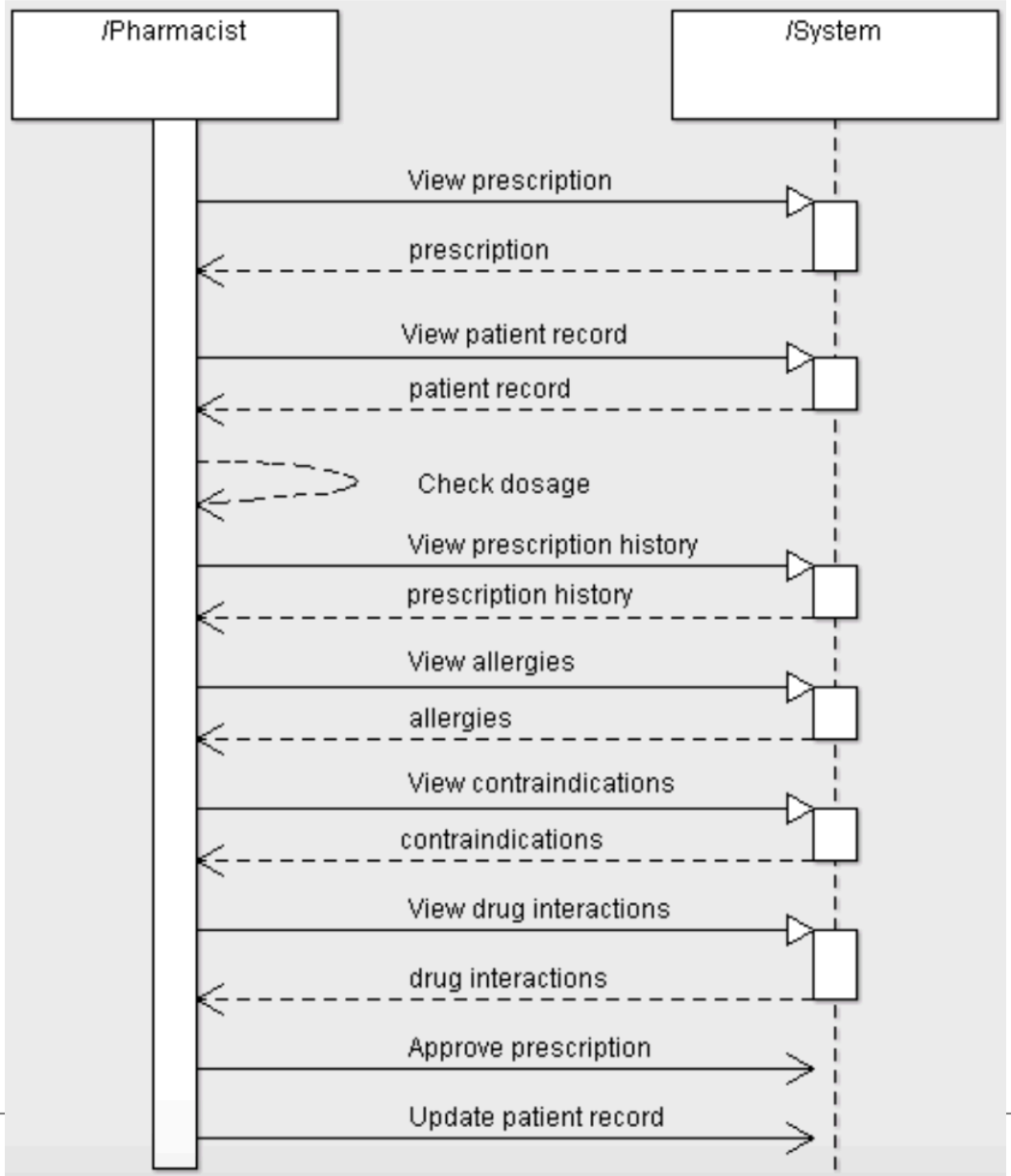
1. Retrieve patient pharmacy records
2. Check prescription & review document for errors:
    1. Check dosage
    2. Check patient's prescription history
    3. Check patient record for possible allergies, contraindications, drug interactions
3. Send approved prescription back to pharmacy technician
4. Update patient file

Accompanying UI screen mockups

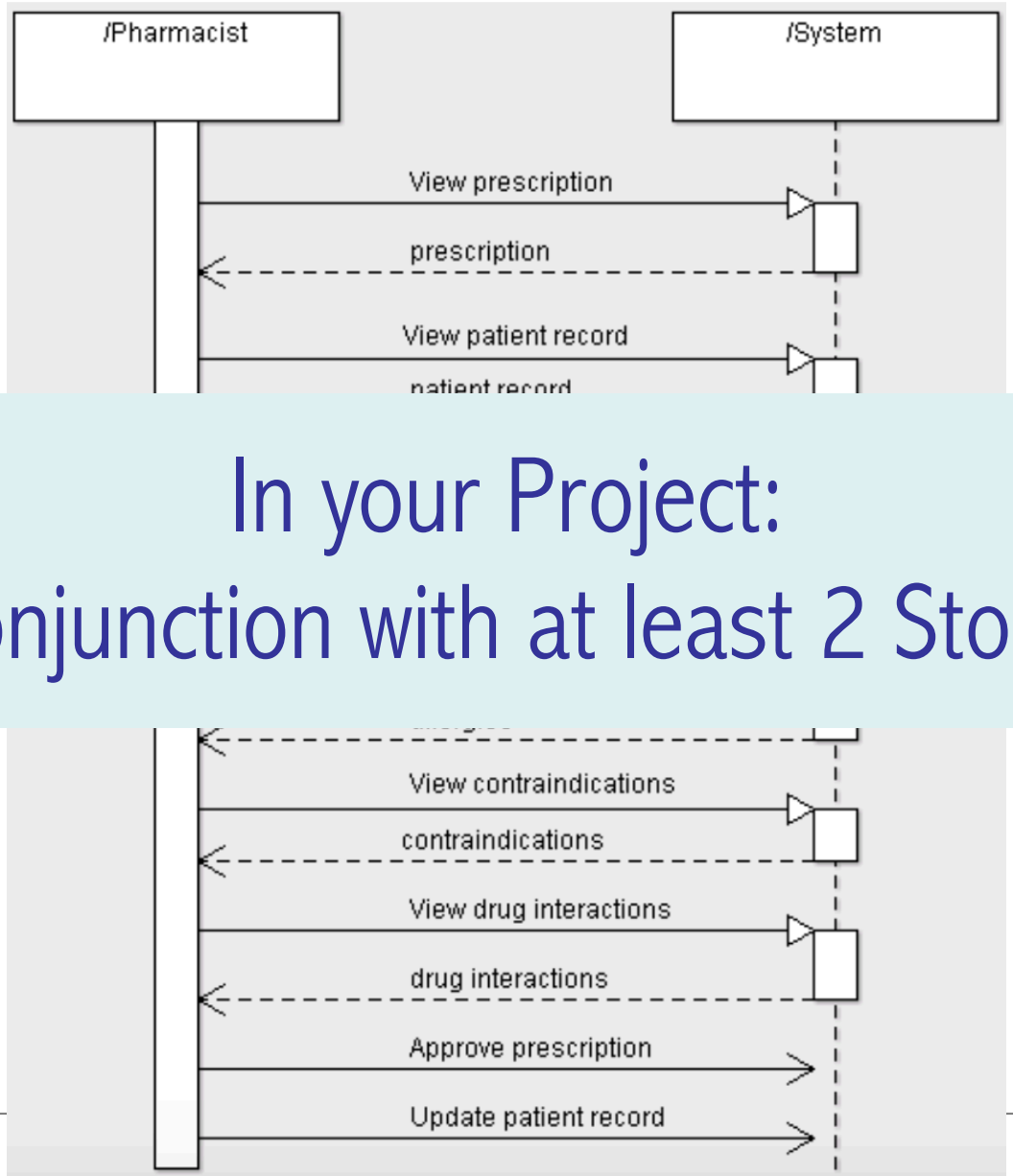


On to User Interface Modeling

System level Sequence Diagram



System level Sequence Diagram



In your Project:
Use in conjunction with at least 2 Storyboards

Like moving mountains!

All our models are created **in parallel** and i**teratively**:

we often build more than one an the same time

We come back to one model when we learn something relevant from another model

E.g., We write a **use case**, note that there is a potential **user interface screen** involved, and mock it up on paper

Or, while mocking up a screen, we discover some more info about the domain and revise our **ERD**s or **DFD**s, etc.

Why create a UI model?

To explore requirements with stakeholders in a visual (less abstract)

To help you and stakeholders envision the future system

As a basis for the actual system user interface (this is design!)

How do you create a UI Model?

1. Should directly support **one** or **more use cases**
2. Draw a **system level sequence diagram**
3. Pick **steps** from a use case that could be carried out **using screens** in the future system, e.g.:
   - Something is being written down
   - A report is being read
   - Information is being consulted

How do you create a UI Model?

Should visualize things from the domain model

Consult the domain model for what types of things will be displayed

What can you draw?

Boxes for text display and entry

Drop downs, choice lists

Buttons

Pictures

Graphs

Screen divisions/areas

Different Media

Paper sketch

Post-it notes on paper (allows rearranging)

White board sketch (then take photo)

Drawing program (e.g., MS Paint, Visio, etc.)

Types of Prototypes

Throw away prototypes:

- Developed early in the lifecycle
- Rapid prototyping methodology

Evolutionary (incremental) prototypes

- Developed during the entire lifecycle
- Prototype altered to incorporate design changes
- Eventually becomes the final product

Prototypes

Low-fidelity prototypes

- paper based, illustrate the user interface, look and feel, functionality
- Quick and cheap to prepare and modify

Particularly useful during requirements validation

- **To elicit user reactions/modifications/misunderstandings**

Medium or high-fidelity prototypes

- developed with a visual language
- provide more sophisticated scenarios of use

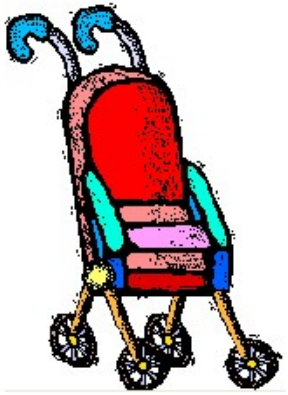
Sketches

Drawing of the outward appearance of the intended system
Crudity means people concentrate on high level concepts
– but hard to envision a dialog's progression!

What to do

Touch a different color, or scan another item.

What you selected



JPG Stroller
For children between 1-3 years old **...$98.**

- [X] Green
- [ ] Blue
- [ ] Red (out of stock)

Item	Style	Cost	
JPG Stroller	Green	98.00	Delete

tax: 6.98

Total: $104.98

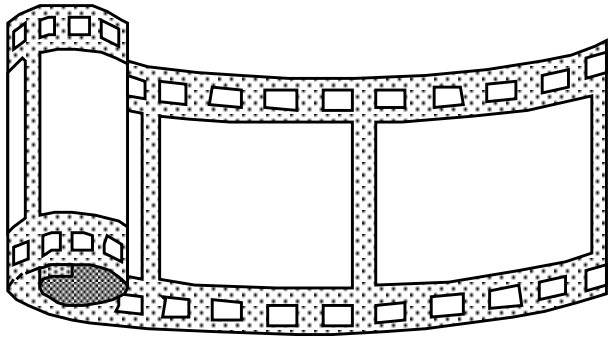
All done?

Place your order | Print this list | Throw this list away

Storyboarding

A series of key frames (sketches)

Users can evaluate quickly the direction the interface is heading



Initial screen

What to do
Find the item you want in the catalog and scan the bar code next to it.

What you selected

Item	Style	Cost

tax:
Total: $ 0.00

All done?
Place your order | Print this list | Throw this list away

Scan the stroller ->

What to do
Touch a different color, or scan another item.

What you selected

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Item	Style	Cost	
JPG Stroller	Green	98.00	Delete

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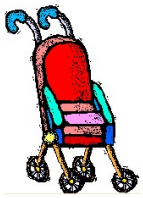
All done?
Place your order | Print this list | Throw this list away

Change the color ->

What to do
Touch a different color, or scan another item.

What you selected



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All done?
Place your order | Print this list | Throw this list away

Place the order ->

What to do
To get your items, bring your printout to the front counter.

What you selected

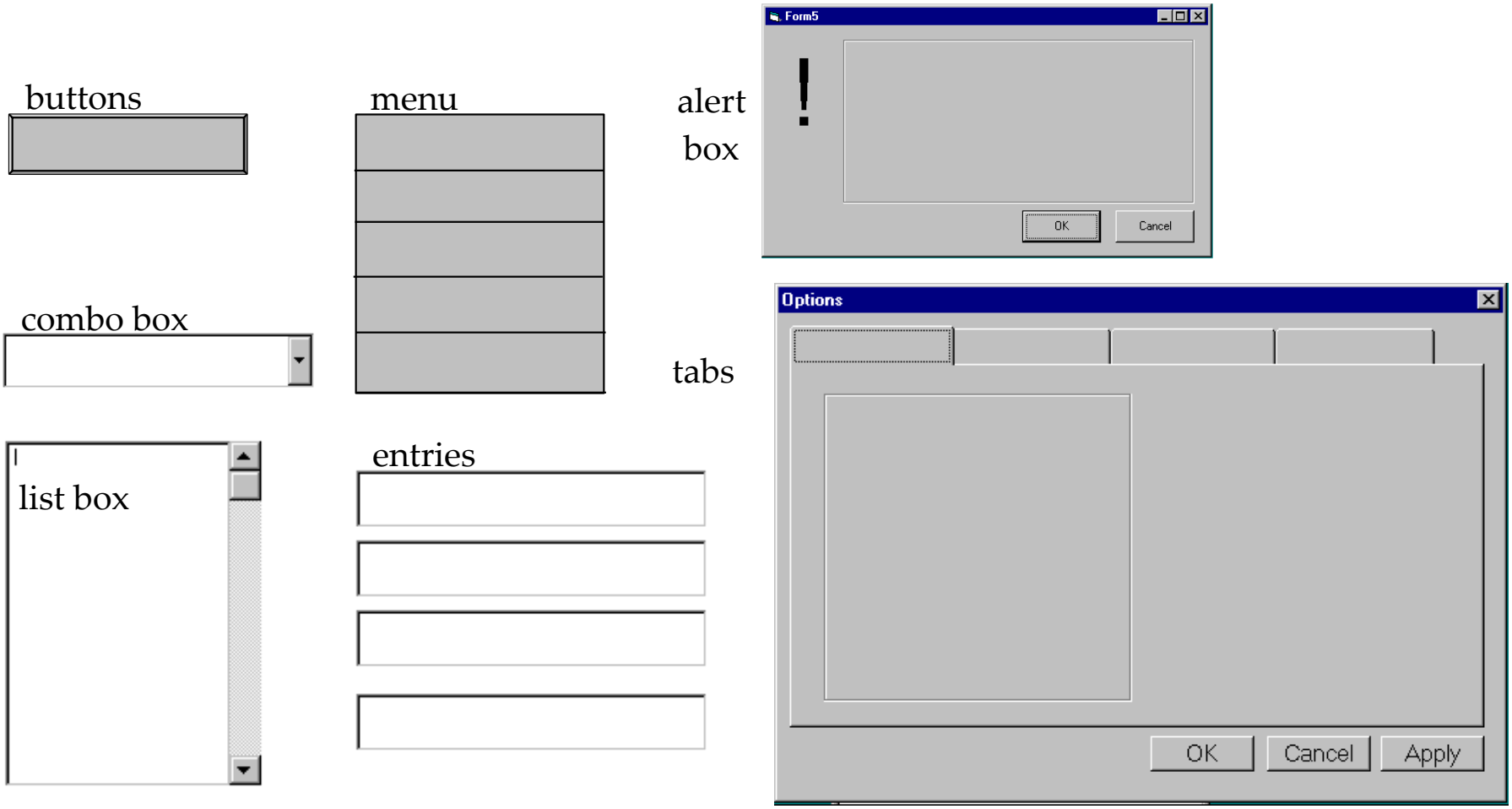
Item	Style	Cost
JPG Stroller	Blue	98.00

tax: 6.98
Total: $104.98

All done?
Place your order | Print this list | Throw this list away

Pictive

Can pre-make paper interface components



Some guidelines: Keep things at a high level

Try to understand an overall screen flow

- Movement between screens that supports the use cases

Group similar things together

Don't try to do too much on one screen/page

No need to mock up all screens at once

Evaluation

Once you have mocked up some screens, ask a **stakeholder** to walk though them and ask:

- What's good?
- What's bad?
- What's missing?

Refer to the **use case steps** as you walk through

Update your UI screens with new sections, move things around etc.

Then **re-evaluate** (repeat until done)

Video

http://www.youtube.com/watch?v=GrV2SZuRPv0&feature=fvw

Prototypes: advantages

Quick and cheap to produce

Elicits detailed user interface requirements better than interviewing; clarification of otherwise vague requirements, reduced ambiguity

Developer gains experience and insight by building the model

Communication between developer and user is improved; builds confidence in the customer that the developer can produce a system

Improves decisions by providing alternatives

Prototypes: disadvantages

Can focus design on aesthetics rather than functionality

False impression that system will be easy to build

Customer may view shortcomings of prototype as flaws in design

Sometimes a working prototype is put into production!

In your Projects

For each **use case** develop:

- system level **sequence diagram** and other diagrams (e.g. Dialog Map, see Data Flow Diagram slides)
- **storyboard** showing user interaction with the system
- **description** of the storyboard in a paragraph style

In your Project:

Include Storyboards in the Requirements Document

Storyboards for Features/Functional requirements (not just the two use cases)

Readability of the final document is very important