Φροντιστήριο 8

Θέμα : Building Better UIs With User Experience Storyboards

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Motivation

- Use cases describe the way a system will be used, but they don't specify the system user interface (UI).

- User experience (UX) storyboards, based on the use cases, add the process and techniques to design and build a user interface that will meet requirements.

- UX storyboards describe actors (user characteristics), screens, input forms, navigation between screens, and usability requirements.

Structure for a Use Case

1 Brief Description

2 Actors

3 Flows of Events

   3.1 Main (basic) Flow

      3.1.1 Step 1

      3.1.2 Step 2

      3.1.3 Step ...

   3.2 Alternative Flows

      3.2.1 Alternative Flow 1

         3.2.1.1 Step 1

         3.2.1.2 Step 2

         3.2.1.3 Step ...

      3.2.2 Alternative Flow ...

4 Special Requirements

   4.1 Usability guidance

   4.2 Usability Requirements

   4.3 Actor Characteristics

5 Pre-conditions

6 Post-conditions

3. Flow of Events

3.1 Basic Flow

3.1.1 BID
This use case starts when the Buyer bids on a displayed item currently available for auction.

3.1.2 ENTER AMOUNT
The Buyer enters the bid amount. The system validates the bid amount. The entered bid must be greater than the current (i.e., greatest) bid by an amount greater than the minimum bid increment specified for the auction.

3.1.3 BUYER CONFIRMS BID
The system provides information that tells the legal obligations of placing a bid. The Buyer confirms that the bid should be placed.

3.1.4 POST BID
The system posts the bid for the auction. The entered bid becomes the current (i.e., greatest) bid.

3.1.5 SEND EMAIL
The system sends an email confirmation to the Buyer, including the bid amount for the auction item, as well as when the auction will close.

3.1.6 SYSTEM CONFIRM BID
The system notifies the Buyer that the bid has been accepted and displays the Buyer's name and email address, as well as the item name and the bid amount. The use case ends.

3.2 Alternative Flows

3.2.1 AUCTION IS CLOSED

At BF BID, the auction for the item has been closed, a message is displayed to the Buyer stating that the auction has been closed, and the bid is not accepted. The use case ends.

3.2.2 BUYER HAS PENDING PAYMENTS

At BF BID, the Buyer has pending payments, the system displays a message to the Buyer, reminding him/her that he/she has pending payments that are due and that until those payments are made, the Buyer cannot participate in an auction, either as a Buyer or a Seller. The use case ends.

3.2.3 ENTERED BID IS INVALID

At BF ENTER AMOUNT, the User enters an invalid bid, the system indicates to the User the reason the bid is invalid (e.g., the entered bid was not greater than the greatest bid by an amount greater than the minimum bid increment specified for the auction). Resume at BF ENTER AMOUNT.

3.2.4 BID NOT CONFIRMED

At BF CONFIRM BID, the Buyer does not confirm that the bid should be placed. The use case resumes at BF ENTER AMOUNT.

Creating UX storyboards

There are five steps for creating UX storyboards:

1. Add actor characteristics to the use case.
2. Add usability guidance and usability requirements to the use case.
3. Identify UX elements.
4. Model the use-case flows with the UX elements.
5. Model screen navigation for the use case.

Step 1: Add actor characteristics to the use case

- Knowing a significant amount of detail about the system users is critical to creating a usable system.

- The first step in creating a UX storyboard is to add that detail to the use case. This may include:
  - the users' average level of domain knowledge
  - general level of computer experience
  - physical environment
  - how frequently they will use the system
  - the approximate number of users represented by an actor.

4.3 Actor Characteristics

4.3.1 BUYER

4.3.1.1 FREQUENCY OF USE

4.3.1.1.1 The typical Buyer will bid on an item three times per week.

4.3.1.1.2 Near the end of an auction, bidding activity may be very intense.

4.3.1.2 GENERAL LEVEL OF COMPUTER EXPERIENCE

4.3.1.2.1 The typical Buyer only uses his/her computer on a casual basis.

4.3.1.3 ENVIRONMENT

4.3.1.3.1 The typical Buyer uses the system from his/her home.

4.3.1.4 NUMBER OF USERS

4.3.1.4.1 The targeted number of users is 50,000.

- Usability guidance includes things such as:
  - advice for making the UI easier to use
  - average attribute values
  - average action usage
- Usability requirements might specify:
  - how fast a user must be able to do something
  - how fast the system must respond
  - maximum error rates
  - maximum number of mouse clicks
  - learning times
- You can think of usability requirements as boundaries the system should not cross, and of usability guidance as hints on how users will use the system.

4. Special Requirements

4.1 User Experience Guidance

4.1.1 At AF PENDING PAYMENTS, pending payments normally occur in only 10% of the cases.

4.1.2 At AF INVALID BID ENTERED, Invalid bids are normally entered 15% of the time.

4.1.3 At BF BUYER CONFIRMS BID, the legal statement will be approximately 150 characters in length.

4.1.4 At BF ENTER AMOUNT the system should automatically provide choices at the next three bid increments.

4.2 Usability Requirements

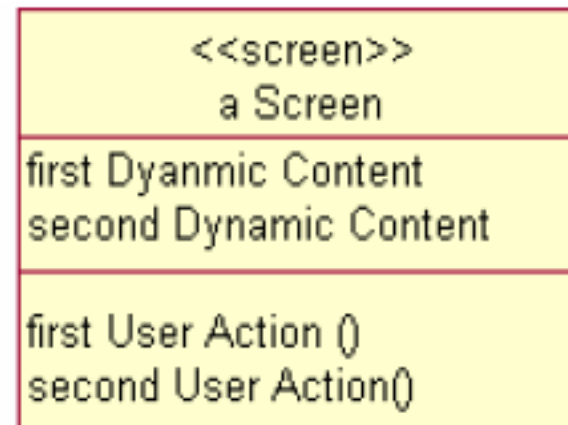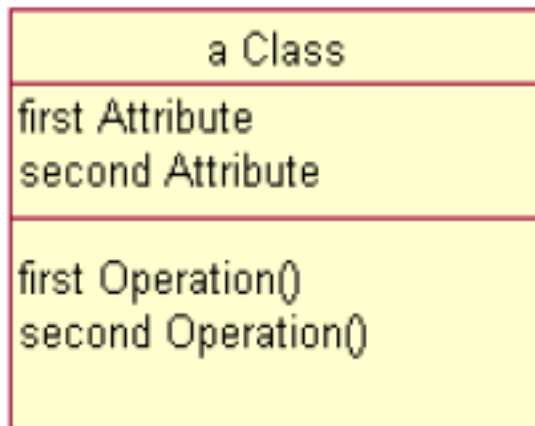*4.2.1 The Buyer must be able to confirm his/her bid with a single mouse click.*

4.2.2 The system must update the current bid within 5 seconds of the Buyer confirming his/her bid.

4.2.3 The system must return confirmation of an accepted bid within 2 seconds.
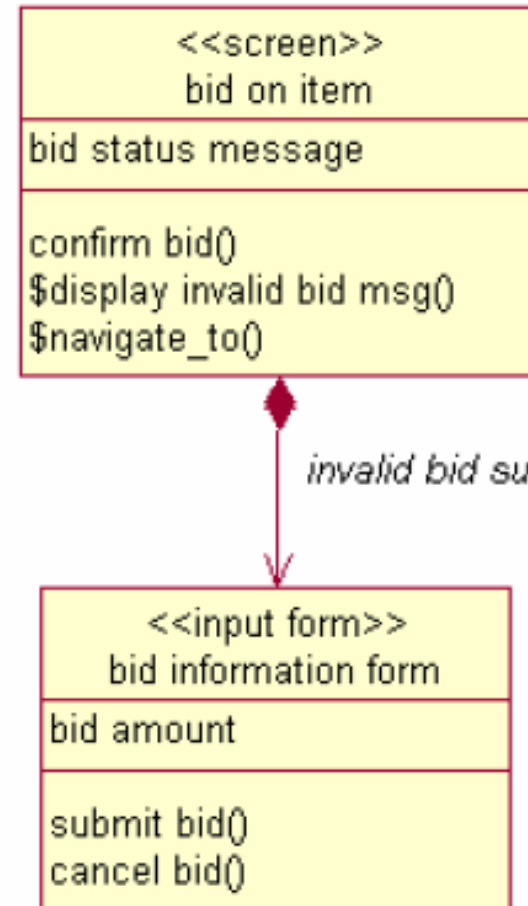
Step 3: Identify UX elements

- UX elements include:
  - Screens
  - Input forms
- Each of these can include dynamic content, user-environmental actions and messages
- We can represent these elements in abstract form, using UML's *stereotype* mechanism.

a Class
first Attribute
second Attribute
first Operation()
second Operation()

<<screen>> a Screen
first Dyanmic Content
second Dynamic Content
first User Action ()
second User Action()

<<screen>>
item detail

category name
item title
description
seller's name
auction start day
auction start time
auction end date
highest bid
minimum bid increment
starting price
number of bids
image available
bid cancelled msg
auction closed msg

bid on item()
display image()
display bid history()
$navigate to()
$display bid cancelled msg()
$display auction closed msg()

<<screen>>
bid on item

bid status message

confirm bid()
$display invalid bid msg()
$navigate_to()

invalid bid submitted

<<input form>>
bid information form
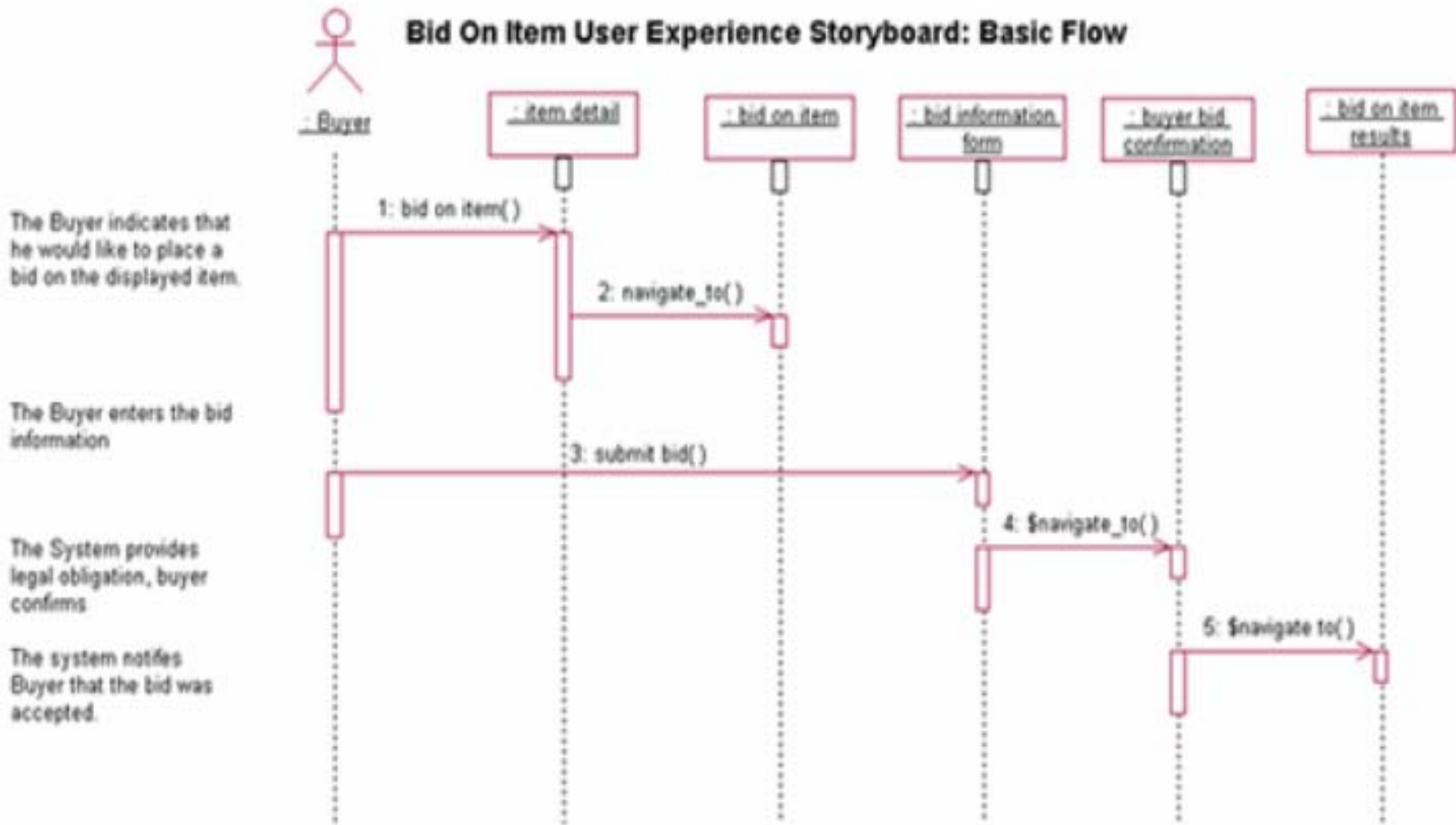
bid amount

submit bid()
cancel bid()

Step 4: Model the use-case flows with the UX elements

- The fourth step in creating UX storyboards is to show how the use-case flows of events are implemented among the screens of the conceptual UI.

- We use interaction diagrams to do this (UML sequence or collaboration diagrams)

- Modeling the flows helps to:
  - show how a user would navigate between screens to accomplish a task
  - ensure that there is either a screen or a user action for everything the user has to accomplish
  - verify that the screens have the content necessary to accomplish the use case

Bid On Item User Experience Storyboard: Basic Flow

The Buyer indicates that he would like to place a bid on the displayed item.

1: bid on item( )

2: navigate_to( )

The Buyer enters the bid information

3: submit bid( )

4: $navigate_to( )

The System provides legal obligation, buyer confirms

5: $navigate to( )

The system notifies Buyer that the bid was accepted.

Step 5: Model screen navigation for the use case

- The fifth step in creating a UX storyboard is to draw a navigation diagram for the use case.

- The diagram shows the relationships among all the screens and how the user can navigate between them.

- Navigation diagrams are a form of UML class diagram
  - elements are screens and input forms instead of classes

- A UX model contains one navigation diagram for each use case and also a navigation diagram for the entire application
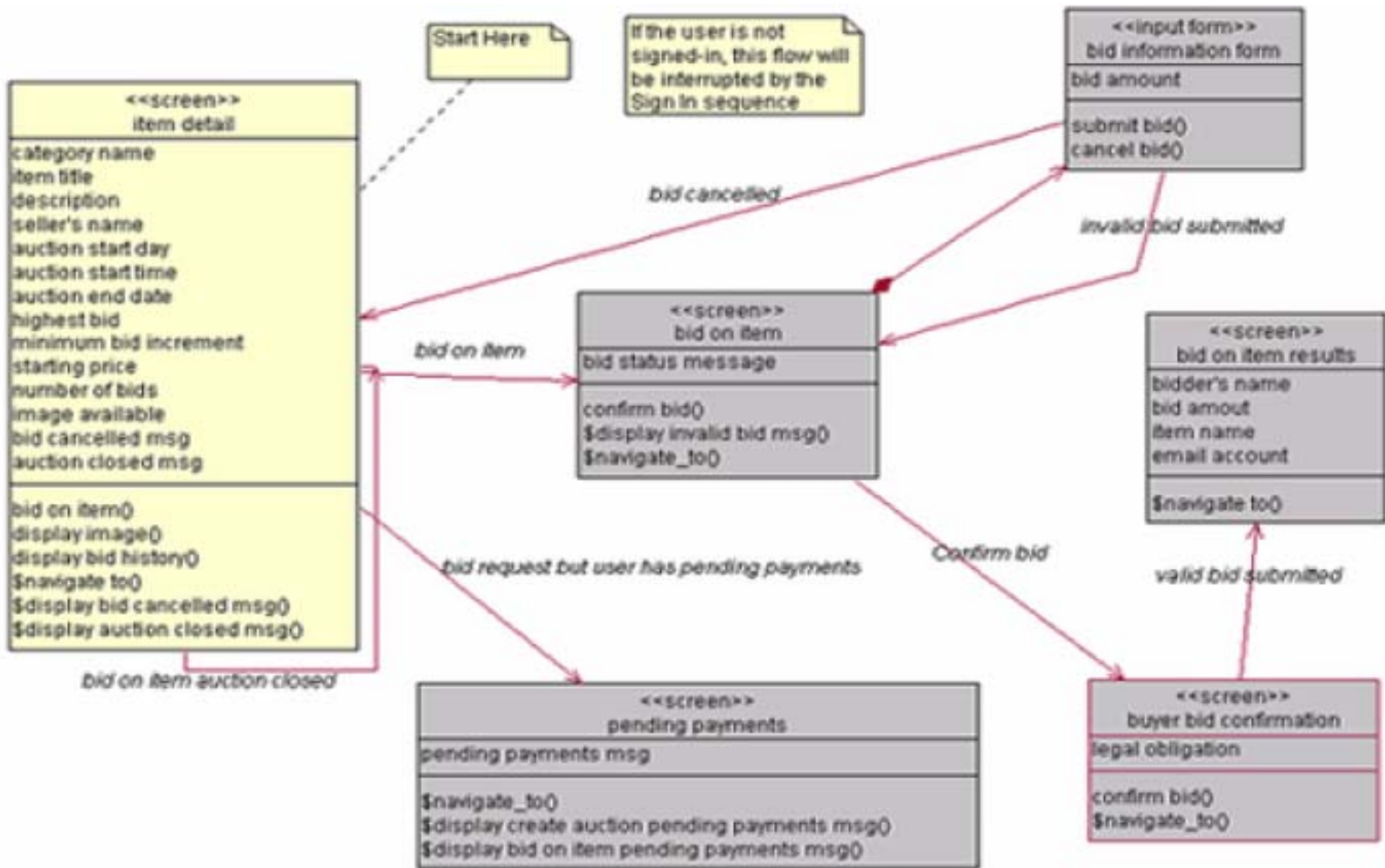
When to use UX storyboards?

- UX modeling is not required on every project

- Typically, the benefit of a UX model outweighs the cost and effort required if:
  - UI errors might have costly consequences
  - the system is very new to the users

Conclusion

- You should ensure that your UX storyboard result in:
  - An augmented use case with actor characteristics and usability guidelines and requirements.
  - A set of screens and input forms with dynamic content, and user and system actions.
  - Flow diagrams showing how the use-case flows of events are implemented via the screens.
  - A navigation diagram showing all of the screens and their relationships for implementing the use-case user interface.

Questions

References

- User experience storyboards: Building better UIs with RUP, UML, and use cases, by Jim Heumann, IBM Rational Software Group, 2003 (available at http://www128.ibm.com/developerworks/rational/library/content/RationalEdge/nov03/f_usability_jh.pdf)