

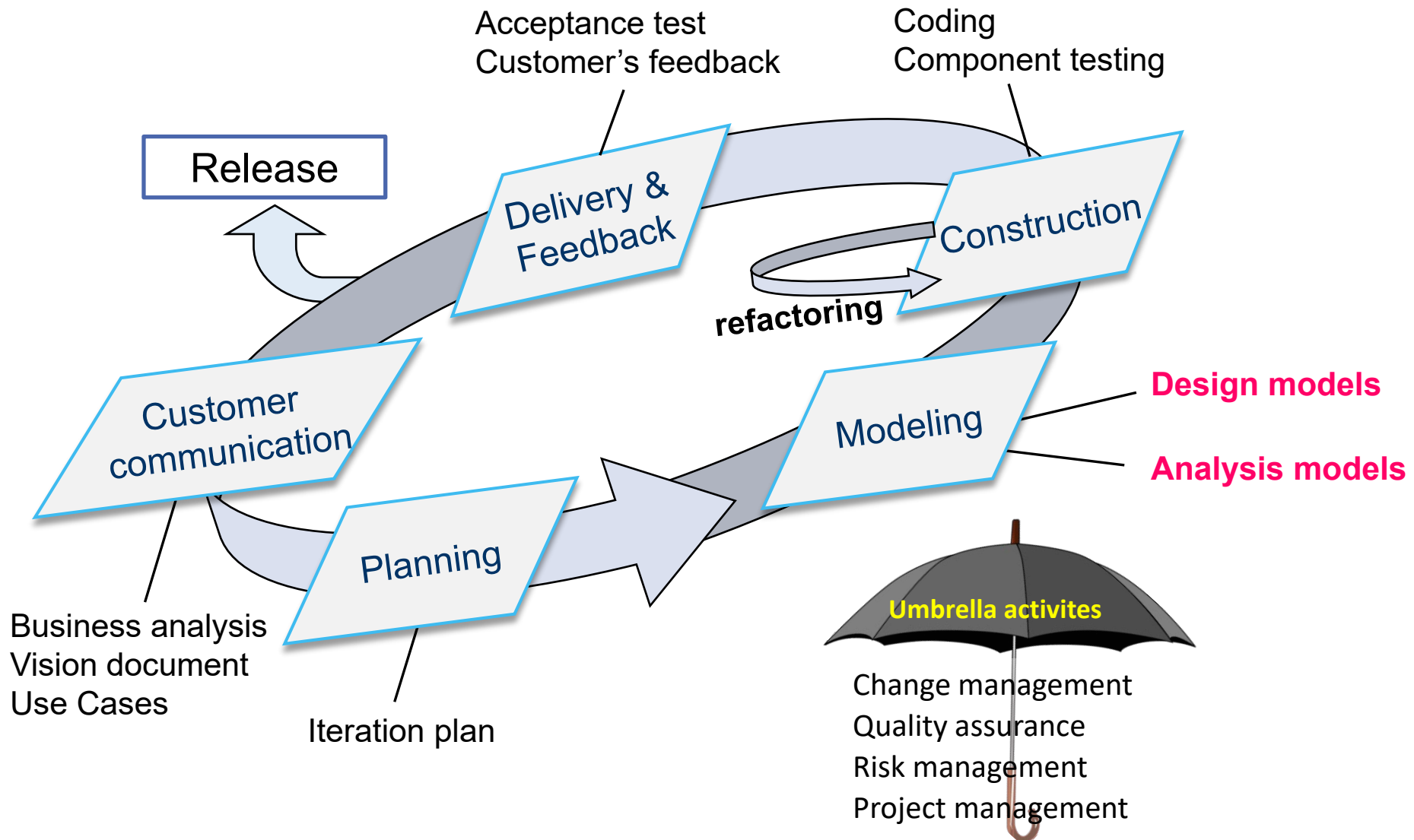
Unit 4: Design of Web Applications (1/2)

Web Application Engineering, Web Application Analysis,
External Design of WebApps.

Unit 4: Design of Web Applications

- ▶ Web Application Engineering
- ▶ Web Application Analysis
- ▶ Web Application Design
 - ◆ External Design
 - ❖ The UX Model
 - ❖ UX Modeling by Example
 - ◆ Internal Design
 - ❖ The Web Application Extension for UML
 - ❖ The Model-View-Controller (MVC) Architectural Pattern
 - ❖ Catalog of MVC-based Patterns

Web Application Engineering

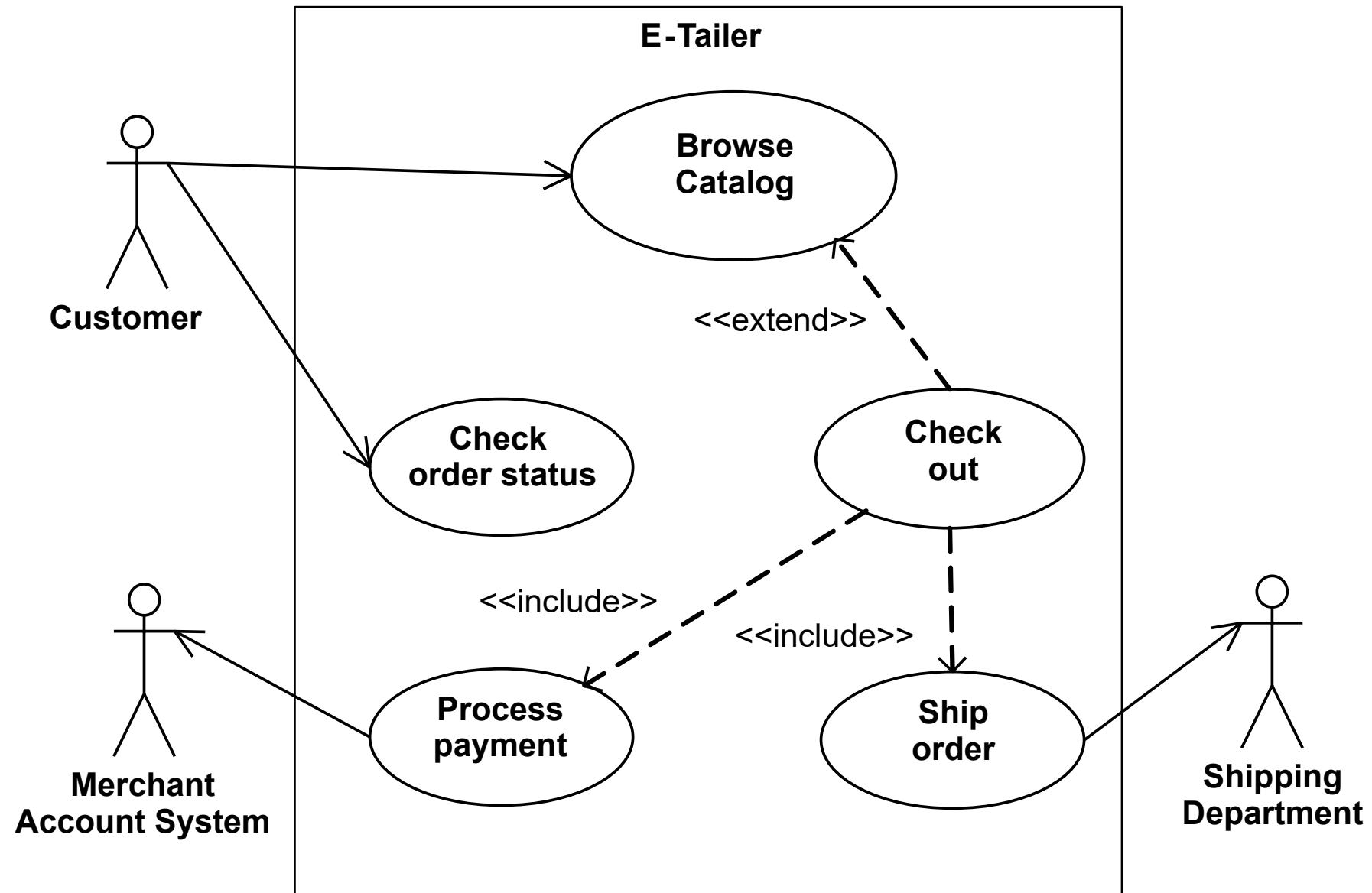


Web Application Analysis

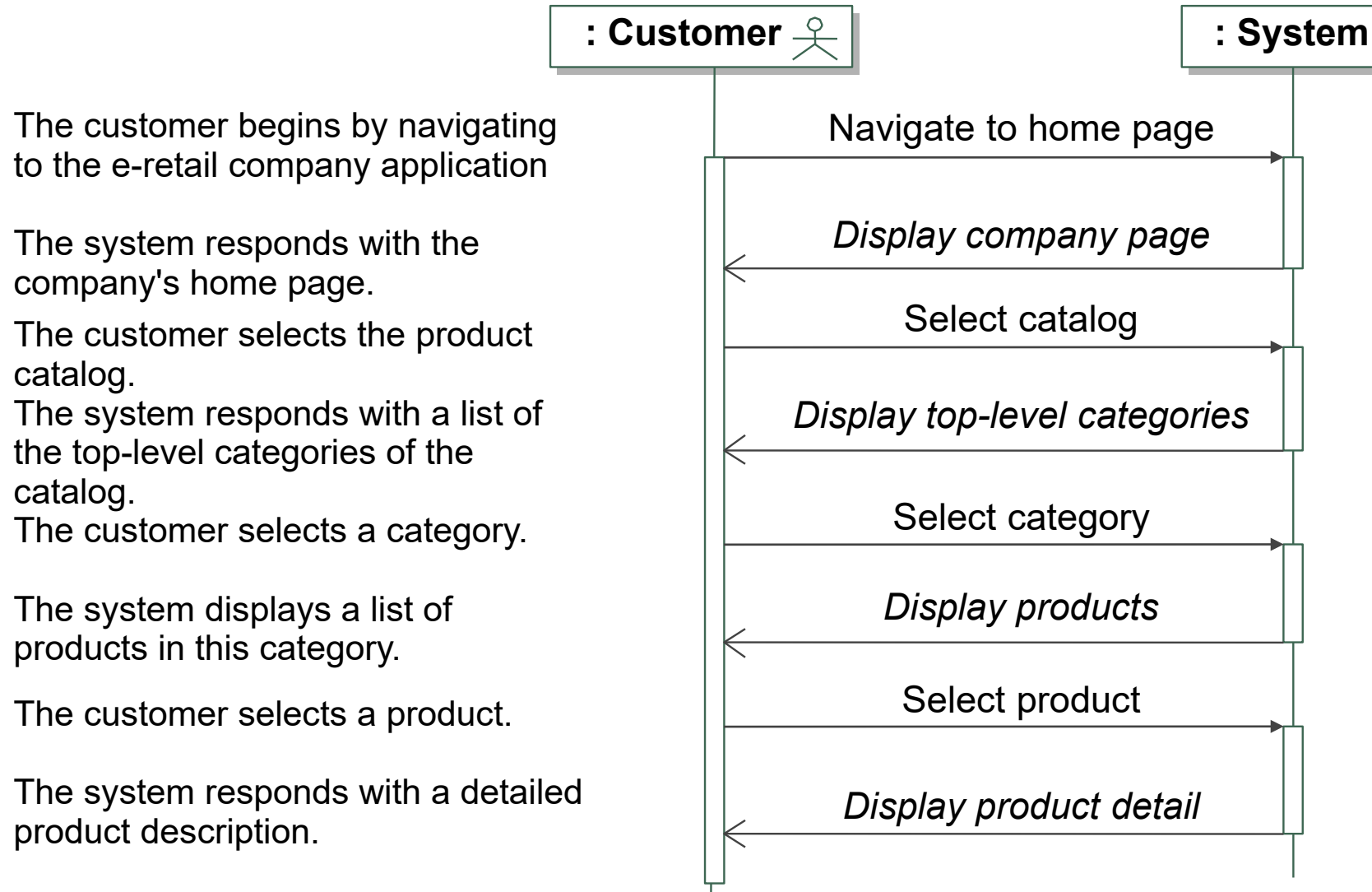
Web Application Analysis (similar to Software Application Analysis) tasks include:

- ◆ Represent WebApp content
 - ◆ Identify content relationships
 - ◆ Refine and extend usage scenarios
 - ◆ Review usage scenarios
 - ◆ Identify system functions
 - ◆ Define constraints and non-functional requirements
- Class Diagram
- Use Cases
- Sequence Diagrams for Use Cases

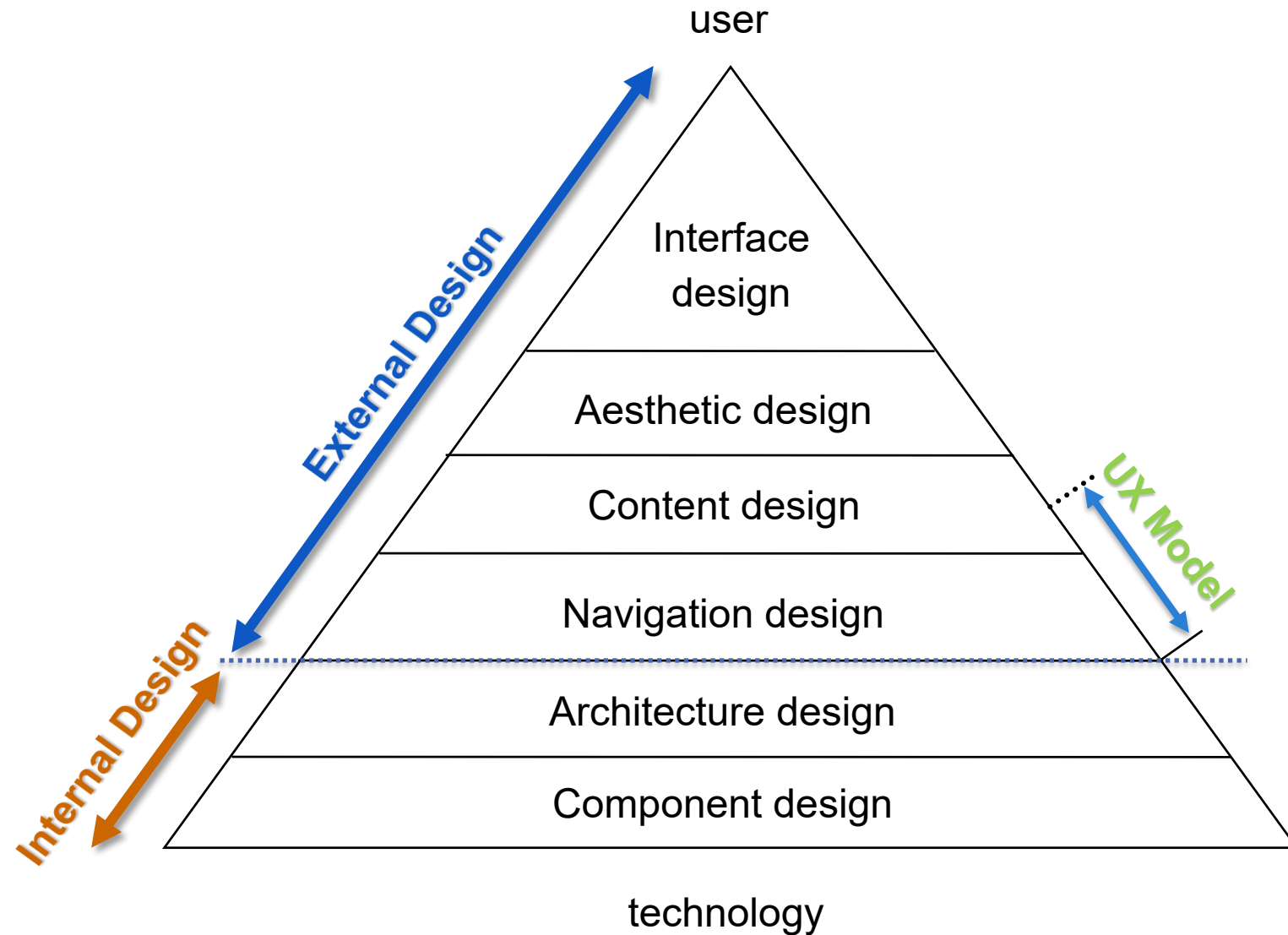
Web Application Analysis: Use Case Diagram Example



Web Application Analysis: System Sequence Diagram Example



Web Application Design



Web Application Design

- ▶ Interface design:
 - ◆ Describes the structure and organization of the WebApp pages
 - ◆ Layout, menus, tabs, links, content, context information, search, etc.
- ▶ Aesthetic design (Graphic design):
 - ◆ Look and feel of the WebApp, colors, text size, font and placement, the use of graphics, etc...
- ▶ Content design:
 - ◆ Content structure and organization in pages
- ▶ Navigation design:
 - ◆ Definition of the navigational flows among pages that implement the different use cases.

Web Application Design

- ▶ Architecture design:
 - ◆ Definition of the overall structure for the WebApp, components and interactions between them.
- ▶ Component design:
 - ◆ develops the detailed processing logic required to implement functional components that support a complete set of WebApp functions.

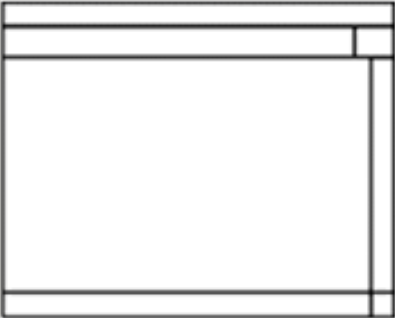

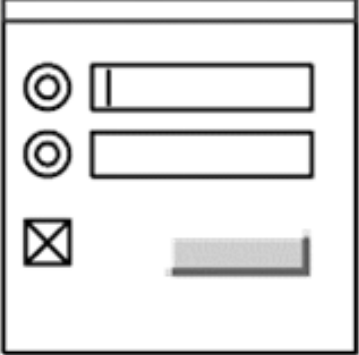

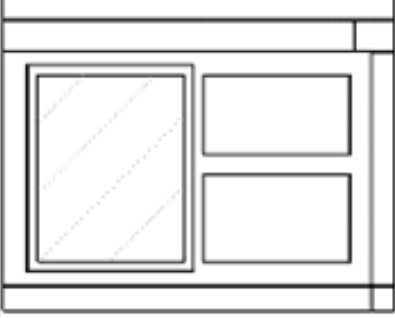

User eXperience Model (UX Model) [Conallen]

- ▶ Corresponds to the Content design (partially) and Navigation design layers of the “pyramid”
- ▶ L’UX Model describes how the (dynamic) content will be structured and organized in different screens and how the user will navigate among those screens to execute the WebApp use cases
- ▶ Artifacts of the UX Model:
 - ◆ **Screens**: something that is presented to the user, which contains the user interface infrastructure, such as menus and controls, as well as business-relevant content
 - ◆ **Storyboard sequences**: describes a typical use of the system through the combination of a set of screens
 - ◆ **Navigational paths and maps**: a road map of the application’s screens

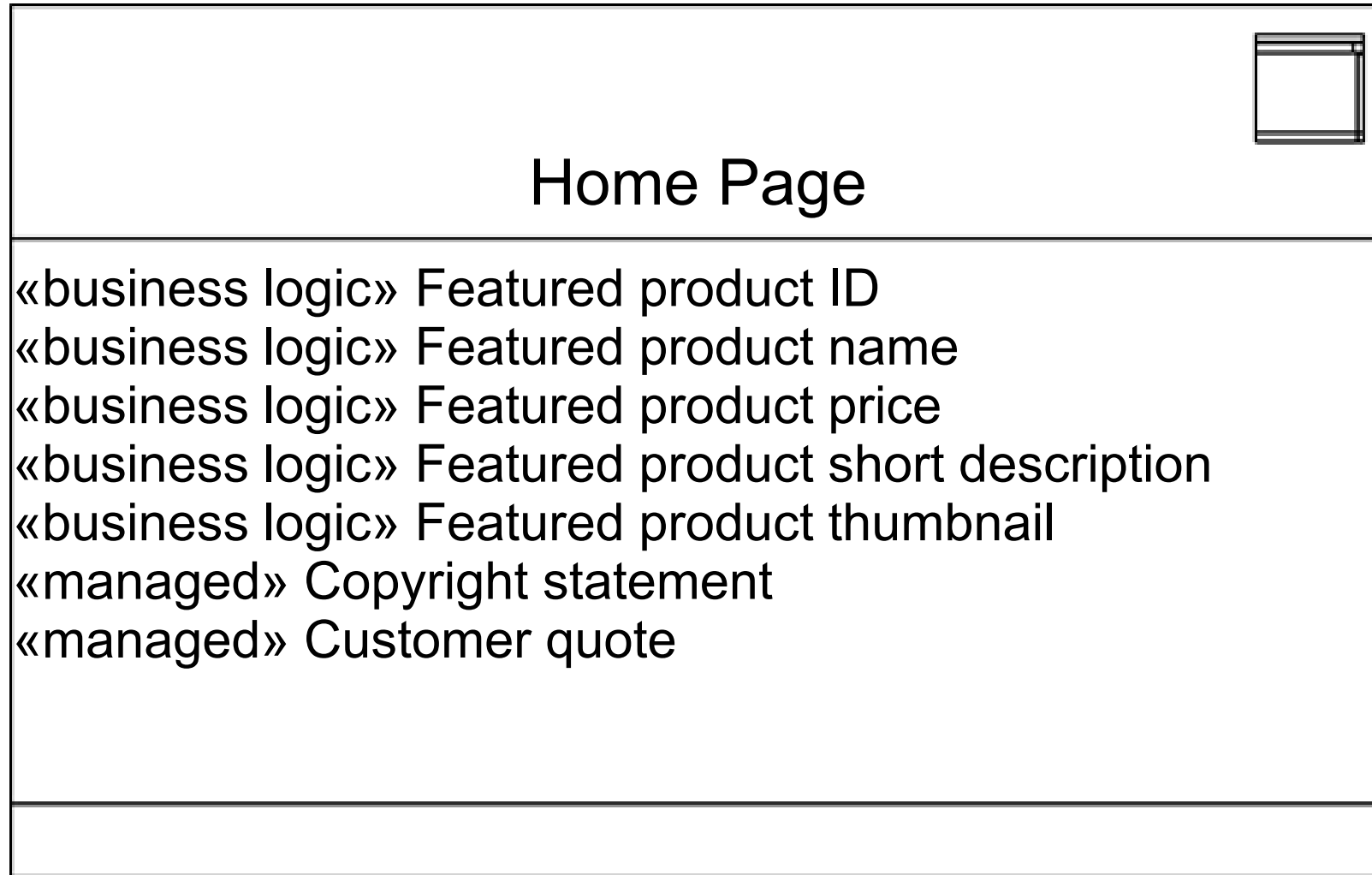
The UX Model: Screen Description

- ▶ A screen's properties and its behaviour with the user define the screen. These include:
 - ◆ Name and description
 - ◆ Structure: screen prototype
 - ◆ Content:
 - ❖ Static content (constant for users): field names, titles, text,...
 - ❖ Dynamic content
 - Business logic content
 - Managed content: Banner ads, help and informational messages, press releases, company and application FAQs, white papers
 - ◆ Input fields and controls that accept user input
 - ◆ Description of user interactions with the screen

The UX Model: UX Model Stereotypes

<i>Stereotype</i>	<i>Icon</i>	<i>Decoration Icon</i>
«screen»		<div>Home Page </div> <div>Product special Product price Visitor count</div>
«input form»		<div>Payment </div> <div>Card holder : String Card number : String Expiration : String</div>
«screen compartment»		<div>Footer </div> <div>Copyright statement</div>

UX Modeling by Example: Home Page Screen



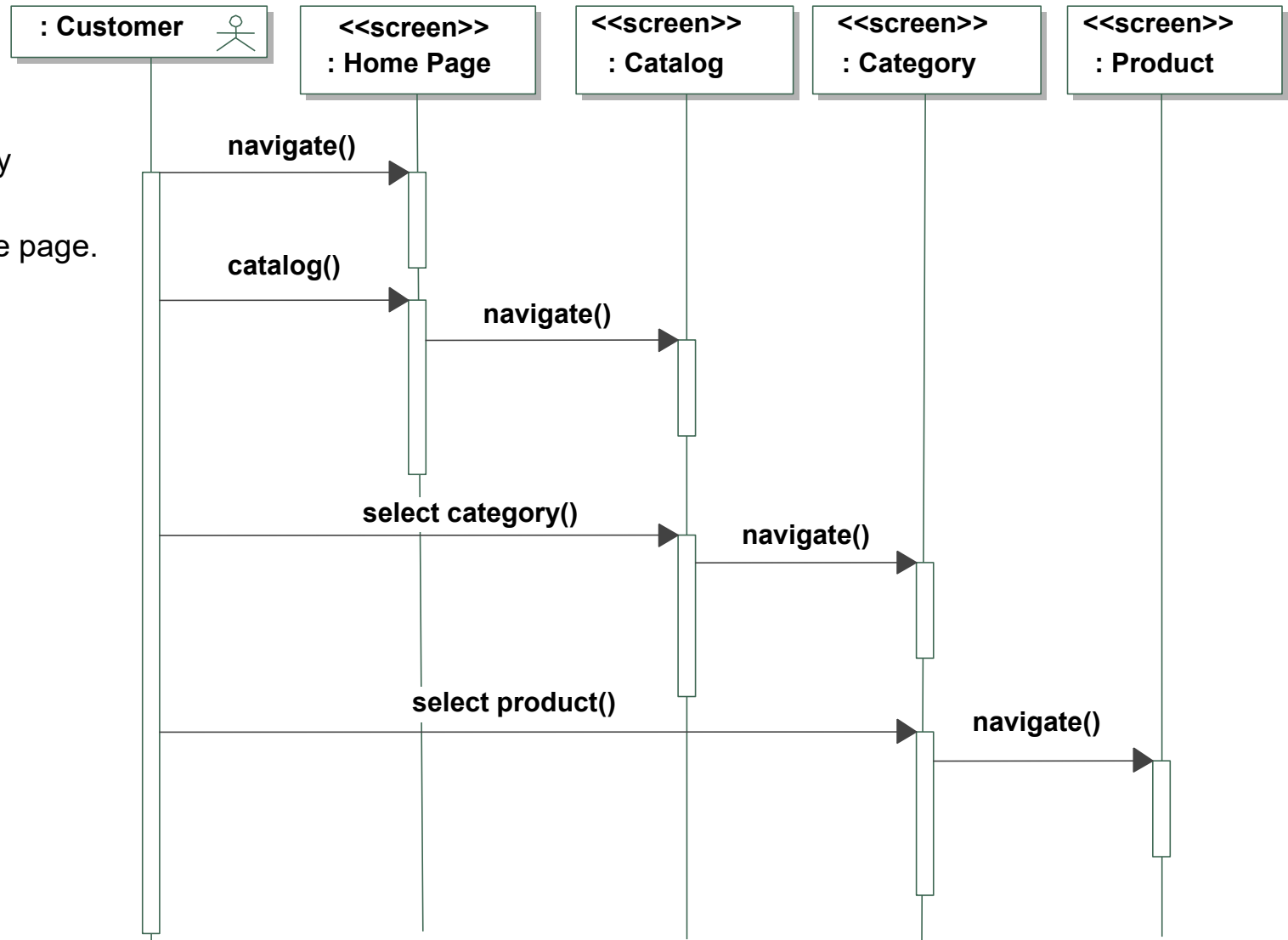
UX Modeling by Example: Browse Catalog Storyboard

The customer navigates to the e-retail company application on the Internet.
The system responds with the company's home page.

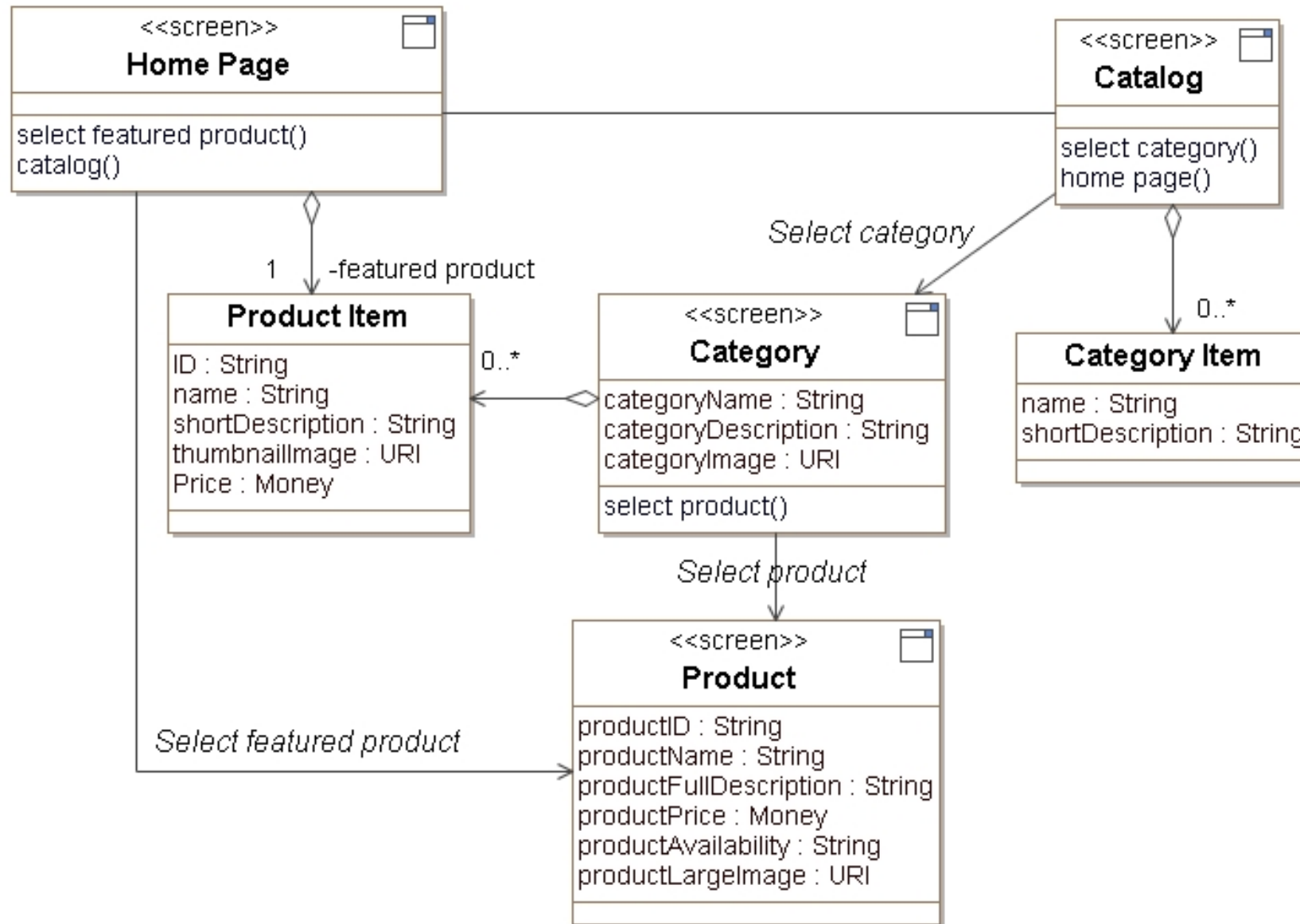
The customer selects the product catalog.
The system responds with a list of the top-level categories of the catalog.

The customer selects a category.
The system displays a list of all products in this category.

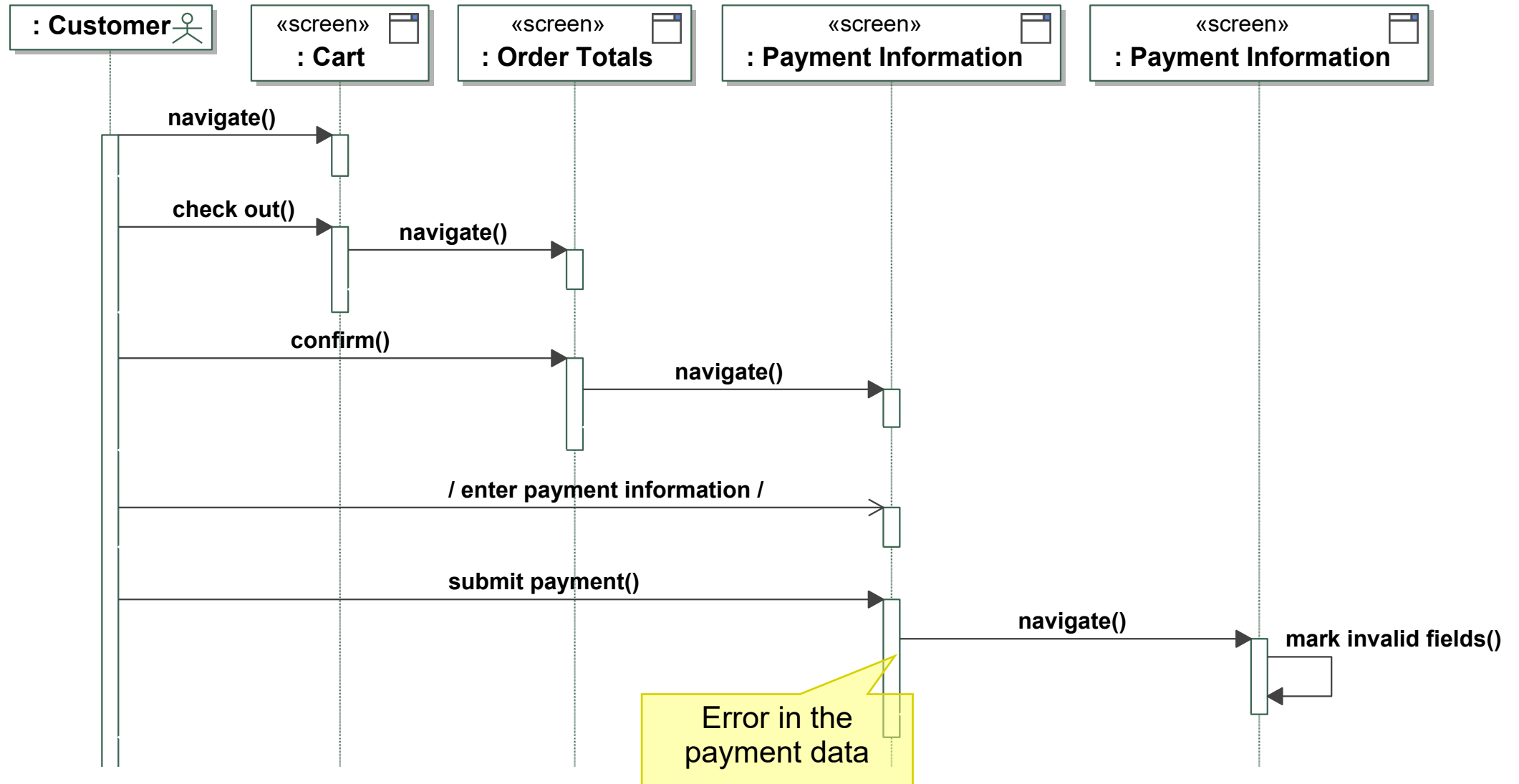
The customer selects a product.
The system responds with a detailed product description.



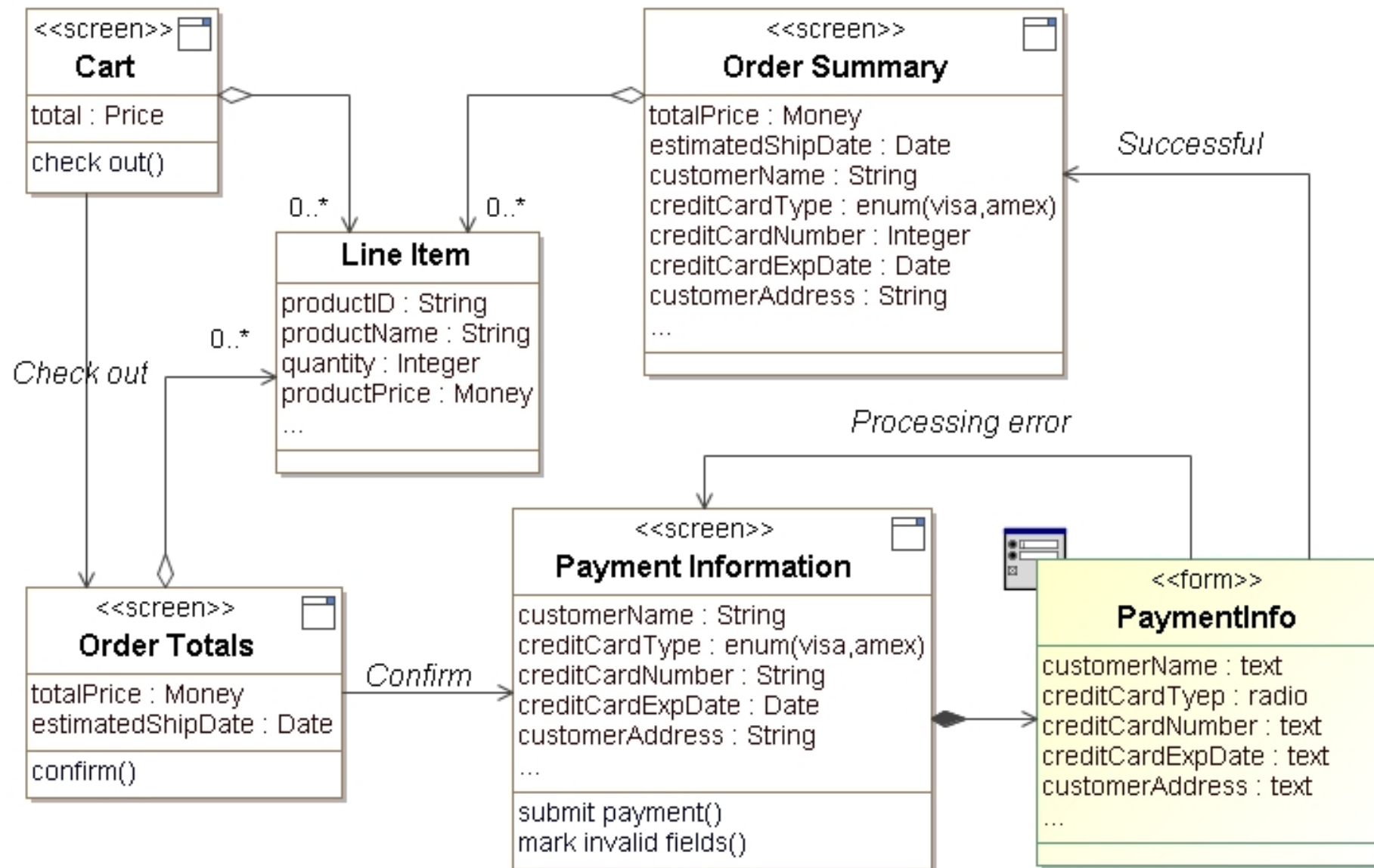
UX Modeling by Example: Screens and Navigational paths



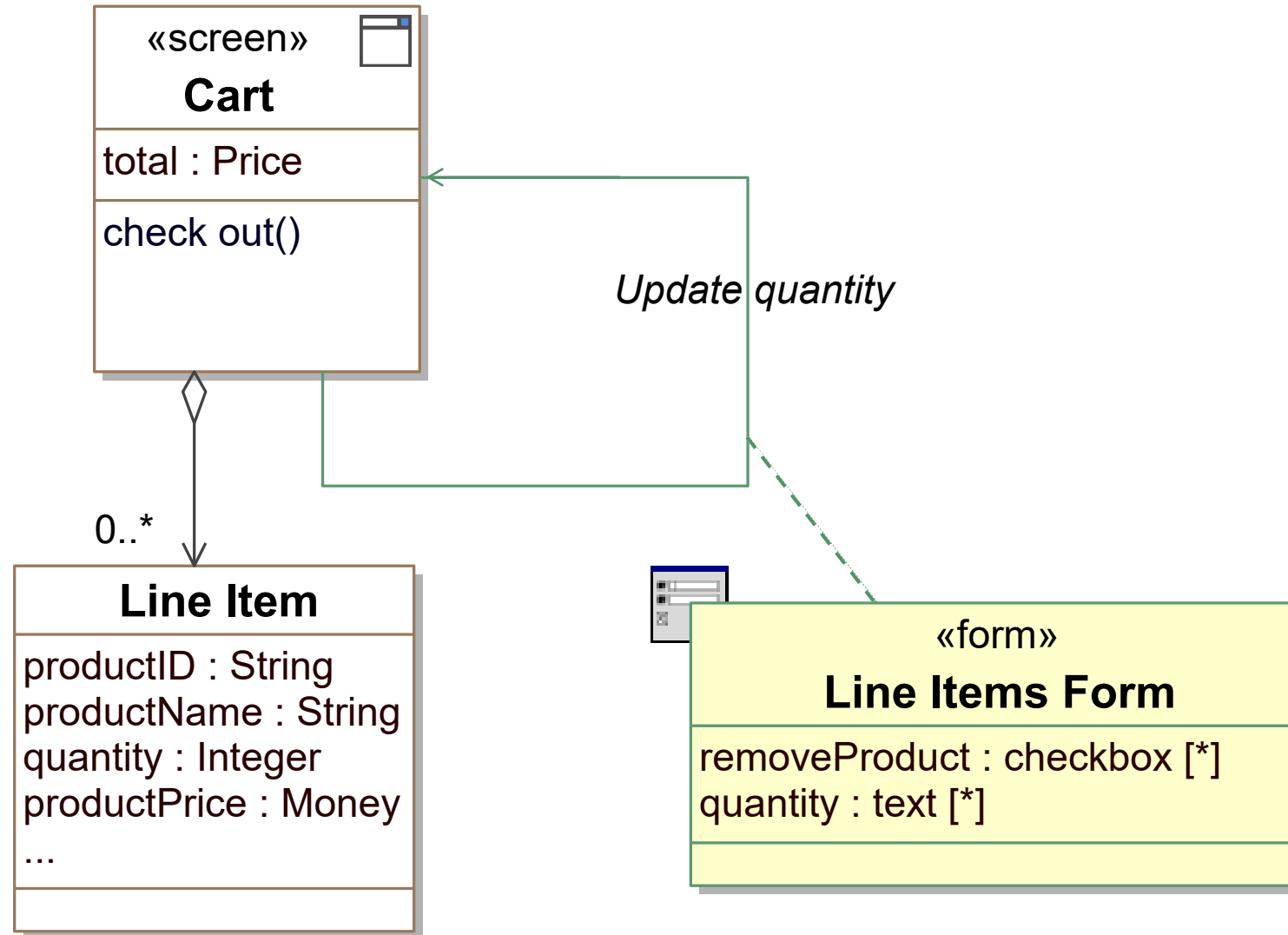
UX Modeling by Example: Checkout Storyboard



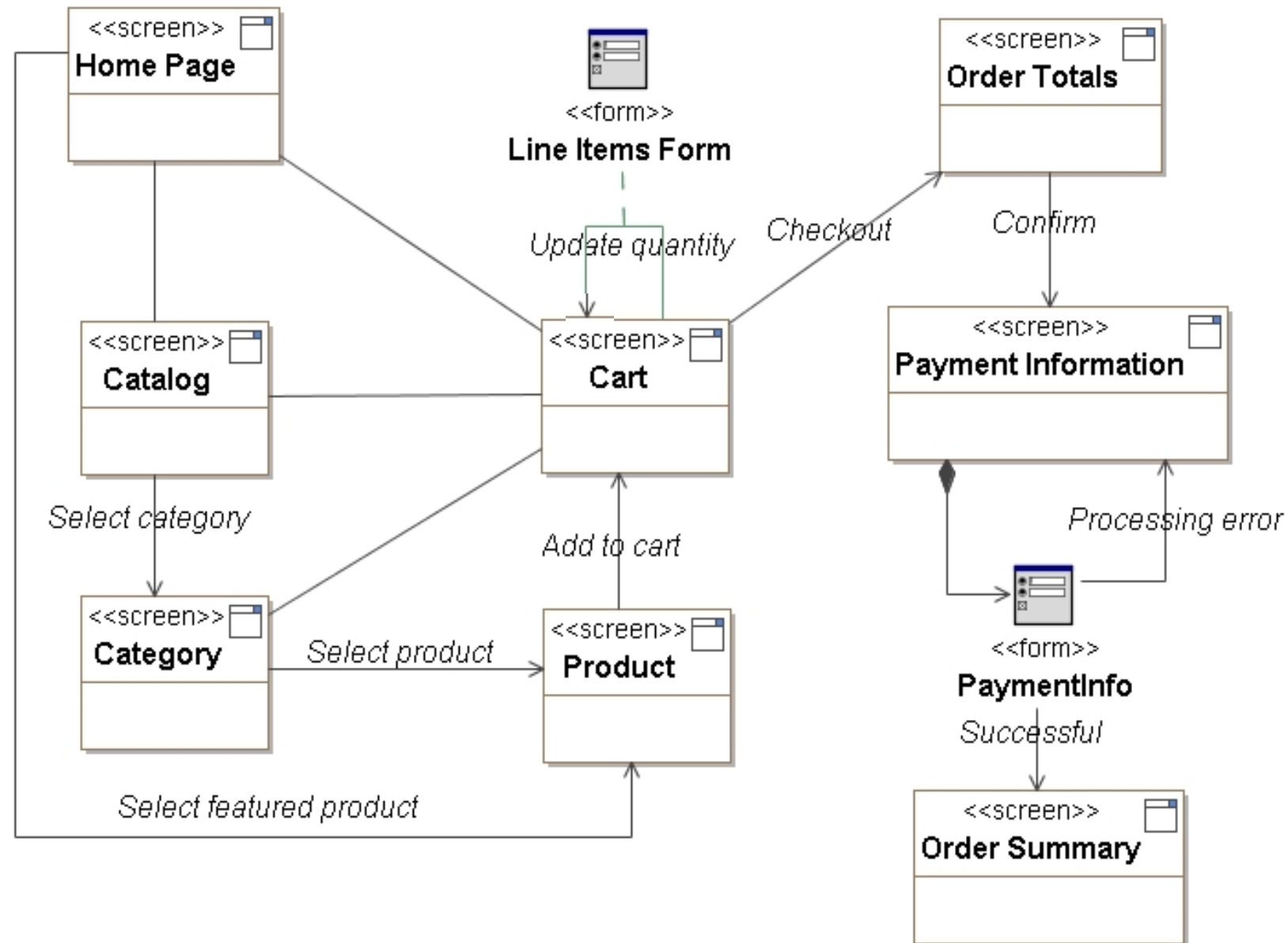
UX Modeling by Example: Screens and Navigational paths



UX Modeling by Example: Cart Update Screens and Navigational paths



UX Modeling by Example: Navigational Map



References

- ▶ R. G. Pressman, D. Lowe: Web Engineering. A Practitioner's Approach. McGraw Hill, 2008. Chapter 8
- ▶ CONALLEN, Jim Building Web Applications with UML, 2on Edition, Addison-Wesley, 2002. Chapters 8-10