



Product Specification

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Specification Activities

- Product Vision
- User Experience Model
 - User Stories
 - Usage Storyboards
 - Navigation Maps
 - Screen Mockups



Product Vision

- Describes product in a few pages
 - Executive summary
 - Problem statement
 - Identify stakeholders
 - List features/functionality
 - Functional constraints
 - Non-functional constraints

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User Experience Model

- Specification of product functionality via user interaction
- Derives from User Stories
- Deals with “screens” – *but not a user interface prototype*
- Expresses both static and dynamic features
- Produce in parallel with use cases – everything should be traceable to a use case

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User Stories

- Elicitation technique of what the product should do *by* the stakeholders
- Describes a chunk of functionality that is meaningful to the user
- Stories are not retained – just an elicitation technique
- Similar to *Narrative Use Cases*, but goals are different

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User Story for Accessing Student Transcripts

- A user can either enter a student ID number or name. If they enter the ID number they get a display of information describing the student and are asked if they want to retrieve that student's transcript. If they do, the transcript is displayed. If they enter the student's name ...

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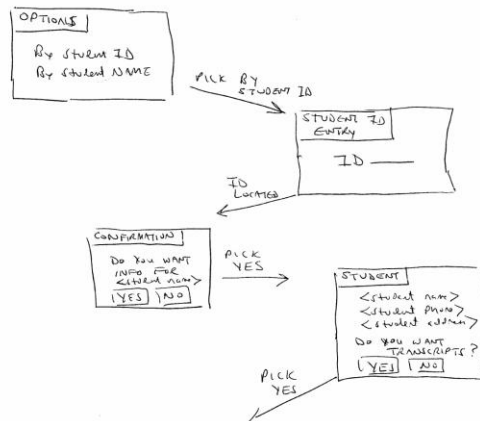
User Experience Artifacts

- Usage Storyboard - sequence of interactions for *one* specific instance of a flow of events – ultimately we should have a storyboard for each possible instance of a particular thread
- Navigation Map – consolidate multiple storyboards into a single diagram – represent *all* related instances
- Retain map, discard storyboards ...
- Screen Mockups

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Usage Storyboard

Sequence of interactions for one specific instance of a flow of events



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Exceptions/Alternate Handling

- Explore exception and alternate behavior in the user stories as well
 - What if the student is not found?
 - What if multiple students with the same name are found?
 - What if the student isn't the one the user wanted?
 - What if ...?

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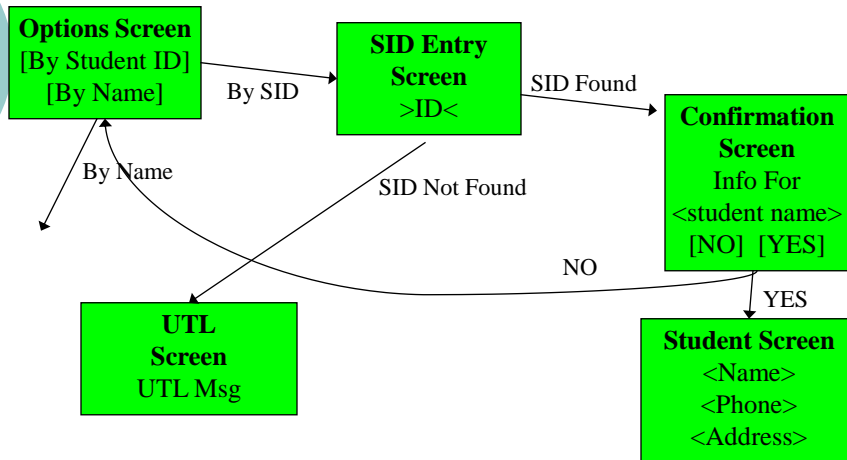


Navigation Maps

- Expected navigational pathways between screens – construct from storyboards
- One map for each functional thread
- Don't try to represent the entire application with a single Navigation Map
- Don't add extra undocumented information
- Archival ...

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Navigation Map



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Screen Mockups

- May optionally associate a screen mockup with a user experience screen, but that isn't the point of experience screens
- Visual studio environment is good for producing screen mockups
- ... so is good ol' HTML ...

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Use Cases

- Description of external system functionality
- Scopes project and provides structure
- Can be used as units of estimation and are smallest unit of delivery
- Set of scenarios that describe interaction between a user and the system
- Doesn't capture non-functional requirements
- Doesn't capture internal functional requirements

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Degree of Detail in Use Cases

Alistair Cockburn: *Writing Effective Use Cases*, Addison-Wesley. Jan 2000

- **Brief** - a few sentences summarizing the use case - suitable to use a spreadsheet for planning software development - can be easily inserted in a spreadsheet cell, and allows the other columns in the spreadsheet to record business priority, technical complexity, release number, etc .
- **Casual** - a few paragraphs of text elaborating the use case in the form of a summary or story
- **Fully Dressed** - formal document based on a template with fields for various sections

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Finding Uses Cases

Wirfs-Brock Associates, Inc.

- Describe functions users will want from the system
- Describe operations that create, read, update or delete information that the system requires
- Describe how users are notified of changes to the internal state of the system

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Sections for a *Fully Dressed* Use Case

- Use Case Name
- Iteration
- Summary
- Preconditions
- Triggers
- Basic course of events
- Alternative paths
- Postconditions
- Business rules
- Notes
- Author and date

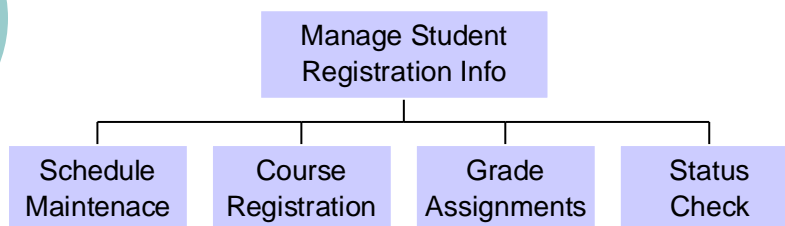
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Hierarchy of Use Cases

- **Summary Use Cases** provide overview of system functionality
- **Core Uses Cases** describe user tasks during user interaction with the system
- **Supporting Uses Cases** explain how the system behaves in support of the Core Use Cases
- **Internal Use Cases** describe how components behave and interact
- *May not need to construct each kind ...*

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Summary and Core Use Cases



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System Boundaries

- Summary Use Case define boundaries of the system
- Ask yourself:
 - what's within its scope? what's outside it's scope?
 - how does the system interact with users?
 - how does system interact with other systems?
- Uses cases are both a specification tool **and** an elicitation/working tool

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Use Case Forms

- **Narrative** – provides a high-level view of what the options and goals of the use case are – used to convey general goal
- **Scenario** – shows sequence of actions to be performed by the use case – also use to show variations – may need several for one Narrative Use Case
- **Conversation** – describes “conversation” between user and system - clear description of what the user does and what the system does – corresponds to Scenarios

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Narrative Use Case for Schedule Maintenance

- Database Maintainer (DM) either modifies an existing course or adds a new course to the Course Database. If course currently exists, DM locates course in the database using the CRN and updates appropriate fields based on CSM submitted by Academic Department. If course does not exist, DM enters course information from CSM provided by Academic Department, generates new CRN and e-mails CRN to Academic Department.

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Scenario Use Case for New Course Addition

1. DM Selects **New Course** option
2. DM enters course information: Department, Course Number, Course Title, Section, Credits, Instructor ID, Requested Room
3. System confirms no other course with this information already in the Database
4. DM commits entry
5. System generates CRN, assigns to course and displays for DM
6. DM sends e-mail with Course Number and Section and new CRN to Department

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Conversation Use Case for New Course Addition

Database Maintainer	Registration System
	disp Options Screen
Select New Course	
	disp Entry Screen
Enter "Course Information"	disp Confirmation Screen
Commit Entry	
	•generate CRN •assign CRN to course •disp CRN Box
Send e-mail with Course Info & CRN to Department	

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Selecting Level of Abstraction

- Can write Use Cases at a very low level of abstraction: "Mary enters CRN 80467" or at a very high level of abstraction: "User enters information"
- Select the level of abstraction that covers the widest range of situations without losing significant details
- When entering Lab courses, there may be a variable Lab Fee – previous example would not accommodate that
- May need to generate additional Use Cases

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Guidelines

- Give Use Case a descriptive name – begin use case with verb
- Identify actor and their goals for Use Case
- Identify preconditions
- Describe normal (*primary*) use case first.
- Describe variations as *secondary use cases* later – distinguish between variations and exceptions – show recovery in supplement
- Describe business rules or policies that affect the Use Case in a separate section
- Leave out user interface – put in Glossary

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Glossary

- Department, Course Number, Course Title, Section, Credits, Instructor ID, Requested Room, CRN, CSM ... what do these mean?
- Use Glossary as central repository to:
 - Define key concepts
 - Clarify ambiguous terms
 - Explain jargon
 - Define business events
 - Describe software action
- Glossary used to obtain team agreement on uniform definitions

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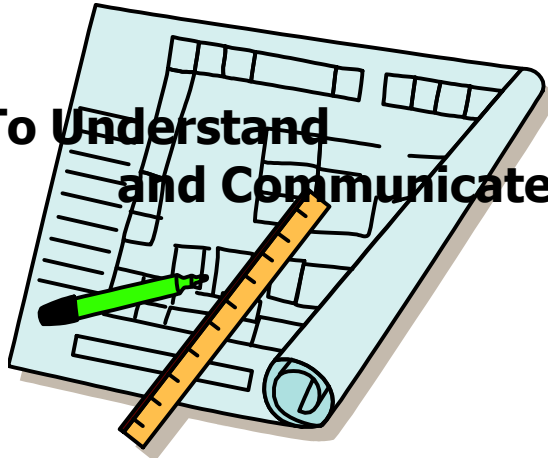
Glossary Entries

- Why is concept is important
- Clarify likely misunderstandings
- What are typical values?
- Provide an example
- Identify related entries

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Goal of Use Cases

**To Understand
and Communicate**



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