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User Interface Architecture Methodology

UI Specification

The UI Spec is the most important of the three deliverables involved in the UI Architecture development process. This UI (Design) Spec document consists of Wireframes (page mock-up diagrams produced in Visio2002) arranged in a relatively linear workflow (storyboard) representing “virtual screen shots” of intended functionality. These Wireframes illustrate the top 3-4 levels of drill-down for each new feature or functionality enhancement proposed for the given software development lifecycle.

The purpose of a wireframe is to provide a guide to the content types and functionality elements on a web page, including the grouping of elements and their relative weight and / or importance. Although wireframes do not indicate the actual layout format that the graphic design will express, wireframes do illustrate the juxtaposition of content / functionality elements in a readable format which facilitates review, discussion and revision of content placement within available screen real estate, based on the relative priority status of each content element vs. other neighboring content items. The emphasis is on the front-end design model, navigation schema, and nesting of content. The purpose is to illustrate the top 3-4 levels of drill-down for each planned feature/functionality with the intent of mapping how all functions coexist within a cohesive *planned* architecture. Multiple simultaneous enhancements to an enterprise level business software **must be planned with regard to Information Architecture**; otherwise, the software will evolve into an un-navigable maze of features which seem “tacked-on” without regard to usability and overall structure.

Wireframes do not represent the graphic design (look and feel) which the final live application or web site will exhibit, nor do they literally depict actual placement of elements on individual live web pages; instead, wireframes serve as a paper mock-up of all content and functionality specific to a given web page or page template. They are intended to provide a ‘blueprint’ or storyboard of web page content and application workflow (for development, design, and business stake holders); the wireframes are provided in an effort to keep all stake holders on the same page when discussing revision and implementation of web-based applications in an iterative product development life-cycle. Wireframes and sitemaps together make up the Information Architecture section of any software design document.

Inputs To Wireframe Creation (dependencies)

Use Cases / Business UI Requirements

The Use Cases are typically a family of documents (or separate chapters comprising an overall book) of Business Requirements documentation describing each proposed new feature or enhanced functionality for a given software product. The Use Cases should contain as a chapter, a business UI Spec, defining business requirements for the UI of each new (or redesigned) feature proposed for development. The Business UI Spec document is written by a Business Analyst who gathers the Business Requirements during interviews with the Business Initiative Leaders / Subject Matter Experts, and then captures those requirements as a chapter or subset of his Use Case documentation.

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Document Owner: Lead Business Analyst

Contributors: Business Analyst, Business Initiative Leaders and / or Subject Matter Experts.

Receiver: Information Architect / UI Architect, Business Initiative Leaders and / or Subject Matter Experts.

Techniques and Processes of UI Spec Creation

UI Review Sessions

Sitemap and Wireframes are created in Visio2002 by The UI Architect and are used in User Review Sessions with Business Initiative Leaders to facilitate revision of UI Spec (and to ensure Business sign-off on UI Spec before back-end code writing officially begins). There are typically 2-3 rounds of User reviews to allow User redlining & UI Architect revision to the UI Spec doc; sign-off is typically requested after the third and final review session, [this is an iterative process repeated for each module of new functionality being “mocked-up.”]

UI Design and Implementation Methods in the Software Development Lifecycle.

- Interviews with both Subject Matter Experts and select Design Team members. Interviews may be used iteratively at pivotal points in the development lifecycle.
- The Card Sort method is an exercise typically performed with Subject Matter Experts to help derive the content and functional organization, data nesting and hierarchy design [by writing down all key content element names on 3 x 5 cards or sticky notes and asking the SME's to help arrange and rearrange until the appropriate categorization / nesting structure emerges].
- Secure User “buy in” on the navigation and data nesting scheme described in the high-level Sitemap Overview (this is an approval rather than a formal sign-off, because site-map will evolve as development progresses and interdependent requirements become clearer).
- Questionnaires either from online sources or paper with end users. Questionnaires can be used to assess both usability and platform (compatibility) requirements.
- Research & elaborate on the business' UI requirements which were defined by BA in the UI Section of his Use Case. Work with BA to iteratively refine wireframes document before presenting to User Group for UI Review Sessions.
- Facilitate a series of three review sessions for each module of functionality described in UI Design Spec (wireframes) documentation.
- Secure Sign-off on Master (Design) UI Spec document (module by module)
- Build electronic UI Mock-ups in DHTML code utilizing Cascading Style Sheets and Javascript to provide robust interactivity while also building and maintaining a library of reusable UI components [HTML 'object' library]. The code from this effort should be 100% re-useable in the JSP of the finished product [this should NOT be wysiwyg page layout producing throw-away code].
- Work with Java developers to insure smooth integration of HTML screens into JSP code.

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- Provide HTML and Browser bug troubleshooting during the Q / A process.

Facilitator: Information Architect or UI Architect and UI Developer (DHTML code writer)

Contributors: Business Analyst, Business Initiative Leaders and / or Subject Matter Experts.

Process Steps:

1. **Information Architecture Research:** Read Use Cases, Business UI Spec, and Functional Specs. Analyze existing digital content and software design, if any is available
2. **Secondary Investigation & Discovery:** interview subject matter experts from business and application architects from design team, get clarification on issues & questions that arise from researching above documentation, and perform card sort exercise with SMEs to determine appropriate nesting and navigation structure.
3. **Deliver Draft of Sitemap** (illustrating 3-5 levels of data nesting structure captured during User Interview Session) Created in MS Visio.
4. **Facilitate 2nd round SME Content Discovery Session:** interview subject matter experts from business and application & technical architects for development team to get clarification on issues and questions that arise from researching above documentation of intended functionality and capture User Submitted Inputs & Revisions.
5. **Implement revisions to Sitemap accordingly** and seek Business Leader / User Sign-Off of Sitemap Overview
6. **UI Investigation and Discovery Research:** Read Use Cases, Business UI Spec, and Functional Specs.
7. **Create Draft of Wireframe Diagrams** (module by module) in Visio.
8. **Present First Draft of UI Spec /wireframes:** conference workout session with SMEs to gather revisions on given UI Module.
9. **Implement revisions to UI Spec / Wireframes accordingly**
10. **Begin building HTML mock-ups based on wireframes documentation**
11. **Facilitate 2nd round User Review Session:** capture User Submitted Revisions
12. **Implement revisions to Wireframes and HTML screens accordingly**
13. **Facilitate Final round User Review Session:** obtain User / SME Sign-off
14. **Implement revisions to HTML screens accordingly**
15. **Iterative Revision Cycle:** UI Architect facilitates User Review sessions and passes captured revision requirements on to UI Developer who changes the HTML code accordingly under supervision of the Information Architect.
16. **Deliver Final Revision of UI Prototype:** show final changes to SMEs for approval and request Business Initiative Leader Sign-off on given UI Prototype. (Note: UI Prototype is completely functional from a front-end navigation perspective; however, it is not yet linked to live back-end data

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processing functionality). UI Architect is responsible for securing User Approval of HTML Prototype, but final sign-off of UI is not required until after UI has been united with the live back-end functionality for the purpose of User Acceptance Testing.

17. Integration of HTMLs into JSP Code: *once the completed UI Mock-ups are signed-off by SMEs and delivered to the development team, the HTML / UI developer is responsible for working with the Java development team to ensure that HTML is correctly written when it gets 'torn down and rebuilt' into JSP code. This means that the UI Developer role requires an experienced DHTML developer who can read and edit JSP code as well.*

18. Tools: Visio2002, Conference Room Workout Session, 3 x 5 Sticky Notes, Super Size Sharpie Marker, Macromedia Dreamweaver UltraDev, Allaire Homesite, Sametime Presentations & Conference Calls.

Outputs:

1. High-Level Sitemap Overview
2. Final (signed-off) UI Design / Architecture Spec Document
3. Final (signed-off) UI Prototype

Summary of The UI Dev Team's Methodology: it all boils down to three basic deliverables

1) **Sitemap Overview** The Sitemap Overview provides Business and UI Dev Team with documentation of intended front-end design model at a high level, it allows further design work to proceed with the assurance that Users have agreed to the "Big Picture" or foundation that the design will build upon.

2) **UI Design Specification Document** - A tangible artifact containing a storyboard Illustration. The UI Design Spec also serves as a model of the UI Architecture that helps keep all the stakeholders focused. They give UI Developers a map from which to produce the HTML Prototype pages. They give Business Initiative Leaders a tangible example of what their intended business requirements will look like in implementation. And they give Java Developers a visual representation of what the business expects them to build. Wireframes facilitate questions, discussion, revision, and overall quality of the finished software product.

3) **HTML Prototype** (delivered as unique web application segments for each required software module) UI Developer writes code for an electronic prototype in HTML using or developing shared UI objects wherever feasible. Shared UI objects are cataloged in the Shared UI Library.

Document Owner: UI Architect and UI Developer.

Contributors: Information Architect, UI Architect, HTML Developer, Business Initiative Leaders, Subject Matter Experts, and Business Analyst

Tools: Microsoft Visio 2002, Adobe PDF, Macromedia Dreamweaver UltraDev
Macromedia Dreamweaver UltraDev, Allaire Homesite

Templates: Please use "ACME Master UI Spec" as a UI Design Spec template, which can be found at:

Required Approvals: Business Initiative Leaders, IT Project Manager, and Business Project Manager.

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Receivers: Primary: Application Design Team and Java Developers, also, Business Initiative Leaders, Software Development (implementation / build) Team, IT Project Manager, and Business Project Manager.

Roles and Responsibilities

Information Architect

- Develop common information and content standards for User Interface and common re-use of UI components across all projects
- Create High-Level Site (or application) Map defining Content Nesting, data hierarchy, and front-end architectural model.
- The Information Architect creates a site map based on use case analysis.
- Review the Site Map with Business Initiative Leaders and obtain approval before continuing.
- Define global navigation and workflow actions to ensure functionality and
- Work with project UI Leads, end-users on HTML user interface
- Maintain global CSS and UI interactions
- Train Business Analyst on common UI navigation and user interactions
- Supervise HTML developer's implementation of UI Design Model
- Define scalable content solutions for remote and mobile users

UI Architect

- Usually the same person as the Information Architect Mentioned Earlier, but here the focus is on Page Design & Process Flow, whereas the IA focus is more on content nesting / management & overall workflow design.
- Ensure standards for User Interface and common re-use of UI components
- Develop user interface design model, html mock-ups for each project.
- Creates Wireframe drawings (paper prototypes) of each page. Typically, these are Visio diagrams (user interface style **not** flow charts).
- Illustrate mock-ups of page content, functionality, and navigation in a linear workflow or storyboard format. Wireframes may be incorporated into use case documentation or into more detailed user interface specification, depending on the scope of the project.

There are several methods that the UI Architect may Use ”
in deriving wireframes in addition to use case analysis:

- Heuristic evaluation is evaluation of existing (“as is”) software design by usability experts using well-known guidelines to determine if an application is usable and identify any mission-critical features that are not usable. This methodology is also sometimes known as “guerilla or discount usability testing.”

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Criteria for the evaluation should include recognized best practices from the W3C organization and industry-wide consensus. For a list of applicable heuristics see the *designed4use Web UI Standards' 15 Heuristic Metrics* document available at the URL:

- Design Walk-Throughs are meetings between the Information Architect and Subject Matter Experts to review and solicit revisions of wireframes or the final prototype.
- Manage User Interface Review and Sign-off Process
- Works with Business Analysts, end-users (Client SMEs), & UI Developer on designing and iteratively revising user interface to effectively secure Business Initiative Leader sign-off on proposed UI before the first lines of back-end systems code are written.

UI Developer

- Writes the initial HTML code & applies “web design” skills in Producing UI Prototype whose code is then re-useable in the actual JSP build and implementation of the application.
- Designs the look-and-feel of UI, collaborates with UI Architect on layout/workflow design, and implements the UI design model as described in the “Design UI Spec”
- Maintains the User Interface Style Guide and ensures that application meets the standards outlined in the Style Guide
- UI Developer develops an electronic prototype in HTML/DHTML using or developing shared UI objects wherever feasible. Shared UI objects are cataloged in the Shared UI Library.
- The UI Developer should review every widget (object) from the Wireframes to determine if an existing shared object can be used or extended to fit this purpose. New widgets should be considered for potential additions to the shared library and should be coded to allow reuse. For example, navigation bars or common functionality can become shared objects that are deployed via Cascading Style Sheets.
- Revise the HTML prototype as per corrections generated in User review sessions and obtain approval of revised version before turning the prototype over to Java Developers for production.
- Add or update any UI widgets developed from the prototype to the Shared UI Library for future reuse.