The LUCID Design Framework
(Logical User Centered Interaction Design)

developed by Cognetics Corporation

LUCID – Logical User Centered Interaction Design – began as a way of describing the approach to interface design at Cognetics Corporation. Over the years, it has evolved into a framework to manage the process of designing an interface in a way which can, if not guarantee, at least encourage software usability.

Its goals are:

- To provide UI designers with a framework within which to apply best practices
- To allow for seamless integration of design and usability activities with software development methodologies
- To support a user-centered approach to interface design
- To enhance the usability of the finished software

	LUCID	
Logical	**User Centered**	**Interaction Design**
The design process builds on a strong conceptual model. Iterative review and refinement includes user feedback at all critical stages. Successive prototypes and team reviews allow opportunities for technical review and ensure viability of the design	Software is designed in the context of the overall tasks and work flow (including both manual and computerized activities). Design is based on user activity and employs the user's language and context. The design model fits the user's mental model rather than the technical implementation model.	Interaction design is treated as distinct from technical design. The scope of the design is "everything but code" and includes: ❑ look and feel ❑ language ❑ screen objects & layout ❑ navigation ❑ user assistance

Over the past 30 years, several techniques for managing software development projects have been developed and documented. While these techniques have helped large software development projects meet time, budget, and quality goals, they do not directly address usability issues. Because most systems being developed today are interactive, software development methodology must be expanded to include the design of the user interface.

The LUCID Framework was developed to fill this need. It is a methodology for designing the interactional components or “front end” of a software product. The LUCID Framework can be integrated with other software engineering methodologies or, for small product development efforts, can be used as a stand-alone methodology.

LUCID is organized into six stages:

Stage 1: **Envision**	Develop UI Roadmap which defines the product concept, rationale, constraints and design objectives.
Stage 2: **Analyze**	Analyze the user needs and develop requirements.
Stage 3: **Design**	Create a design concept and implement a key screen prototype.
Stage 4: **Refine**	Test the prototype for design problems and iteratively refine and expand the design.
Stage 5: **Implement**	Support implementation of the product making late stage design changes where required. Develop user support components.
Stage 6: **Support**	Provide roll-out support as the product is deployed and gather data for next version.

Each of these stages is completed in sequence building the elements of the interface until the design is complete. Many of the tasks within a stage are iterative – repeated in a rapid cycle with review tasks until the result is a satisfactory conclusion. In addition, key documents such as the UI Roadmap and the requirements analysis are reviewed at the end of the design stages to ensure both that any new information is incorporated and that the design work has stayed within the scope outlined in them.

LUCID Stage 1: Envision

The purpose of LUCID Stage 1 is to create a clear, shared vision of the product. This vision is described in the UI Roadmap—a comprehensive high-level document that communicates the design vision, manages expectations, and serves as the basis for evaluating progress throughout the project.

It is difficult to overstate the importance of developing the product concept at the beginning of the project. Although a remarkable number of development projects proceed without a clear product concept, this inevitably leads to serious problems later in development. In addition to communicating the product concept to interested parties, the UI Roadmap is used to guide decision making and evaluate progress throughout the design project.

Goals

❑ create a concise description of the product
❑ identify the business and design objectives that will shape the design
❑ identify constraints on the product
❑ identify the target user population
❑ identify the main functionality of the product
❑ create screen sketches that demonstrate the product concept

Prerequisites

❑ A need has been identified.
❑ The design group has been assembled.
❑ There is corporate support for the project.
❑ The basic technical environment has been identified.

Decisions

1. How will the design group solicit user input? For example, you may bring in users, utilize ‘surrogate users’ (typically someone within your organization who once was a user), or perform field surveys.

2. During Stage 1, you may decide that the design group is missing some desirable skill or type of knowledge. Make sure the design group is appropriate for the project, and reconfigure the group if necessary.

3. Based on the UI Roadmap created at the end of Stage 1, you may need to rethink the project. Possibilities include expanding, shifting, or reducing the scope based on time, budget, or technical constraints.

Tasks

Task 1.1 Create a High Concept Statement for the product
Task 1.2 Identify the business objectives the product will serve
Task 1.3 Identify the user population
Task 1.4 Identify usability goals
Task 1.5 Identify high-level constraints
Task 1.6 Identify high-level functionality
Task 1.7 Produce screen sketches
Task 1.8 Create the project plan
Task 1.9 Create the UI Roadmap

Deliverables

The primary deliverable of LUCID Stage 1 is the UI Roadmap, a comprehensive high-level description of the product.

LUCID Stage 2: Analyze

In LUCID Stage 2, members of the design group work with representatives of the user community to document work processes and identify specific needs. This information is used to produce the requirements analysis.

Because the design team must understand the setting in which the product will be used, LUCID Stage 2 begins with a review of the environment in which the product will be used. Next, the users are divided into groups with similar needs and a data-gathering plan is developed. Then, after data has been gathered, it is used to describe the work flow. Various methodologies may be used to extract functionality requirements from the work flow.

Goals

The primary goal of Stage 2 is to uncover the underlying workflow process and develop a set of objects to represent it. In order to do this, the design team must first understand the requirements in job-related (rather than technical) terms, and then identify key objects that will be used to display, manipulate, or store data.

Prerequisites

❑ LUCID Stage 1 has been completed.

❑ The high product concept statement, business objectives, user population, usability goals, and high level functionality and constraints have been defined and documented.

❑ Preliminary screen sketches have been created.

Decisions

1. How will you gather data? Will you visit customer sites, bring customers in, arrange focus groups, perform observations, or interview user surrogates?
2. Will re-engineering be considered during Stage 2? Your organization may mandate that it be included in the development process, and some minor re-engineering can be incorporated in the LUCID Design Framework. However, major re-engineering should be separated from user interface design.
3. How will you analyze the data to document the work flow?
4. How will you extract the functional requirements from the work flow?

Tasks

Task 2.1 Team preparation
Task 2.2 Segment the user population
Task 2.3 Create a plan for gathering data
Task 2.4 Gather data
Task 2.5 Review and organize data
Task 2.6 Document the work flow
Task 2.7 Extract functionality and requirements
Task 2.8 Create the requirements analysis

Deliverables

The primary deliverable of LUCID Stage 2 is the requirements analysis.

LUCID Stage 3: Design

In LUCID Stage 3,the product’s basic design, including overall navigation, screen layout and visual design and information or work-flow organization, is defined. The design is iterated through user and expert reviews until the team is satisfied that the design concept meets usability goals and is strong enough to be used for complete UI design specifications.

Goals

The key goal of Stage 3 is the development of the key screen prototype, which will be used as the basis for the interface design specifications in Stage Task 4. The key screen prototype demonstrates the software’s basic navigation and ‘look and feel,’ as well as screen layout and critical screen objects. The key screen prototype typically includes the entry to the program; the basic home screen; major branches off the home screen; and examples of screen objects used to collect, manipulate or present data.

Prerequisites

LUCID Stages 1 and 2 have been completed.

Decisions

1. Will the product include a conceptual metaphor? While a conceptual model is required, a metaphor is optional.
2. Do you want to investigate several different design alternatives and/or ‘looks’ before creating the key screen prototype? Low fidelity paper prototypes can be used to compare several different approaches before making the selection for the key screen prototype.
3. What type of prototype will be created initially? At the end of this Stage? Three basic types are possible: low fidelity paper prototypes; medium fidelity on-screen prototypes; and high fidelity on-screen prototypes.
4. What methods will you use to obtain feedback on the prototype(s)? Possibilities include demonstration/user review, expert evaluation, and usability testing.

Tasks

Task 3.1 Develop the conceptual model and metaphor (if used)
Task 3.2 Develop and test the design concept
Task 3.3 Develop a low-fidelity prototype
Task 3.4 Conduct informal usability tests
Task 3.5 Develop a visual design
Task 3.6 Test the visual design (optional)
Task 3.7 Create the key screen prototype
Task 3.8 Usability test the key screen prototype
Task 3.9 Review the UI Roadmap, Product Concept and Requirements Analysis and revise them if necessary

Deliverables

The primary deliverable of LUCID Stage 3 is a key screen prototype that demonstrates the basic design of the software product.

Stage 4: Refine

In LUCID Stage 4, iterative refinement is used to transform the prototype into a complete specification. Two processes are used to expand the prototype: elements that were not fully detailed are fleshed out, and designs are added for functions that were not originally included. As new elements are added to the prototype, additional heuristic reviews and/or usability tests are conducted.

Goals The key goal of Stage 4 is to complete the development of the prototype and create the specifications for the interface design, which the developers can use to implement the program.

Prerequisites LUCID Stage 3 key screen prototype has been completed.

Decisions

1. Will the key screen prototype be completely developed into a full working model of the interface, or will only representative screens be created?
2. Will the specifications be complete before “back end” programming begins? If not, how will the team ensure that the systems design will support the complete interface?
3. How will new design elements be tested during this stage?
4. Will there be a final usability test of the prototype, or will usability testing of the general interface be done on early versions of the completed software (during Stage 5)?
5. How formal will the design specifications be?
6. Will the style guide be developed for this application or also be used for other interface designs?

Tasks Task 4.1 Complete the design for all functionality
Task 4.2 Review and evaluate the expanded prototype
Task 4.3 Create an interface style guide
Task 4.4 Create formal design specifications

Deliverables The primary deliverables of LUCID Stage 4 are a working model of the user interface, a style guide, and the interface design specification

LUCID Stage 5: Implement

Once the design specification created in Stage 4 is passed to the programming team, the technical development process begins to take precedence. However, the design team continues to play a role in the development process, addressing design changes mandated by unexpected technical problems as they occur.

In addition, the installation procedures must be designed and tested. Another parallel development effort is that of creating on-line help, user documentation, and any required tutorials. Whether the design team itself works on the creation of these elements, or coordinates with user assistance specialists, these elements can be critical to the user acceptance of the program and should not be overlooked.

Goals

The goal Stage 5 is to make any design changes required by unexpected technical problems, and monitor the development work for usability problems which may be introduced. Simultaneously, the designers support the development of user support materials such as on-line help and tutorials, and of the installation program.

Prerequisites

The design and specifications are complete and have been delivered to the programming team.

Decisions

1. What changes during implementation require user review, and how will that review be carried out?
2. How will the installation program be tested?
3. Is a final user test of the "out of the box" experience required, and how will it be conducted?
4. How will user assistance materials be tested?

Tasks

Task 5.1 Manage late stage change
Task 5.2 Develop and test user assistance components
Task 5.3 Design and test the installation program or procedure
Task 5.4 Test the "out of box" user experience (optional)

Deliverables

The primary deliverables of LUCID Stage 5 are programming team support, the design of the installation program and the participation in the development of the required user support elements.

LUCID Stage 6: Support

In LUCID Stage 6, the new product is released to the user community. This phase, often unplanned, is critical to the acceptance of the product.

Although the design team may feel that their work is complete once the product and supporting materials have has been created, usability support is critical during Stage 6.

Goals The key goal of Stage 6 is the successful introduction of the new product into the workplace or marketplace.

Prerequisites LUCID Stages 1-5 have been completed, and the product has been created by the programming team.

Decisions:

1. How will the product be introduced to users or the market?
2. Is the next version of the product already planned? If so, what information must be gathered from users of this version to prepare for that release?

Tasks

Task 6.1 Develop a release plan
Task 6.2 Evaluate the product and prepare for the next version

Deliverables The deliverables for Stage 6 are a release plan, an assessment of user satisfaction with the product, and a list of usability issues that should be addressed in future versions.

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