Position Paper for: Creating a Usability Ontology

Duane Degler
IPGems

Lisa Battle
Design for Context

Background and Experience

- *Describe your education, work experience, and interest in the topic.*

Duane is a consultant with a diverse background in usability, knowledge/content management, system development, organizational communication, technology, multimedia and training, which all contribute to his multi-disciplinary approach to design. As an extension of his work, Duane supports usability, semantic web, and content management communities of practice.

Lisa is a usability and design consultant, who started in technical writing before moving into the usability field. She now focuses primarily on user needs analysis and interaction design activities in the early part of the software development lifecycle, leading to usable systems.

We are both participants in the UPA Body of Knowledge working group, and have been contributors to that effort over the past two years. Lisa is the content editor for the design section of the BoK.

Goals

- *Do you have a need for a usability ontology in your work or volunteer projects? Why do you want to participate in the workshop?*

Our goal for this workshop is to jump-start the effort to create an ontology that we can use for the Body of Knowledge, and to connect the BoK to various UPA publications. We hope to meet other interested people who are willing to contribute their time and expertise to the effort.

We know that there can be many different interpretations of terms and their relationships, so one goal is to support the UPA's ability to gain consensus while fostering diverse opinions.

Experience with Ontologies

- *Describe any prior experience related to the creation or use of ontologies in any subject domain.*

For the past few years, Duane has been developing innovative policy content management and ontology management applications for the Social Security Administration, as part of a team from Lockheed Martin. As part of this work, he has worked with subject experts on the development of domain ontologies and facilitated ontology working sessions on an ongoing basis for the past five years. Prior to that, he

has developed navigation schemes and controlled vocabularies for a range of metadata-driven applications and user support tools.

Lisa has applied her cognitive psychology and technical writing backgrounds to the design challenges of context-driven applications, using common user terminology to improve understanding and usability.

Input to Usability Ontology

- *Raw materials contributed as starting points for the creation of a usability ontology (include information on the rights of use for these materials). This section should be the focus of the position paper.*

Our input to the usability ontology workshop is based on draft content outlines for design and organizational topics that Lisa originally produced for the Usability BoK working group, as well as a list of methods produced by other members of the working group. We believe that these lists are incomplete and will need to be reorganized, but they have served as a starting point for authoring content in the Body of Knowledge, and we see many valuable items in these lists that should be included in a usability ontology.

Some of the Methods terminology may be derived from early draft work done in the international standards community. The final rights and provenance of some terms are still being determined by members of standards workgroups working with the BoK team.

Methods

Method Name	Lifecycle stage
Analyse Content	1. Planning
Getting Started	1. Planning
ISO 13407	1. Planning
Planning	1. Planning
Stakeholder Meeting	1. Planning
Analyse Context	2. Context of Use
Artifact Walkthrough	2. Context of Use
Case Studies	2. Context of Use
Contextual Inquiry	2. Context of Use
Diaries / Journals	2. Context of Use
Future Workshops	2. Context of Use
Private camera conversations	2. Context of Use
Stories	2. Context of Use
Field Study	2.1 Context: Users
Participant Observation	2.1 Context: users
Personas	2.1 Context: users
User Observation	2.1 Context: users
User Profiles	2.1 Context: users

Method Name	**Lifecycle stage**
User Surveys	2.1 Context: users
Ethnographic interviews	2.1.1 Interviews
Interviews	2.1.1 Interviews
Participant Recruiting	2.1.1 Interviews
Semi-structured interviews	2.1.1 Interviews
Structured interviews	2.1.1 Interviews
Telephone surveys	2.1.1 Interviews
Unstructured interviews	2.1.1 Interviews
Essential use cases	2.2 Scenarios
Scenarios of Use	2.2 Scenarios
Timeline scenarios	2.2 Scenarios
Use Cases	2.2 Scenarios
Focus Groups	2.3 User feedback
Kano Method	2.3 User feedback
Online Focus Groups	2.3 User feedback
User Group Feedback	2.3 User feedback
Work environment analysis	2.4 Environment
Competitive Analysis	3. Requirements
Cost-Benefit Analysis	3. Requirements
QFD	3. Requirements
Requirements Meeting	3. Requirements
Evaluating Existing Systems	3.1 Competitive Analysis
Brainstorming	3.2 Ideas
Brainwriting	3.2 Ideas
Icon Design Game	3.2 Ideas
Laddering	3.2 Ideas
Metaphor Brainstorming	3.2 Ideas
Mind maps	3.2 Ideas
Nominal group technique	3.2 Ideas
PICTIVE	3.2 Ideas
Affinity Diagramming	3.3 Organising
CARD	3.3 Organising
Card Sorting	3.3 Organising
KJ Method	3.3 Organising

Method Name	**Lifecycle stage**
Repertory Grid	3.3 Organising
Contextual Task analysis	3.4 Tasks
Hierarchical Task Analysis	3.4 Tasks
Task Analysis	3.4 Tasks
Fitts' law	3.5 Analytical
GOMS KLM	3.5 Analytical
Claims Analysis	4. Design
Design Guidelines	4.1 Guidelines
Interface Design Patterns	4.1 Guidelines
Style Guides	4.1 Guidelines
Experience Prototyping	4.2 Prototypes
Interface Theater	4.2 Prototypes
Medium Fidelity prototypes	4.2 Prototypes
Paper Prototyping	4.2 Prototypes
Participatory Evaluation/Design	4.2 Prototypes
Rapid Prototyping	4.2 Prototypes
Screen-based interactive prototypes	4.2 Prototypes
Sketching	4.2 Prototypes
Storyboard Prototyping	4.2 Prototypes
Storyboarding	4.2 Prototypes
Vision Prototyping	4.2 Prototypes
Parallel Design	4.3 Design methods
Meta-Analysis	5. Evaluation
Usability Bugs	5. Evaluation
Cognitive Walkthrough	5.1.1 Inspection
Consistency Inspections	5.1.1 Inspection
Expert Evaluation	5.1.1 Inspection
Feature inspections	5.1.1 Inspection
Formal inspections	5.1.1 Inspection
Heuristic Evaluation	5.1.1 Inspection
Individual expert reviews	5.1.1 Inspection
Perspective-based inspections	5.1.1 Inspection
Pluralistic Walkthrough	5.1.1 Inspection
Role Playing walkthrough	5.1.1 Inspection

Method Name	**Lifecycle stage**
Usability walkthroughs	5.1.1 Inspection
Accessibility testing	5.2 Testing
Controlled experiments	5.2 Testing
Eye Tracking	5.2 Testing
Icon Testing	5.2 Testing
Post Release Testing	5.2 Testing
Remote Evaluation	5.2 Testing
Retrospective Evaluation	5.2 Testing
Usability Study/Test (Classic)	5.2 Testing
Wizard of OZ	5.2 Testing
Cooperative Evaluation	5.2.1 Formative evaluation
Critical Incident Technique	5.2.1 Formative evaluation
Diagnostic Evaluation	5.2.1 Formative evaluation
Evaluate Prototype	5.2.1 Formative evaluation
Information Race	5.2.2 Summative evaluation
Performance Testing	5.2.2 Summative evaluation
Image-for-meaning icon test	5.2.3 Feature evaluation
Meaning-for-image icon test	5.2.3 Feature evaluation
Mix and match icon testing	5.2.3 Feature evaluation
Readability formulas	5.2.3 Feature evaluation
Standards inspections	5.2.3 Feature evaluation
Pleasure	5.3. Subjective evaluation
Pop-up Web Surveys	5.3. Subjective evaluation
Subjective Assessment	5.3. Subjective evaluation
Subjective Evaluation	5.3. Subjective evaluation
User Satisfaction	5.3. Subjective evaluation
QUIS	5.3.1 Questionnaires
SUMMI	5.3.1 Questionnaires
Survey / Questionnaires	5.3.1 Questionnaires
SUS	5.3.1 Questionnaires
TLX Subjective Workload Questionnaire	5.3.1 Questionnaires
WAMMI	5.3.1 Questionnaires
Beta Questionnaires	
Blueprint Mapping	

Method Name	**Lifecycle stage**
Checklists	
Cognitve mapping	
Concept Mapping	
Constructive interaction	
Co-participation	
Critical Decision Method	
CUTA	
Descriptive Artifacts (Collages/Albums)	
Discourse Analysis	
Document analysis	
Fishbone diagram	
Force-field diagrams	
Forum Theaters	
Group Elicitation Method	
Horizontal/Vertical prototypes	
Icon attribute ratings	
Icon brainstorming	
Interaction diagrams	
Kansei engineering	
Link analysis	
Logging	
Online self-reports	
Organizational Game	
Peer review	
Pivots (physical mockups of task environments	
Product Personality assignment	
Question, Options, Criteria (QOC)	
Reaction checklists	
Read and Locate Test	
Reverse Card Sorting	
Rich Picture	
RITE	
Root Cause Analysis	
SEQUAM (Sensorial quality assessment)	

Method Name	**Lifecycle stage**
Sign diagram	
Statechart diagrams	
Summary Test	
Teachback	
Technical Support Debriefings	
Unattended recording	
Unobtrusive Measures	
Usability Roundtables	
User Edits	
Work Mapping	

Organizational Topics

1) Usability capability of an organization
    a) Usability Maturity Model
2) Introducing UCD into an organization
    a) Organizational change
    b) Obstacles to change
    c) Strategy for change
    d) Managing change
    e) Environmental assessment
    f) Foot in the door
    g) One-person usability department
    h) Growing a team
    i) Pilot projects
    j) Influencing product design
    k) Executive level champions
    l) Grass-roots supporters
    m) Institutionalizing usability/UCD
    n) Disbanded usability/UCD team
3) Integration with the lifecycle
    a) Software engineering
    b) Requirements engineering
    c) Lifecycles
        i) Waterfall
        ii) RUP
        iii) Cyclical lifecycles
        iv) Agile/XP
    d) Role overlaps
        i) Requirements analysts
        ii) Developers
        iii) Graphic designers
        iv) Marketing
4) Educating about usability
    a) Educating at the grassroots level
    b) Educating management
    c) "Selling" usability
    d) Training
    e) Informal knowledge-sharing
5) Managing a usability/UCD group
    a) Hiring
    b) Roles
        i) Skills
        ii) Mentoring
        iii) External consultants
    c) Contracting
    d) Managing a team
    e) Leadership
    f) Collaborative work
    g) Creative people
    h) Professional development
    i) Integrating new team members
    j) Growing from small to large team
    k) Changing roles of people on an existing team
6) Positioning within an organization
    a) Where in the organization should a usability/UCD group belong?
    b) What to call the usability/UCD group (usability, user experience, user research, etc.)
    c) Centralized
    d) Decentralized
    e) Matrixed team
    f) Building relationships
        i) Relationships with IT/Systems
        ii) Relationships with other organizations that promote quality
        iii) Relationships with management
        iv) Cultivating an executive champion
    g) Department where usability/UCD group is located
        i) UCD in IT/Systems/Engineering departments
        ii) UCD in Marketing departments
        iii) UCD in Training departments
    h) Type of company

   i) UCD in new start-up companies
   ii) UCD in small companies
   iii) UCD in large companies

7) Managing UCD projects
   a) Multidisciplinary teams
   b) Distributed or “virtual” project team
   c) Scalable
   d) Flexible
   e) Scope
   f) Project planning
   g) Level of effort estimates
   h) Cost estimates
   i) Analyzing and managing risks
   j) Creating project plans
   k) Deliverables
   l) Lessons learned
   m) Prioritizing use of usability/UCD resources
8) Creating and Managing Infrastructure for Usability/UCD
   a) Processes
   b) Tools
   c) Templates
   d) Standards
   e) Style guides
   f) Work spaces
      i) Usability labs
      ii) Design rooms
      iii) Facilitation rooms
   g) Training

Design Topics

1) Introduction to design
    a) Types of design
        i) Interaction design
        ii) Visual design
        iii) Information design
        iv) Other design disciplines
2) Design principles and heuristics
    a) Simplicity
    b) Error prevention
    c) Self evidency
    d) Efficacy
    e) Progression
    f) Support
    g) Context
    h) Structure
    i) Visibility
    j) Feedback
    k) Tolerance
    l) Consistency
    m) 80/20 rule
    n) Progressive disclosure
    o) Error prevention
    p) Plain language
    q) Make common tasks easy
    r) Match the user's view of the task
    s) Recognition rather than recall
3) Foundations
    a) HCI
    b) Human factors
    c) Cognitive psychology
    d) Perception
        i) Memory
        ii) Sensory storage
        iii) Information processing
        iv) Mental models
        v) Learning
        vi) Skill
            (1) Novices
            (2) Experts
            (3) Perpetual intermediates
        vii) Chunking
        viii) Error types
        ix) Fitts' Law
        x) Mental models: representations of systems derived from experience (Lidwell, 130)
        xi) Wayfinding
    e) Visual considerations
        i) Eye movements
        ii) Reading direction
        iii) Eye tracking
        iv) Visual attention
        v) Visual acuity
        vi) Gestalt
    f) Physical considerations
        i) Movement control
    g) Environmental considerations
    h) Accessibility
        i) Universal usability
        ii) Accessibility Standards:
            (1) Section 508
            (2) WAI
        iii) Multiple views
        iv) Low vision
        v) Blind
        vi) Mobility impairments
        vii) Deaf
        viii) Cognitive disabilities
        ix) Seniors
        x) Aging
        xi) Children
4) Conceptual design
    a) Types of applications

- i) Type of conversation and interaction
- ii) Frequency of use
- iii) Response time

b) Matching the user's mental models

c) Metaphors

d) Idioms

5) Navigation design

a) Depth vs breadth

b) Orientation

c) Signposting

d) Progress indicators

e) Process indicators

f) Breadcrumbs

6) Interaction design

a) Page layout

b) Primary windows

c) Secondary windows

d) Dialog boxes

e) Frames

f) Page elements

- i) Menus
  - (1) Organization of menu items
  - (2) Naming menus and options
  - (3) Cascading menus
  - (4) Expanding menus
- ii) Toolbars
- iii) Tooltips

g) Affordances

h) Undo

i) Data retrieval

- i) Search
  - (a) Boolean
  - (b) Full-text
  - (c) Faceted
- ii) Filtering

j) Data entry

k) Defaults

l) Selection methods

- i) Direct manipulation
- ii) Drag and drop
- iii) Pointing devices

m) Mapping of controls to functions

n) Wizards

o) Modes

p) Feedback

- i) Status
- ii) Progress indicators
- iii) Alerts
- iv) Confirmation messages,
- v) Pop-ups,
- vi) Auditory feedback

q) Error messages

r) Controls/widgets

- i) Radio buttons
- ii) Drop-down lists
- iii) Tabs
- iv) Drop-down/ pop-up/ roll up menus
- v) Command buttons
- vi) Radio buttons
- vii) Check boxes
- viii) Text boxes
- ix) List boxes
- x) Multiple selection list boxes
- xi) Tables and grids
- xii) Sliders
- xiii) Tree views
- xiv) Push buttons
- xv) Bread crumbs
- xvi) Required fields
- xvii) Inactive controls grayed out

s) Data entry formats

- i) Addresses

- ii) Currency
- iii) Calendar/date
- iv) Credit card numbers
- v) SSNs

t) Combinations of buttons
- i) OK and Cancel
- ii) Back and Continue

u) Adaptive interfaces

v) Multimodal interfaces

w) Personalization

x) Customization

y) User preferences

7) Internationalization
- a) Internationalization
- b) Localization
- c) Translation

8) Platform-specific design issues
- a) GUIs
- b) Web
  - i) Web sites
  - ii) Web applications
- c) Embedded systems
- d) Handheld devices
- e) Kiosks
- f) Hardware

9) Information design
- a) Organizing information
- b) Chunking information
- c) Readability
- d) Plain language
- e) Information embedded in an application
  - i) Screen text
  - ii) Field labels
  - iii) Online help
  - iv) Context-sensitive help
- f) Information visualization
  - i) 3-d displays
  - ii) Fisheye views
  - iii) Graphs
  - iv) Charts
  - v) Focus+context
  - vi) Visual comparisons

10) Graphic design/ Visual design
- a) Principles
  - i) Visual noise
  - ii) Clutter
  - iii) Contrast
  - iv) Similarity
  - v) Differentiation
  - vi) Grouping
  - vii) Emphasis
  - viii) Proximity
  - ix) Alignment
  - x) Grid
  - xi) Balance
  - xii) Visually pleasing composition
  - xiii) Legibility
  - xiv) Mapping
  - xv) Modularity
- b) Icons
- c) Branding elements
- d) Fonts
- e) Colors
- f) Backgrounds
- g) Animation
- h) Multimedia

11) Patterns

12) Standards