

Issue #1: 🔐 User-Centered Design Guidance

Repository: CherrelleTucker/codesign-toolkit **URL:**

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🔧 User-Centered Design Guidance

Practical Framework for Co-Developing Earth Observation Solutions with Users

Tool Category: Technical Co-Development | **Phase:** Cross-Cutting | **Difficulty:** ✅ Intermediate

Systematic approach for integrating real user workflows, abilities, constraints, and decision needs into the technical design and development process throughout Earth observation solution co-development.

📋 Tool Summary Card

Attribute	Value
🎯 Purpose	Provide structured methods for user-centered design throughout solution development lifecycle
⌚ Time Required	Ongoing integration: 2-4 hours weekly user engagement + milestone-specific activities
👥 Participants	Development team + user representatives + stakeholder engagement lead + UX specialist
📊 Outputs	User requirements, design specifications, validated prototypes, implementation plans
🔄 Frequency	Continuous process with structured touchpoints at each development phase
💼 Materials	User research tools, design templates, testing protocols, documentation frameworks

🎯 When to Use This Tool

✓ Essential For:

- Earth observation solution development projects with multiple stakeholders and complex user needs
- Teams committed to creating solutions that users will actually adopt and find valuable

- Projects requiring systematic user engagement throughout development lifecycle
- Organizations prioritizing user-centered design and co-development approaches

Particularly Valuable When:

- Developing solutions for users with complex workflows and decision-making processes
- Creating tools that must integrate with existing organizational systems and procedures
- Building solutions where user adoption is critical for project success
- Working with diverse user groups across different organizations and contexts

Consider Alternatives When:

- Purely technical research projects without direct user applications
- Single-user or very small team solutions with informal feedback mechanisms
- Projects with extremely tight timelines that cannot accommodate iterative user engagement

Prerequisites:

- Access to representative users throughout development process
 - Organizational commitment to user-centered design principles
 - Resources for ongoing user engagement and iterative development
 - Team training on basic user-centered design concepts
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User-Centered Design Fundamentals

What is User-Centered Design?

Definition and Core Concept:

User-Centered Design (UCD) is a collaborative approach to solution development in which developers work together with end users to formulate solutions and implementation plans. Co-design fosters an environment where users participate in the solution space, providing insight into workflows and decision-making processes during structured engagement touchpoints.

Key Characteristics:

Characteristic	Description	In Practice
 Collaborative	Users are partners, not just subjects	Joint workshops, shared decision-making, co-creation sessions
 Iterative	Continuous feedback and improvement cycles	Regular testing, rapid prototyping, incremental refinement
 Context-Aware	Deep understanding of user environments	Workflow observation, constraint analysis, organizational factors
 Evidence-Based	Decisions grounded in user research	Data-driven choices, validated assumptions, documented rationale
 Outcome-Focused	Success measured by user value delivery	User satisfaction, adoption rates, workflow integration

Six Foundational Principles

► 🔎 Core UCD Principles Framework

📊 Phase-Based UCD Implementation

🔍 Phase 1: Needs Assessment & Opportunity Analysis

Objectives and Approach:

Goal: Identify core needs, relevant stakeholders, and solution opportunities through participatory engagement

► 📋 Phase 1 Activities and Methods

🛠️ UCD Methods and Tools Reference

🔍 User Research Methods

Discovery and Analysis Techniques:

Method	Purpose	When to Use	Time Required	Participants
💬 Discovery Interviews	Understand user needs and contexts	Early needs assessment, requirement validation	60-90 min each	5-8 representative users
📊 Stakeholder Mapping	Identify and analyze relationships	Project initiation, scope definition	Half-day workshop	4-8 team members
📋 Workflow Analysis	Document current processes	Requirements phase, integration planning	2-4 hours observation + analysis	Process owners, observers
🔗 Information Flow Mapping	Trace data pathways	Systems integration, bottleneck identification	3-4 hour workshop	4-6 process participants
📝 Needs Assessment Surveys	Validate priorities across user base	Initial consultation, broad validation	15-20 min per respondent	Large user population

🎨 Design and Specification Tools

Collaborative Design Techniques:

Tool	Purpose	Application	Outputs
🤝 Co-Design Workshops	Collaborative solution definition	Requirements gathering, design	Requirements, mockups, decisions

		validation	
 User Journey Mapping	Workflow integration planning	Solution design, touchpoint identification	Journey maps, integration plans
 Requirements Canvas	Structured requirement capture	Specification development, validation	Detailed requirements, criteria
 Interface Mockups	Visual design collaboration	UI/UX design, user feedback	Wireframes, prototypes, feedback
 Technical Specifications	Development requirement translation	Implementation planning, validation	Technical docs, architectures

Testing and Validation Methods

User Validation Techniques:

Method	Focus	Best For	Success Metrics
 Usability Testing	Task completion and user experience	Interface validation, workflow testing	Completion rates, time on task, satisfaction
 Prototype Reviews	Feature validation and feedback	Development milestones, design decisions	User approval, improvement priorities
 A/B Testing	Design option comparison	Alternative evaluation, optimization	Performance comparison, user preference
 Acceptance Testing	Comprehensive solution validation	Pre-deployment, quality assurance	Requirements compliance, user approval
 Soft Launch Testing	Real-world usage validation	Final validation, deployment preparation	Adoption rates, issue identification

Documentation and Communication

Knowledge Capture Framework:

Document Type	Purpose	Audience	Update Frequency
 User Requirements	Specification and validation	Development team, users	As requirements evolve

 Design Rationale	Decision documentation	Team members, stakeholders	After major decisions
 Testing Reports	Validation and improvement	Development team, management	After testing cycles
 User Guides	Adoption enablement	End users, trainers	With feature releases
 Success Stories	Impact demonstration	Stakeholders, leadership	Quarterly or as achieved

Co-Design Touchpoint Framework

Structured Engagement Timeline

Touchpoint Overview:

A "touchpoint" is a structured opportunity to engage users and solicit feedback throughout the solution lifecycle, ensuring continuous user involvement and validation.

Complete Touchpoint Schedule:

-  **Comprehensive Touchpoint Timeline**

Best Practices and Common Pitfalls

UCD Best Practices

Engagement Excellence:

-  **Proven Success Strategies**

Integration with Other Tools

Tool Integration Matrix:

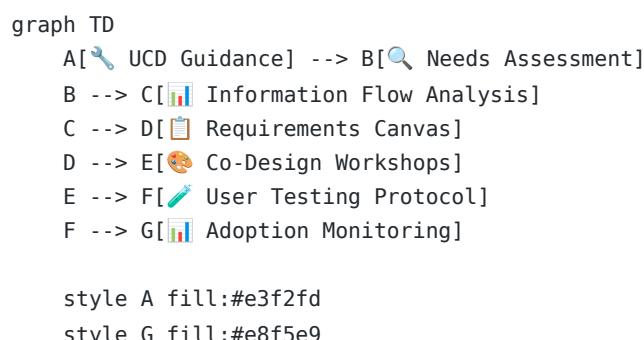
Integration Type	Tool	Information Exchange
 Foundational For	 Needs Assessment Tool	UCD principles guide needs assessment approach
 Foundational For	 Information Flow Analysis	User-centered approach to understanding workflows
 Foundational For	 Requirements Definition Canvas	UCD methods for collaborative requirements development
 Enables	 Co-Design Workshop Facilitator Manual	UCD principles for effective workshop facilitation

Enables	User Testing Protocol	Systematic approaches for user validation
Informs	Adoption Monitoring Dashboard	User-centered metrics and success criteria
Informs	Designing for Impact 101	User-centered design as foundation for impact

Process Integration Points:

Development Phase	UCD Integration	Key Touchpoints	Success Criteria
Project Initiation	User problem validation	Stakeholder engagement, needs assessment	Clear user problems identified
Requirements Development	Collaborative specification	Co-design workshops, requirement validation	User-approved requirements
Solution Design	User-centered design process	Design reviews, prototype testing	User-validated designs
Development	Iterative user validation	Regular testing, feedback integration	User satisfaction with progress
Deployment	User adoption support	Training, support, monitoring	Successful user adoption

Cross-Tool Workflow Example:



Workflow Description:

1. **UCD Guidance** provides principles and methods
2. **Needs Assessment** applies UCD to understand users
3. **Information Flow Analysis** maps user workflows
4. **Requirements Canvas** captures user-centered specifications
5. **Co-Design Workshops** collaboratively define solutions
6. **User Testing** validates solutions with users
7. **Adoption Monitoring** measures user-centered success

Source Attribution

Primary Sources:

- **Solution Co-Development Toolkit Narrative** - Core user-centered design approach and iterative development methodology for Earth observation solutions
- **NSITE Solution Project Plan Template** - User engagement requirements and co-design expectations for EO solution projects
- **NSITE Solution Project Requirements and Expectations** - User-centered design standards and validation requirements

Supporting Sources:

- **SERVIR Service Design Tool 2021** - Collaborative service design methodologies and stakeholder engagement approaches
- **SERVIR Stakeholder Mapping Tool 2021** - Participatory stakeholder analysis and engagement planning methods
- **MSFC Coordination on Solutions Co-Development Toolkit** - Multi-stakeholder coordination and user engagement best practices

Supplementary Sources:

- **NSITE SEP and Co-Design Plan, Vision, Structure** - Structured touchpoint framework and engagement timeline
- **SERVIR Service Planning Toolkit 2021** - Context awareness and user workflow analysis approaches
- **Information Chain Analysis Overview** - Information flow mapping and decision pathway analysis methods

Methodology Foundation:

- User-centered design principles from human-computer interaction and design thinking literature
- Participatory design methodologies from collaborative software development practice
- Co-design approaches from service design and social innovation research
- Agile development methods adapted for user-centered solution development

Community Discussion

Share your user-centered design experience:

- What user engagement approaches have been most effective for your Earth observation solution projects?
- How do you balance comprehensive user research with project timeline and resource constraints?
- What techniques work best for facilitating productive collaboration between technical teams and diverse user groups?
- How do you maintain user engagement and motivation throughout long development cycles?

Tool improvements:

- What additional UCD methods would be valuable for Earth observation solution contexts?
- How do you adapt user-centered design approaches for different organizational cultures and technical environments?

- What metrics and indicators have been most useful for tracking UCD process effectiveness?

 **Tool Maintainer:** @your-username |  **Last Updated:** [Today's Date] |  **Version:** 1.0