DESIGN RESEARCH IN THE CONTEXT OF FEDERAL LAW ENFORCEMENT

BARBORA BATOKOVA, ANNE CONNELL & TODD WAITS Carnegie Mellon Software Engineering Institute

IEEE INTERNATIONAL PROFESSIONAL COMMUNICATION CONFERENCE OCTOBER 11-13, 2014

INTRODUCTION



Design research facilitates the conceptual development, planning and making of **products that meet the needs of human beings**.

DESIGN RESEARCH

Helps us identify the **needs of future users**.

Integrates **specialized knowledge** into meaningful solutions.

Creates **structured and productive conversations** among team members and the client.

Builds credibility of the team and their process.

Creates value for the client.



Exploratory

Helps us understand people and their behaviors, perceptions, experiences, needs and desires.

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Generative

Provides for effective development of new ideas and concepts, leading to innovation.



Evaluative

Helps systematically test products for their usability, usefulness and desirability.

DESIGN RESEARCH IN CONTEXT





PROJECT OVERVIEW

Client Federal Law Enforcement Agency

Challenge

Create a software and hardware solution to automate and standardize the processing and collection of paper-based evidence using OCR.

Resources

18 Months | Team of 3–7 | 50–100% effort

PROCESS OVERVIEW

APPLICATION



Research

Secondary Research **Contextual Inquiry** Literature Review Hardware Assessment

Synthesis

Stakeholder Matrix Current System Model Task Flow Analysis **Content Analysis** Key Findings **Design Implications**

Analytics		Reminders	Monthi	y Activity	
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Concept Development

System Components Model Hardware Architecture System Workflow User Workflow Software Architecture Wireframes Interactive Prototype **Concept Validation Identity Standards** Screen Designs

Implementation

Agile Software Development Task Completion Testing **Iterative Deployments Usability Testing** Unit Tests

Transition

Collaborative Integration Stakeholder Touchpoints **Expansion Proposals**

DOCUMENTATION

Needs Assess	sment			
	System Requireme	ents Specification		
		System Desi	ign Document	
		Concept Validation Report	Usability Testing Plan	Technical Documentation
			User	Guide
				Training Materials

DESIGN RESEARCH CHALLENGES

Laws and regulations affecting our access to data and target audience.

Working in the data-sensitive realm of **cybersecurity**, **digital intelligence**, and **evidence processing**.

Restricted physical access to people and places to conduct design research.

Dissemination of information stemming from the gathered data.



RESEARCH

CONTEXTUAL INQUIRY

Immersive observation and interviewing of people that reveals underlying (and invisible) work structure.

Data

Visits to 5 field offices Six 2-hour sessions

Purpose

Understand our future users, their environment and current processes. Uncover tacit knowledge.

SYNTHESIS

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STAKEHOLDER RESPONSIBILITY MATRIX

Maps the key participants and their responsibilities within a defined workflow.

Purpose

Understand the varying roles and needs for the new solution.

Identify the primary user to keep in mind when making design decisions.

TASK FLOW ANALYSIS

Breaks down the elements of a user's workflow, including actions and interactions, system response, and environmental context.

Data

Observed steps Discrepancies Pain points

Purpose

Understand the primary user's current sequence of tasks so that the future solution could enable their completion.

CURRENT SYSTEM MODEL

Visualizes the interactions, connections and breakdowns among actors, artifacts and technology.

Data

Observed steps Discrepancies Pain points

Purpose

Analyze the communication and data flows among the various elements of the observed system

KEY FINDINGS

Lack of automation causing significant delays and breakdowns within the entire process.

Manual processing and entry of information was very tedious and allowed for human error.

Overwhelming amounts of evidence and related information.

Purposeful **omission of information** ocurred to speed up the process.

Untimely intelligence gathering.

DESIGN IMPLICATIONS

Integrate with existing systems and databases to close the information gap.

Use high-speed scanners to **automate the intake** of evidence and related information.

Use OCR technology to provide efficient, complete and **accurate records**.

Provide **contextual information** to aid in intelligence gathering and pattern identification.

Create a **unified methodology** to help standardize processing.

Daily Activity 🗸

Analytics







Keminders

Monthly

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CONCEPT DEVELOPMENT

SYSTEM & USER WORKFLOWS

Define the overall system stages and individual steps of a process.

Purpose

Define a unified methodology and approach for evidence processing.

Define specific software and hardware requirements.



USER WORKFLOW 1 (ABSTRACTED)

	Stage 1		Stage 2	0	Stage 3		
1	Step Description		Step Description		Step Descript		
2	Step Description		Further instructions or notes about Step 5.	9	Further instru about Step 6.		
Z	Further instructions or notes about Step 2.	5	Another note about Step 5.		Step Descript		
	Step Description		Instructions on how to	10	Further instru		
3	Further instructions or notes		during Step 5.		about Step 6.		
	about Step 3.		Step Description		Further instru about Step 5.		
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					Another note		
4					Instructions o		
	Instructions on how to	8	Step Description		handle a spec		
	handle a special use case during Step 4				during otop J		

WIREFRAMES

Visualize the identified requirements and establish content and functionality in the form of a simplified graphical user interface.

Purpose

Establish core functionality.

Validate high level requirements with the client. Validate concept and overall workflow.

WIREFRAME 1 (ABSTRACTED)



WIREFRAME 1 (ABSTRACTED)

nalytics



2,378 Processed Evidence



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Monthly Activity



CONCEPT VALIDATION / TESTING

Combined wireframes, task completion analysis, usability testing and a survey to create an interactive PDF to test the concept.

Data

4-hour teleconference call with 27 participants from 24 field offices.

Purpose

Validate concept with future users. Get feedback for future iterations.



IMPLEMENTATION

PAPER-BASED DATA CAPTURE FORMS

Record session feedback in the absence of remote testing technology and direct observation.

Purpose

Gather feedback from participants to further improve the solution and user experience.

Gather metrics on process improvement.

PAPER-BASED DATA CAPTURE FORMS

	Day 1	Day 2	Day 3	Day 4	Day 5
How much evidence did you scan?					
How long did it take?	START hh:mm	START hh:mm	START hh:mm	START hh:mm	START hh:mm
	END hh:mm	END hh:mm	END hh:mm	END hh:mm	END hh:mm
Was any evidence	O Yes				
unscannable	O No				
If yes,					
How many?					
 Why? (e.g., Torn? Taped? Fragile?) 					

CONCLUSION



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THANK YOU!

bbatokova@sei.cmu.edu

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This material is based upon work funded and supported by United States Secret Service under Contract No. FA8721-05-C-0003 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center sponsored by the United States Department of Defense.

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DM-0001716