

# DESIGN RESEARCH IN THE CONTEXT OF FEDERAL LAW ENFORCEMENT

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# Report Documentation Page

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# INTRODUCTION

## DESIGN RESEARCH

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

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.

## DESIGN RESEARCH METHODS

### **Exploratory**

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

### **Generative**

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

### **Evaluative**

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

# DESIGN RESEARCH IN CONTEXT



## Evidence Processing Application

## 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

## DESIGN RESEARCH CHALLENGES

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

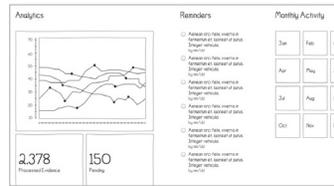
Working in the data-sensitive realm of **cybersecurity**, **digital intelligence**, and **evidence processing**.

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

**Dissemination of information** stemming from the gathered data.

# 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

### Concept Development

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

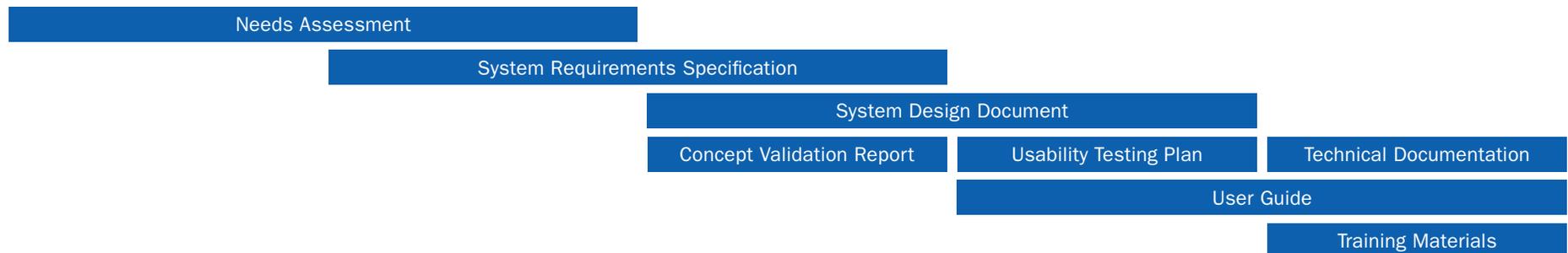
### Implementation

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

### Transition

- Collaborative Integration
- Stakeholder Touchpoints
- Expansion Proposals

## DOCUMENTATION





RESEARCH

## SECONDARY RESEARCH

Collecting and synthesizing information from existing data, rather than creating original material through primary research with participants.

### **Data**

Client and agency division information

Evidence to be processed

### **Purpose**

Define product context

Create overall design direction

## LITERATURE REVIEW & HARDWARE ASSESSMENT

Distilling information from published sources on previous research or projects as they might inform the current project.

### **Data**

Agency documentation, training, directives, etc.

OCR technology solutions

### **Purpose**

Define product context

Understand the market and competition

## 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.



## STAKEHOLDER RESPONSIBILITY MATRIX

Mapping the key participants and their responsibilities within the defined investigative and processing 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 ANALYSIS

Breaks down the constituent elements of a user's work flow, 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.

## SYSTEM MODEL

Visualizing the interactions, connections and breakdowns among the 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

## CURRENT SYSTEM MODEL

Visualizing the interactions, connections and breakdowns among the 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.

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

**Overwhelming amounts** of evidence and related information.

**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 ▼

Today

Jan 23

Jan 22

Jan 21

Last Week

Jan 18

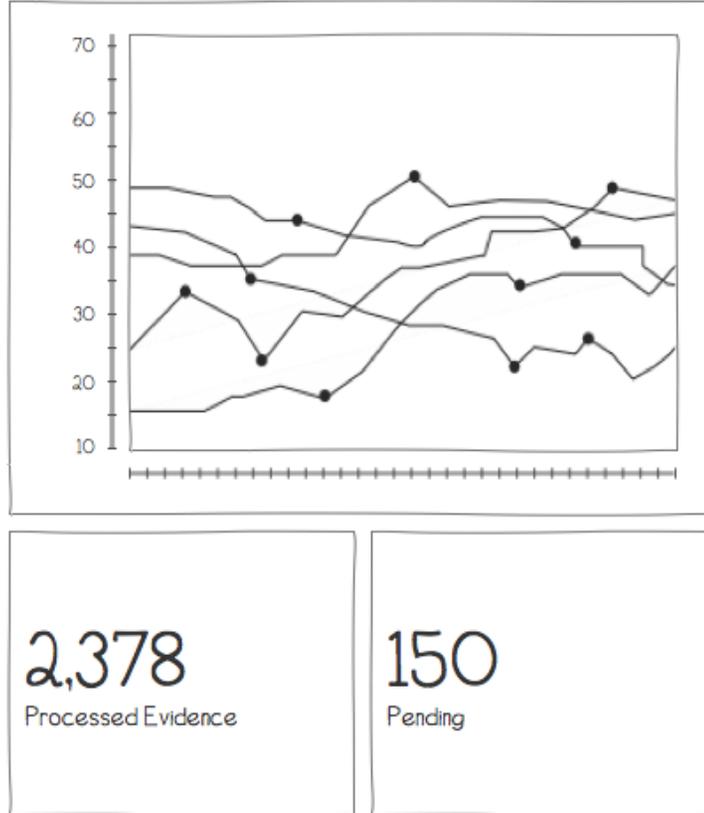
Jan 17

Jan 16

Jan 15

Jan 14

Analytics



Reminders

- Aenean orci felis, viverra in fermentum et, laoreet ut purus. Integer vehicula. by mm/dd
- Aenean orci felis, viverra in fermentum et, laoreet ut purus. Integer vehicula. by mm/dd
- Aenean orci felis, viverra in fermentum et, laoreet ut purus. Integer vehicula. by mm/dd
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Monthly

Jan

Apr

Jul

Oct

# CONCEPT DEVELOPMENT

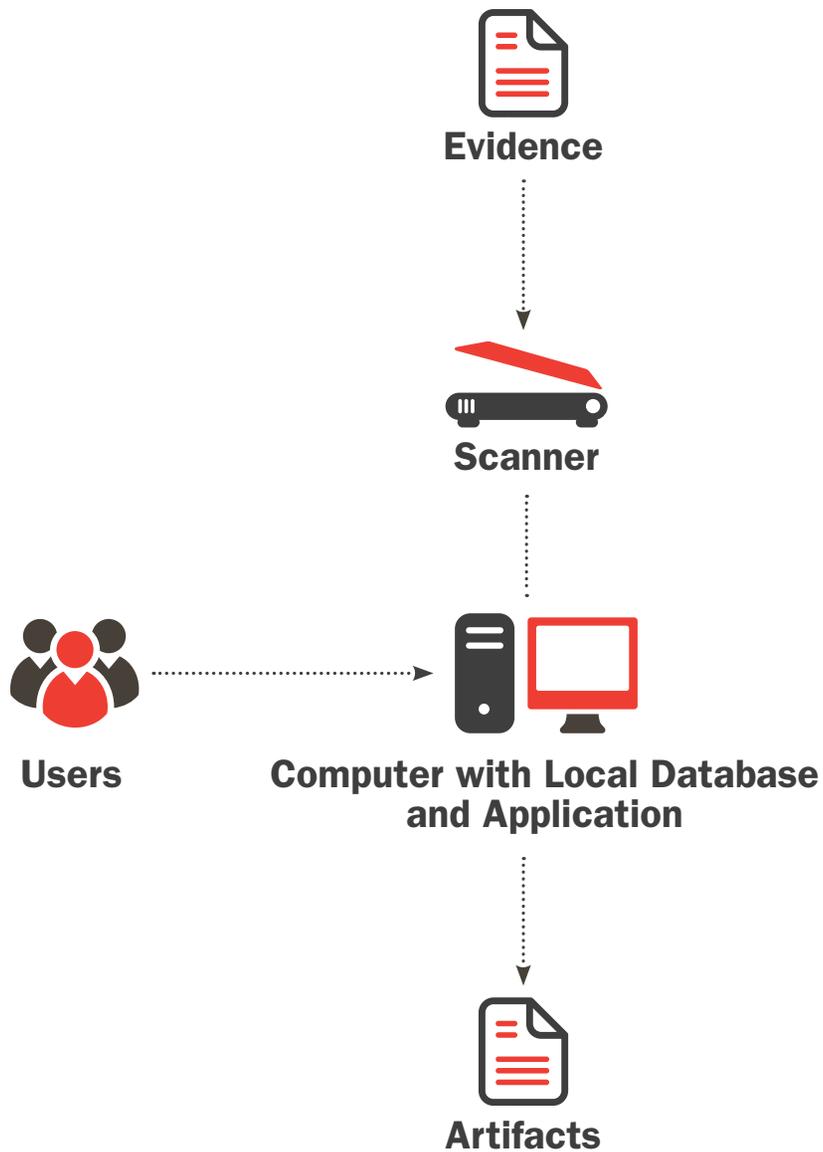
## SYSTEM COMPONENTS MODEL

Visualizing the key components of the new solution.

### **Purpose**

Begin to develop a new approach to processing paper-based evidence.

# SYSTEM MODEL (SIMPLIFIED)



## SYSTEM & USER WORKFLOWS

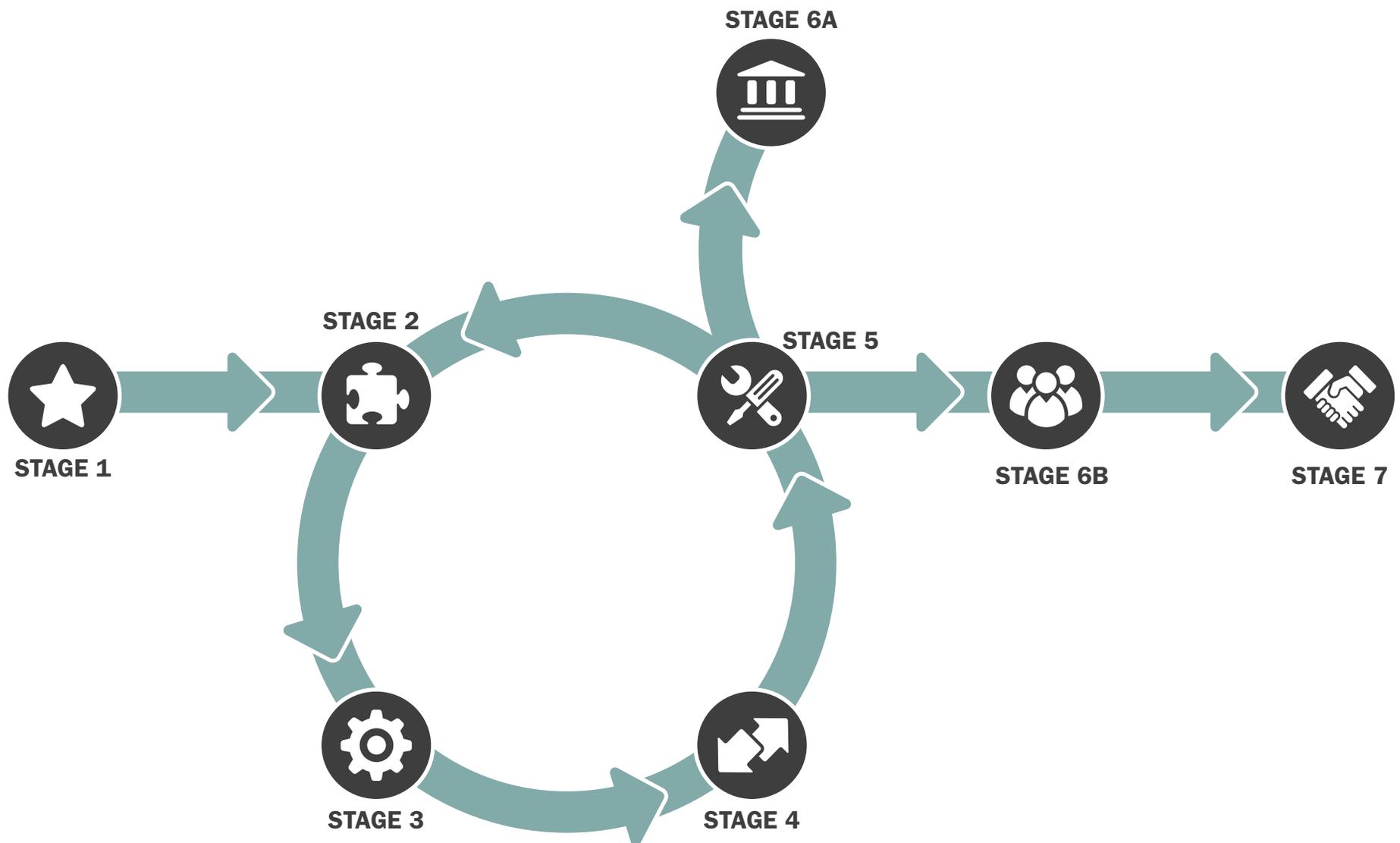
Defining the overall system stages and the individual steps a user would take to process the evidence using the new software and hardware solution.

### **Purpose**

Define a unified methodology and approach for evidence processing.

Define specific software and hardware requirements.

# SYSTEM WORKFLOW 1 (ABSTRACTED)



# USER WORKFLOW 1 (ABSTRACTED)

★ Stage 1	🧩 Stage 2	⚙️ Stage 3
1 Step Description		
2 Step Description Further instructions or notes about Step 2.	5 Further instructions or notes about Step 5. Another note about Step 5.	9 Step Description Further instructions or notes about Step 6.
		10 Step Description Further instructions or notes about Step 6.
3 Step Description Further instructions or notes about Step 3.		
	6 Step Description Further instructions or notes about Step 6.	11 Step Description Further instructions or notes about Step 5. Another note about Step 5.
4 Another note about Step 4. Instructions on how to handle a special use case during Step 4.		
	8 Step Description	Instructions on how to handle a special use case during Step 5.

## SYSTEM & USER WORKFLOWS

Defining the overall system stages and the individual steps a user would take to process the evidence using the new software and hardware solution.

### **Purpose**

Define a unified methodology and approach for evidence processing.

Define specific software and hardware requirements.

## WIREFRAMES

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

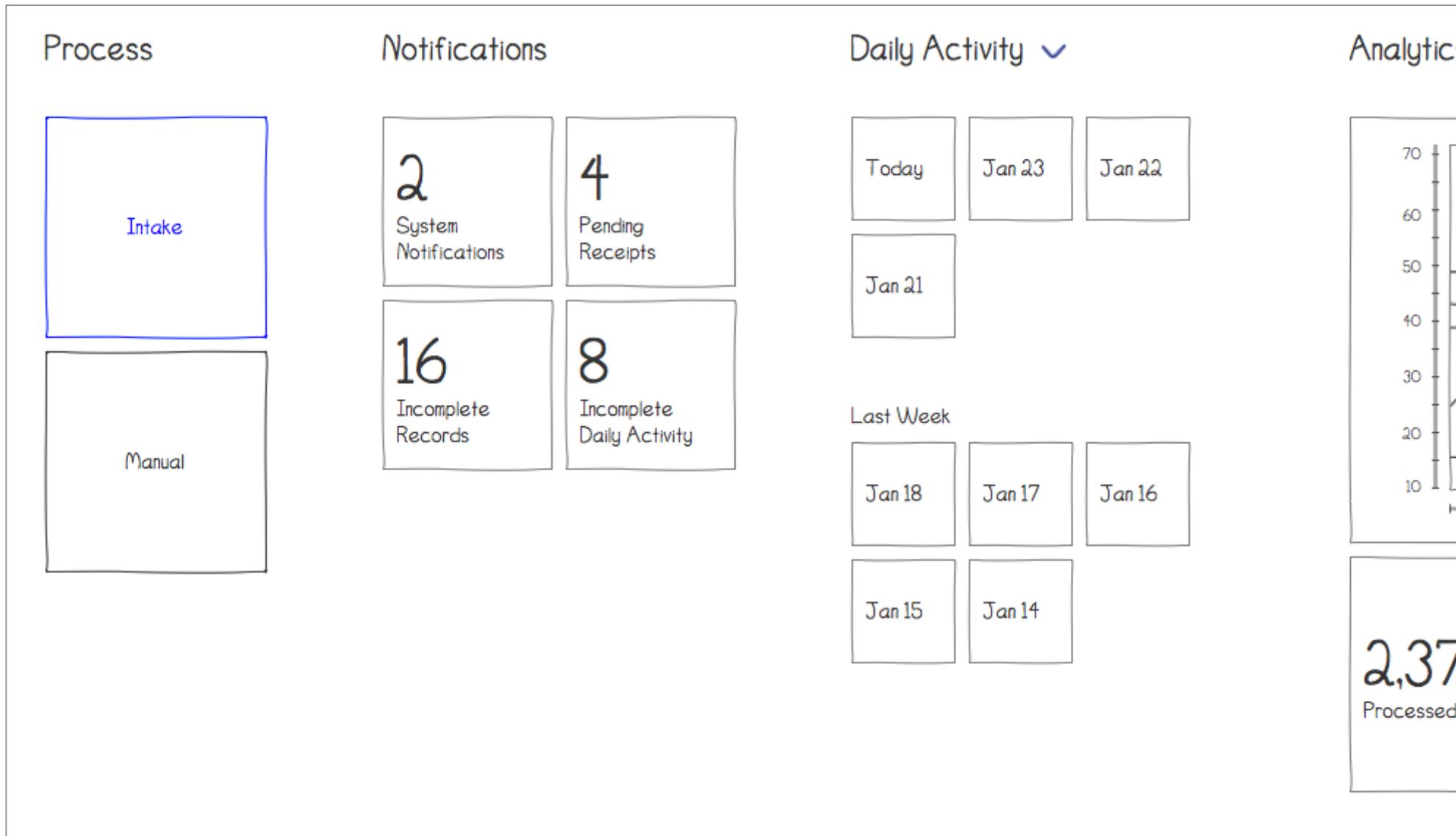
### **Purpose**

Establish core functionality.

Validate high level requirements with the client.

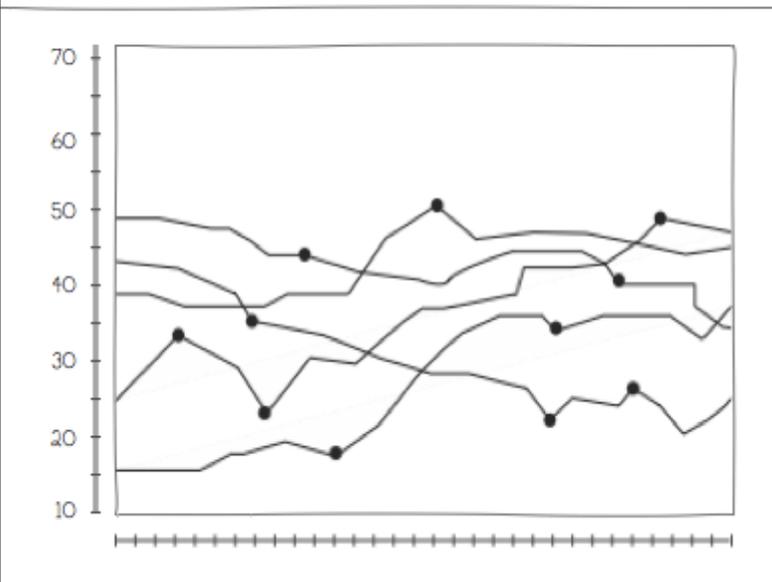
Validate concept and overall workflow.

# WIREFRAME 1 (ABSTRACTED)



# WIREFRAME 1 (ABSTRACTED)

## Analytics



2,378  
Processed Evidence

150  
Pending

## Reminders

- Aenean orci felis, viverra in fermentum et, laoreet ut purus. Integer vehicula. by mm/dd
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## Monthly Activity

Jan	Feb	Mar
Apr	May	Jun
Jul	Aug	Sep
Oct	Nov	Dec

## CONCEPT VALIDATION / TESTING

Combining wireframes, task completion analysis, usability testing and a survey, we created 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.

## CONCEPT VALIDATION / TESTING

### Structure

WORKFLOW: Identifying workflow breakdowns.

USER INTERFACE: Stepping through a scenario to evaluate task completion.

CONCEPT: Rating the overall system concept.

EXPERIENCE: Giving feedback on overall experience with the system and its potential.

## CONCEPT VALIDATION / TESTING

### **Usability Metrics**

Task completion

Critical errors

Non-critical errors

Subjective evaluations



# IMPLEMENTATION

## PAPER-BASED DATA CAPTURE FORMS

Recording 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 END hh:mm	START hh:mm END hh:mm	START hh:mm END hh:mm	START hh:mm END hh:mm	START hh:mm END hh:mm
Was any evidence unscannable?	<input type="radio"/> Yes <input type="radio"/> No				
If yes, <ul style="list-style-type: none"> <li>How many?</li> <li>Why? (e.g., Torn? Taped? Fragile?)</li> </ul>					

## RETROSPECTIVE THINK-ALOUD PROTOCOL

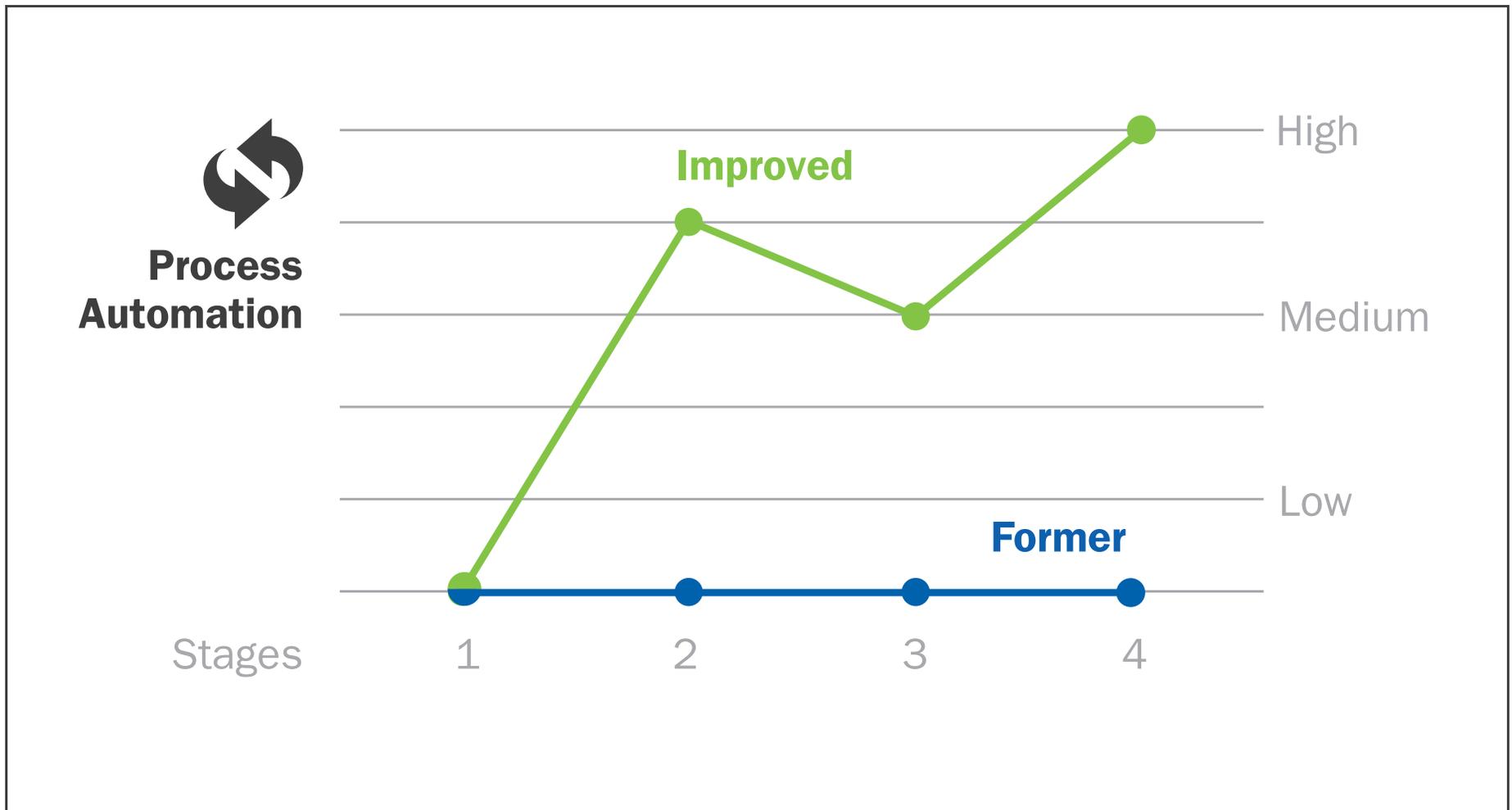
Verbalizing retroactively the feelings and thinking after task is completed, also revealing the reasoning, intentions and strategy behind a task.

### **Purpose**

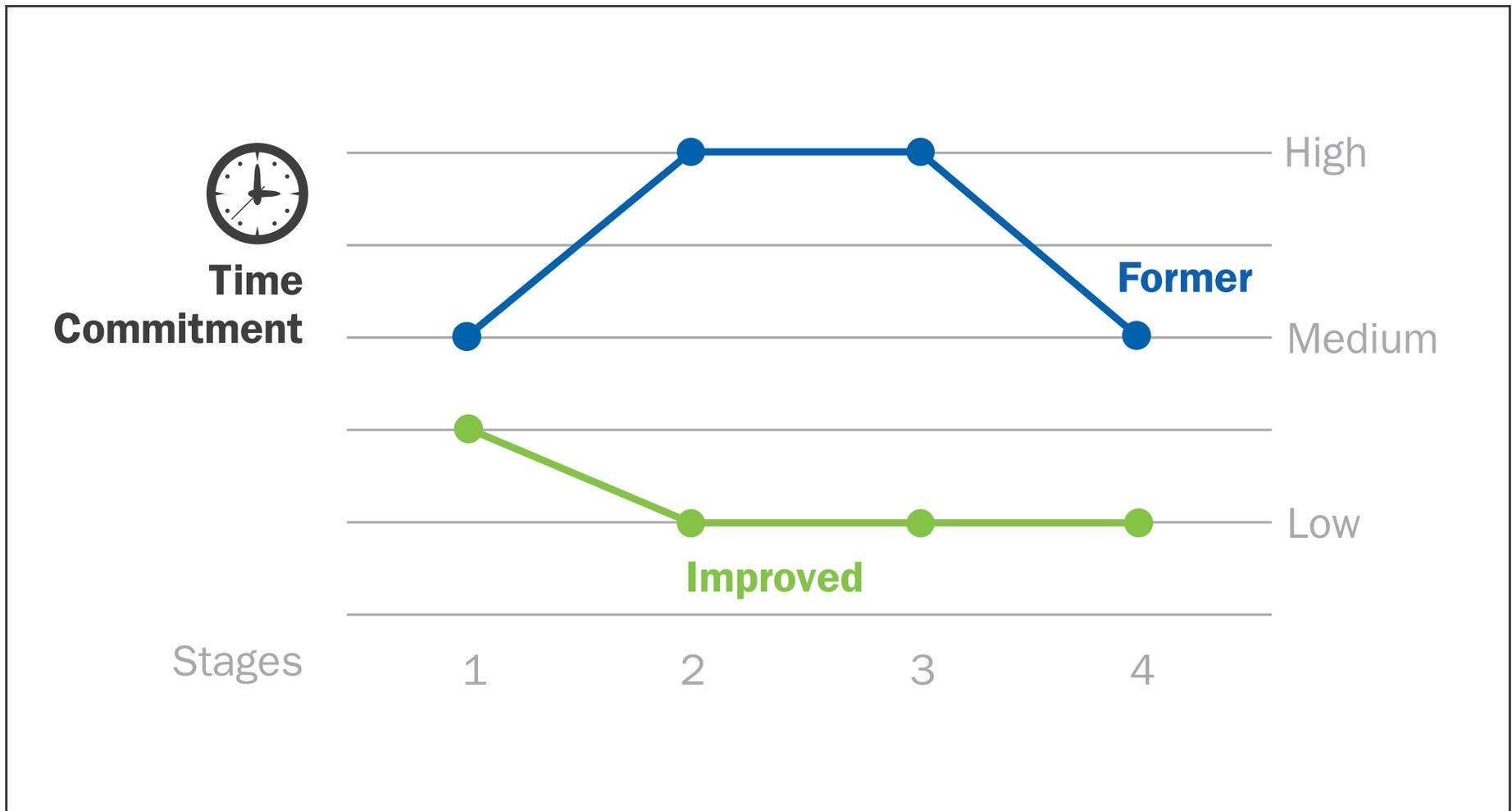
Gather feedback from participants to further improve the solution and user experience.

CONCLUSION

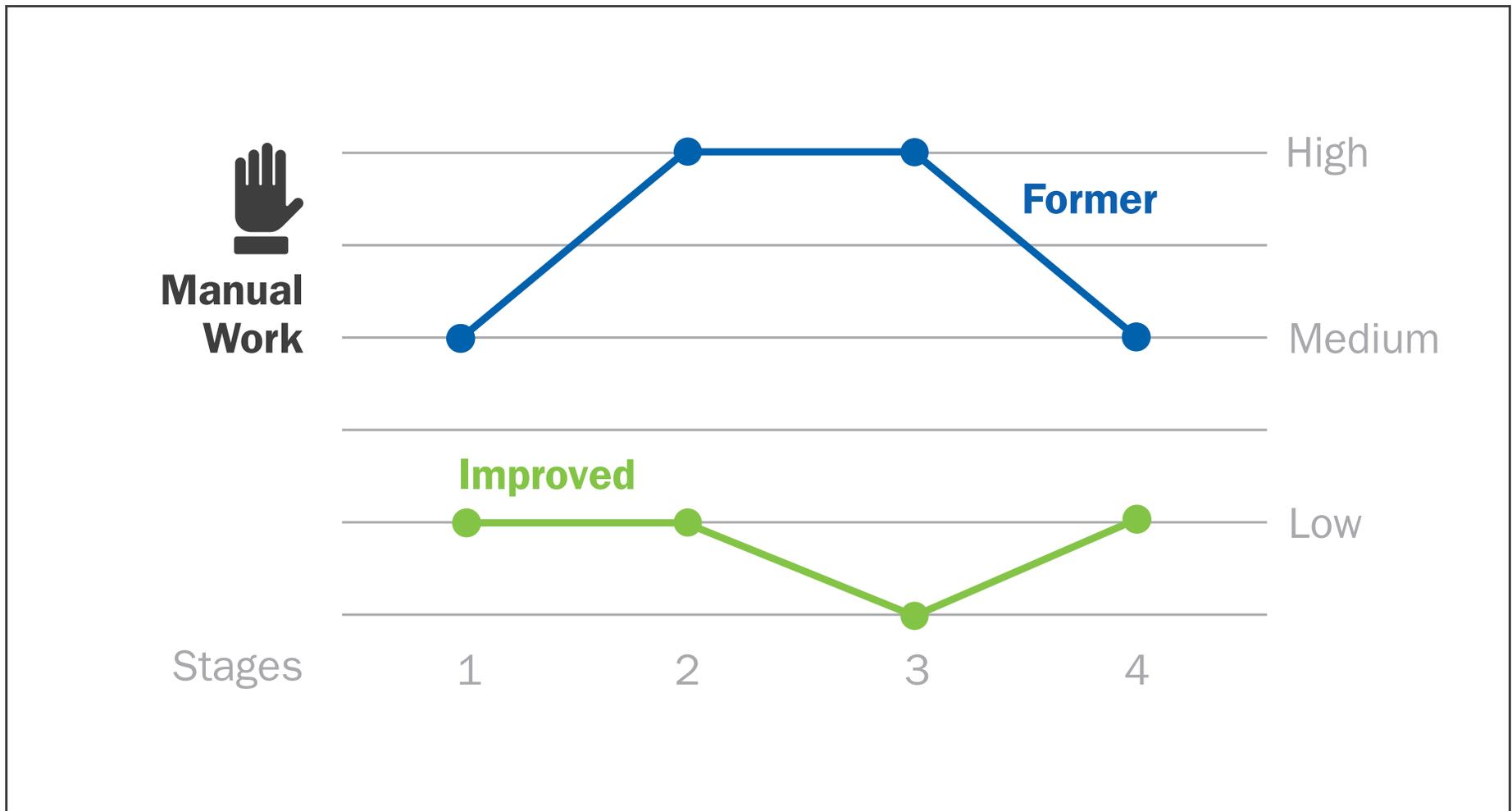
# PROCESS IMPROVEMENT



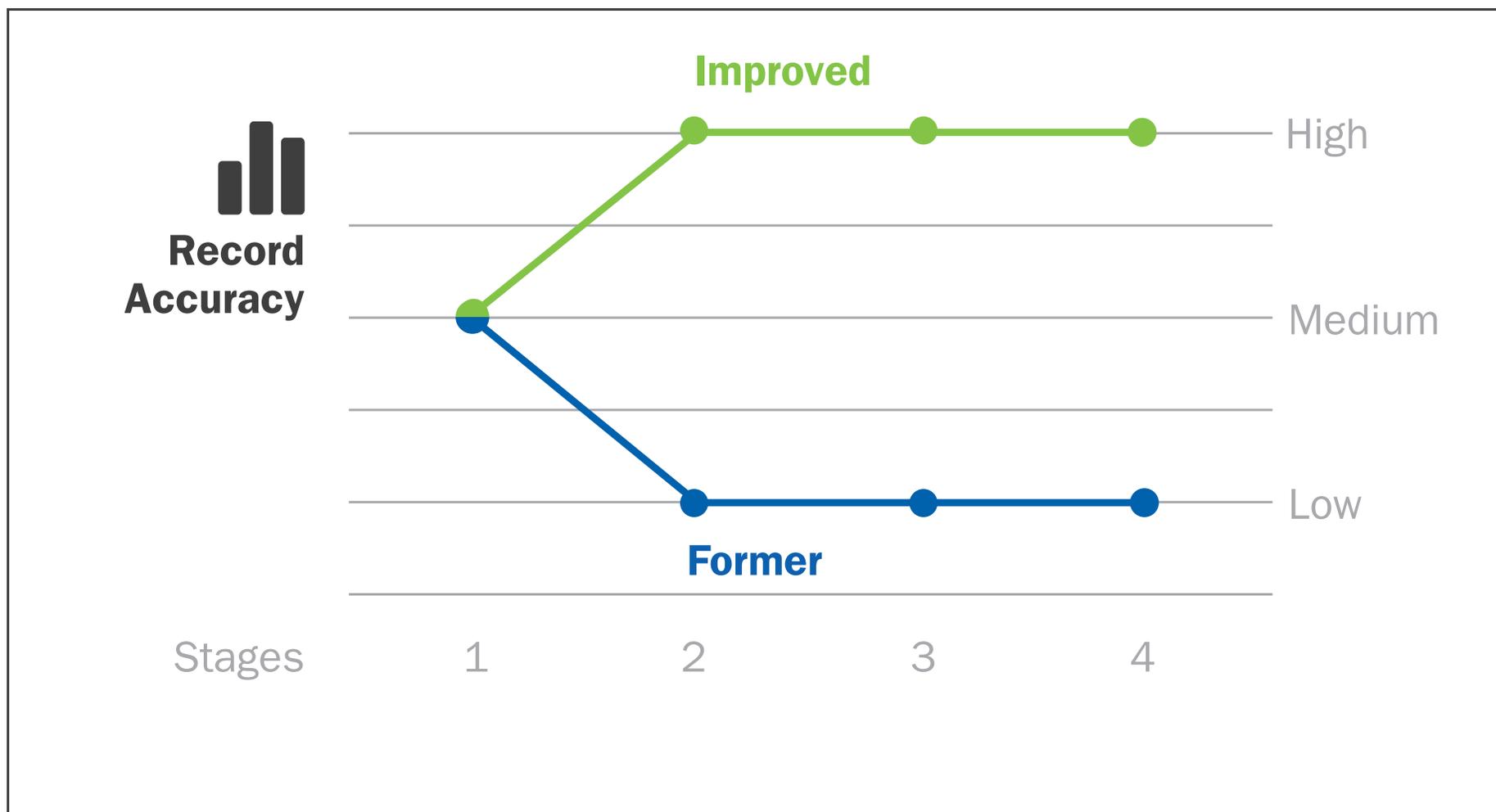
# PROCESS IMPROVEMENT



# PROCESS IMPROVEMENT



## PROCESS IMPROVEMENT



THANK YOU!

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