## Case Study: Inventory Verification APP

Alex Dospinoiu



## Project overview

#### The product:

Mobile APP that allows users to verify: *location*, *information*, *and quantity* of inventory scanned by barcode using the phone's camera





## Project overview



#### The problem:

Inaccurate inventory (location/data) resulting from warehouse associates placing inventory in positions <u>without</u> the ability to update information on-the-spot.



#### The goal:

Create mobile APP for warehouse personnel to use on-the-go to verify location-information and to be able to <u>update</u> data at the point of placement of inventory.

## Project overview



#### My role:

Lead UX designer & Lead Software Engineer



#### **Responsibilities:**

User research, wireframing, prototyping, low-fidelity designs, high-fidelity designs



## Understanding the user

- User research
- Personas
- Problem statements
- User journey maps

## User research: summary



- **Problem Statement**: Luke is constantly struggling with inaccurate inventory. He needs a way to walk up to a shelf, and verify the inventory is correct in that shelf. He also needs a way to scan a piece of inventory, and verify if it is in the correct location. Bob is constantly under stress to place inventory away after it is received. Often when he goes to an indicated location, there is already inventory there. So he gets frustrated and just finds an open spot to place the inventory in so he can complete his task.
- **Research goals**: What specific issues are each user struggling with in completing their desired tasks.

## User research: pain points



Paper based information

Warehouse associates do not have access to on-the-spot information. They are given a printed piece of paper indicating where to place inventory

## Inaccurate information

2

Warehouse associates discover the information is inaccurate only when they arrive at the designated spot and find inventory already present.



3

Lack of time



### Inability to update data on-the-spot

Warehouse associates do not have the ability to update incorrect data on-the-spot when they discover it as incorrect



### Ben

Age: 38 Education: 2yr Associate Degree Hometown: Tucson Family: Wife, 3 Kids Occupation: Warehouse Supervisor "I need to know where all the inventory is in order to make sure the right thing can be found at the right time."

## Goals

- Have accurate inventory
- Find inventory in the place indicated in the system
- Know how much inventory is available

## **Frustrations**

- Lost inventory
- Inaccurate inventory locations
- Not knowing how much inventory is available

Ben is a Warehouse Supervisor overseeing three Warehouse Associates. Ben's responsibility is to ensure all inventory is placed in the right location and the inventory is properly recorded in the system with the correct location. He often struggles with new employees that "don't follow the process" of first finding an open position in the system, then placing the inventory at that location, then updating the system.



"I don't want to waste time on a screen looking for the right spot. I just want to put the inventory away to finish my task quickly."

### Goals

- Quickly find open spot
- Quickly place inventory in open spot
- Complete task quickly

### **Frustrations**

- Spending time first finding a spot to place inventory
- Doesn't like sitting at a desk searching for an open spot

## Austin

Age: 22 Education: High School Degree Hometown: Tucson Family: Single, lives at home Occupation: Warehouse Associate Austin is a Warehouse Associate whose responsibility is to place inventory on shelves in specific locations. He hates spending time at a computer finding an open spot. Often when he goes to the indicated spot, there is already something there ... so the spot is not really open. Rather than go find another open spot, and update the one in the computer, he just sees an open spot and places the inventory there. The packages keep coming and if he doesn't move quickly the Supervisor gets on him for being behind.

#### Google

## User journey map

ACTION	Receive Inventory	Identify Open Spot	Place Inventory In Spot	Record Inventory Location
TASK LIST	<ul> <li>A. Identify inventory received</li> <li>B. Let the system know inventory has been received</li> </ul>	A. Find open spot (in the system) where to place the inventory	<ul> <li>A. Take inventory to open spot.</li> <li>B. Place on shelf</li> </ul>	<ul> <li>A. Record inventory placed in spot</li> <li>B. Record spot location</li> </ul>
FEELING ADJECTIVE	Neutral, this task is easy. Have hands-on inventory and simply informing system it is available.	Annoyance building. First have to spend time "finding an open spot" before physically going to an open spot.	Frustrated. Often when arrive at "indicated open spot" there is something already there.	Frustrated. First the spot was not "really open". Now have to find another "physically open spot". Then when try to record new spot, system says it is occupied. Give up; leave inventory where it is.
IMPROVEMENT OPPORTUNITIES	User interface to make it extremely simple and effective.	System should automatically indicate the available open spots.	System accuracy/validation that an open spot is truly open.	Semi-automatic way of recording inventory in whatever spot it is placed in.

# Starting the design

- Paper wireframes
- Digital wireframes
- Low-fidelity prototype
- Usability studies



## Paper wireframes

- Initial concept for the APP functionality



## Paper wireframes

- Initial concept for the APP workflow



## Original Prototype / Design Tested

https://www.figma.com/proto/8NU78Yz0 NM3ycrhviZGiJL/Original-Wireframe?pag e-id=0%3A1&node-id=2%3A2&viewport=2 41%2C48%2C0.56&scaling=scale-down& starting-point-node-id=2%3A2





## Theme #1: Users attempted to click icons as often as buttons

Supporting evidence from the usability study.

• 4 out of 5 participants clicked the icon first, then clicked the button

"Would be nice to be able to click on the pictures ..." (P2)

G	
SCAN LOCATION	
	Tried to 'Click' 1st
SCAN	
LOCATION INFORMATION	-
INVENTORY INFORMATION IN LOCATION	
< 🎢	
	Google

## Theme #2: Wanted access to additional information

Supporting evidence from the usability study.

- 3 out of 5 participants clicked the information (text) to see if more information was presented
- Often clicked on the last step ... perhaps as a way to update the information presented

"How do I update this information if it is wrong?" (P4)

•	
SCAN LOCATION	
INVENTORY INFORMATION IN LOCATION	Tried to 'Click'
ACCURATE WRONG	
÷ 🏠	
	Google

## Theme #3: Users got lost in the flow of the process

Supporting evidence from the usability study.

- 2 out of 5 participants went back and forth between screens multiple times
- Often clicked back and forward to see how many screens/steps there were

"How long is this process? How many steps to I have to take?" (P1)

•		
	SCAN INVENTORY	
DESCRIPTION	SCAN OF INVENTORY	
LOCATION INF	ORMATION OF INVENTORY	'Clicked' multiple times
ACCURAT	E WRONG	
÷	<b>☆</b>	
		Goog

le



Some users might not understand the text on the button ... however they do understand the image of the icon. Users tried to click on the data presented as a method of updating if it was incorrect Users clicked back and forth between screens several times as if they were trying to figure out how long the process was ... i.e. how many steps

## Refining the design

- Mockups
- High-fidelity prototype
- Accessibility

## Mockups

Original progression to final design



# High-fidelity prototype

https://www.figma.com/proto/WZwsBhdLAbew UkkPT845WO/Updated-Wireframe?page-id=0% 3A1&node-id=116%3A2&viewport=241%2C48% 2C0.71&scaling=scale-down&starting-point-nod e-id=116%3A2





## Accessibility considerations

Considered both buttons and images as 'clickable' so the user can move through the screens easier.

Considered images rather than text to indicate path through the APP. (i.e. Home-Button rather than Home-Written)

2

3

Considered simple design due to the need of the Warehouse Associate to quickly move through to completion of the task.

## Going forward

- Takeaways
- Next steps



## Takeaways



#### Impact:

The Warehouse Associates were able to use the final design in real-world applications. As they were placing the inventory in the spots, if they discovered an error in the data, they could update it on-the-spot. Accurate inventory was achieved.



#### What I learned:

Iteration of design is necessary to arrive at the final NEED of the user.

## Next steps



The current APP only runs on mobile phones. Update the design to run on tablets as well. Integrate barcode printing with the tablets/mobile phone in order to be able to print barcodes on-the-spot

2

3

Add data analytics to show how many inventory slots are free/occupied to be able to see the status of the warehouse space.