



BUYING TIME

A FRESH TAKE ON RETAIL PURCHASING

TEAM DUÈ | CARNEGIE MELLON | MHCI | SUMMER '16

DESIGN REPORT





TURNING RETAIL INSIDE OUT

Team Duè collaborated with LH Ventures to design a solution that supports more informed buying decisions, and enables retail buyers and vendors to engage in the buying process more effectively.

Your new shirt's journey

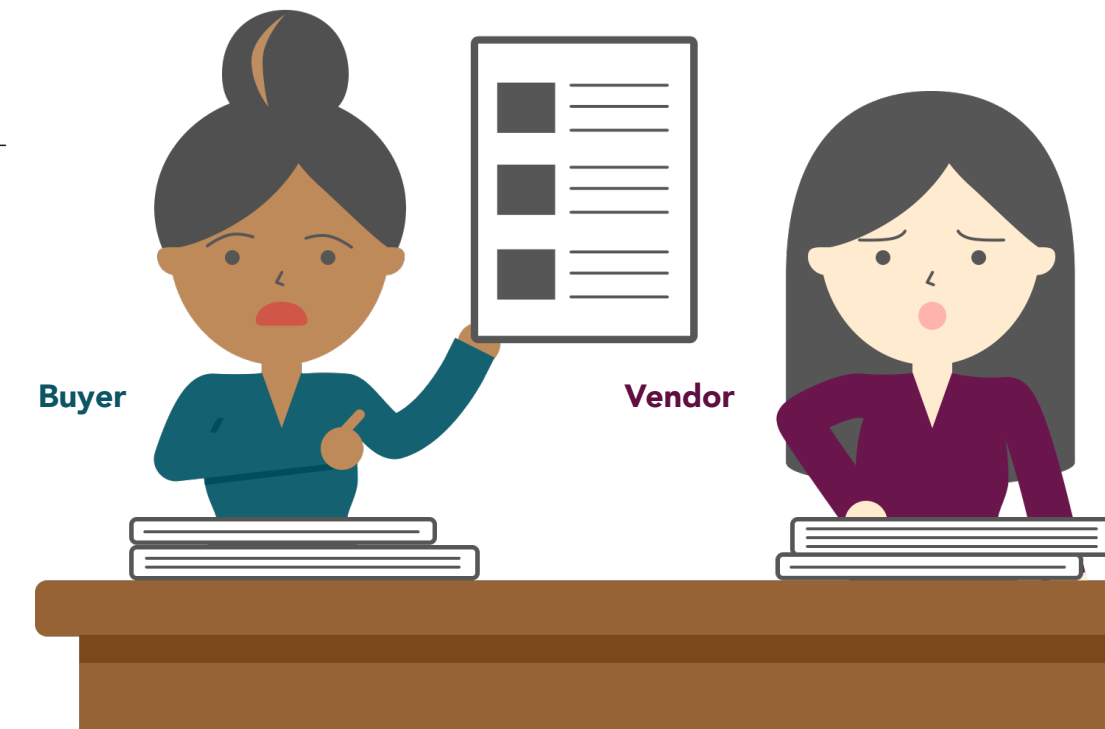
How did the new shirt you just bought make its way to the store? Every day, **retail buyers** make decisions that determine which products are available to you, the consumer. They work with their **vendors** to source or manufacture products, negotiate prices, and deliver them to your nearest store.

The missing threads

Our team embarked upon four months of human-centered research into the retail purchasing world, conducting interviews, contextual inquiries, empathy-building exercises, and other research activities. Our biggest takeaway: buyers' decision-making processes are compromised by their current purchasing tools—**email, stacks of printed sales data, Microsoft Excel, product offer PDFs, cameras, calculators**—because these tools are unconnected, decontextualized, and require duplicated effort. Our challenge is to improve working relationships and processes between buyers and vendors, and the people supporting them.

Designing seamless buyer-vendor collaboration

Over the course of another four months, we iteratively prototyped and tested design ideas for a new type of buyer-vendor collaboration platform. We created Buying Time, a service-oriented platform for buyers and vendors to move from product offers to purchase orders efficiently and effectively, while having fun along the way.



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THE WORST SHOPPING EXPERIENCE

For four months, we immersed ourselves in the fast-paced, complex world of retail purchasing—diving into buyers' and vendors' needs, desires, and processes. We learned that the current state of buying is *not* an enjoyable shopping experience: it's filled with spreadsheets and paperwork, not thrill. We relied on four research insights to make buying both fun *and* effective.



Buyers can't find the needle in the haystack.

Buyers live and breathe products. However, to get a product's full story, they have to cross-reference a muddled stack of sales spreadsheets, offers and meeting notes from vendors, and many other documents and emails. When a buyer transitions roles, getting up to speed on all this product information can take months (especially when half the information is lost to the previous buyer's email account).

Supporting Research Methods: Artifact Analysis, Contextual Inquiry, Competitive Analysis, Interviews

Buying Time centralizes, visualizes, and keeps a record of all products, allowing buyers to find the product-level information they need.

Buyers struggle to put the puzzle together.

Buyers engage in many different "qualitative" activities: gathering insights from comp shopping, observing their customers in-store, and discussing trends with vendors. These activities, though critical to strategy, are typically very ad-hoc and unstructured. As it stands, most buyers work from a general gist of this information, rather than specifics, because it is too cumbersome to organize.

Supporting Research Methods: Interviews, Contextual Inquiry, Empathy-Building Activity, Survey

Buying Time helps organize insights into buying programs and easily communicate them with vendors.



Purchase Orders are 20% work, and 80% headache.

Communication challenges plague the current purchase order (PO) process. Issues between buyers and vendors can cause late shipments, missed opportunities, and strained relationships. This process is critical to retail buying, and improving it is our core focus—maximizing both buyer and retailer benefit, as well as value to LH Ventures.

Supporting Research Methods: Contextual Inquiry, Interviews, Artifact Analysis, Competitive Analysis

Buying Time's service approach helps buyers feel decisive and empowered: they can now create a purchase order with one click. No more headaches.

What Happened to the Thrill?

Buying creates a unique high that is part shopping, part strategic gambling, and part competition. But now it's followed by a low: the paperwork. A successful tool needs to lessen the lows without sacrificing the highs. It also needs to work both for in-person meetings and remote purchasing.

Supporting Research Methods: Contextual Inquiry, Interviews, Empathy-Building Activity, Card Sort, Survey

Buying Time is flexible. It works seamlessly when the buyer and vendor are meeting in-person or discussing products remotely.



INTRODUCING BUYING TIME, A BUYER AND VENDOR SERVICE

PLATFORM, WITH 3 CORE VALUES:

1. AT YOUR SERVICE
2. DECISIVE, NOT DISORGANIZED
3. COMMUNICATE IN CONTEXT

AT YOUR SERVICE



Vendors provide better service when they understand their buyers' preferences.

BEFORE

Give Me a Moment

Lengthy buyer-vendor "dating" period

Vendors learn needs by trial and error

Long, 'product dump' offers from vendors

Minimal tracking of products offered vs. products bought

"I sent a huge product offer PDF to her. So far there is only one product she really likes."

-Vendor, 5 years

AFTER

At Your Service

Buyers and vendors get to know each other quickly

Buyers specify trends, styles for buying programs

Short, curated product offers from vendors

Built-in success rate analytics

"I know my program objectives like the back of my hand, which can make it hard to explain to vendors...this tool reminds me what to tell them."

-Buyer, 11 years

There's a Gaping Hole in the Market

We conducted a competitive analysis of 10 existing buyer-vendor collaboration platforms and found a surprising hole in the market: **there are no retailer-focused tools that facilitate high-touch buyer-vendor interaction.**

Buyers from large retail companies expect high levels of service from their vendors. These buyers want to feel like their vendor is a "friend who gives great advice." They only work with vendors who are willing to work in 'high-touch interactions': come prepared with products that these buyers are interested in, or be nimble enough to customize.

Very large retailers (think Walmart) have created their own proprietary platforms to meet their needs. However, there are many smaller-but-still-large retailers (think Ross) that are left without a viable solution to this high-touch problem. They write large enough orders to warrant their own platform, but are not large enough to invest in a proprietary solution. With Buying Time on the market, these retailers have access to a platform created for their unique needs.

This is particularly valuable for a major subset of these type of retailers: off-price retailers. Off-price retailers particularly benefit from a tool that consolidates their products, because they do not have e-commerce websites that track product information and inventory.

	Small Vendors	Large Vendors	Large Retailers	Largest Retailers
	Writeorder Brandwise Apps4fashion Handshake	Invendix New Order Joor Brandboom Pepperi	Buying Time	Proprietary Platform
Create purchase orders	✓	✓	✓	✓
Historical purchase order tracking			✓	✓
Buyers browse full vendor product catalogue	✓	✓		
Buyers receive curated product offers			✓	✓
Product customization			✓	✓
Buyer-vendor communication			✓	
Sample management			✓	

The Bully on the Playground

Buying is a constant negotiation, with power tactics employed by both sides. In wholesale retail, power dynamics favor the party that has the larger order volume, and also impact the software retailers and vendors choose for purchase order generation.

Retailer > Vendor = Buyer Power

Large retail buyers (think Target) don't have time to scroll through 1,000+ products in a vendor's product catalogue. These buyers want their own software platforms, and they have the leeway to mandate that their vendors sign up—or risk losing the retailer's business. We found a dearth of tools that satisfy these buyers' needs.



Buying 10 products and buying 10,000 products are categorically different activities—**large buyers** get additional service from their vendors because they are able to place such large product orders.

Retailer < Vendor = Vendor Power

When the retailer is smaller (think small boutique shops), buying can be similar to an e-commerce experience: buyers go to the vendor's website, pick out what they want, and order products as is. Larger vendors with more sway expect buyers to use their software platforms. This market is saturated.



Small vendors (compared to the retailers they work with) have the advantage of agility. However, they don't always have the lowest prices that economy of scale brings. To stay competitive, these small vendors have to really know their market, and offer outstanding service to buyers.

*"I would never tell them 'filling out 50 order sheets is too much'. Of course you're just going to do it."
-Vendor, 4 years*



Buyers say what they want...

To better serve buyers' needs, we help buyers give a little to get a lot. Buyers create buying programs in Buying Time, sharing with their vendors what styles they are looking for in their upcoming assortment.

Create New Program

Name

Due Date Ship Date Maximum #Products

Category

Select Vendors

Select All

Best Home Storage Mary Davis Bags & Baskets Jane Hudson All The Bags Karen Washington

Best Home Storage Maria Lee Bags & Baskets Angela Chung All The Bags Jenny He

Financials (Only Visible to Me)

of Units (Only visible to Me)

Need to Have

Nice to Have

- I make it work for my schedule.** I set the timetable for my program to make sure vendors set their production schedule according to my needs.
- I select who I want to tell.** Only the vendors that I specify will see an announcement for a particular program.
- I tell vendors what I need.** I can specify what I want to see in the product offers my vendors send to me, both what is a 'Need to have' and a 'Nice to have.'
- I give vendors images for inspiration.** I can attach a trend board or other files to give vendors visual representations of what I am looking for.
- I set limits.** I can set a maximum number of products an offer can contain in order to keep things manageable for me.



...and vendors give great service

Now that vendors better understand their buyers' current needs, they are able to select products and create offers that are tailored specifically for the buyer's program.

Create New Offer

Program

Title

Lead Time

Key Features (Optional)

Products

Image	Item#	Description	L"	W"	H"	Master Pack	Cube	MOQ	Unit Cost	
	LH49210	2 Pc Oval Fabric Hamper with Wood Frame Set				1	4.8	300	\$19.38	<input type="button" value="ADD"/>
		1 Medium Hamper	20.0	15.9	20.3					
		1 Small Hamper	17.1	13.1	20.6					
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>
	LH49213	Single small coffee colored wicker basket with thick white canvas	15.3	18.1	25.8	1	4.8	300	\$11.38	<input type="button" value="ADD"/>

- I know what my buyer needs.** I feel confident submitting my offer to a program my buyer created.
- I provide my buyer with offer-level information.** I specify the lead time for my offer, and can add any additional descriptive text.
- I marry buyer needs to my capabilities.** I choose the products from my catalogue that match up with my buyer's needs.

DECISIVE, NOT DISORGANIZED



Buyers make better decisions when all their offers, products, and vendors are in one place.

BEFORE

Drowning in Paperwork

Product offers arrive as email attachments

Each vendors uses their own offer format

Nearly impossible to compare vendors head-to-head

Laborious self-organization techniques, like organizing inbox by vendor

"Sometimes I will get caught up in buying for a program and afterwards realize I spent \$20 million on what was supposed to be a \$4 million program."
-Buyer, 5 years

AFTER

Decisive not Disorganized

All offers organized by program and date in the Buying Time home screen

All offers are created in standardized Buying Time format

Buying Program Aggregate screen allows product comparison across vendors

Built-in filters and user-created groupings to work like you want

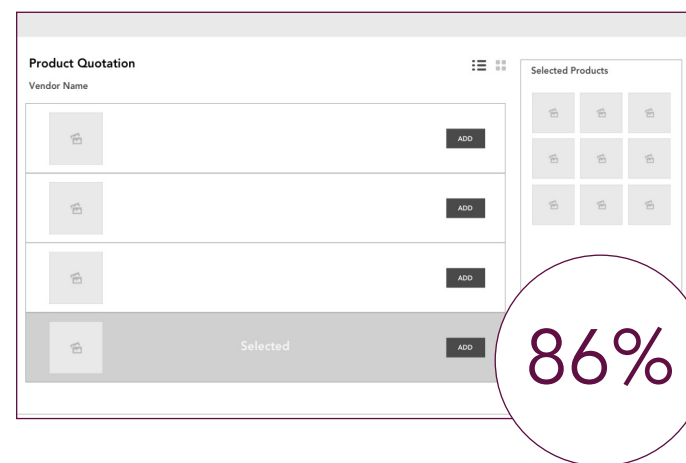
"It would have been so confusing to look at multiple Excel spreadsheets from each vendor and try to compare them head-to-head. This is amazing."
-Buyer, 3 years

Organization: This or That?

We conducted A/B testing of different organizational schemes to understand buyers' mental models of information organization. We tested with 14 buyers and vendors at the Americasmart Apparel Tradeshow. Two example tests are analyzed below.

When you're making decisions on a product offer, would you rather select the products you want, or remove the products you don't want?

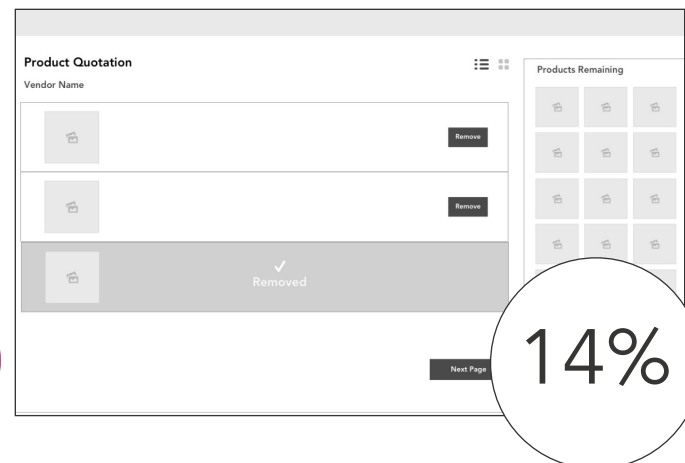
Adding Products



Benefits: Participants liked that this technique made them thoroughly review each product before adding to their 'cart'—a workflow familiar from e-commerce. Interestingly, some commented that adding products felt more 'positive', while removing products felt 'negative'.

Trade-offs: Participants were worried this might be more time-intensive, especially if they wanted to order the majority of the products within an offer.

Removing Products



Benefits: Participants felt that this technique was 'cleaner', allowing them to progressively make the order smaller and smaller as they eliminated products that didn't fit their needs.

Trade-offs: Participants were concerned they might forget to remove a product from a large offer, and accidentally order something they didn't want.

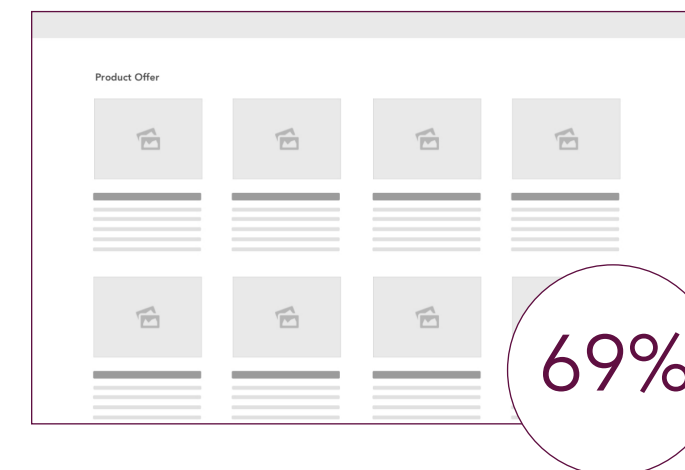
Impact on Final Design

We began by taking a purely Additive approach, a clear winner in our A/B testing. However, after additional testing we incorporated the 'cleaner' benefit from the Subtractive approach: buyers can 'hide' products that they know they don't want so the view is less cluttered.

"I want to see the most I can possibly see on the page at once. A choice between 6 and 100? I'll go with 100."
- Buyer

How would you prefer to view product details: in list view or in grid view?

Grid View



Benefits: Participants liked the focus on pictures within this view, a key decision-making factor. After they see a picture, they can then drill down for more information if desired.

Trade-offs: Grid view doesn't help users compare products attributes (price, size, etc) with each other.

List View



Benefits: Participants were familiar with this type of view, since most of the product data they work with is currently in Excel spreadsheet format.

Trade-offs: Participants wanted to see the most products at a time on the screen; unless the product images are very small, the list view shows less products.

Impact on Final Design

Buying Time uses a combination of the two views. In contrast to our A/B test results, when we tested the offer details screen again with a real task, buyers needed more information than the grid view could offer in order to make a real decision.

When buyers want to visually review their buying program as a whole, we show them in a grid view.



Buyers view the big picture...

Buyers can view an aggregate of all products that they have purchased or are considering purchasing for a particular buying program, such as a Back to School program.

The screenshot shows a dashboard for a buyer. At the top, there are navigation tabs: HOME, HISTORY, VENDORS. The main section is titled 'Back to School 2016'. It features a summary card with the following data:

- Total Units: 1000 (300/700/3,000)
- Total Cost: \$11,523 (\$535/\$11,350/\$32,000)
- Total Retail Price: \$20,817
- Average Margin: 24%
- Total SKUs: 4
- Due Date: 03/25/2016
- Ship Date: 09/01/2016

Below the summary card, there are two tables: 'Ordered' and 'Under Review'. Both tables have columns for Image, Vendor, Description, Item#, L("), W("), H("), Master Pack, Cube(ft2), Qty, Unit Cost, and Total.

The 'Ordered' table shows:

Image	Vendor	Description	Item#	L(")	W(")	H(")	Master Pack	Cube(ft2)	Qty	Unit Cost	Total
	Bags & Baskets	2 Pc Oval Fabric Hamper with Wood Frame Set	LH49210				1	4.8	300	\$18.88	\$5,664
		1 Medium Hamper		20.0	15.9	20.3					
		1 Small Hamper		17.1	13.1	20.6					
	Bags & Baskets	Single small coffee colored wicker basket with thick white canvas	LH49213	15.3	18.1	25.8	1	4.8	200	\$11.38	\$2,276
	Best Baskets	Single small coffee colored wicker basket with thick white canvas	LH49213	15.3	18.1	25.8	1	4.8	200	\$11.38	\$2,276

The 'Under Review' table shows:

Image	Vendor	Description	Item#	L(")	W(")	H(")	Master Pack	Cube(ft2)	Qty	Unit Cost	Total
	Bags & Baskets	2 Pc Oval Fabric Hamper with Wood Frame Set	LH49210				1	4.8	300	\$18.88	\$5,664
		1 Medium Hamper		20.0	15.9	20.3					
		1 Small Hamper		17.1	13.1	20.6					

At the bottom left, there are two progress bars: one for units (100/300/2000) and one for cost (\$1,220/\$2,350/\$8,000).

1 I view aggregate calculations. I see a snapshot of all relevant calculations for a program, including average margin, total quantity, and physical size of the order.

2 I view all products for the program. I see all the products I am considering for a particular program, with a clear view of their status.

3 I track my financials. I see how close I am to the budget I set for the program.

4 I buy within my time frame. I keep tabs on the schedule needed to get my products to stores on time.



...and both stay organized

Collaboration means access to some of the same information. Both buyers and vendors can see all product offers and purchase orders on one Home screen.

The screenshot shows a vendor's dashboard. At the top, there are navigation tabs: CATALOG, HISTORY, BUYERS. The main section is titled 'New Purchase Orders'. It features a table with columns: Date, PO#, Buyer, Start Date, Cancel Date, FOB, Units, and Total Cost.

Date	PO#	Buyer	Start Date	Cancel Date	FOB	Units	Total Cost
04/23/2015	LH38048593427589	Jacqueline Bradley	08/23/2015	09/01/2015	Qingdao	500	\$14,349
04/23/2015	LH38048593427589	Jacqueline Bradley	08/23/2015	09/01/2015	Qingdao	5	\$14,349

Below the table, there are two sections: 'Back to School 2016' and 'Christmas Season 2016'. Each section shows a 'Draft' button and a carousel of product thumbnails. The 'Back to School 2016' section also includes a 'Modified' date (02/18/2016) and a description: 'Predicted best sellers for your Back to School 2016. A lot of Natural materials, everything is on trend'. The 'Christmas Season 2016' section includes an 'Unread' date (03/11/2016) and a description: 'Home Storage products for your Christmas season 2016. Best sellers, your customers will love them'.

1 I can see all my Purchase Orders. My goal is to receive new Purchase Orders, so I see new ones at the top of the screen.

2 I can filter and search. I can slice and dice my offers by program, buyer, and date.

3 I view offers by program. When I click on a program, I see the program details and any relevant offers.

4 I preview before diving in. Each offer I see has thumbnail images that give me the gist of what is included in the offer.

5 I can access my history. I can find offers that are no longer active in my History section.

COMMUNICATE IN CONTEXT



Buyers and vendors get to the point faster when they communicate directly about a product or offer.

BEFORE

Wasted Noise

Not able to audit communication

Describe product, then ask a question

Overloaded email inboxes with intra- and inter-company communication

Buyers' personal notes are jotted down in notebooks and post-its

"Sometimes I will attach a sticky note to a piece of jewelry, then put it inside a Ziploc bag and send it to the manufacturer."
-Vendor Sales Representative

AFTER

Communicate in Context

All product conversations logged and organized by product

Context is clear, so cut right to the chase

All communications with vendors in one singular location

Personal notes are attached directly to the product for future reference

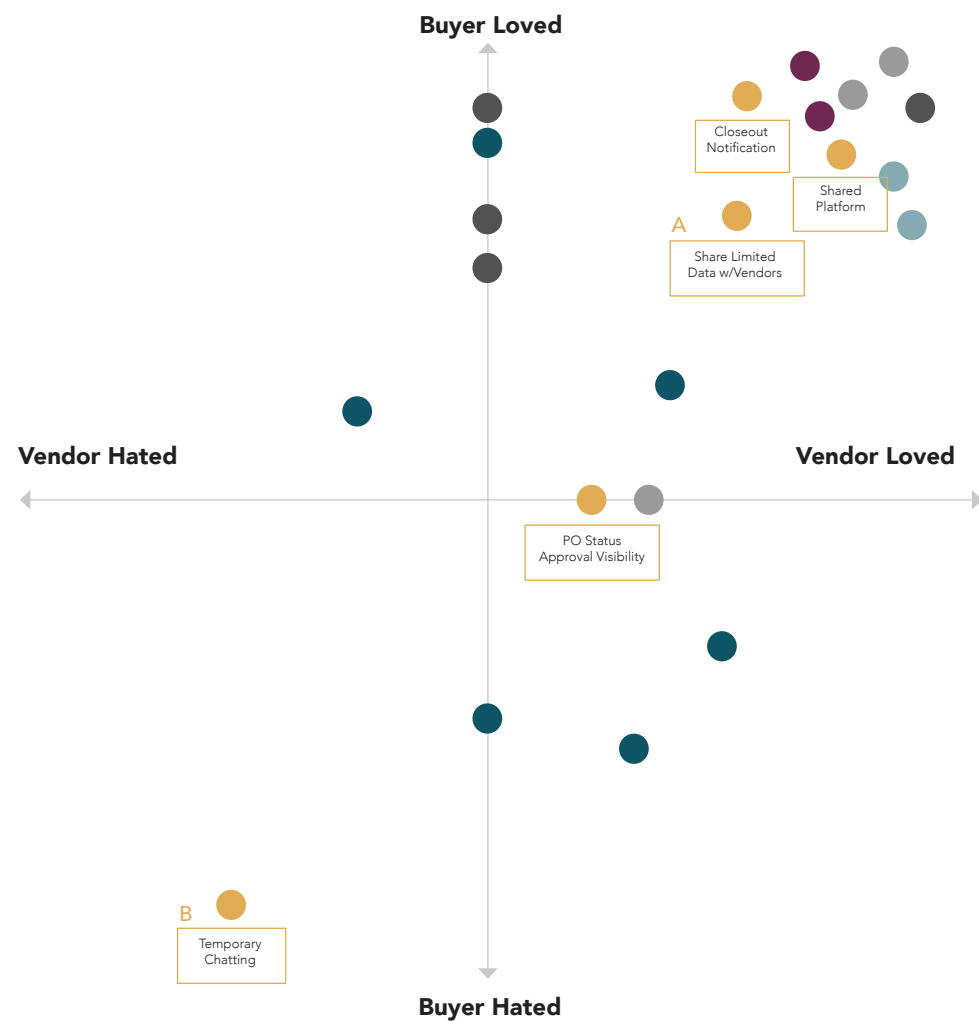
"I would use this tool to message things like 'Here is a screenshot of something similar at a lower price,' and 'Hey can you switch this wicker from black to brown?'"
-Buyer, 10 years

Storyboarding: Let's Talk about Communication

In our low-fidelity exploration phase, we wanted to test new concepts quickly, with low overhead. We created storyboards to test new concept ideas, gauging both buyers' and vendors' comfort and interest. Below is a summary and review of two such storyboards.

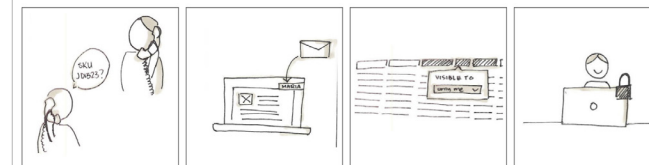
- Product Visualization
- Learning Buyer Preference
- Point of Sales Data
- Customizing Products
- Communication
- Other

Several of our storyboards were concerned with how the new platform could successfully shake up communication methods. Overall, the communication concepts we tested received very positive feedback from buyers and vendors, placing them in the top right quadrant of our Storyboard Value Metrics Chart, with a few caveats that informed our final design decisions.



A

Sharing Limited Data with Vendors



Mark asks Maria how his company's products are doing in her stores. Maria sees an option to send over some of the sales data from within the software. Maria changes the privacy settings in order to hide the margins. She leaves the other metrics visible. Maria sends the data to Mark, confident that she has shared just the right amount of information.

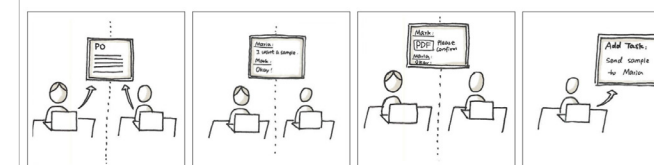
What Worked: Buyers and vendors liked modifying privacy settings, noting privacy is very important to maintaining negotiating power.

What Didn't: Participants hoped the process of data-sharing would be even easier than depicted—there is data vendors need, and data they don't. Buyers wanted to give access to the former without receiving requests for the later.

Impact on Final Design: Our design incorporates several features that give buyers their own personal, non-shared spaces within the tool: personal notes and individual margin calculations. Buyers can also choose which vendors have access to specific buying programs.

B

Temporary Chatting



Mark and Maria are remotely working together on their purchase order. Maria decides that she wants to see a sample of a certain product. She is able to quickly open a chat right there in the document with Mark. Mark attaches a PDF of the product page to make sure he has the right item. After confirmation, Mark make a note in the tasks section of the software so he remembers to take action later, since the chat is only temporary.

What Worked: Buyers and Vendors liked the ability to quickly communicate around a specific product, especially with relevant file attachments.

What Didn't: Participants were very against the idea of temporary chatting, considering it too 'casual' and even 'rude'. Vendors were concerned that fielding several one-off conversations could get out of hand, and buyers noted that if it was important, they would rather place a call.

Impact on Final Design: Our messaging design is product-specific and action-oriented. We made sure to add elements to satisfy users' business needs: incorporating a full message audit log, adding the ability to resolve a thread, and branded as 'Product Conversations.'



Buyers ask for lower and better...

Buyers can play with numbers within the tool to calculate their designed margins, or profits. Then they can collaborate with their vendors to negotiate prices and customize products.

1 Product Inquiries sidebar

2 Ask Price input field

3 Item# input field

4 Total Cost and Total Retail summary

5 'VIEW OR' button

- 1 I make personal notes.** I can make notes that aren't visible to my vendor to help my current decision-making or make sure to remember next time I order.
- 2 I negotiate price per product.** I can input a particular price bid, and reference my price negotiation history at the same time to see whether we are converging.
- 3 I make personal calculations.** I'm supported in my negotiation process by inputting a retail price and viewing the resulting margin for a particular price bid.
- 4 I view aggregate calculations.** While I'm working through the offer, any changes I make are summarized in the bottom panel.
- 5 I can ask questions about products.** I can reach out directly to my vendor about a particular product by making a product inquiry.



...and vendors make it happen

Vendors can respond to incoming price bids and field inquiries about both products and entire offers from their buyers.

1 Product Inquiries sidebar

2 Unit Cost input field

3 Ask Price input field

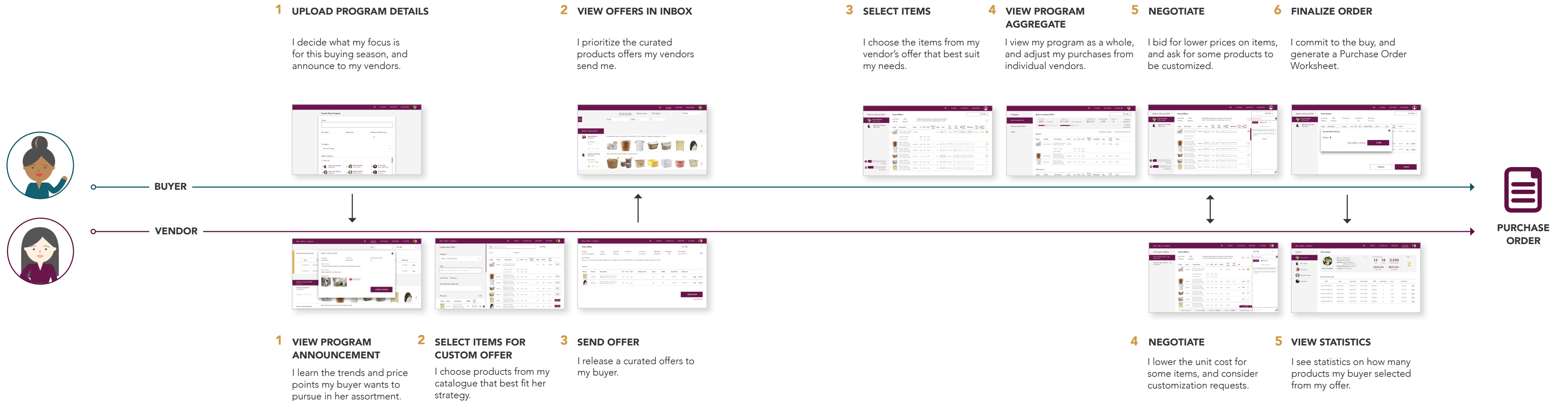
4 'Edit' button

5 'Type something...' input field

- 1 I can answer offer inquiries.** I can field negotiations about the entire offer, such as requests to adjust the shipping date or sourcing.
- 2 I can respond to price negotiations.** I can adjust pricing to reflect a Buyer's bid, or suggest my own.
- 3 I can answer product inquiries.** I can view and respond to new messages about a particular product, whether it be a question or customization request.
- 4 I can edit product information in response.** If the customization process progresses, I can easily update the product information to reflect our new agreement.
- 5 I can send and receive file attachments.** I can preview images and other files within the messaging stream, and send pictures of designs-in-progress.

FROM PROGRAM CREATION TO PURCHASE ORDER

Buying Time re-envision the current purchasing process, adding new decision-making tools and removing the need to exchange multiple emails and documents.



THE EVOLUTION OF BUYING TIME

To adhere to the overarching Buying Time vision, we suggest implementing the following features. We describe the feature details, how it integrates into the existing value proposition, and indicate why it was not included in the Buying Time 1.0 minimum viable product (MVP).

Buying Time 1.0

A minimum viable product (MVP) platform to facilitate purchase order creation and enhanced collaboration between buyers and vendors.

Program Creation
At Your Service

Program Aggregate
Decisive, not Disorganized

Facilitated Price Negotiation
Communicate in Context

Curated Product Offers
At Your Service

Inbox of Offers
Decisive, not Disorganized

Inquiry Channels
Communicate in Context

Buying Time 2.0

A service platform that facilitates all aspects of PO creation, including supporting tasks such as coordination between buyers, assistant buyers, and buyer managers.

Sample Tracking
Communicate in Context

What? A comprehensive system for buyers to request and track samples, and associate them with an correlating offers.

Why? Buyers receive product sample shipments almost daily, but as one buyer put it, they have ‘zero system’ for handling the influx.

Why not now? Though an important part of decision-making, samples require an existing collaboration platform. This feature should be developed soon after the MVP to enhance the communication aspect.

Intra Company Coordination
Decisive, not Disorganized

What? Task management tools that allow buyers to coordinate with their assistant buyers and managers.

Why? Buyers typically work in pairs: the buyer leads the strategic direction, while the assistant buyer manages the tactical aspects of purchasing.

Why not now? By making tactical processes more streamlined, Buying Time may shake up aspects of traditional roles. We want to address the real effects, rather than guess at potential situations and outcomes.

Buying Time 3.0

A full service platform that brings buyers through the entire buying process: from data analysis and trend-gathering all the way to a final purchase order.

Data Visualization
At Your Service

What? Data visualizations and decision support using point of sale data to validate the purchasing decisions.

Why? Buyers look back and forth at their paper ladder reports to see how products are selling—we envision buyers can make smarter choices when the data is displayed directly within the purchasing process.

Why not now? This feature would require integration with the retailer’s point of sale data system, adding significant overhead to software implementation and delaying product launch.

Comp Shopping
Decisive, not Disorganized

What? Features that allow buyers to gain more strategic insight from their comp shopping by organizing and processing these photos.

Why? Buyers use ‘qualitative’ data from comp shopping to inform strategies; with object detection and geo-location, we can make the data more organized and actionable.

Why not now? To be usable and gain major traction, this feature would require a Buying Time mobile presence.

Buying Time 4.0

A buying platform that supports all professional needs of buyers, while facilitating the product development needs and processes of vendor users as well.

Buying Automation
At Your Service

What? Optimization and automation of purchasing based on machine learning of point of sales data.

Why? As the Buying Time platform gets smarter at understanding the mechanics behind purchasing, we anticipate that some purchasing can become highly assisted or even partially automated.

Why not now? Storyboards that included buying automation were met with negative feedback, indicating that this type of change will need to be gradual, proving its value over time.

Trend Analysis
Decisive, not Disorganized

What? Observing and predicting trends in fashion-forward industries.

Why? With a large user base, Buying Time could track current trends and provide quantitative support for what is currently only gathered qualitatively.

Why not now? This feature requires a critical mass of both vendors and retailers on the platform, and positioning of the platform as a multi-retailer tool.



UNCOVERING THE WHAT & THE HOW
ARRIVING AT OUR FINAL DESIGN ,VALUES, AND
FUTURE DIRECTION

IDENTIFYING “THE WHAT”

After three months of research, we were bursting with ideas to improve the buyer-vendor collaboration process. We used the following techniques to hone in on the core features that would give our minimum viable product (MVP) maximum impact.



Scoping with Client

After our Spring presentation, we worked with LH Ventures to prioritize the identified opportunity spaces. We placed opportunities along 2 axes: user benefit vs. perceived profit, and user benefit vs. perceived cost. We then used a Brand Ladder exercise to begin identifying key user, management, and company values, benefits, and features.

Key Takeaway: We decided that re-imagining the purchase order (PO) creation process was the best alignment between user benefit, perceived profit, and perceived cost.



Bodystorming

To deconstruct the current purchase order creation process, we conducted a bodystorming activity, embodying a person or communication method. We then added a role for the Buying Time platform, and re-envisioned how the PO creation process could take place on the new platform. Our imagined future redistributed 10 documents and communication artifacts traditionally managed by the buyer and vendor—and even eliminated three.

Key Takeaway: Our bodystorm of the buying process showed that our ideas were a promising way to reduce unnecessary documents and work duplication.



Speed-dating Storyboards

We created 30 storyboards that depicted how a new tool could improve several parts of the PO creation process. We used them to validate underlying needs and gauge reactions to potential solutions. After synthesizing reactions, we placed each storyboard concept along a buyer/vendor perceived value matrix.

Key Takeaway: We learned that both buyers and vendors place the most value on concepts that enhance product visualization. Communication concepts needed strong privacy controls to succeed.



Tradeshaw Testing

We attended the Americasmart Apparel tradeshow armed with several concepts to test, and conducted guerilla testing (including in an elevator!) with over 50 buyers and vendors.

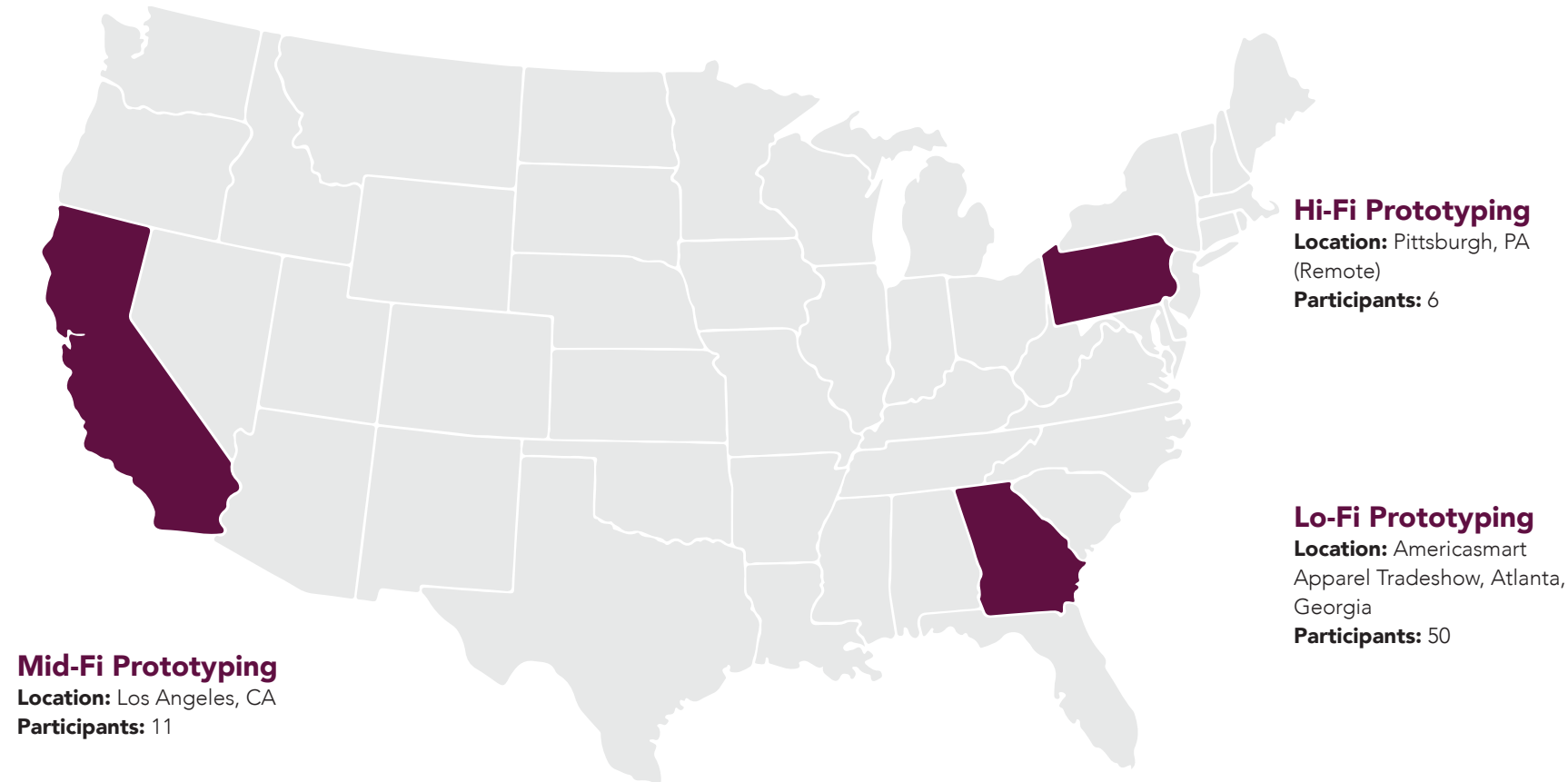
Communication Card Game: Two sets of cards to pair up: a communication method, and one of a buyer’s everyday tasks.

A/B Testing: Quick ‘this or that’ sketches of different concepts for the interface.

Key Takeaways: Participants wanted their communication to be just the right balance between casual and professional; video was “awkward” because of the time and technology needed. They wanted the interface (communication features, negotiation tools) to be structured around products.

FIGURING OUT “THE HOW”

We designed and tested iterative prototypes in sprints. We ran user tests to validate usefulness and usability in 3 different locations: Pittsburgh, Atlanta, and Los Angeles.



Lo-Fi Prototyping

Assumption Prototype

A cardboard mobile app for buyers to purchase products by scanning physical product cards

Key Takeaways:

Samples will never go away: Buyers need to gauge touch and feel, so we placed Sample Management on the Buying Time 2.0 roadmap. Product scanning tools exist, primarily for the tradeshow environment.

Digital Sketches

Black and white Sketch wireframes with just the core workflow to test rapidly

Key Takeaways:

Buyers are primarily concerned about the time it takes to make a purchase -- they want ‘no nonsense buying’. Existing softwares handled a portion of the PO creation workflow we were envisioning, and we needed to differentiate.

Mid-Fi Prototyping

Linked Wireframes

Black and white screens created in Sketch, and linked with Invision into pre-defined interactive task flows.

Key Takeaways:

Buyers needed more flexible ways to negotiate—both on the product and the entire offer. Buyers wanted to organize their offers within buying programs.

Hi-Fi Prototyping

Screen Mockups

Color screens and a defined Style Guide with mock data

Key Takeaways: Buyer and vendors need the application to adhere to existing naming conventions, and mental models of information organization. The iconography confused some, and the navigation needed to be more flexible.

Final Deliverable

Final Screen Mockups

We created a full set of wireframes that cover every feature and interaction of the MVP.

Animated Screens

We animated screens coded in Framer.js to help communicate our interaction designs to a front-end developer.

User Stories

We worked with LH Venture's agile development team to make Buying Time a reality. We created a comprehensive set of user stories to guide development.

Customer-Facing Website

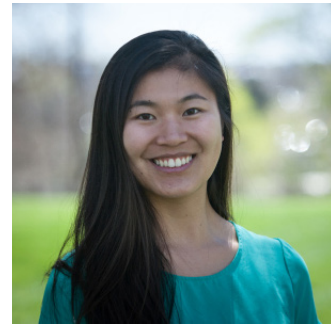
We design a website that showcases the value of our solution to future customers.

GETTING TO KNOW TEAM DUÈ

Buying Time is the result of an interdisciplinary team of five studying at Carnegie Mellon University's Human-Computer Interaction Master's program. Blending together different professional backgrounds (Industrial Design, Computer Science, Healthcare, Instructional Design and more) and home countries (China, Canada and the US), we called ourselves Team Duè—literally, 'Team Team' in Mandarin—to emphasize our focus on collaboration.

Angela Liu

Angelaliu.com



Q: What was your most memorable user testing moment?

A: At the Atlanta tradeshow, we conducted some of our user testing in an elevator. We always started with, 'Can I ask you a quick question?'. They would chuckle, like 'Oh you got us when we are stuck.' It resulted in some other funny situations too: if they asked us what floor we would say 'Whatever you want'. We ended up getting a lot of candid responses because it was such a casual setting. We had to finally stop doing it because the elevators there went really fast, and we both got motion sickness!

Leeyat Slyper

Leeyat.com



Q: If you had to describe capstone in one word what would it be?

A: Real. Because the experience that we have is surprisingly real-world for being in school. Though you have your faculty for advice and they are extraordinarily helpful, most of it is self-prescribed within your team. You have to figure it out on yourself because advice by necessity has to be generic, every project is so unique. It's interesting when people ask me now "So you're still in school, how are the tests?" But actually, I feel like I'm going to work. A good workplace!

The five of us sat down one-on-one to reflect on our personal journeys in our Capstone experience. Here is a collection of some of the most surprising, amusing, and impactful occurrences from our eight months together.

What was your favorite thing you worked on?

A: I enjoyed coming up with features for the product. One of the most fun, but also most frustrating and most productive brainstorming sessions was during our LA trip. We were tasked to re- envision the messaging feature, and that's when we came up with the channel concept. We sat there for two hours. We totally tore it apart, starting from ground zero. It was endless coming up with things, shutting down some, but we came away with a lot of good ideas. It was a daunting task, but it was really fun.

Q: What skill did you most improve?

A: I've expanded my experience with interviewing. I like the flow of it: how you have to come up with a cadence of light questions, heavy questions, broad, specific. Sometimes the most simple question like "how do you feel about that?" leads them to talk for 15 minutes straight, with so many gems that help you understand what they are going through and why. Also, I cold-called/emailed over 30 people for our LA trip recruiting—I joked that I could work for LH doing sales!

Tarnisha Washington

TarnishaMarie.com



Q: What is one thing you added to the team to push us forward?

A: I'm probably the most strict of us on visual design. If you work hard to make something, it should be presented accordingly. With food, you eat with your eyes first. Visual design is like the thesis statement: the attention-grabber. Then they notice you and take you seriously.

Qianxu Zeng

Qianxuzeng.com



Q: What has been your favorite Capstone food experience?

A: I had a fish taco during our first team dinner, and it was so good. It's become kind of our 'team food.' The hot pot that we had in LA was also really good. It reminded me of my hometown. Here in Pittsburgh, the hot pot is not real hot pot. I hadn't had spicy food for a long time, so I think I got weaker. I felt like fire—my stomach was burning, my mouth was burning. I'm trying to eat more spicy food recently to be prepared for when I go home.

Paul Goodwin

Goodwinux.com



Q: What did you learn from our empathy-building activity, running a bake shop?

A: I had to learn a lot about business analytics and development very quickly—there's many measures you can make but choosing the right ones is difficult. If you only look at the numbers, you end up with the Girl Scout incident: the 'numbers team' didn't know our sales went down because the Girl Scouts were also selling, and ended up mistakenly changing our shop hours because of it.

Q: How did this project affect other parts of your life?

A: When we started this project, every buyer I saw I thought, 'These people really remind me of my sister!' Her and my mom are shopaholics, but when she shops she thinks like a buyer: about cost vs. quality vs. style and trend. She's the only person I really trust to shop for me. Now she's considering a career in buying!

Q: What part of the project are you most proud of?

A: I cannot believe we finished so much work. Especially after we got back from LA—we redesigned the whole screens and flow! Also that we are working with developers, I didn't expect that. It's very good for our team, because we get additional experience. When you're doing job interviews a lot of interviewers ask you, 'How did you communicate with the Development team?' Now I have an answer.

Q: What do you do when you get stuck?

A: I've tried to start sketching more when I'm stuck. I start just sketching the problem space out to work through things. Not even trying to solve the problem, just to visually map out where I am. It helped out a lot with defining our tool's value proposition: if you can map out, based on research, why what we're building is valuable, we can clearly articulate the business case.



ACKNOWLEDGMENTS

The Capstone project drew many of us to the Carnegie Mellon's Master's in Human-Computer Interaction (MHCI) program. And this project has never failed to deliver. Through eight months of research and design, we've learned what an MHCI 'real-world experience' encompasses: real problem-solving, real debates, real insights, real friendships...and a real, implementable solution that the five of us are proud of. We want to thank the following individuals who have made this experience memorable.

Client

Thank you to Luke Wang and Doug Heckmann from LH Ventures for sponsoring this project. From the start of the project we knew we would tackle a big, thorny, complicated domain, and you have provided us with the support and encouragement we needed to understand and innovate. We nicknamed our team 'LH Adventures' because working, dining, and traveling with you has always been interesting!

Faculty

To our faculty advisors Skip Shelly and Dave Bishop: thank you for providing thoughtful advice while we explored our problem space and ideated solutions. Your whiteboard drawings, no matter the fidelity, helped us tackle issues from a new viewpoint. The underlying theme of your advice: the human-centered design process also needs to be researcher-centered, modifying the methods so you learn the most.

Participants

Much thanks to our buyer and vendor participants, and all the other individuals who have allowed us to go behind-the-scenes into the retail world. It has been fascinating, surprising, and, most of all, motivating—inspiring us to think of new ideas to make your lives easier. If you found Buying Time both useful and enjoyable, we've accomplished our goal.



At Your Service: Give a Little, Get a Lot



Efficiency

Buyers spend less time reviewing spreadsheets full of products that are off-base for their target customer.



Efficacy

With less products to review, buyers can pick just the right product for their assortment.



Feelings

Buyers feel less overwhelmed by the influx of product offers, and more motivated to review the curated offers they do receive.

Buyers feel that their needs are catered to, with fantastic customer service from their vendors.

Value 1 of 3



Decisive, not Disorganized: Rise Above the Mundane



Efficiency

Buyers often create their own spreadsheets to track purchases-in-progress, and spend time categorizing their emails by vendors; this tool does it all for them.



Efficacy

Buyers can view programs in aggregate to make sure the assortment that supports their strategy.

Buyers can track each decision's impact on their Open-to-Buy dollars, ensuring they stay within their program budget.

New Buyers have everything they need to quickly get up to speed on a category.



Feelings

Buyers feel less swamped by inputs from every direction, and able to make fully-informed decisions in a clear and concise fashion.

Value 2 of 3



Communicate in Context: Cut to the Chase



Efficiency

Because of the product-centric nature of the messaging design, there's no need to explain which specific product you're talking about, and the detail in question.



Efficacy

Messages and notes made by either party are attached to the product forever, making it a reference-able audit log.

By including all negotiation history, buyers can draw insight into their vendor's negotiation practice in order to get the upper hand.

Buyers 'resolve' product inquiries that have been answered, making it clear what needs to be done.



Feelings

Vendors feel more confident that their communication will receive a response, and buyers feel less bombarded by overzealous vendors.

Value 3 of 3