

Motorola Research and Development

The objective was to research the modes of product distribution from distribution center through to the point of purchase. Five areas were focused on: distribution, transport, retail, assisted shopping, and point of sale.

My group researched transport and trucking. We talked to truck drivers and distribution centers, and saw that truckers are the crucial link between distribution and retail. Most crucial of all throughout the entire process is the communication and capture of information.

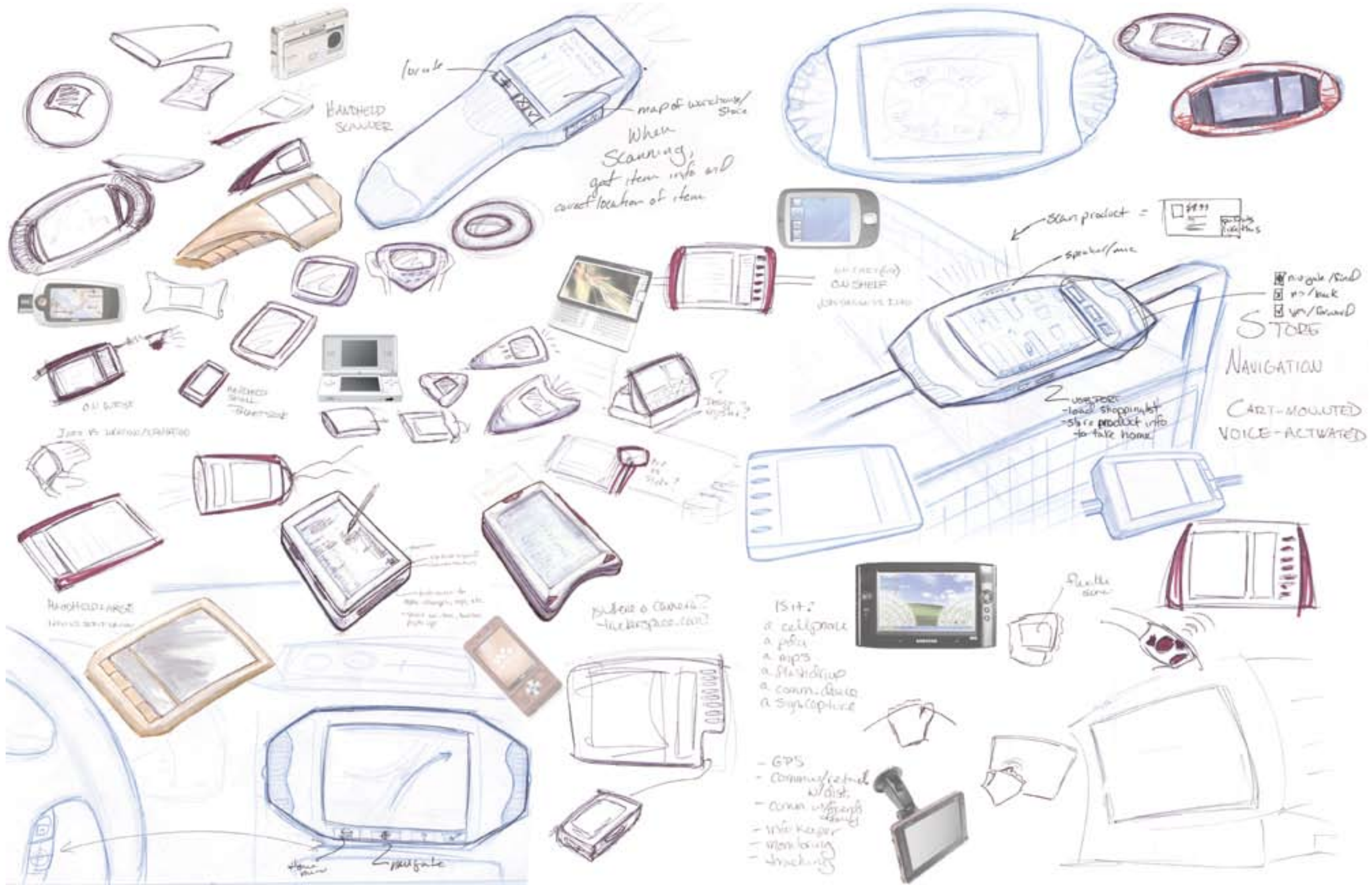


Teammates: Pete Wisber, Amanda Goldberg, Matt Malone

Motorola gave my 5th year class the task of researching the modes of distribution through retail. These were divided into five sections: distribution, transport, retail, assisted shopping, and point of sale. Smaller groups of 4 researched each task while my group focused on transport.

We then each individually designed a family of objects to address the insights that we gathered during our research.

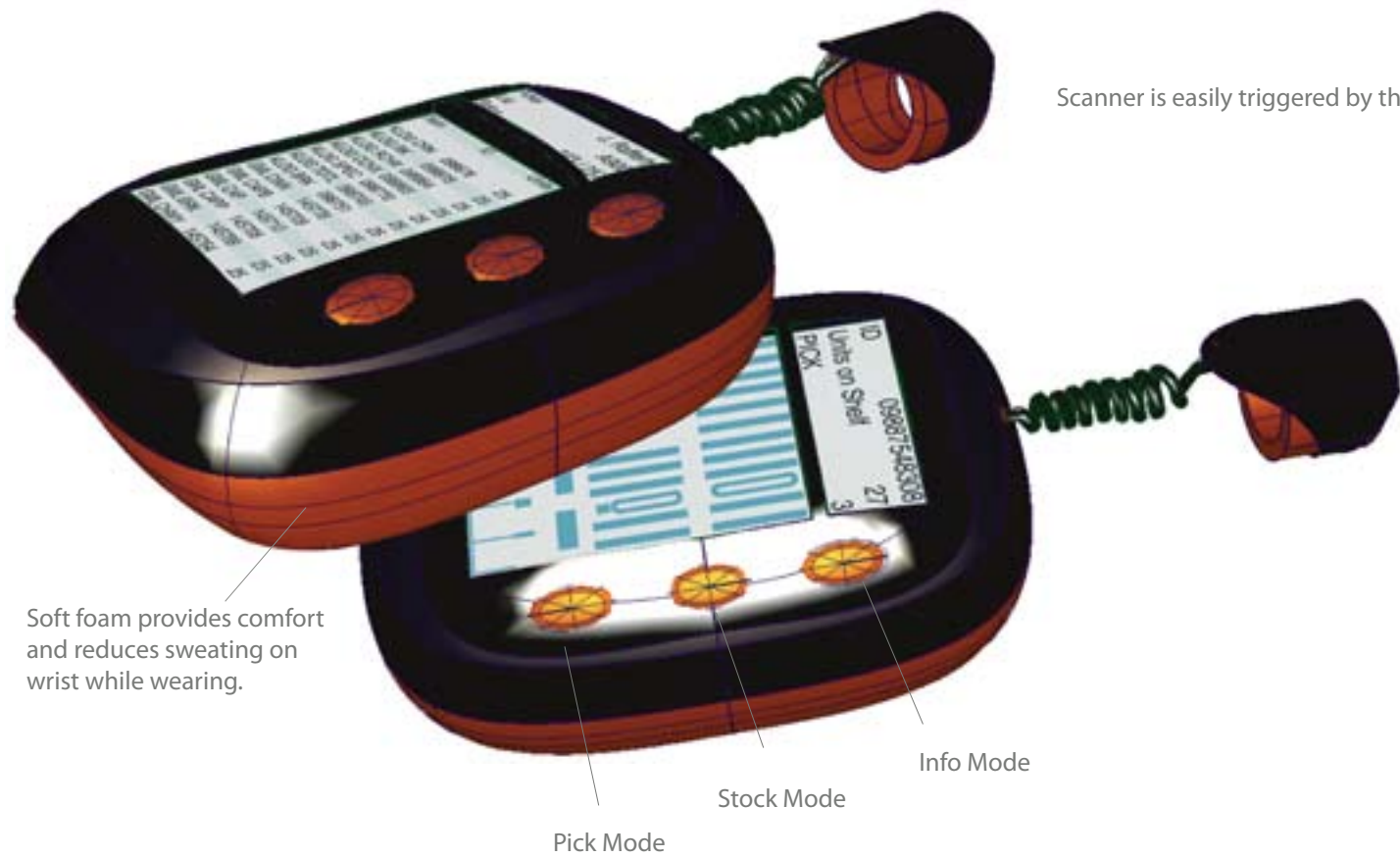
The next series of pages highlights the research the my team and I conducted and some of my own solutions to the problems found therein.



These sketches highlight some of the ideation process. The goal was to create a family of products that would speak to wide range of people, including managers, factory workers, truckers, store employees, and consumers.

How can information be scanned, received, and shared with ease and efficiency to a variety of clients?

Ring is co-injection molded with elastomer for comfort and sizing. Thinner underneath means that scanner will get in the way less often, and pickers will still be comfortable while lifting boxes with both hands.



Scanner is easily triggered by thumb

Soft foam provides comfort and reduces sweating on wrist while wearing.

Modes allow wearer to quickly and easily scan items for the correct task. Pick mode "takes the item off" the shelves, stock mode adds it, info mode does neither.

Unit records which items have been picked and which still need to be. Users can keep track of their picking quotas.

Split screen allows the user visually separate information. Less pertinent or immediate information is displayed on the smaller screen, while more important information is shown on the larger screen.

When an item is scanned in info mode, item information is displayed on one screen, while a visual map of its location is displayed on the other. Users have only to touch the screen to decided which information is more important.

Distribution

Insights: Different companies have specialized needs. For example, at McLane, price labels are only needed on single-sell items. Pickers/receivers will take off the ring and stick it somewhere or let it dangle -it can get in the way or get damaged. Most of the time, only a select number of buttons are used -information does not need to be typed in often. Pickers are given incentives for faster pick rates - they can earn up to 4 dollars more per hour.



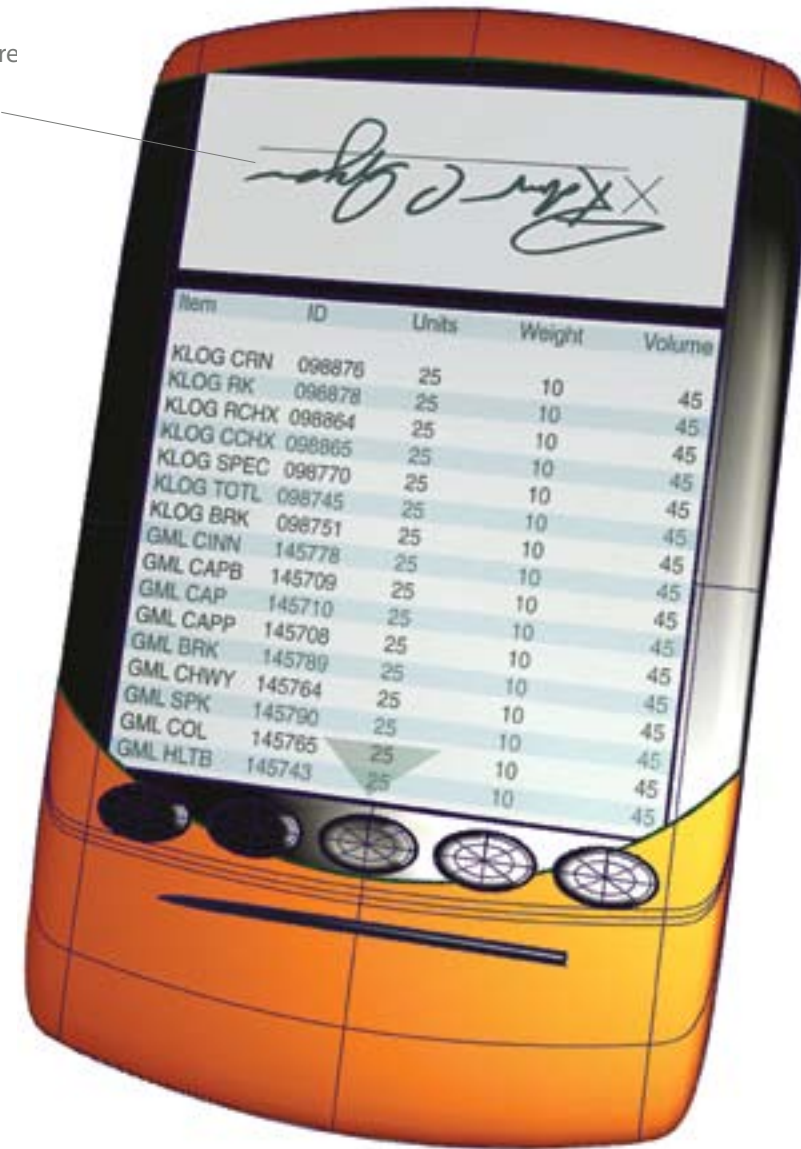
distribution

From our field research, we were surprised to see that many distribution companies are using a mainly paper-based system. With the exception of large corporate distribution centers, most companies we talked to were unable to afford the number of scanners that they required.

The scanners themselves were overly heavy and had far too many functions. Employees used only a small fraction of the tasks available. This means that distribution centers are wasting money on useless capabilities.

Lesser information or the signature capture during verification.

Stores logged hours, inventories, purchase orders, customer information, and navigation information.



Large tablet allows truck driver power over information. With this he is able to log hours, connect to in-cab device, verify delivery and pickup, and surf the web. As it is mobile, the driver can take his work in with him at a diner or rest stop.

Touch screen interface and stylus allow driver to easily manipulate information on screen.

During verification, hard paper copy may be placed on top of screen to capture signature electronically as well as on paper.

Held vertically, device is reminiscent of the driver's standard, the clipboard. When verifying delivery, driver can hand the device to a retail manager as he would a clipboard.

Buttons are large for gloved hands.

In speaking to truck drivers, we found that they are a largely overlooked group as far as design goes.

The average trucker uses his oversized metal clipboard and his trusty CB radio. The driver is in fact overloaded with papers which can be difficult to keep track of.

The driver is responsible for his cargo. This means that he must know at all times what is on his truck and where it is going. How does he get this information? He checks it himself or relies on someone else to have done it correctly.

Transport

Insights: Drivers have a large number of papers to read, file, verify, and fill out. If a change is made to the order, a brand new copy of the entire order must be printed out. A driver is responsible for everything that has or hasn't made it onto his truck. Everything must be verified. While some drivers have consistent routes and cargos, others don't. Employers, clients, cargo, and destination may change regularly.



In-cab device gives driver GPS navigation, easy communication for business or pleasure, weather updates, traffic updates, music, and truck monitoring.

GPS navigation is specially designed for truck drivers. System makes note of traffic, passable roads, low bridges, and points of interest such as eateries and rest stops.

Many truck drivers have onboard gadgets to help them navigate their routes, communicate with their dispatchers, and log hours driven. These gadgets are by and large outdated, ineffective, and often more trouble than they're worth.

Screens are difficult to read, and buttons are small. Too much attention is required than is safe for driving. GPS systems are often unreliable as they are not specialized for commercial vehicles.

Mobile communication device connects digitally to CB radio. Device tears off to be used to call distribution or retail office.

12 button alphanumeric keypad

Call/pickup button
When receiving an incoming call, push to transfer to larger device with speaker.

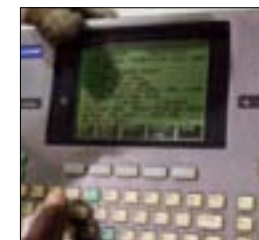
Touch screen interface uses large buttons and menu hierarchy.



Pivoting screen allows driver to customize viewing angle for safer driving.

Transport

Insights: Communicating is difficult. Drivers are expected to type a message or read one on an outdated, hard to read screen. This is often unsafe if not impossible. GPS systems are not designed for truck drivers and often lead them into residential areas or to impassable roads. GPS doesn't show low clearances, road closures, traffic updates, points of interest. Voice-enabled systems can help drivers to stay safe while on the roads, allowing them to keep their eyes on the road and their hands on the wheel.



transport



Distribution Manager



Retail Manager



Truck Driver

Managers use a PDA-like device to communicate with each other and to track the truck's location.

If any information should change, all three parties will be notified simultaneously.

Driver can easily contact retail or distribution with a cellphone-like device. Either party is then notified of the communication that took place.

Communication is one of the most important and potentially effective tools that companies can use. It is something that seems to be underutilized in the distribution industry.

The truck driver is the crucial link between distribution center and retailer, provider and client, supply and demand. It is necessary for all three parties to effectively communicate order information as well as developing circumstances.

Up to date information can reduce loss of time and money to all parties. Resources can be allocated properly, and time can be used productively.

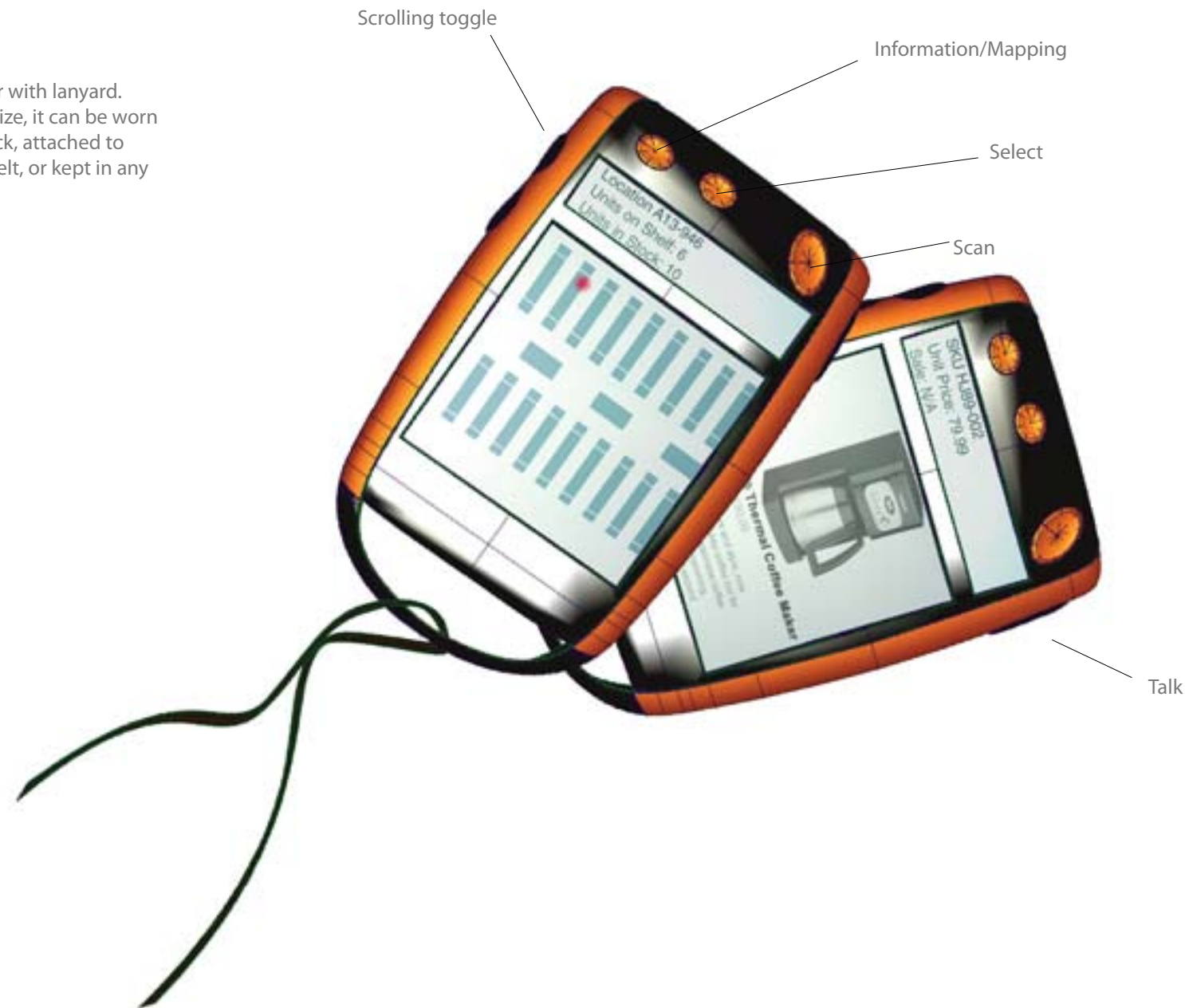
Distribution, Transport, and Retail

Insights: Communication between these three parts of the process is close to nonexistent. Distribution tracks trucking, retail contacts distribution, while trucking keeps plugging along. At any point during transport of goods, either of the three parties is likely oblivious of the other two. Due to ineffective communication, loading and unloading may take hours and often runs into break time. Drivers feel they shouldn't be on the clock while shipment is unloaded



communication

Simple scanner with lanyard. With its small size, it can be worn around the neck, attached to carabiner on belt, or kept in any pocket.



Split screen allows for hierarchy of information.

When item is scanned, basic item information such as SKU, price, and number in stock pops up on screen.

Use the Information/Mapping button for more specific info or item location. Scroll through info and Select to bring to larger screen.

Talk function allows employees to speak with one another, walkie-talkie style.

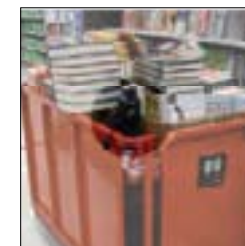
Industrial scanners are made with every possible function in mind. This makes them largely ineffective from a cost standpoint and inefficient to use. This goes double for the same scanners in the retail environment.

Retailers require different functions than their industrial counterparts and yet are still using the same expensive scanners. Most stores do not have enough scanners for all employees on the floor and prefer to use walkie-talkies.

Those who use these scanners find them overly heavy and hard to use. Scanners are big and cannot be carried easily. Walkie-talkies must also be carried at all times.

Retail

Insights: Employees are afraid of dropping their scanners and devices. The scanners often get lost, misplaced, or broken. Employees sometimes forget to scan the product when restocking the front. The scanners are often placed on a shelf or dolly, not in the holsters. Most stores can't afford to have enough scanners to go around. Industrial grade scanners have way too many buttons for the regular retail employee.



retail

Assisted device is mounted on shelf edges. Customers can scan their items below.

Customers can then see product information such as price, manufacturer, and number in stock.

While viewing product information, related information pops up on the second screen. This includes similar products, what other people who bought this item bought, and consumer reports on that item.

To see more about that information, just touch the screen.

Consumers are more savvy than ever. We all want to know more about the products we are buying, where they come from, who made them, what's in them, and what other deals are around. Comparison shopping is alive and well.

With the popularity of online stores, consumers have become accustomed to peer reviews and easy access to competitors, similar products, special offers, wish lists, special orders, and personalized shopping.

Allows customer to ask a sales associate directly via low res webcam-style video

Search online for more information/competitors

Where is...? Navigate

My Stuff: wish list/account

Allows customer to rate an item and read reviews



Assisted Shopping

Insights: Assistive device should fit environment. Signage at the shelf edge is helpful, but customers want to know more information about the products they are interested in. Shoppers want to compare items, learn about product materials and ingredients, hear how the product is reviewed by others. Customers are increasingly aware of where their products are coming from, what they're made of, and how eco-friendly they are. People rely on each other for shopping advice more than "experts."



assisted shopping