




About Us Resources Relationships Recognitions Disciplines Portfolio Case Studies


about us
structure
PDT story

tzlimited




sister company
Focuses on development & commercialization of proprietary IP


sister company
Solutions based product development



The idea behind a product is only the beginning. Other pieces are necessary in a business:

- Marketing
- Research
- Engineering
- Sales Channels
- Manufacturing
- Distribution
- Finance

Resources, expertise, and markets are often local, but the ability to communicate ideas

And have experts work on their area drastically speeds up getting to market.



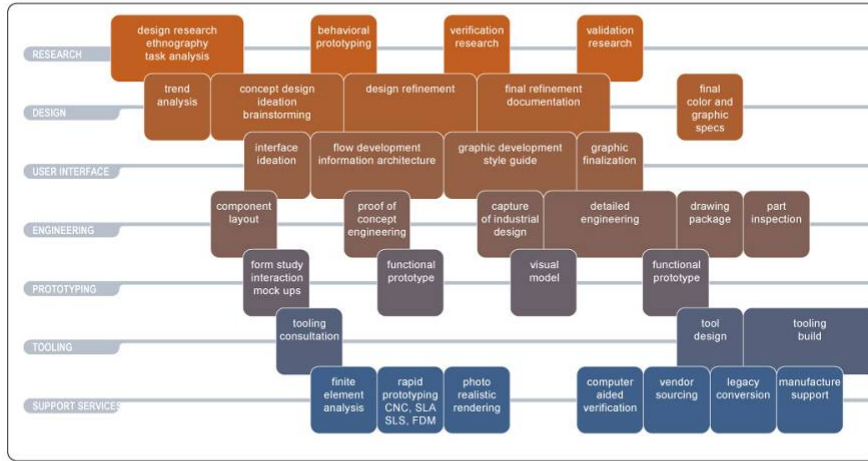
Complete products (and businesses) can be created quickly by locating the missing pieces, and communicating effectively so that they understand and can execute their piece.

Business can focus on their own technology and their own market.
PDT (and other similar firms) brings a set of skills to complete the product.



Informed Innovation:

A process structured around development timelines makes us flexible.
Our full range of services and integrated process makes us unique.



PDT Process

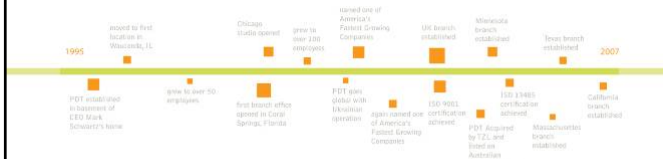


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about us

structure


PDT story



- Began in 1995 as a two-man operation
- Full service, award winning product development firm
- Over 100 global employees
- Eight worldwide locations
- Integrated development processes, from concept to manufacture
- Process begins with end in mind
- Efficient production and successful commercialization



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global resources


facilities strategically located to provide resources close to clients

24 hours project resources

diverse teams with varied expertise and experiences

pdt

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RTI

Johnson
A FAMILY COMPANY

wilson jones.

Snap-on.

QUALCOMM®

medela®

ITT Industries
Engineered for life

Swingline.

Cobra

UCDAVIS

Fellowes.

B BRETTFORD

DELL


SANFORD

pdt


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Explored.	Created.	Realized.
<ul style="list-style-type: none"> research 	<ul style="list-style-type: none"> industrial design user interface design mechanical engineering electrical engineering & software 	<ul style="list-style-type: none"> prototyping quality assurance tooling asian sourcing short run production

Complete Product Development



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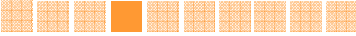


mechanical engineering:


Creating quality, manufacturable solutions backed by hundreds of years of combined experience.

Capabilities:

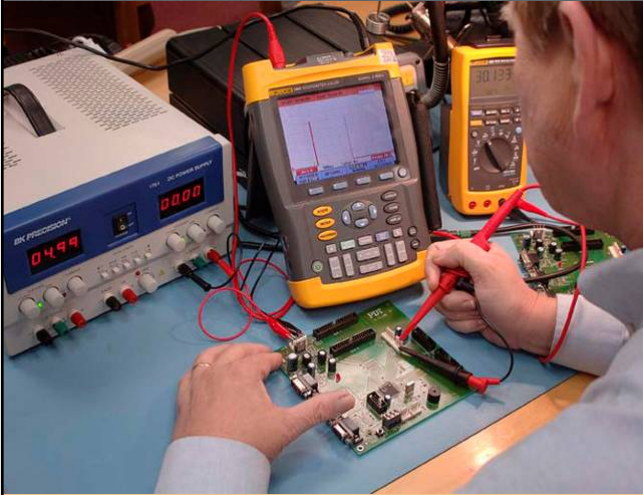
- pro/mechanica fea design
- emi/rfi shielding & enclosures
- design for low & high volume production
- design of water-resistant products
- mechanism design
- design for manufacturability



Mechanical Engineering



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electrical engineering:


Bringing products to life while assuring tight product integration.

Capabilities:
 hardware & software design
 analog, digital & rf design
 embedded, optoelectronic
 embedded device software
 conception through transfer to production
 regulator management

Electrical Engineering

pdf

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model making:


Creating mockups, appearance or functional models to check the functional, visual & ergonomic aspects of a design.

Capabilities:
 full appearance models
 engineering/functional prototypes
 3d printer/cnc machining

Prototyping

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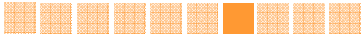
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quality assurance:

Delivering piece of mind on the quality & accuracy of your project.

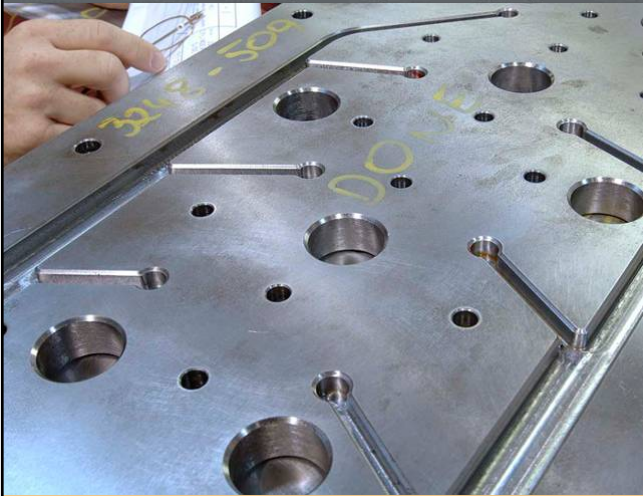
Capabilities:
 computer aided verification
 multiple scanners
 reverse engineering



Quality Assurance



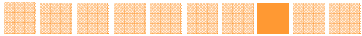
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tooling:

Tool design and engineering supported through fully integrated program management services.


Capabilities:
 design for manufacturability
 3d part and tool design
 global engineering resource allocation
 web-based conferencing
 comprehensive documentation and database management



Tooling



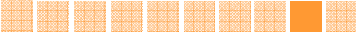
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asian sourcing:

Facilitating a smooth transition of design projects into the overseas tooling and manufacturing phases.


Capabilities:
 die cast & plastic tooling pre-qualified suppliers
 plastic, die cast part or part & full assembly pre-qualified suppliers
 3 levels of project support and pricing



Asian Sourcing




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short run production:

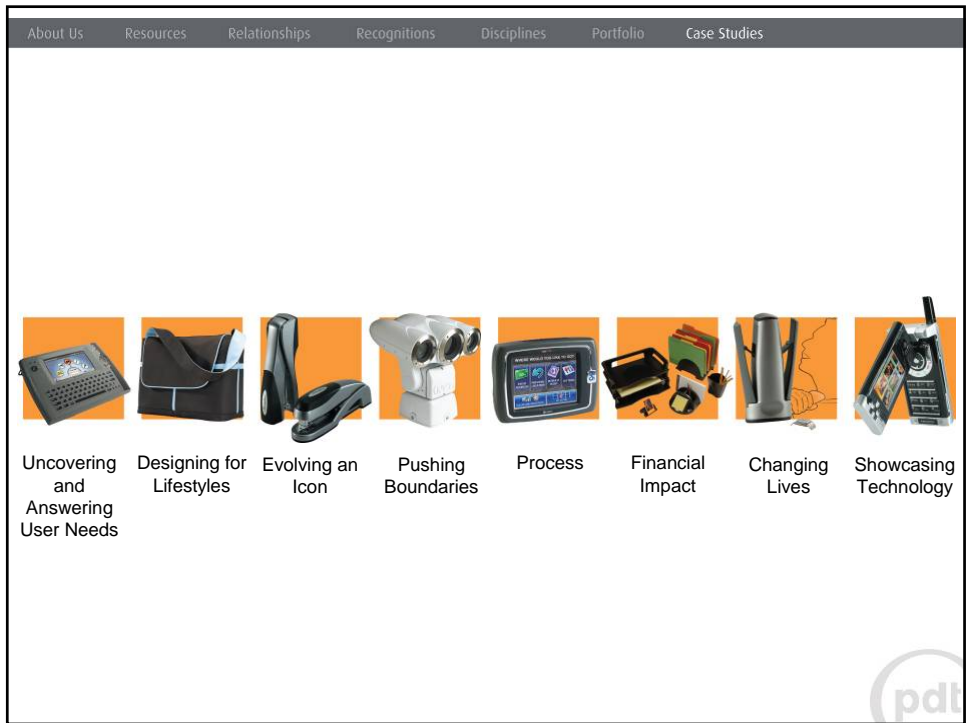
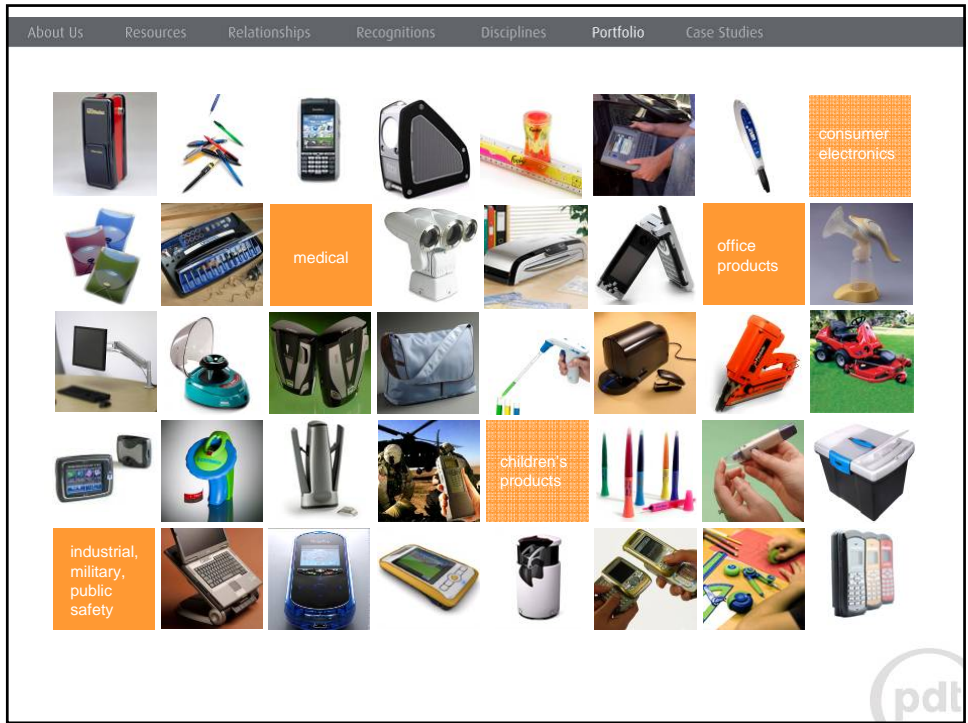
Integrating concepts into reality.

Capabilities:
 piece part & supplier quality control
 assembly fixture design & manufacture
 environmental testing thermal/humidity
 Traceability: inventory control, work build sheets, process flow analysis, risk mitigation
 secondary operations: form-in place gaskets, painting and machining



Short Run Production





CASE STUDY: SWINGLINE

Understanding consumers... how, why, where do people naturally use staplers.



Identify frustrations, commonalities and strains to lead on to new functional innovation.

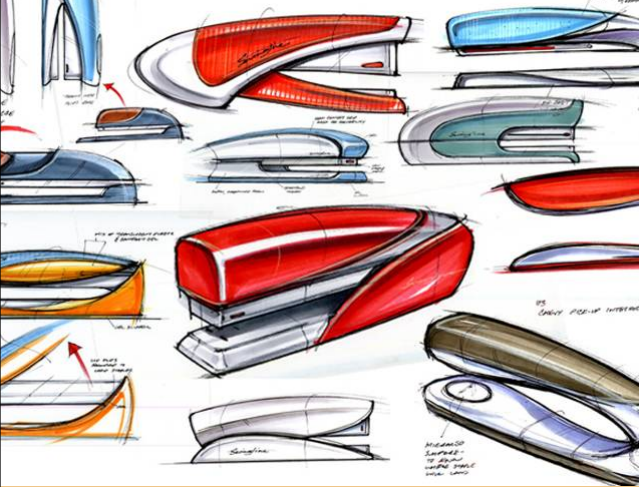


CASE STUDY: SWINGLINE



Multiple sketches were placed on the walls of the project room.




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CASE STUDY: SWINGLINE
First phase ideation.



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CASE STUDY: SWINGLINE
Foam models allowed the team to experiment with and prove out form, ergonomics, scale and proportion.



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Goodbye Black

Stable

Muted

Business

Tonal layers

Crossover

Youthful Fashion

CASE STUDY: SWINGLINE

Creating and compiling color palettes based upon upcoming trends, associated styles and products.

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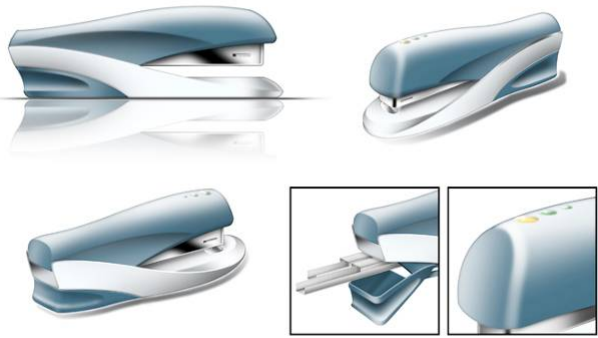
CASE STUDY: SWINGLINE

Palettes were created to define a theme of product colors and finishes.

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CASE STUDY: SWINGLINE

Innovative features and improved functionality was the focus for the Invision and Companion staplers.



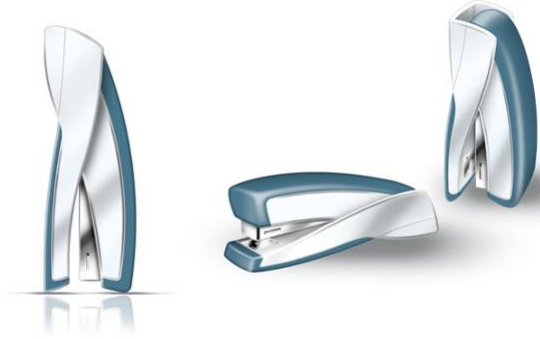
A horizontal orange bar with a central square containing a small grid of four images, all within a larger square frame.

pdf

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CASE STUDY: SWINGLINE

Style and ergonomics was the focus for the optima staplers.



A horizontal orange bar with a central square containing a small grid of three images, all within a larger square frame.

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CASE STUDY: SWINGLINE
Defining the palettes.

Part	Description	Color	Texture	Material	Finish
1	Top housing	488 ovc	MT - 10383	Polycarb	An. mold
2	Bottom housing	488 ovc	MT - 10383	Polycarb	An. mold
3	Slipper	488 ovc	MT - 10383	Del	Chrom
4	Magazine	Natural	none	Stainless steel	Polished
5	Logo	solid grey 11 ovc	none	Paint	Post primed
6	Indicator	red 582 ovc	none	Alloy	Painted
7					

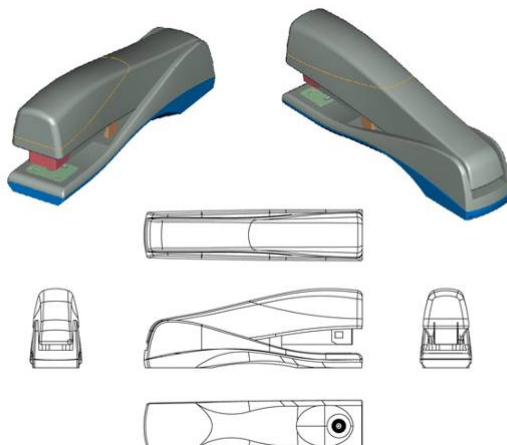
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CASE STUDY: SWINGLINE
Over mold and heavy duty die cast define the Optima desk stapler and provide a professional, high quality appearance.



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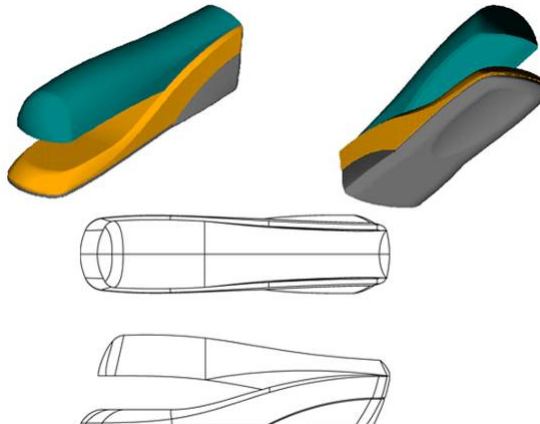


CASE STUDY: SWINGLINE

Ergonomics, soft touch and for each part that the hand touches and die cast compose the award winning Optima grip stapler.






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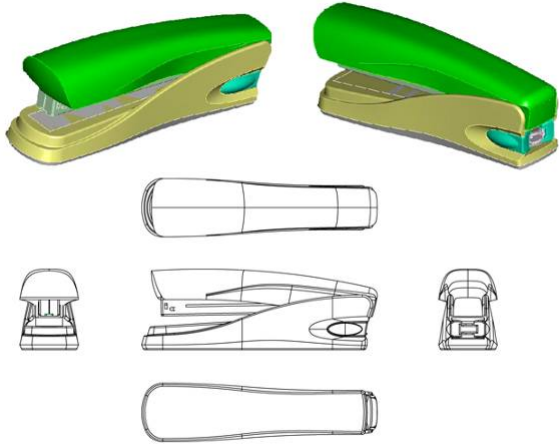


CASE STUDY: SWINGLINE

Engineering was challenged with the Invision stapler to determine a boot material that is strong yet flexible as well as creating an indicator that properly indicates when the stapler is low on staples.






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CASE STUDY: SWINGLINE

The Companion stapler also challenged engineers to determine where the built in stapler remover was located, its size and fit.



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CASE STUDY: SWINGLINE

Appearance models of the stylish die cast models were created.



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CASE STUDY: SWINGLINE

Appearance models of the feature rich models were also created.








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“The product platform marks one of the most significant points in the history of Swingline.”

“These new and enhanced staplers are designed to make everyday tasks easier and will only further our already solid reputation as a reliable and sought after brand.”

-Jeff Ackenberg, VP of Marketing and Sales and Product Development, Swingline





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CASE STUDY: COBRA

Product specifications, hardware and software features were compared with eight major competitors and rated.

SOFTWARE FEATURES	Language								Interface				Integration				Usability
	English	Spanish	Portuguese	French	German	Italian	Japanese	Chinese	Map	Search	Routing	POI	Real-time	Integration	Integration	Integration	
NAVMAN iCN 430 (DELPHI)		X		X	X	X	X	X	X	X	X	X	X	X	X	X	
TOMTOM GO		X		X	X	X	X	X	X	X	X	X	X	X	X	X	
GeoSATZ		X		X	X	X	X	X	X	X	X	X	X	X	X	X	
LOWRANCE WAF 500				X	X	X	X	X	X	X	X	X	X	X	X	X	
COBRA NAV ONE 3000	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
MAGELLAN Roadmate 700		X		X	X	X	X	X	X	X	X	X	X	X	X	X	
GARMIN StreetPilot 2600				X	X	X	X	X	X	X	X	X	X	X	X	X	
PIONEER AVIC-N1	X																
SONY AV-NVH XYZ																	

● included
 X not available

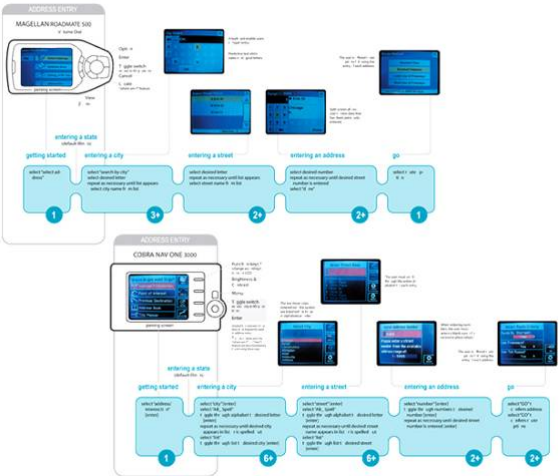

* Includes: auto-parking, navigation, including: speed, traffic, weather, etc.




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CASE STUDY: COBRA

Competitive Task Analysis:
The user interface of the existing Cobra unit and its three biggest competitors were compared and rated.




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CASE STUDY: COBRA

Ten participants with varying exposure to GPSM systems were observed using four different GPSM models.

Ride-alongs and unmanned video cameras provided insight into real-world driver behaviors and the frustrations that navigation causes.

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CASE STUDY: COBRA

Brainstorming based on user insights were based off findings uncovered by research.





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FRANKA

23-year-old female
Recreational use.

Recent college grad who moved from Manhattan to New Mexico to take a job designing war game software for the military. She likes to explore New Mexico and neighboring states on the fly in her freetime. While she doesn't use her new system much in Las Cruces, she does typically keep it on for the "fun factor."

Recently bought a brand new BMW Mini Cooper convertible that she loves to drive. Franka loves driving fast and has found the open roads of the Southwest to suit her adventurous personality. She considers her car to be freedom.



Franka has all of the expected electronic products including an iPad and PS3. She loves technology and wants to try to buy whatever is new on the market.

Franka is very athletic and counts snowboarding, mountain biking, camping, and rock climbing among her interests. She also loves alternative music and will drive for miles to see her favorite band Stone Kinsky.

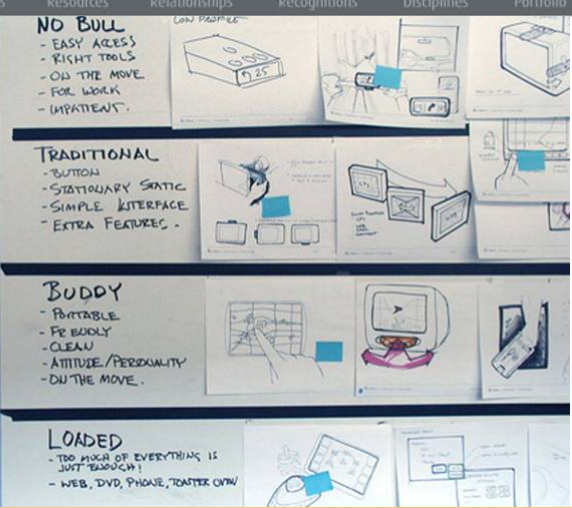
CASE STUDY: COBRA

User personas based on a summary of user needs identified in the field research provided a focus for initial ideation.

Personas gave design a tangible target based on research as concepts were developed.

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NO BULL
- EASY ACCESS
- RIGHT TOOLS
- ON THE MOVE
- FOR WORK
- IMPATIENT.



TRADITIONAL
- BUTTON
- STATIONARY STATIC
- SIMPLE INTERFACE
- EXTRA FEATURES.

BUDDY
- PORTABLE
- PE BUDDY
- CLEAN
- ATTITUDE/PERSONALITY
- ON THE MOVE.


LOADED
- TOO MUCH OF EVERYTHING IS JUST TOO MUCH!
- WEB, DVD, PHONE, TOASTER OVEN

CASE STUDY: COBRA

Brainstorming was grouped into four categories based on physical qualities and features that began to define user interface prototypes.



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CASE STUDY: COBRA

User behaviors were prototyped in order to establish the new system's architecture.

Research was conducted with users in their cars to define physical and software-based issues later addressed by design.

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CASE STUDY: COBRA


Screen interface files were created to simulate what a user would see and do during certain identified circumstances including address entry, loss of satellite signal, etc.






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CASE STUDY: COBRA

Establishing appropriate themes to the two architectures that were chosen by Cobra allowed us to gather imagery of products that contained form, color and personality that can inspire unique designs for the unit.



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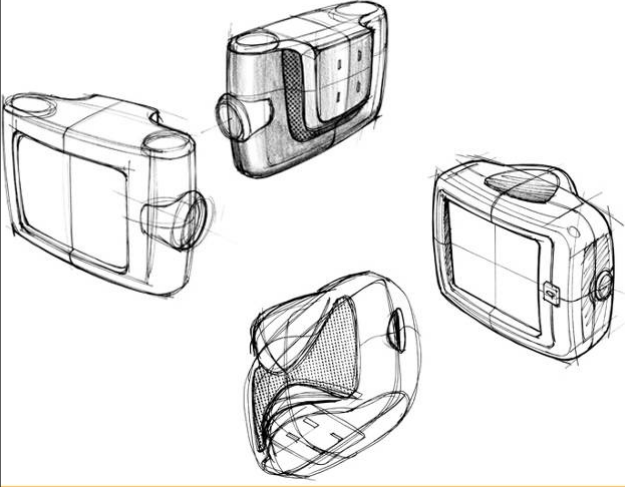
CASE STUDY: COBRA

Design awareness of the vital components and the environmental conditions help identify features to be considered and designed on the unit.








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CASE STUDY: COBRA

Friendly and sophisticated were the two design directions that were created from research and brainstorming.



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CASE STUDY: COBRA

Capturing the design gestures and incorporating real life manufacturing and internal fittings.

The design team works closely with engineering in order to maintain the essence of the design and also assist in designing around issues and changes that occur in the developmental process.



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CASE STUDY: COBRA

Illustrations are created for colors and textures.

These details are called out for client approval and submission to vendor.

Technical drawings of the COBRA device showing various views and callouts for manufacturing details:

- Slight Deboss of Cobra Logo on the Lens
- Power/Volume Dial
- Power Component
- SD Card Loading Area
- User Programmable Button Back light when turned on
- Eject Button Releases Unit From Mounting Bracket
- Mini USB
- Manufacture Label
- Mounting Bracket Area

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CASE STUDY: COBRA

Appearance models were made to show the final layout and aesthetic.

Photograph of a physical appearance model of the COBRA device, showing its dark grey, textured surface and perforated speaker area.

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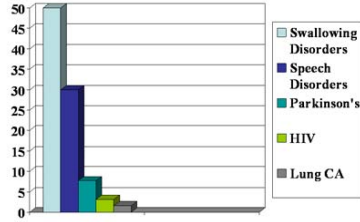
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“PDT has truly been an exceptional partner for Cobra Electronics. They are not merely a vendor; they are an integral part of our team. In addition to their obvious creativity, what makes PDT so outstanding is that they are both highly responsive and highly proactive. PDT is an extraordinary organization composed of extraordinary professionals.”
 -John Pohl, Vice President, Cobra Electronics

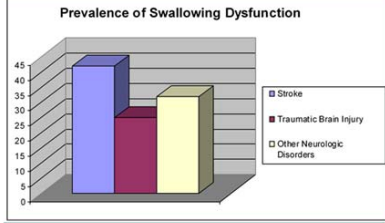



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Condition	Prevalence (Approximate)
Swallowing Disorders	48
Speech Disorders	32
Parkinson's	10
HIV	5
Lung CA	2

Prevalence of Swallowing Dysfunction





Category	Prevalence (Approximate)
Stroke	45
Traumatic Brain Injury	30
Other Neurologic Disorders	35

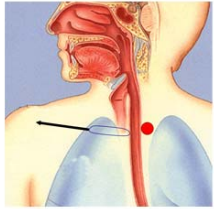
CASE STUDY: UCDHS

Swallow Enhancement Device™ (SED™):

Dysphagia (difficulty or discomfort in swallowing) is a problem for millions that is relatively unknown because medical work around solutions currently exists, however, feeding through tubes cause huge “quality of life” problems.

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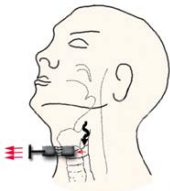




CASE STUDY: UCDHS

The program was really designing a system consisting of two products, each with unique requirements, which had to work together seamlessly.

The goal was to allow patients to externally control their swallowing for the first time and allow people to eat again after a minimally invasive procedure.

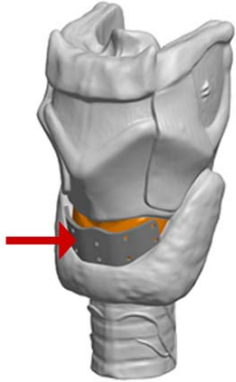
1st time external control of UES
Minimally invasive procedure
Allow some people to eat again
New era in dysphagia treatment



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Model of Throat and Implant Location



CASE STUDY: UCDHS

We first investigated and quantified through prototyping the magnetic strength of various material options for the implantable portion of the device.


The original idea was to implant a magnet into the body, but we quickly realized that it would be better for the magnet to be completely external.

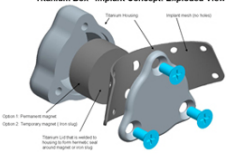
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Early Concept

"Titanium Box" Implant Concept



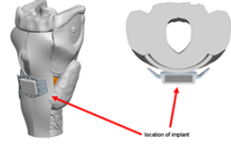
"Titanium Box" Implant Concept: Exploded View



Option 1: Titanium Box
Option 2: Titanium Magnet (on top)
Titanium Box: Titanium housing to house the magnet, with electrical steel lamination.

Refined Final Concept

Implant Concept K: Titanium Combo Machined/Sheetmetal



location of implant

Implant Concept K: Titanium Combo Machined/Sheetmetal

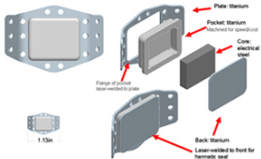




Plate Titanium
Pocket Titanium
Case electrical steel
Back Titanium
Laminations to front for magnetic seal



CASE STUDY: UCDHS

We determined the best approach was to implant a small titanium housing enclosing ferrous electrical steel on the front of the patient's cricoid cartilage.

The electrical steel laminations accept and release magnetic force easily, providing a solid bond to an external magnet without retaining power when the magnet is removed.



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CASE STUDY: UCDHS

Patient feedback was important throughout the process, but due to the nature of the product we first tested its functionality on cadavers.

Living dysphagia sufferers were brought in to help understand the debilitating nature of their problem and how our solution could best be tailored to improve their quality of life.

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CASE STUDY: UCDHS

The problem had many challenging requirements:

- The external device had to provide the right amount of attraction while accommodating the differences in patients' weight, skin thickness, etc.
- The patient had to safely engage and disengage the magnetic attraction so as not to cause pain or damage to their throat.
- The device had to be sized for use by patients with a variety of throat and hand sizes and operated by people with a wide range of strength and dexterity.
- The device had to look attractive and unobtrusive so patients could use it at restaurants and other public places.

1 Magnet is retracted within housing until user squeezes handles, internal magnetic attraction allows comfortable placement / removal of device...

2 ...User squeezes handles, moving magnet to front of housing and engaging magnetic attraction to implant on Cervical Cartilage

3 With magnet engaged user gently pulls device forward, pulling the Cervical Electromagnet CCM inside and opening the Cervical Electromagnet to swallow.

To avoid damage to throat, mechanism automatically releases magnet if force exceeds safe parameters

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CASE STUDY: UCDHS

The external handheld device contains a magnet sliding within an ergonomically contoured housing.

A spring encourages the retraction of the magnet from the implant to ensure smooth removal from the throat.

The device includes a safety release to prevent tension from becoming too strong.

Silicone Pad: for skin protection

Magnet: Shown in most forward (full-power) position

Spring: to counteract magnetic force
High force separation point

Stops: for Power Adjust

Linkages: for Activation

Levers: for Activation

Screw: for Power Adjust

Cap: Removable, Hides Power Adjust

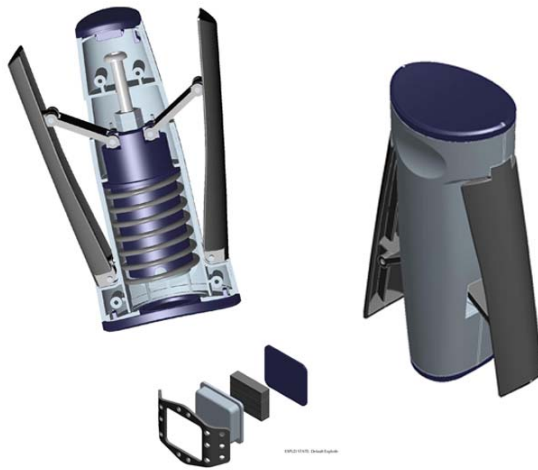


CASE STUDY: UCDHS

The patient controls the movement of the magnet by squeezing/releasing comfortable grips.

Once engaged, the device is gently pulled away from their throat, which pulls the implant- and cricoid cartilage- along with it.

The esophagus is thus artificially opened and the patient can now "swallow" their food.



CASE STUDY: UCDHS

Explanatory views of the external device and implant.



The product is currently in early stage testing and must gain FDA approval before being used on patients in large scale.

