UX/UI for Embedded HMI Systems

June 24, 2020

FRESH

Our Story

Fresh Consulting was founded in 2007

Headquartered in Bellevue, we now have four locations, a global team of over 300 strategists, designers, developers, engineers and roboticists helping our clients engineer the future.

We have continued to grow with our clients' success, and we're regularly recognized for our innovation, growth, and project execution.
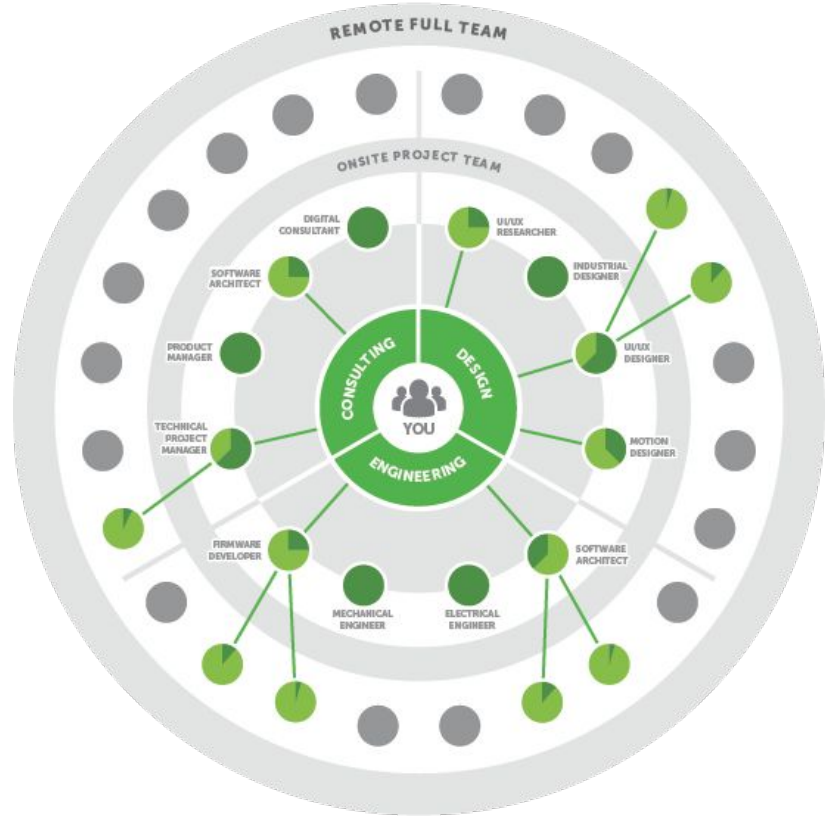
Founded
2007

Staff
300+

Offices
4

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Small Enough
Big Enough

Powered by our end to end talent, we deliver end-to-end solutions with holistic perspective for today's opportunities and challenges.

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Microsoft

NIKE®

Google

amazon

PHILIPS

adidas

oculus

BOEING

T··Mobile·

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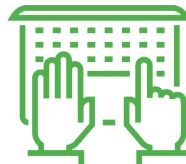# End to End Services

Strategy

Digital Product Strategy

Innovation as a Service

Innovation Sprints

UX/CX Research

Design

Brand & Identity Design

Industrial Design

UX/UI Visual Design

Video & Motion Design

Software

AR/VR Development

Mobile App Development

Web App Development

Website Development

Hardware

Autonomous Robotics

Manufacturing Automation

Test Automation

Research & Development

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User **Experience** Design
(UX Design)

The holistic process of using research to drive design decisions that match user needs and expectations

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Why should we invest in UX design?

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Researchers at **Usability.gov** estimate that 15% of IT projects are abandoned and at least **50% of a programmer's time** during the project is spent doing avoidable rework.

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Poor UX
**Carries Negative Consequences
and Diminishes Value**

✘ Decreased Sales

✘ Dissatisfied Customers

✘ Poor Ratings and Reviews

✘ Negative Impact on Brand

✘ Increased Need for Training

Good UX
**Leads to Better Products
And More Value**

✔ Increased Sales

✔ Increased Customer Satisfaction/Loyalty

✔ Better Reviews and Word of Mouth

✔ Positive Impressions of Product and Brand

✔ Decreased Training, Support, Errors

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What is the process to create a good user experience?

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Challenge

Design touchscreen interfaces for 4 unique restaurant products and create a style guide for future products

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Goals

- **Reduce the need for training by unifying the interface look and interactions across product lines**

- **Reduce time designing and developing future products**

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Where did we **start?**

Research helps you **define** the product roadmap based on **facts** instead of opinions

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DEFEAT
B.O.C.O.

YOUR PRODUCT DEPENDS ON IT

The **Beast of Conflicting Opinions** takes on many forms. Master UX Tools to reach consensus and vanquish disagreement.

START THE JOURNEY →

Research

Define

Ideate

Prototype

Test

Understand the Business

- Business & Project Goals
- Current State Benchmarks
- Competitive Landscape
- Technology Constraints
- Timeline Constraints

Fresh UX Principle #39

Build process around timeline, budgets and ROI

As no two projects or businesses are equal, process should be tailored to bring the optimal value to our clients.

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UX Review

We use our own **'10 ingredients'** framework which focuses on the key elements of designing modern and highly usable digital products. Each category was given a score as follows:

3 - High End

2 - Progressing

1 - Developing

1. Security & Privacy	3
2. Performance	3
3. Aesthetics & Layout	2
4. Accessibility	2
5. Information Architecture	1
6. Content	2
7. Learnability	2
8. Feedback & Interactivity	2
9. UI Pattern Best Practices	2
10. Support	2

Total
21
Out of 30

Research

Define

Ideate

Prototype

Test

Empathize with the User's Point of View

- Key touch points

- Daily / Weekly / Monthly tasks

- Pain points around tasks and touch points

- Key Influences

Who are the people using
the product and how are they using it?

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Fresh UX Principle #14

Build Meaningful Personas to Create Empathy

Personas align teams on the core users types and pain points for quick reference when discussing product features

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Persona Overview

Settings Sofía — 45

- Has to ensure employees are proficient users with little time to train and high turnover
- There is a large learning curve to using advanced features

Two-Click Nick — 35

- New on the job and received little training on machine
- I don't like cleaning the machine

Fit-It Frank — 15

- Problem is usually unknown until tech arrive at the restaurant
- Fault logs don't give enough information

Expert Ed — 5

- Programming into the interface on the front of the oven is tedious and uncomfortable
- My customers forget everything as soon as they leave

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Don't just ask them.
Observe them.

4
Products

10
Locations

12
Interviews

22
Users
Observed

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Research

Define

Ideate

Prototype

Test

Define the Problems and Prioritize

- What are user needs and why?

- How frequent is the need?

- How does the need impact the user?

- How does the need impact the business?

Fresh UX Principle #8

Build User Stories to Drive User Flows

Creating stories that identify what tasks a user will undertake allows us to design effective user flows.

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Who has the need?

What is the need?

Why do they need it?

How often do they they need it?

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User Story Example

WHO
As Settings Sophia

TASK
I need to group all my lunch recipes together

WHY
so I or my staff can quickly cook during the lunch rush

FREQUENCY
4 - Rare/Quarterly

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User Story Example

WHO
As 2-Click Nick

TASK
I need to cook a lunch sub quickly

WHY
so I can fulfill a customer order in a timely manner

FREQUENCY
1 - Daily / Multiple Times

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Research

Define

Ideate

Prototype

Test

Challenge Assumptions to Innovate

- Invent Value
- Information Architecture
- Team Design Huddles
- Wireframing & Sketching
- Mockups

Tap the mindshare of your people and partners through **online challenges**
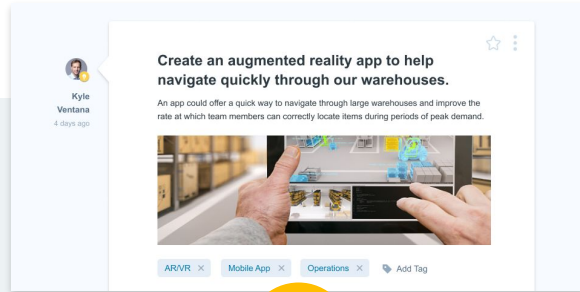
1 Ideate

Frame a problem and generate new ideas through online challenges
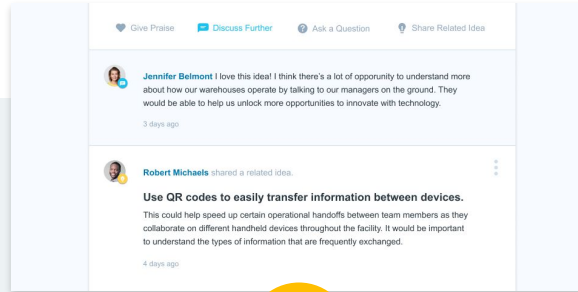
2 Collaborate

Discuss ideas and collaborate on robust solutions
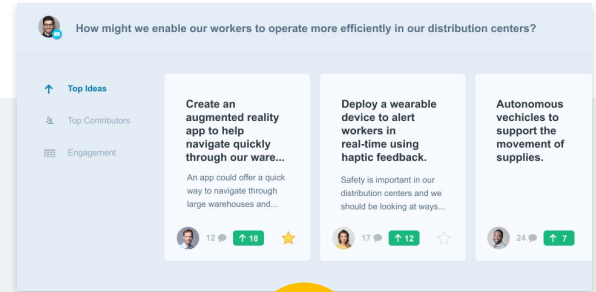
3 Evaluate

Select the best solutions to move forward with further development

Invent Value

Sketching and **Wireframes**

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SHAKE MENU

MIX LEVEL HEAT TREAT PUMP WASH

VANILLA CHOCOLATE STRAWBERRY SPECIAL

EDIT SHAKE FLAVORS

? 🔧 ⚙

02/22
DATE

SHAKE MENU
VANILLA

SOFT SERVE
VANILLA CUSTOM

DESIGNER

MODE SHAKE SOFT SERVE STANDBY
AUTO STANDBY MIX LEVEL

MAINTENANCE
RINSE CLEAN
14 DAYS
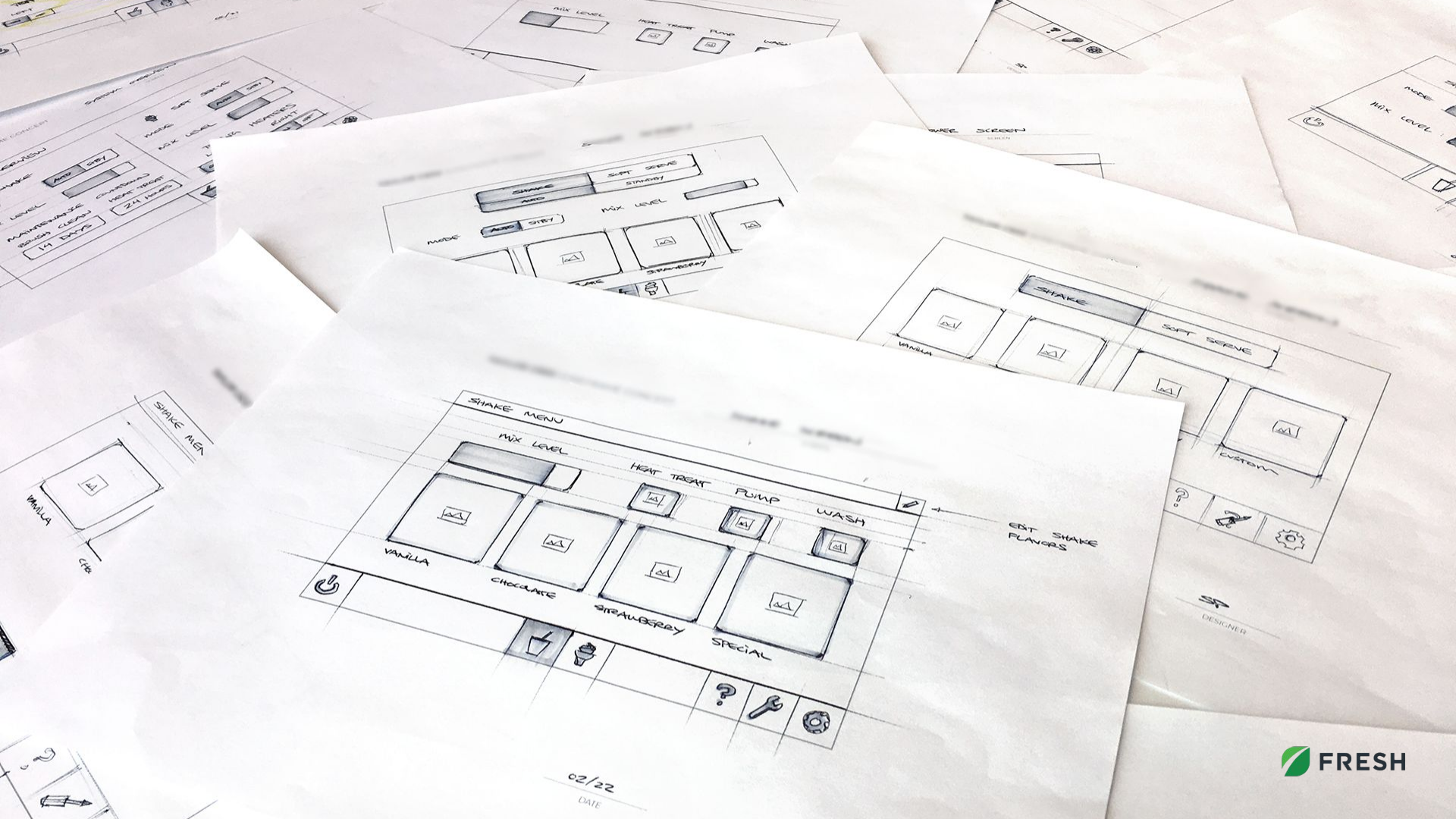
Menu Groups

| 450° | **500°** |

Wings   **Nachos**   **Meat Pops**   **Veggies**   **All Items**

OFF

Warming 473°

| **Menu** | Manual |

Menu Groups (Edit Mode)

| Edit 450° | | **450°** | 500° | | + Group |

Breakfast   **Sandwiches**   **Pizza**   **Chicken**   **Steak**

Breakfast   **Sandwitches**   **Pizza**   **Chicken**   **All Items**

A̲Z̲

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Fresh UX Principle #2

Paper is Cheaper than Code

Iterating by sketching and wireframing on paper saves time and money in the long run by mitigating the need to make changes during the later stages of process

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Fresh UX Principle #11

Wireframe Simply, Without Color, Imagery, or Style

Colors and imagery evoke emotions, whereas the purpose of monochrome wireframes is to establish solid functionality and structured layout conducive to a user's goals.

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Research

Define

Ideate

Prototype

Test

Don't Just Imagine it, Prototype it

- Paper Prototypes
- Interactive Wireframes
- Interactive Mockups

Touchscreen UI Best Practices

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Tap areas should be 9mm and above. The pixel density of the screen determines how many pixels it takes.

A 7" screen at 1024x600 requires more pixels to hit 9mm than a 7" screen at 800x480

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Tap Targets & Frequent interactions

% OF MISSED TAPS

25%
20%
15%
10%
5%

1 in 30 (3%) miss target

1 in 100 (1%) miss target

1 in 200 (0.5%) miss target

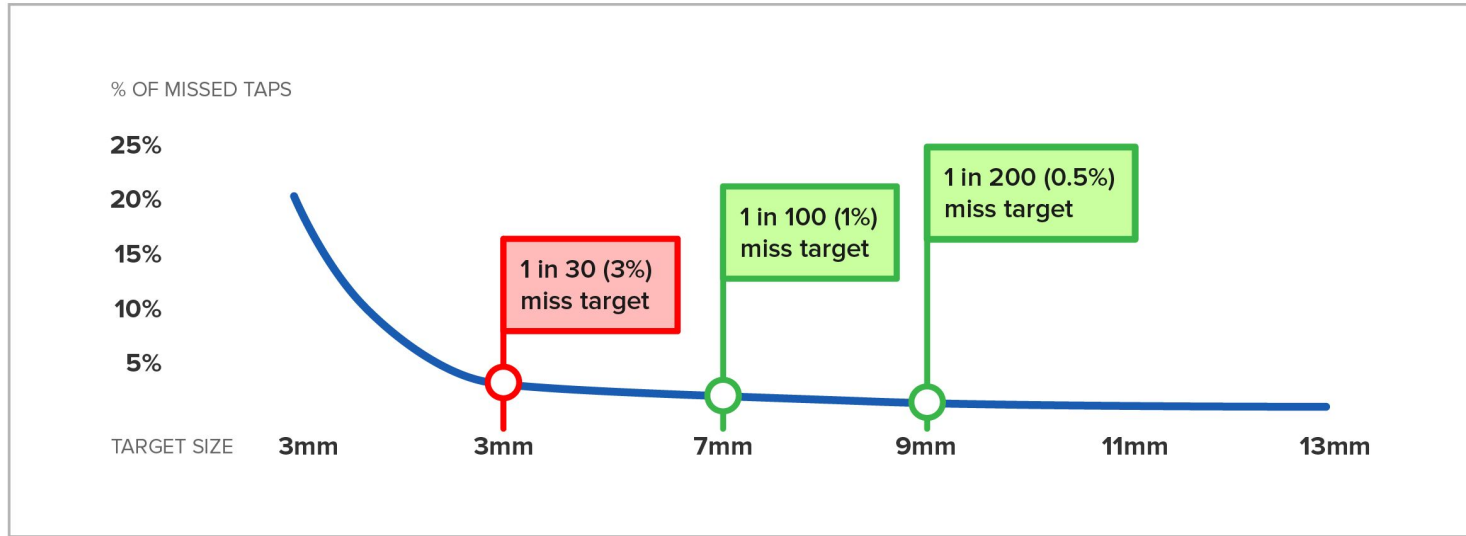TARGET SIZE   3mm   3mm   7mm   9mm   11mm   13mm

Chart from *A Book Apart: Designing for Touch*

Fitts's Law:

The time to acquire a target is a function of the distance to and size of the target.

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2

Icons

Most icons are not universally recognized and may require a label

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Icon 1

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Icon 2

Select a Language

- ✓ English
- جزائري
- Nederlands
- français
- Deutsch
- हिन्दी

More Settings

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Cognitive Barriers
User Apprehension

Expected number of steps

Perceived length of steps

Perceived difficulty of each step

Cognitive Loading
User Frustation

The number of choices I have

Amount of thought required

Confusion & Choice

GOAL

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Chicken Cordon Bleu

03:32

MIN   SEC

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4

System Feedback

Provide **system feedback** to confirm and inform actions

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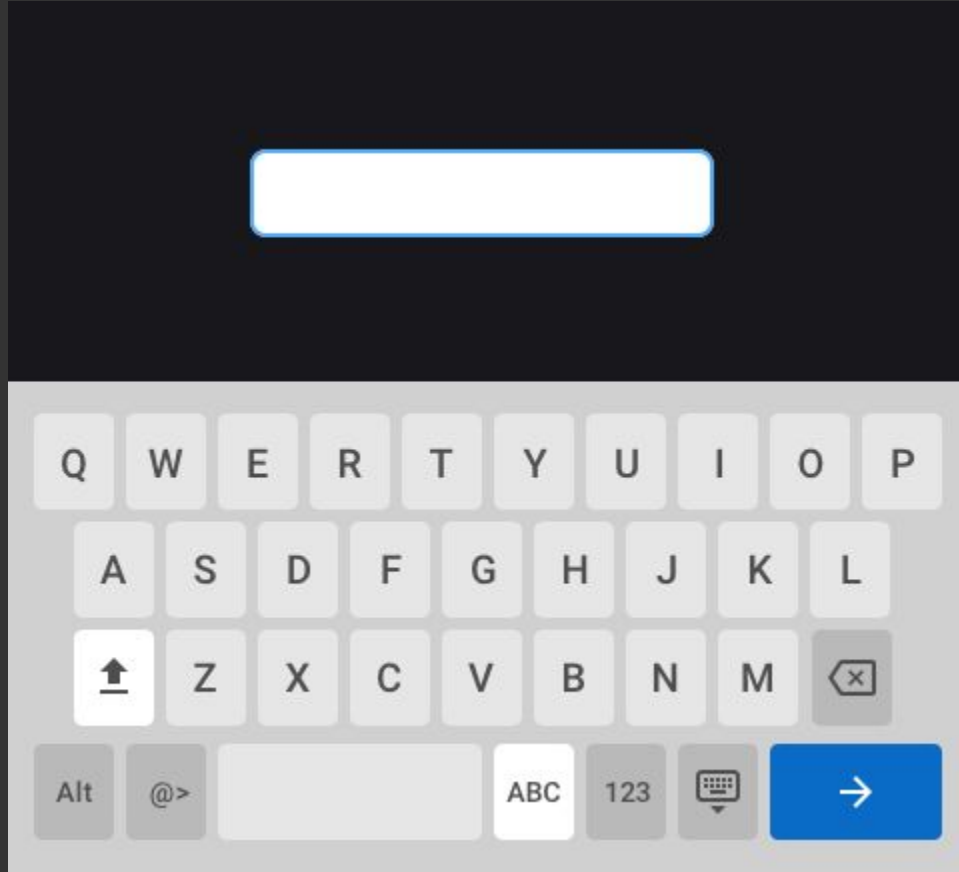
Fresh UX Principle #29

Color Has Meaning

In addition to color guiding a user's attention, People respond emotionally to color, evoking trust in a brand or intuitively knowing they've made an error

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Use color to communicate status or hierarchy, but don't rely on color alone. Use secondary indicators to account for color blindness.

✓	Confirmation Message	ⓘ	General Message
⊘	Error Message	⚠	Warning Message
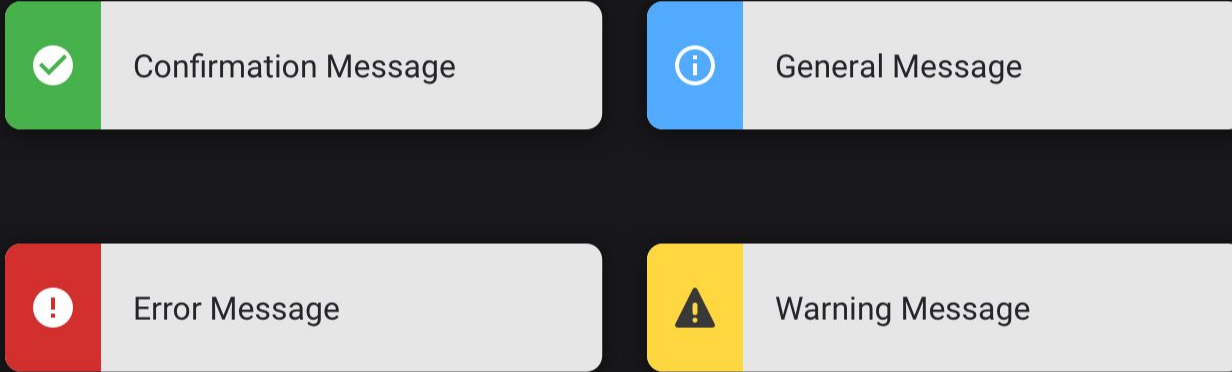
Icons used with color communicate the message type at a glance

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Fresh UX Principle #50

Animate for Usability Not Just Flair

With a bit of animation, the user can maintain their cognitive continuity. They remain immersed in the experience

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Link Name 1

Link Name 2

Accordion 1 ⌄

Accordion 2 ⌄

Link Name 3

Link Name 4

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Research

Define

Ideate

Prototype

Test

Test it to Validate and Refine the Design

- Usability Tests

- Task Time Tests

- Impression Tests

- A/B Preference Tests

Fresh UX Principle #10

Most People Don't Get it Right the First Time

Failure leads to insights and observations that, combined with user testing, results in a design that creeps ever closer to the unattainable ideal of perfection.

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Start early but test throughout the lifecycle
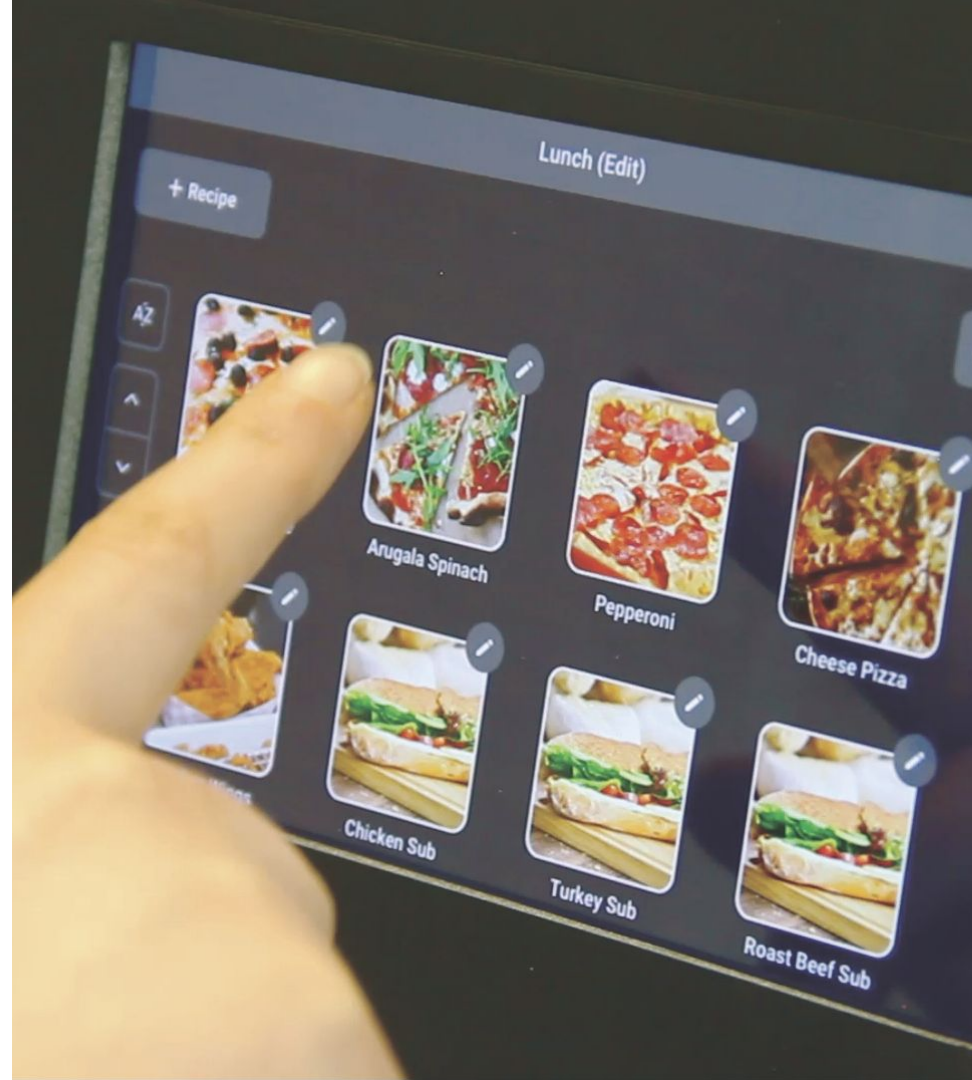
Wireframe Prototypes
- High level functions and flow

Mockup Prototypes
- Detailed flows with higher realism
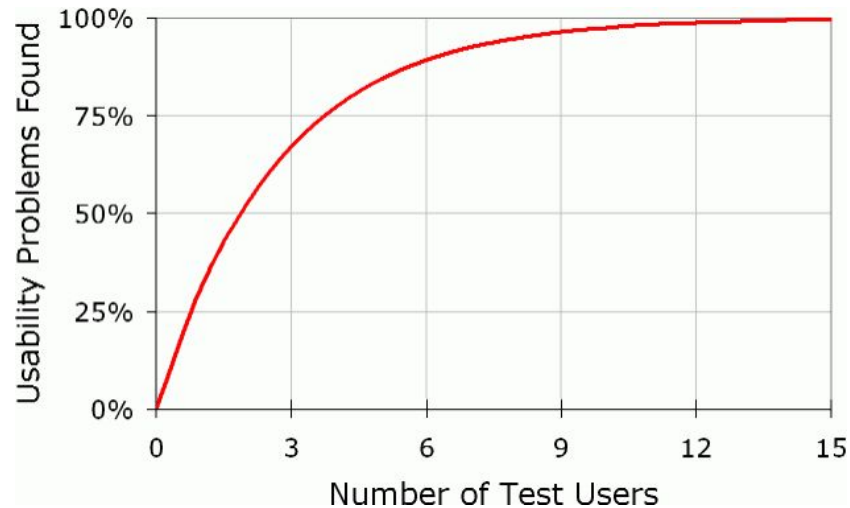
Coded Prototypes
- Detailed flows with full realism

Testing **5 users** is enough to uncover common usability problems

Source: https://www.nngroup.com/

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Our Tests

4 **Product Prototypes**

27 **Users Tested Across Each of the 4 Personas**

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Our Results

+3 **Usability Score Improvement**

3-74 **Seconds Saved Per Task**

+2 **NPS Impression Rating**

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Deliver Designs to Crank
with **Confidence**

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Developer Handoff

- Periodic check-ins when creating a new function that may impact development effort

- Consistent Naming Conventions of Files

- Style guide

- Functional specs

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Post Developer Handoff

- Involve Designers in the QA process to ensure adherence to styles and collaborate on interactions that may need to be adjusted during development
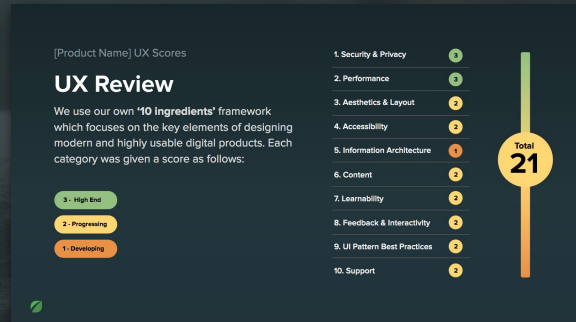
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THANK YOU

Interactive UX Journey
defeatboco.com

Free White Paper Download
freshconsulting.com/resources/roi-ux-design

UX Review - $1900

[Product Name] UX Scores

UX Review

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Total **21**

Benefits

- Review your product based on 10 ingredients
- Align teams on areas to improve
- Define potential areas to test or review with users

*Interface must be delivered to Fresh

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Invent Value - 1 month Free / up to 100 users
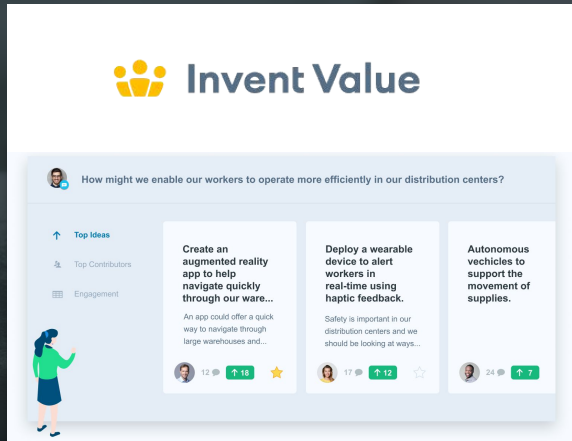
Benefits

- Give your team members an equal voice and avoid groupthink
- Encourage collaboration
- Create action items from the best ideas

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Offerings Contact

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