

Unearth: Case Study – Splice Management

Background

In this exercise, I am a Senior Product Manager at Unearth responsible for the OnePlace platform. Currently, OnePlace serves solely as a pipeline management solution. My main take-away after completing some market research is stated below, along with some questions and goals I would like to achieve.

1. Research takeaway
 - a. Opportunities exist to pivot the OnePlace horizontal workflow solution to a vertical solution spanning additional industries.
2. Questions
 - a. What new industry/vertical solution would you target to test this and why? Define your goals and the 2-3 user scenarios you'd solve first and the alternate solutions you considered.
 - b. How would it look and fit into the UX of the current platform? (wireframes or mockups are helpful)
 - c. Discuss trade-offs, risks, and metrics for determining success. Are there times the product would be used a lot but still not a success?

What industry & solution would you build to test the assumption and why?

The new solution I'd build is a **Fiber Optic Splice Repair (FOSR) solution** for the **Telecom industry**. This solution is low effort and moderate risk. Initial market entry would require only minor modifications to the existing platform and a marketing effort. This test will allow us to quickly and easily enter the mid and upper-market with minimal cost to companies at both levels while simultaneously allowing us to better understand the market potential within this industry, inform future product development, and increase monetization over time. It will also prove out a method for entering new industries.

To test the pre-defined assumption, I've crafted a hypothesis for the new solution, goals, and target users.

I believe **office personnel** and **in-field service techs** will prefer a **paperless FOSR solution**, which will lead to app use in this industry. Use of the FOSR solution will result in better repair **quality**, **faster response times**, and **objective evidence** of repair quality/completion.

I've also included below how I plan to test my hypothesis.

Hypothesis Unknowns

Below are the unknowns, or loosely defined aspects of my hypothesis, that I should keep in mind as I proceed.

- How would I more clearly define prefer?
- How would I more clearly define use?
- How would I more clearly define better quality, faster response, and objective evidence?
- What's our baseline (e.g., where are we at today)?
 - How many existing users are cross-industry that may use this?
 - What is our current reach to potential new users (non-customers)?
 - What other (non-paperless) options are currently available to users?

Assumptions

I want to state my assumptions, which will inform how I move through the process.

- Research indicates that few paperless FOSR solutions are available in the market.
- Utility companies want paperless FOSR forms to be used by in-field personnel.
- Contractors and service techs want to submit paperless FOSR forms.
- Both a company and a contractor can initiate repair forms, but only contractors fill them out and only companies receive completed ones (more on the workflow later).
- Prefer is defined as choosing to use a paperless solution over other repair documentation methods such as paper or direct reporting.
- Use is defined as a fiber utility or service contractor disseminating, filling out, and submitting our FOSR forms (# forms submitted will be the key metric).
- Better quality is defined as fewer occurrences of splice repair rework/failure.
- Faster response is defined as decreased time from a repair being requested to the receipt of verification that the repair is complete.
- Objective evidence is defined as documentation (photos, video, notes, etc.) attached to the repair form to show the completed repair meets certain quality standards.

Brainstorming

I want to brainstorm some concepts and possible features of the solution, both short and long-term, that will help create value and drive usage.

After first making the list, I reviewed it again a few times carefully. I want to make sure that the items make sense and are feasible/realistic. Then I ranked each item's risk v. difficulty. High risk, low difficulty solutions are noted with asterisks (*). Future experiments can be derived most easily by testing the biggest unknowns (risk), so it makes sense to start with high-risk, low effort items to inform next steps.

- Initiate repair on desktop and receive completed forms back – send form via URL in email/text (utility company)*
- Initiate, complete, and submit the repair form in the field on mobile devices using geohash – send form URL via email (contractor/technician)*
- Attach objective evidence of repair completion from mobile device*
- Leave comments, notes, and links to other URLs (incl. other repair objects)
- Repair alerts
- Reports/insights
- Scheduled splice and line maintenance for existing fiber installations
- Fiber monitoring system, with autogenerated repair requests (added cost feature)
- Plan and manage new installation projects on desktop (added cost feature)
- Regulatory adherence stats/report (added cost feature)

User Assumptions

The next step in this exercise is to understand the user. Since existing info is limited, some assumptions are required to estimate the size of the market. I used the available metrics and my own industry experiences to narrow down the user groups to a single user persona to focus on.

- Market data and our reach is limited to the U.S. so all user metrics will be limited to this.
- While the FOSR forms can be initiated by both office personnel (e.g., dispatchers, etc.) and in-field technicians, the forms must be completed in the field so we will assume all users are in-field technicians.
- Fiber utilities account for ~20% of the Telecom industry.

- There are roughly 160K in-field technicians across the Telecom industry, meaning there are ~32K fiber techs (the concentration of techs in fiber utilities is consistent with the industry).
- The current users of Unearth’s gas pipeline software account for 80% of that industry’s current adopters of paperless systems (which is about one-third of all gas utilities)
- Assuming that about one-third of utilities are likely to quickly adopt paperless systems, we know that there’s a segment of ~10K technicians, and we might expect to gain about 80% of those (or 8K techs across about 50 companies)
- [Validation] This expectation is plausible because 8K techs is roughly 5% of all techs in the Telecom industry and 25% of those within the fiber utility sub-segment.
- [Expectation] Techs perform 1-3 repairs per day on average so we would use that as a baseline to evaluate the extent to which techs are utilizing the paperless solution.

User Personas

The two key user personas that a successful experiment rely on are 1) the in-field technician and 2) the office worker. I need to better define the attributes of these two user personas. To do this I wrote out two example personas that might represent the typical technician and office worker. These personas were based on information from the industry, conducting interviews, and my personal experience.

Technician Persona

- Meet Tyson – the fiber optic technician
- Tyson is 31 years old, male, and married with two children
- Has worked for a fiber optic contractor in Milwaukee for 8 years
- Has a high school diploma, some college, and is licensed (completed 4+ yrs vocational training)
- Works in the field daily and drives from home directly to repair sites (e.g., businesses)
- Already uses a company-issued mobile device (iOS) for some work functions
- Gets work/repair notifications via email on the mobile device
- Completes repair forms on paper (turned into office at EOW), but notifies office of completion via email
- Other relevant attributes:

	No						Yes
I’m comfortable with technology					X		
Being efficient defines me						X	
I value convenience							X
I want to utilize tech for work					X		
Office personnel trust me				X			
I act on ads I see on my work device		X					

Office Worker Persona

- Meet Ebony – an office worker at a fiber optic repair contractor
- Ebony is 50 years old, female, divorced and remarried with 1 child and 2 step children
- She has worked for a fiber optic contractor in Pittsburg for over 12 years
- Has completed a 4-year college degree

- Is responsible for technician operations, schedules and coordinating and sending repair requests
- Uses a desktop computer for work
- Uses email or text to transmit repair work requests out to technicians
- Other relevant attributes:

	No						Yes
I'm comfortable with technology			X				
I look for ways to make my job easier							X
I value convenience					X		
I want to utilize tech for work				X			
I act on ads I see on my work device					X		
My peers and management trust me					X		

Relevant User Action Signals

I have target users and have identified some viable and testable solutions, so next I want to brainstorm the types of user actions that will be important signals when evaluating the successfulness of the experiment.

- Number of ads seen
- Number of ads clicked
- Time on landing page
- New "free account" set up
- Number of forms sent to techs via email
- Number of forms initiated by techs from email in the field
- Number of forms submitted
- Number of forms submitted with photos, videos, notes
- Number of daily repairs initiated
- Number of forms submitted per day
- Total and daily ratio of initiated to submitted (submit success rate)
- Number of referrals sent ("referral" sent with each submission)
- Referral click-through rate
- Number of free accounts from referrals
- Number of new free accounts from direct marketing
- Number of free accounts converted to paid subscription accounts
- Increase NPS

Viable Solution w/Testable Hypothesis

At this point I seemed to have a viable product solution with a hypothesis I can verify. The next step would be to brainstorm possible visual mockups and extract some product requirements.

How would it look and behave? Would it fit into the current platform?

I decided at this point in the exercise to limit the discussion to a single user persona, that of the Technician. The reason I did this is because I don't want to spend a lot of time solving the desktop application, primarily because I think that success is based most heavily on in-field use.

Although office personnel may want in-field techs to use a paperless solution, if the end user conducting the work is unwilling, our chances of failure increase. For this reason, I want to focus on the technician first and ensure we address the needs of that user as paramount. Later, we will conduct similar exercises for the office worker to determine the interfaces they will interact with.

User Stories

Using my testable hypothesis and solution above, I need to flesh out the primary user stories I would like to start with in determining how the product will look and function. Since the Technician is the persona of focus, my user stories will be constructed from that persona's point of view.

- I want the app to focus on my current location when I open it.
- I want to start a new repair form by tapping on the app at the exact location of the repair.
- I want to be able to enter the exact address of the repair and a location name/description.
- I want to submit repair reports via email.
- I want all repairs to be logged in the system and visible on the map.
- I want to be able to enter objective evidence that the repair was completed.

Product Requirements

Now that I have basic user stories, I want to use them to formulate proper product requirements. Aside from this exercise, I also want to review the stories with a product designer to determine design requirements and with a dev lead for any additional technical requirements. Those, along with some information here, will become the eventual PRD.

- Users can see a map when opening the app, with their location centralized.
- Users can tap/click on the screen to initiate a new repair form at that exact location.
- Auto-capture geohash, show coordinates in the form. Save geohash as part of form data.
- Users can enter a custom name/description and enter an address.
- Users can save progress without submitting the form.
- Each repair should have a unique, system-generated ID.
- Users can Submit the form to any email address.
- Submitted forms are sent as PDF attachments to the specified email address.
- PDF attachments should include images and URLs, but other attached media/files should be embedded in the PDF.
- Email confirmation with PDF should also be sent to the user who submitted the form.
- Emails sent should include links to begin free enterprise trial.

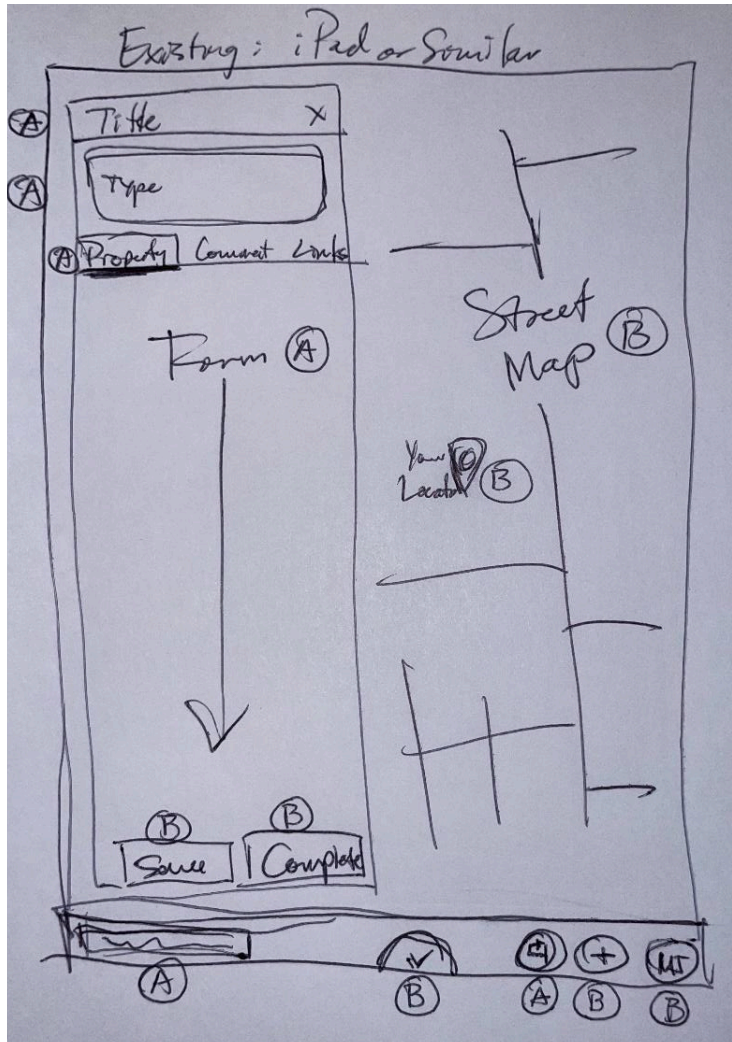
Initial Brainstorming

Various visual and UI conceptual ideas have been forming while I've been working on this exercise. Now that I have the basic requirements, I want to rapidly wireframe some of those ideas. Getting ideas on paper will help me quickly refine them; I need to see how they will play within the existing UI. I prefer paper or whiteboard for this over digital tools simply because I can iterate more quickly.

I started first by drawing out the existing mobile UI to give myself an idea of what things may need to be refined with additional team members. This is a new product that we intend to flex into the existing UI so it won't fit in seamlessly without some adjustments to the overall UI.

I marked UI components with an (A) if they may require some change and a (B) if they are most likely to remain as they are. Here is a list of screen elements and how they may change or not.

- Title (change) – we need to allow users to edit the Title.
- Type (change) – we may need to change this to be a text entry for this form to support a Description and address.
- Tabs (change)
 - o The first tab which case. We “Repair”
 - o The “Link” since links the main
 - o Comments
- Form (change) – needed but Save should stay.
- Bottom nav
 - o “Project” is version of
 - o “New relevant.
 - o “New Repair” should stay.
 - o nav handle.
- Map – Street location should ability to tap a



currently is “Property” doesn't apply in this would want this to be instead. tab may not apply and media are part of form. tab should stay. custom form fields are and Complete buttons

(change) not relevant in the first this product. Project” is not

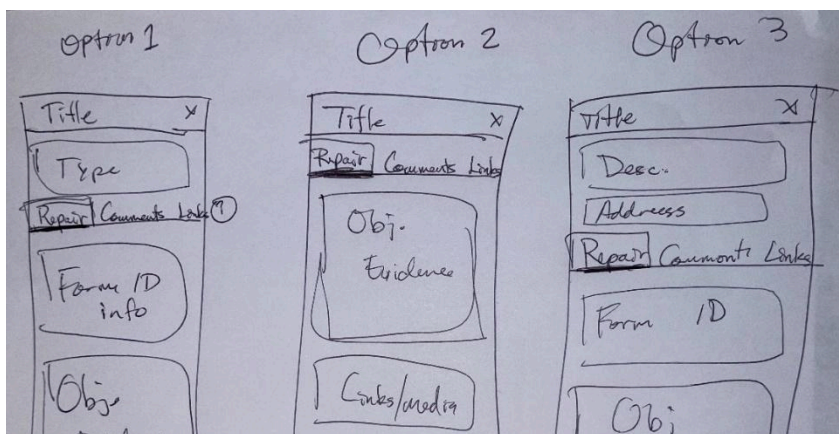
and the user profile So should the collapse

map and current stay, as should the precise location.

a tab for Links, but my media/links within the interested in testing on which action from users. This

**The current UI has concepts have main form. I'd be conducting A/B concept gets more could be an improvement for the UI in general.

In this case, the main change will be to the Form panel on the left side of the screen while the map and location view will remain largely as they are. Knowing this, I wanted to look at a few concepts for the form panel.



I realized once I finished Option 2 that I had left out needed Description and Address fields, so I added that back in Option 3. Otherwise, the main question to be answered is what order the main form elements should be in. Usually, it makes most sense to have identifying information near the top, which would lead me more towards some combination of Options 1 and 3.

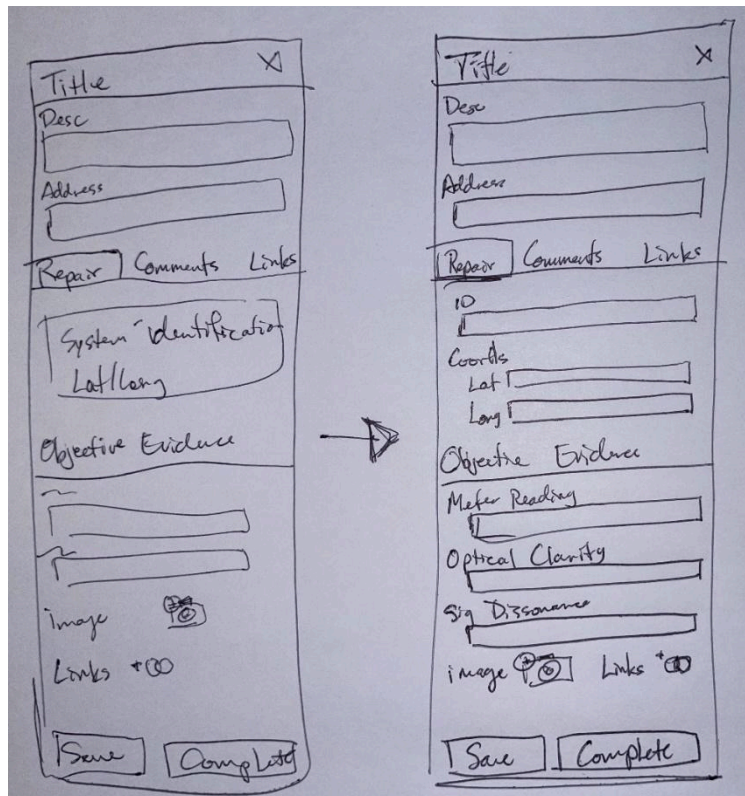
Refining the Wireframes

Combining Options 1 and 3, I settled on having main identifying information nearest to the top of the form. This includes both user-entered data (e.g., Title), system data (ID), and geolocation data.

This led to me to look at more specifics for each component/region of the form itself. The biggest question was what exact Objective Evidence would signal that 1) the repair was completed and 2) the quality was high. Using my experience, I determined that combining photo evidence with actual measurements and readings would provide the best objective evidence for completion and quality.

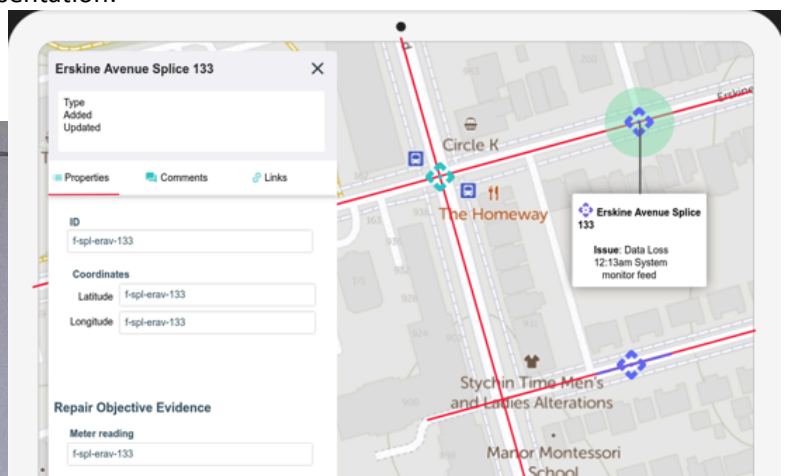
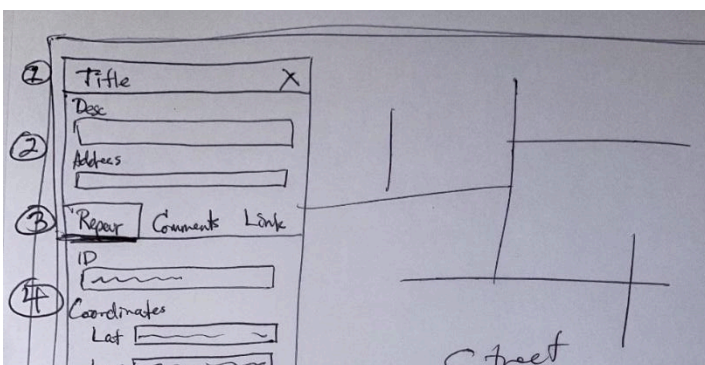
Side Note: these bits of Objective Evidence provide a key advantage over paper forms. Capturing reading and measurement data provides potential for reporting and analysis that is difficult without manually reentering data twice. Photo/video evidence is not possible with paper and provides an additional layer of semi-passive quality control.

Using my experience and market research, I settled on the following measurements/readings: meter reading, signal dissonance, and optical clarity. Images and other media/URLs would be optional for now.



The Final Concept

After completing the form, I grabbed one last piece of paper and laid out the final wireframe within the existing UI as I planned to present it. This is shown below on the left. I was able to go from the initial wireframe concepts to the final wireframe within a few minutes. This last wireframe also included notes about each of the elements to add clarity and help me preserve my thought process. Later, working with design and engineering, the following UI concept was mocked up for a presentation:



Trade-offs, risks, and metrics of success.

Trade-offs & Risks

It's important to identify the risks and specify the assumptions we are making and to test this new product in a way that will answer the outstanding questions. The best way to do this is to test the specific features of the new product that will help us answer these questions. An entirely new product is more difficult to move than existing products or features because we don't already have users or sample data nor are we entirely sure who to test with or how to conduct the tests. This will require a good plan and the ability to learn and pivot quickly.

There will be trade-offs we will want to evaluate early on as well. Most important will be who to direct marketing efforts towards and how. Changing day to day operating procedures can cause backlash, even for seemingly simple things like a required form that is now paperless. I'd like to discuss ideas with marketing about how to leverage the personas to create synergistic outcomes for our goals where both players can quickly see how the paperless method benefits *them*.

Creative marketing and design decisions can help solve these problems, but not without carefully stepping through it. I'd only want to launch this with a well-planned and thought-out marketing plan. I'd want to see if there are any existing customers who may be cross-industry and could be early adopters that we can talk to and learn from.

Success Metrics

There are 11 metrics I'd want to track that I've listed below. Since the original assumption was form usage, I'd say the key success metric would be number of completed forms submitted so I've put asterisks next to that in the list to denote that it is the primary metric. However, since form submissions alone do not represent revenue I'd also want to track metrics related to account types and conversion rates to paid accounts. All of metrics tie back to either form submissions or accounts.

Generally, we'd want to see the number of forms submitted increasing until we near the number we expect for market penetration, and hopefully, to exceed that number indicating increased penetration.

1. ******Number of submitted forms per day, per week, and per month
2. Percent of expected market penetration using forms submitted per month, on an ongoing basis
3. Percent of total forms opened (links clicked) that end up being submitted, on an ongoing basis
4. Number of forms generated by technicians per day, per week, and per month
5. Number of forms generated by office personnel per day, per week, and per month
6. Number of referral links clicked per week and per month
7. Number of accounts created from referrals per week and per month
8. Number of forms created from referral accounts per week and per month
9. Number of new accounts created per week, per month, and per year
10. Conversion rate from free trial to paid subscription per month and per year
11. Conversion rate from trial to subscription of referral accounts vis-à-vis non-referral accounts

Are there times the product would be used a lot but still not a success?

Brainstorm possible unsuccessful findings.

- The paperless forms may not be used at all
- A high number of different users may use the form a few times and then stop
- The forms can be used at a high rate by all users until the free trial runs out
- Many free trials could be used consecutively by multiple users at one company
- The forms could be adopted by one key persona and rejected by the other
- The forms could be adopted by both personas and rejected by the company due to price or other factors
- Many ads or referral links could get clicked, but the forms do not get adopted at all

Answer

Yes, it is possible for the forms to be adopted during the trial window, but abandoned after the trial. Number of forms submitted will indicate success in the short term, but marketing success, conversion rates and number of forms submitted will all be needed to indicate long term success. If there are a lot of new trial accounts and new forms created, it could give the short-term impression of success for several months if forms submitted is the only metric used. It will be important to keep a close watch on long-term indicators from the start and to evaluate outcomes based on industry norms.

Long-term Product Vision

While performing this exercise I had many thoughts about the long-term vision for this new product. I began to see some additional tools and features that could be added to this product segment for Unearth that could yield additional value for customers and added revenue for Unearth. I want to record these thoughts because I will need to pitch this new product to the CEO and other executives to get buy-in and I want to plant ideas in their minds about the greater potential this product has. This is a list of the ideas that came naturally as I went through this exercise:

- New splice creation (why limit the product to just repairing existing splices when adding a new splice is almost no effort from a technological perspective?)
- Splice inspection reports for continuous and preventative maintenance
- Automated Splice Monitoring System to monitor signal quality and auto-generate inspection and repair requests when signal quality is lost or compromised.
- Project Planning & Tracking for new installation projects

These could all add significant additional value to customers. The last two would be significant value-added props for customers that could command large dollar amounts for add-on licensing.