Designing for Outdoor Engagement

UX Research and Requirements Report

Julia Lauer, Bridget Doherty, Destiny Franks, & Yongjae Kwon
SI 487 | February 4, 2020

Table of Contents

Project Description

Client Background

TOTAGO, otherwise known as Turn Off the App, Go Outside, is a web and mobile application founded in 2015 that focuses on getting people outside and doing outdoor activities. According to the founder, Adrian Laurenzi, TOTAGO's mission is to inspire value and appreciation of the outdoors by expanding public access to parks, wilderness, and open space worldwide. TOTAGO's value proposition is their ability to leverage data and technology to enable and promote usage of public transportation for accessing parks and open space. This is done through a proprietary mobile application. TOTAGO's platform provides users with detailed trail maps and directions via public transportation based on users' current location and desired destination.

Project Overview

Our project is to create a design solution that tracks activity completion rates to see if users are actually getting outside and completing activities. As of now, TOTAGO offers users a variety of outdoor adventures, transit options and trail paths. However, their application currently lacks adequate functionality to track hike completion rates amongst users. Our goal is to implement a design solution that tracks completion rates in a way that does not contradict TOTAGO's mission to get people off their devices and appreciate the outdoors.

Currently, TOTAGO uses multiple data-tracking methods to assess completion rates. MixPanel is used for funnel tracking and counting the number of clicks on links and buttons. Funnel tracking is the number of steps a user takes while viewing certain activities. TOTAGO views the greater number of steps in the funnel as an indicator of completion. Additionally, TOTAGO views the "plan trip," "go," "save," and "download" buttons as indicators of completion. We found these methods cannot be concrete indicators of completion because there are many use situations where users do not complete the intended activity. Additionally, TOTAGO has no user research data that could outline or justify these habits as markers of completion. TOTAGO is implementing its software onto white-label partners' interface which creates a variation in user experience across a network of apps. Therefore, TOTAGO may not always be able to track completion rates and inform white-label partners on the effectiveness of their service.

Our Goals

Project Goals

In taking into account the stakeholder requirements, as specified by our client, we have produced the following overarching goals for our project:

1. **Balance the app's functionality while supporting the company's mission of turning off the app.**

   TOTAGO, otherwise known as "Turn Off the App, Go Outside," promotes disengaging from technology in order to engage further with the outdoors. Our client communicated a clear desire for a design solution that minimizes user activity within the actual application, instead prompting users to explore outdoor recreation. Our job is to balance designing a functional solution with high utility and the organization's motivation to get its users off the app.

2. **Develop a function for TOTAGO to track user completion rates across all platforms and experiences.**

   In order to appeal to white labels and business partners, TOTAGO tracks data to prove user engagement. However, there is a lack of clarity regarding if users are actually engaging in the activities they view on TOTAGO's platform. Having this data would give insight into TOTAGO's success of getting their users outside and off their phones to support public transit and local parks. Additionally, this data would support TOTAGO's business plan of allowing destinations of interest to promote themselves through the app.

3. **Improve the accuracy of TOTAGO's data tracking.**

   For this project, we'd like to improve TOTAGO's data tracking by implementing a feature that will allow TOTAGO to track or gather data on whether or not users are completing the hikes they plan within the app. Currently, TOTAGO has no way of answering this question, and is forced to make assumptions based on user behaviors they predict indicate completion of the planned outdoor activity within the app. This solution would help them obtain more accurate data.

4. **Create an accurate profile of TOTAGO's users.**

To design a solution for TOTAGO users, we must first gain an accurate and comprehensive understanding of who the TOTAGO user is. Through our research, we hope to capture users' attitudes, behaviors, experiences, and emotions with regard to their use of the TOTAGO application. In acquiring such a user profile, we will be able to tailor our design solution to the user's needs and create relevant, guiding UX requirements to ensure we are designing for the end user.

5. **Improve TOTAGO's understanding of user habits and behaviors.**

One of the main concerns of the client is their limited knowledge regarding how users utilize their product to actually complete hikes. We have been tasked with designing a solution that captures data that can inform our client of users' end behaviors. Through designing a tracking solution, we hope to increase our client's comprehension of their users' journeys, from start to finish, within the TOTAGO application.

Research Goals

TOTAGO's core mission of encouraging outdoor activities, while getting users to turn off the app, introduces challenges associated with tracking user completion rate. While the current method involves funnel tracking and analyzing hits to the "plan trip," "go," "save," and "download" buttons, there is insufficient data to associate actual completion of trips with the aforementioned sources alone. Our following research goals aim to address those challenges:

1. **Collect data on how users interact with technology and smart devices for outdoor activities.**

TOTAGO values a noninvasive experience both outdoors and on the platform. Therefore, it is important to understand how users optimize technology as a part of their outdoor experience to identify any tension between turning on the app and engaging with the outdoors. This would help us to identify when devices are more frequently accessed and what features benefit outdoor experience.

2. **Analyze user behavior to gain a better understanding of conversion rates from trip planning to actual completion.**

Through our research, we hope to gain a comprehensive idea of the user journeys that TOTAGO users undertake when planning and completing outdoor recreation. Our research will strive to understand the pain points that

currently exist at each step in this process, and will enable us to determine where within the overall user experience a tracking solution could be implemented.

3. **Determine what users value most as part of the outdoor experience.**

   By discovering what users value most as part of their outdoor experience, we'll be able to better understand how users would feel about integrating technology into this experience. Additionally, it will provide a more holistic view of how users already do integrate technology, such as TOTAGO, into their outdoor experience.

4. **Understand how users currently track their outdoor progress.**

   In uncovering how users already track their outdoor activity, we will gain insight for the design solution we will implement within the TOTAGO application. By understanding users' existing habits, we can pinpoint what features and functionalities are important to users, and get a clearer picture of the kind of experience users seek when logging outdoor progress.

Research Methodology

Research Questions

The culmination of both the project goals and research goals are instrumental in setting the foundation of our project. Next, our research questions will serve as the guiding principle for our overall efforts in uncovering the user needs and UX requirements necessary for our project:

1. **How do current and potential users feel about the integration of technology into their outdoor experiences?**

   By answering this question, it would help us understand how we can implement a tracking solution that aligns with the current lifestyle and attitudes users and potential users have towards integrating technology into their outdoor experiences. Additionally, it could uncover ways they already are integrating technology in that space.

2. **How are TOTAGO users currently tracking their completed outdoor experiences via the application, if at all?**

Here we want to identify users' desire for activity tracking and any pain points they have tracking activities. Understanding these needs would help us develop a method for tracking that is best suited for current users' habits. This would ensure TOTAGO's interface remains noninvasive while creating added benefits.

3. **What value do users derive from tracking their activity within the application?**

Answering this question will provide insight into the attitudes users hold toward activity tracking, as well as the value users place upon that specific functionality. Our client emphasized the importance of uncovering these attitudes, as they will help inform the decision of whether the implementation of tracking functionality within the TOTAGO application is beneficial to the organization's goals.

Research Plan

I. Competitive Analysis

Our research began during the Fall semester, as we conducted a competitive analysis that helped to better understand TOTAGO's main competitors, providing insight into the space TOTAGO serves. The competitive analysis aimed to answer our research questions regarding how users currently track and integrate technology into their outdoor experiences. Although we are ultimately interested in how *TOTAGO users* accomplish this task, by thoroughly examining features of competitors' applications, we gained knowledge about the greater user base -- outdoor adventurers -- as a whole. We conducted a standard feature analysis, comparing TOTAGO against seven of its direct and indirect competitors, across twenty-eight assessment criterias and feature categories (see Appendix). The competitors featured in our analysis were specified by TOTAGO's CEO, Adrian Laurenzi. Our team created the comparison criteria; keeping in mind the project's focus on tracking outdoor engagement, we made sure to include features relevant to logging outdoor activity. Other notable assessment criteria included: social integration, trail features -- such as ratings, photos, filters, weather conditions, and the ability to save or download a trail -- and internal vs. third-party transit directions. Analyzing TOTAGO's activity tracking methods against its competitors enabled us to largely accomplish our research goal of collecting

data regarding how users interact with technology and smart devices for outdoor activities.

II. Heuristic Evaluation

Lastly, we performed a heuristic evaluation of the TOTAGO application. The first phase of the evaluation focused on the mobile application, while the second focused on the desktop site. We tested both platforms by running the route planning interface through varying iterations and combinations to see how they respond and what kind of results are outputted by the system. Then we specifically looked for consistency in standard, menu mapping, error prevention, and overall design to complete the heuristics evaluation. The evaluation enabled our team to identify problems and patterns within TOTAGO's application, as well as answer the research question: how are TOTAGO users currently tracking their completed outdoor experiences via the application, if at all? Using Nielsen's ten heuristics for user interface design (see Appendix), as well as additional heuristics generated to evaluate TOTAGO's existing tracking functionality, we measured the usability, utility, and aesthetic appeal of the current TOTAGO system design. Our heuristic evaluation encompasses the entire application and its functionality; however, we dedicated greater attention to evaluating TOTAGO's tracking functionality, in order to adhere to our project goals.

III. Survey Data
Next, we analyzed the information TOTAGO had already collected about its users using an affinity diagram. The client has made available to us survey data collected largely in 2016 (the survey questions have been included in the Appendix). There are five surveys and each one encompasses a specific aspect of the user experience.

IV. User Interviews

Conducting interviews with both current and potential users is the next, and potentially most important, phase of our research. We created two interview scripts -- for current and non-users -- aimed at answering our three central research questions. The current-user script seeks to accomplish two of our research goals: determine what users value most as part of the outdoor experience, and understand how users currently track their outdoor progress. Our recruitment strategy for current TOTAGO users involved reaching out to contacts provided to us by the client. On the other hand, the non-user script focuses more on determining attitudes held toward the integration of

technology into outdoor experiences, as well as how users interact with technology and smart devices while participating in outdoor activities. We recruited non-users by reaching out to University of Michigan students in outdoor activities clubs, such as the Outdoor Club at Ross and the Michigan Backpacking Club, as well as MeetUp groups within the larger Ann Arbor community. We leveraged monetary incentives in an effort to encourage interview participation, motivating potential respondents with the opportunity to win a $15 Amazon gift card. To approach and analyze the data gathered from our interviews, we planned to use an empathy map to help us identify common feelings/themes amongst users.

Research Results

Competitive Analysis

Our competitive analysis of TOTAGO's seven main direct and indirect competitors, across twenty-eight assessment criteria, yielded a number of important results. All but two of TOTAGO's competitors offer both web and mobile applications, reinforcing the need for our client to continue to develop and improve its beta mobile app. Whereas most of TOTAGO's direct competitors focus solely on hiking and biking recreation, its indirect competitors offer more expansive access to water, snow, and wildlife recreational activities, as well. TOTAGO and Outdoor Project possessed the most partnerships; however, all seven of TOTAGO's competitors promote partnerships with other outdoor-oriented organizations. Two of TOTAGO's key functionalities - the ability to download offline maps and create custom trail maps - were shared by only about 50% of its competitors. TOTAGO paled in comparison to its competitors in regard to offering social integration into the app; TOTAGO and the Hiking Project were the only two applications to fail to provide this feature. In analyzing transit functionality, we found about half of TOTAGO's competitors to provide internal routing, whereas the other half relied upon a third-party service. The existence of an activity log, one of the most important assessment criteria included in our analysis, was observed in all but one of TOTAGO's competitors. Lastly, TOTAGO's trail features stood somewhat favorably in comparison to its competitors, falling short in four categories (Ratings/Reviews, Filterable, Weather/Trail Conditions, Notes/Comments) against more content-heavy applications like AllTrails and hiking Project.

Heuristic Evaluation

Competitive analysis and survey data enabled our team to get an impression of how the market is tackling outdoor activity tracking as well as what perception users have about TOTAGO. As a final step, we performed a heuristic evaluation to test the usability of both the web and mobile application versions of TOTAGO to better ascertain areas of improvements. For the web, we observed poor visual feedback throughout the system stemming from ineffective application of iconography. Specifically, it was difficult to determine where users currently are within directories. Actionable items, when clicked or engaged, do not show clear notifications of progress leaving users wondering whether a specific function is not working or simply taking a long time to load. Moving onto the mobile application, we observed poor system-level visibility ranging from difficult to locate downloads section to the application redirecting users away from the app itself without prompting or warning users. Additionally, the application demonstrated inefficient information hierarchy with design structure and system behavior lacking coherent style. When put side-by-side, both the web and mobile version of TOTAGO have ambiguous language style where filters are unclear, terminologies are subjective, and icons are not descriptive enough. They are further compounded by unclear navigation and lack of an activity tracking functionality. By performing a heuristic evaluation, we were able to get an insight on the weak points of TOTAGO's platforms which were instrumental in our analysis efforts.

Survey Data

In order to gain insight on current users we analyzed TOTAGO's survey results from past surveys in order to determine what users valued, their general attitude towards TOTAGO, and things they desire within the TOTAGO experience. We analyzed 5 different survey results. There was a generally small sample size of 5-10 participants for each survey. TOTAGO did not record any demographic information within the survey. We found this process to be important in getting a preliminary idea of who the users are and what they desire before starting the interviews with users and non-users.

User Feedback Survey (2016)

This survey had 4 participants and 10 questions. It pulled demographic information, figured out how users view and would describe TOTAGO, and figured out what features TOTAGO users appreciate as well as features that TOTAGO is missing. Because the amount of participants in this survey is so small it was really hard to find

trends or patterns within the responses. Despite this, every participant noted that they'd describe TOTAGO in some way related to their public transportation navigation feature. Additionally, cross-listing the results from this survey with results from the other surveys, we found that generally the users appreciate curated trail experiences in addition to the easily accessible public transportation information. Demographically, the participants in this survey ranged from 27-47.

Early Adopters Feedback Survey (2016)

With 11 participants and 6 questions, this survey was used to gain user feedback on TOTAGO's web and mobile apps. This feedback included which feature they found most useful, any apparent bugs in the application, and how they discovered TOTAGO. From this survey there was a pattern within the most useful question in which most participants stated the offline maps feature was their favorite part. There were also a number of issues and bugs within the app, which users noted.

TOTAGO Web and Mobile App Feedback (2016)

This survey asked one question which asked users to "walk me through your experience planning a hike." There were 13 participants. The purpose of this was to gain feedback on the systems and the process of planning a hike from the perspective of the users where they outlined major and minor issues within the platform. From this, we primarily found that there were once again bugs in the system, but also that some users would be interested in a sort of tracking feature to see total elevation and more. Additionally, the desire to meet fellow hikers was brought up in conjunction with adding social functionality to the app. We also found that some users mentioned they would export trail information from TOTAGO into Strava, which speaks to the tracking functionality.

React Native App Feedback - TOTAGO and Partner Apps Survey

This was once again a compiled feedback sheet, in which users gave feedback on TOTAGO. There were an unidentified amount of participants because we only had access to the compiled feedback. Once again a pattern we found was that users appreciate the offline maps feature. Some found it difficult to use TOTAGO seamlessly on multiple devices (i.e. planning a trip on the computer and using your phone to navigate the trail).

Vote for TOTAGO Improvements Survey

For this survey, there were 4 participants and 1 question. The question was essentially a checklist that listed 8 ways users believe TOTAGO could improve their

web and mobile apps (placed within the appendix). Because the participant pool was small we cannot infer too much from this data. That being said, the majority of participants stated that TOTAGO needs, "more tools to filter / browse / search for trips," and to "better offline maps."

User Interviews

Participant 1: TOTAGO User

Participant 1 became familiar with TOTAGO through its partnership with Trailhead Direct, an organization promoting the use of public transit, and by which the participant is currently employed. The participant frequently uses TOTAGO in the Seattle area to discover new trails in their community. They noted the application was especially helpful as a new resident to the area, and expressed a desire to continue to explore local outdoor activities.

Features considered notable by Participant I include TOTAGO's trail database, its public transit options, altitude lines, and "great" map interface. The participant noted TOTAGO's trail database is detailed in that it provides specific trails beyond the trailhead--something other maps do not do. They further explain that this is a fantastic way for them to explore new trails in their area, and expressed positive attitudes specifically regarding TOTAGO's recommended trails. The user appreciated that recommended trails were evaluated according to fitness levels and expectations, offering a "personality profile" of the hiker.

Participant 1 does not track their hiking progress, within or outside of the TOTAGO application. They rely upon memory to distinguish completed hikes from new trails when searching on the TOTAGO app, and expressed a lack of interest in logging activity. However, in evaluating tracking functionality as a whole, the participant regarded the feature as "helpful to a community," and realizes the potential to benefit from both sharing their own experiences, as well as gaining exposure to that of their community. Most notably, Participant 1 feels that "TOTAGO does a good job of establishing trust," and that this fact could influence a change in their attitude toward activity tracking.

Participant 2: TOTAGO User

Participant 2 has utilized TOTAGO a small amount and works for a city government in the state of Washington. They typically recommend TOTAGO for people who are looking to hike in the areas surrounding Issaquah, Washington. This participant noted

that many people in the area like to meet up with fellow hikers in order to car-share to specific hiking locations, as trailheads are typically packed.

Additionally, this participant mentioned the importance of recommended or curated hikes. This is because as a beginner, it can be difficult to understand what type of hikes are a good fit for everyone. Specifically, trail difficulty levels may seem ambiguous to beginner hikers - a trail that is rated as being 'easy' can be difficult to some hikers. Another comment made by this user was that understanding what they need for specific hikes is also important to them. They believe adding an activity log would help to improve recommendations.

Participant 3: TOTAGO User

Participant 3 has had minimal interaction with TOTAGO after coming across the app while searching for an alternative to AllTrails, a major competitor. The participant noted downloading the app and looking briefly at outdoor activity options that were near them; however, their primary search method is relying on social network for recommendations in addition to using Google Maps for outdoor trail discovery. Rather than looking for a particular trail, the participant opts to find a "big green area" to explore with friends.

Participant 3 appreciates TOTAGO's route planning option that incorporates public transportation system and has expressed desires to utilize it, but they noted the infeasibility due to the lack of subways and reliable bus networks in their area. Instead, they rely on ride-sharing platforms to travel within town and trains for long-distance travels.

There are several reasons that initially compelled Participant 3 to download TOTAGO. First, the participant noted the prospect of having an index of things to do that are near them during the spring or summertime. Second, the app's offline trail map capability appealed to the participant as they prefer to disconnect from technology whilst outdoors. Third, the participant expressed desire to support a new startup and player in the market.

Participant 4: Non-user

Participant 4 was a non-user recruited via an outdoor-club on campus. They mentioned that their primary use of technology while outdoors is to navigate, but otherwise they are very minimally on their phone while outdoors. This participant has a car on campus, so they mentioned that they typically do not explore outside of the Ann Arbor area using public transportation. They also noted that their technological

habits are different depending on their goal of being outdoors. For example, recreationally, or if they are trying to use it to lose weight, or track exercise.

Another comment they made was that in terms of finding hikes, they typically utilize their social network to receive recommendation and then will use an application like AllTrails to discover more details about the hike or outdoor activity. This participant also mentioned loving finding new outdoor activities to try, but they've only tried new activities if a friend has been interested in them and had them tag along.

Findings & Analysis

Methods of Analysis

I.   Heuristic Evaluation Results

The two primary takeaways from our heuristics evaluation focuses on visuals and style. During our testing, we observed a system that provided users no visual indication of action progress when buttons were clicked. When buttons were toggled, it was as if the platforms were effectively ignoring user inputs leaving users wondering about the status of their requests. This underscores the importance of giving instructive visual feedback to users in the form of iconography that clarifies functionalities. Not doing so has proven to progressively degrade the overall user experience. Additionally, navigation hierarchy should be reinforced through clearly-defined page titles so that it improves system visibility - currently users do not always know where they are within the app.

Finally, TOTAGO's web and mobile app platforms lack coherent and consistent style. This is a critical element to facilitating a superior user experience - consistent system behavior and design enable a user to make certain assumptions about the user interface which in turn creates a sense of familiarity, reliability, and control. The increased usability not only eliminates confusion, but motivates users to remain engaged with the platforms as well as evoke positive emotional responses stemming from good experiences. With ambiguous terms, confusing logical structure, and varying system behaviors, TOTAGO currently lacks those elements to ensure a positive response. The heuristic evaluations have been instrumental in providing insight into what users are looking for and what can be improved.
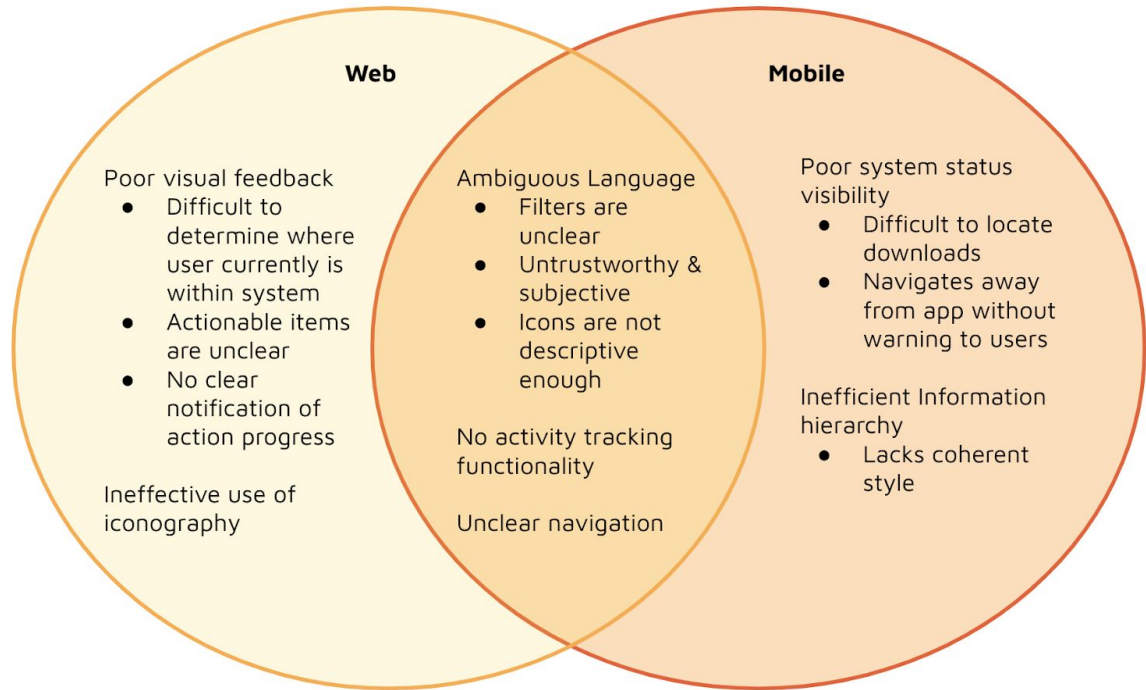
Venn Diagram of Heuristic Evaluation Results

II. Affinity Diagram: Analyzing Survey Data

Pulling data and notable quotes from user feedback surveys, we decided to sort this information using an affinity diagram, in order to best identify patterns and general attitudes TOTAGO users have. This was helpful and provided a lot of insight into the users' desires we previously did not have. We organized our affinity diagram into four categories: "Most helpful features," "Overall Attitudes," "User wants," and "Problems." From this, we found that users most strongly value the ability to download and view trails maps offline, use TOTAGO across multiple devices (computer to phone, etc.), and, lastly, value curated trail experiences. We also discovered that user attitudes were driven by TOTAGO's utilization of public transportation to access trips. A few comments we found interesting that were categorized under user wants mentioned an interest in adding a social feature to TOTAGO that would enable users to meet new hikers and benefit from community experience and knowledge. Some comments also described an aspect users would like implemented that aligned with our ultimate goal of creating a tracking feature for the TOTAGO app. Users mentioned wanting to see their metrics or data related to their hiking trips; for example, total elevation, total miles hiked, and

other related data. Lastly, we found that users primarily have problems with bugs within the app, rather than actual issues with the app's design or functionality. Nevertheless, we were able to find potential areas of improvement by looking into features they would like to see implemented.

Ultimately, through this data we identified that users overwhelmingly appreciated receiving suggestions for hikes that make them feel like the app provides curated trail options in addition to the offline map capability. By identifying patterns across user wants, we were able to identify potential areas of improvement that could include the implementation of social functionality and/or a tracking feature.
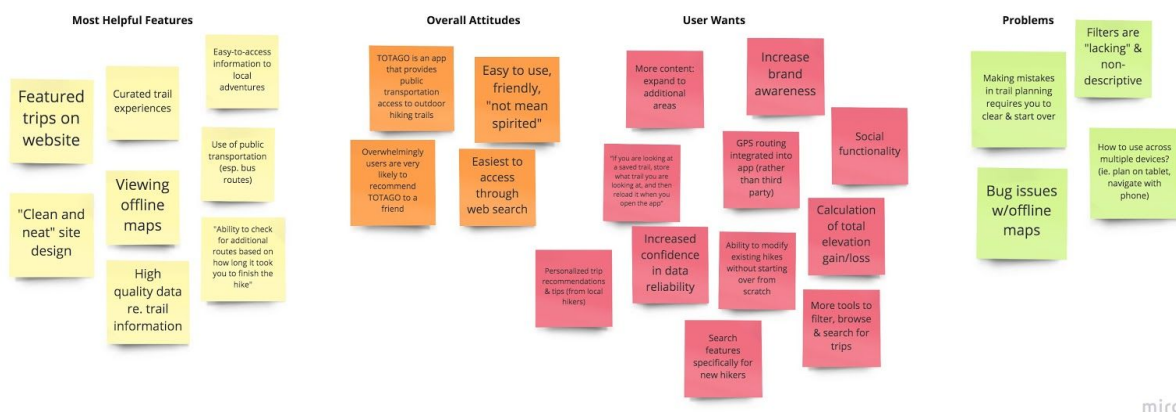

Affinity Diagram

III. Empathy Map: Consolidating Interview Findings

We used an empathy map to sort and analyze the findings from our user and non-user interviews. By categorizing participants' responses into "Says", "Thinks," "Feels," and "Does," we gained insight into trending attitudes, behaviors, thoughts, and opinions held by TOTAGO users, as well as non-user respondents.

Through this analysis, we found that respondents find intrinsic value in incorporating some degree of technology into their outdoor experiences. Beginners note that tracking mechanisms offer a powerful tool to hit the ground running and monitor health-related statistics; however, there is a delicate balance between utility and value. Many respondents indicated that they use technology to find new trails and plan their routes, but few actually use them to track their activities; instead, many prefer to track completed

hikes mentally. While respondents consider TOTAGO to be a good resource for hiking information, the majority of them find deeper value in curated experiences from local experts in addition to recommendations from their social networks. The empathy diagram further underscores the need to balance functionality and value to design a solution that facilitates the best user experience.
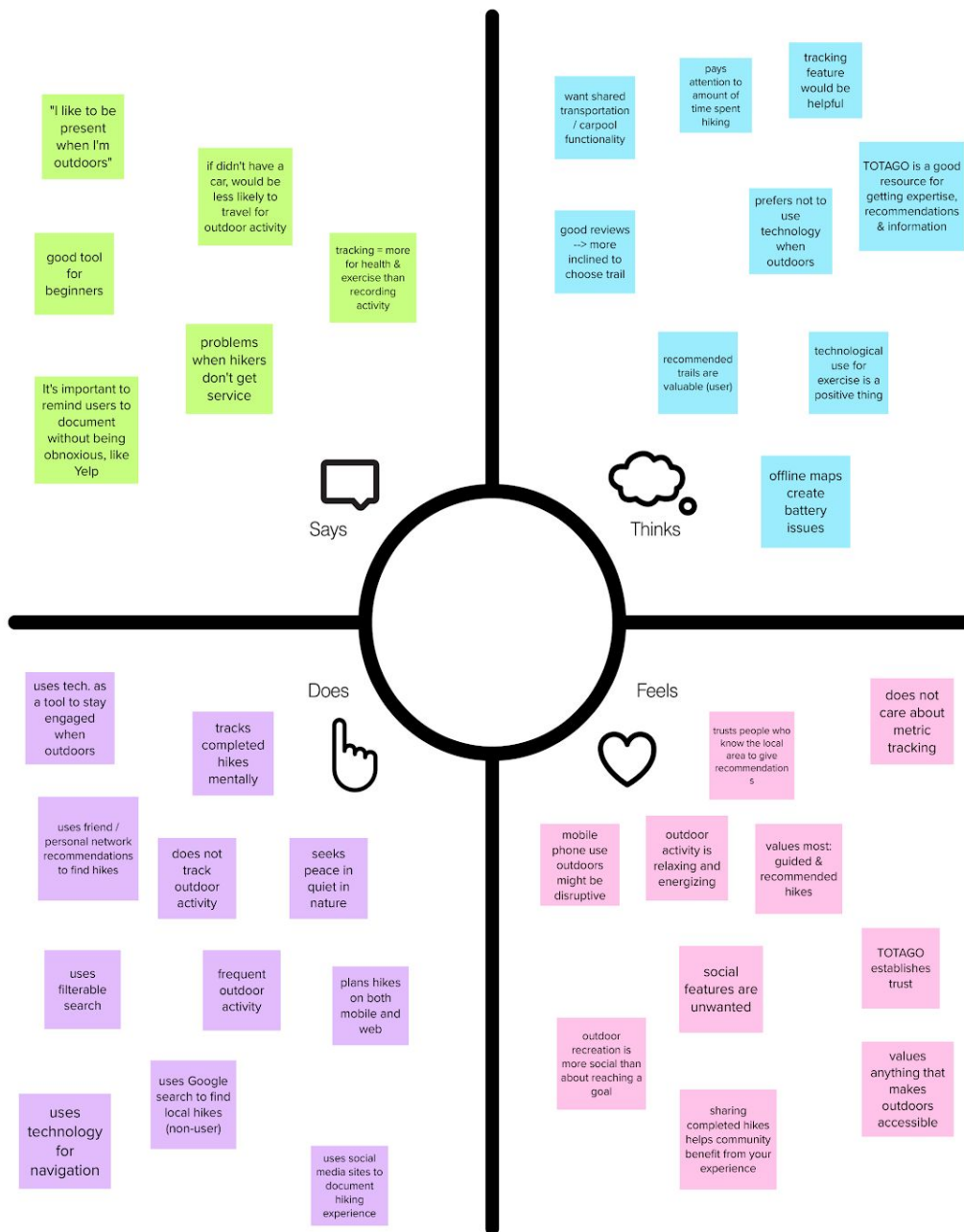
Empathy Map

Key Insights & Themes

    I.   **TOTAGO's Most Valued Features**

Our research identified TOTAGO's strongest features, as valued by users. These features include: offline access to trail information, curated trail experiences, detailed mappings of trailheads, and public transportation information. These features are unique to TOTAGO's interface, set TOTAGO apart from its competitors, and encourage returning users. Therefore, it is important moving forward to consider these features as user motivation, so our design solution supports and does interfere with their functionality.

    II.   **Use and interest in social features**

The mention of social features came up frequently throughout our research. Social features were used outside of TOTAGO as a way to document hikes and trail information. The motivation behind this was mixed. Some users from our interviews mentioned social media as a way to keep a personal log of past recreation trips. This was done through check-ins and photo sharing. The second motivation was to provide information to users' local hiking communities in order to strengthen them through reviews and tips. Social features can not only document hikes, but they can possibly improve upon the planning of a user's outdoor experience.

    III.   **User attitudes toward activity tracking**

The user attitudes we uncovered regarding the idea of tracking one's outdoor activity were also mixed, but provided valuable insight for our overall project goal. We found that most users do not currently track their activity. Amongst TOTAGO current users, we identified a willingness to engage in tracking within the app, as supported by the "sense of trust" established between TOTAGO and its users. Across our non-user interviews, we found that participants hold a desire to obtain hiking metrics that tracking would provide, but do not currently engage in tracking themselves. Overall, our research pointed to users' overwhelming interest in tracking outdoor activity, but a reluctance to participate in tracking behaviors.

User Personas

Primary Persona

Andrew Levere

34 years old
Boulder, Colorado
Expertise: Advanced

Goals

+ To track his past hikes and related metrics in order to improve his ability to set future hiking goals

+ Find suggestions for hikes that are within his typical difficulty range and align with his fitness goals

Motivations

+ Get outside to take a break from the world and the pressures of being constantly connected

+ Live responsibly and ecologically-friendly

Frustrations

+ Finds it difficult to track his hikes without draining his battery

+ Wants to avoid social media but still be able to easily share his hiking experiences with other hikers who are interested

Our primary persona reflects many of the user needs expressed within our interviews and survey data analysis. He is an advanced hiker, meaning his goals lean more towards improving his hiking skills rather than finding assistance in navigating outdoor activities. This classification was evidenced within the TOTAGO user base through our interviews with more advanced hikers, and was further validated through client feedback.

His first goal of tracking his past hikes and associated data is supported by users' desires to receive their calculated mileage and total elevation, as cited in our affinity diagram. We found, through our interviews, that users overwhelmingly value the curated trail recommendations TOTAGO makes; therefore, his second main goal is to receive such suggestions according to his typical difficulty range. His motivations echo attitudes users expressed in user surveys, as demonstrated in our affinity diagram: mainly, appreciation for TOTAGO's emphasis on public transportation and turning off the app to get outside.

His frustrations draw from the pain points we identified through our user interviews. Multiple users expressed that their desire to obtain hiking metrics mobily was often obscured by limitations regarding their device's battery life. Furthermore, his frustrations regarding social media point to the mixed user attitudes we found

through our interviews about social media integration into outdoor activity. Amongst interviewees who did not feel favorably about social media, we found a desire to still be able to share experiences with friends, family, and other hikers.

Secondary Personas

I.   *Secondary Persona 1*

Stacy Vu

21 years old
Los Angeles, CA
Expertise: Unfamiliar

Goals

+ Plan an outdoor activity for an upcoming trip to Ann Arbor

+ Find the best local hiking spots and explore a new city

+ Meet other hikers on her adventure

Motivations

+ Explore the outdoors throughout her travels across the country

Frustrations

+ Lacks knowledge of Ann Arbor and its outdoor opportunities

+ Difficult to get to hikes in unfamiliar areas without an understanding of public transportation

Our first secondary persona reflects user needs expressed within our non-user interviews, as well as client feedback on beginner hiker behaviors outside of the app as well as within. She is a visiting hiker, unfamiliar with the local outdoor opportunities but eager to engage in outdoor recreation in a new city. This classification was emphasized by our client as an important edge case to consider.

Her goals and motivations point to the fact that she is visiting a new city, which she is unfamiliar with and does not know other hikers. Her goal of accessing local outdoor opportunities reflects desires expressed by multiple interview participants to utilize outdoor recreation as a method of connecting and engaging with their local communities. For example, Participant I noted that TOTAGO was especially helpful as a new resident to the area, enabling her to explore local outdoor activities in her new community. Furthermore, her goals and motivations are supported by attitudes we uncovered amongst our non-user interviewees, such as a desire to find new outdoor activities within their local areas.

Her frustrations are drawn from pain points we identified within our interviews and survey data analysis. Users and non-users cited difficulties accessing trail heads without an understanding of public transportation, if driving was not an available option. Furthermore, we found throughout our interviews that one of the main impediments preventing users and non-users from exploring outdoor opportunities was a lack of knowledge of the local landscape. As a "visiting" hiker, this pain point was especially applicable to this persona.

II.   *Secondary Persona 2*

Bethany Smith

55 years old
Vancouver, WA
Expertise: Beginner

Goals

+ Plan an outdoor activity to engage in with friends and family

+ Find suggestions for outdoor opportunities that will align with her level of experience and desired difficulty

Motivations

+ Become an advanced hiker and be able to plan hiking trips independently

Frustrations

+ Difficult to share hiking and other outdoor activity information with her family

+ Feels uncomfortable with planning an outdoor recreational activity on her own

Our second secondary persona draws on research results from our interviews and survey data analysis, as well. She is a beginner hiker that prefers to stay within her local area, a classification supported both by research and our client recommendations. Because of her beginner status, she may utilize the app to navigate in addition to planning and sharing her hikes.

Her first goal, and first pain point, echo user desires expressed throughout our research for the addition of a social integration into the TOTAGO app to enable sharing of trail information with users' personal networks. Next, her second goal reflects research findings from our interviews that users overwhelmingly value the curated trail recommendations TOTAGO makes, as they align with users' typical difficulty ranges. Her motivation to advance her hiking skill and plan hikes

independently reflect a common user desire, we found across our survey data analysis and interviews, to use outdoor recreation planning tools like TOTAGO to enhance users' ability and confidence with engaging with outdoor recreation.

Her pain points echo frustrations both users and non-users expressed in interviews with difficulty sharing hiking experiences and information with their close personal networks. Furthermore, her second pain point is a key user attitude identified by our client as typical of beginner users. Our research supported this frustration, as many users cited utilization of planning tools like TOTAGO to compensate for their discomfort with or lack of confidence in planning hiking activities on their own.
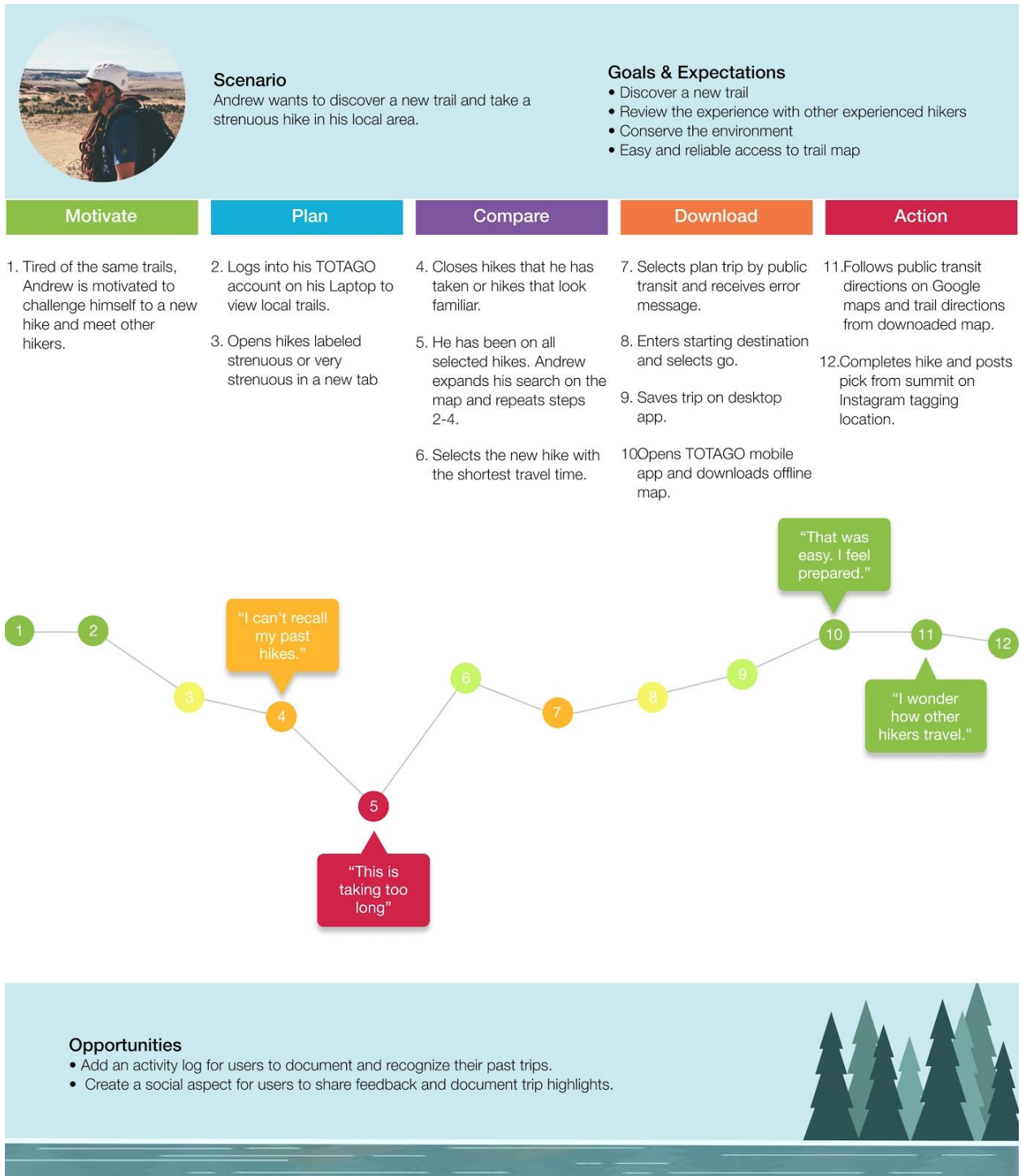
User Journey

To understand a regular user's journey using TOTAGO products, we visualized the process using a user journey map. The map breaks down our primary persona's experience. It establishes an agent, scenario, stages, emotion, thoughts, and opportunities. Visualizing the process helped establish a common ground of the touchpoints between product and user. Additionally, the map identifies paint points and situations where an external application can be used to improve their experience.

We identified some pain points that could arise from users not logging their past hikes. Our agent was located in Boulder, CO where limited trails are logged. An avid hiker such as our primary user would have attempted a high percentage of these trails. However, he had to search through all of the hikes to realize that the results do not provide the ideal trail. The effort of browsing with no success resulted in frustration. To add to the frustration, our user was browsing through similar hikes in his area. As result, it was harder to recognize and recall any of his past hikes. Moving forward, we want to improve user's ability to recognize past hikes and find their desired search results in one attempt.

Other noted factors include the desire for a social aspect. Although there were no pain points as a result of no social feature, it includes possible solutions for TOTAGO's ability to track and document users' past activity. The emotion map helped us pinpoint areas a user may want a social aspect. For example, a use may have questions during transportation or planning.

From analyzing the user's pain points and thoughts, we discovered opportunities for a social aspect and logging sections. These features could solve TOTAGO's problem of tracking activity while being noninvasive to users' outdoor experience because

they are opportunistic and a common desire based on our interviews with current users.

Scenario
Andrew wants to discover a new trail and take a strenuous hike in his local area.

Goals & Expectations
• Discover a new trail
• Review the experience with other experienced hikers
• Conserve the environment
• Easy and reliable access to trail map

Motivate	Plan	Compare	Download	Action
1. Tired of the same trails, Andrew is motivated to challenge himself to a new hike and meet other hikers.	2. Logs into his TOTAGO account on his Laptop to view local trails. 3. Opens hikes labeled strenuous or very strenuous in a new tab	4. Closes hikes that he has taken or hikes that look familiar. 5. He has been on all selected hikes. Andrew expands his search on the map and repeats steps 2-4. 6. Selects the new hike with the shortest travel time.	7. Selects plan trip by public transit and receives error message. 8. Enters starting destination and selects go. 9. Saves trip on desktop app. 10Opens TOTAGO mobile app and downloads offline map.	11.Follows public transit directions on Google maps and trail directions from downoaded map. 12.Completes hike and posts pick from summit on Instagram tagging location.

"I can't recall my past hikes."

"That was easy. I feel prepared."

"I wonder how other hikers travel."

"This is taking too long"

Opportunities
• Add an activity log for users to document and recognize their past trips.
• Create a social aspect for users to share feedback and document trip highlights.

User Journey

UX Requirements

Our research throughout this phase has enabled us to zero in on a set of succinct, yet comprehensive requirements for our design solution. We have organized our UX requirements into three priority levels.

I.   **Priority I**

Our design solution must enable activity tracking without requiring active technological use throughout the activity. This requirement was found to be important through our survey and interview research. Users and non users both mentioned the importance of needing offline capabilities within outdoor recreation apps and this was echoed through our survey analysis. This is important to both our advanced and beginner personas.

Our tracking functionality should be designed to guide accurate user self-reporting. This is a client requirement in addition to being a requirement based on our user research. The client needs accurate information, and the user must also be supplied accurate information. Especially for advanced hikers who would rely on this information in order to improve their skills.

Our design solution should enable users to easily document and review their past activity. Similar to the aforementioned requirement, this requirement should allow users to be able to easily document and review their past activity. Because, through our research, users mentioned a desire to see statistics related to their hikes / outdoor activities our solution needs to include those desires and also make it seamless for users.

II.   **Priority II**

Our design solution should promote user control & should not require user activity tracking if users wish to abstain. This is a client requirement that is meant to promote user control and align with the organizational values of getting off the app. Additionally, through our survey analysis and interviews, we discovered beginner hikers are less interested in tracking activity. Therefore, users should not be required to track activity.

Our design solution should allow users to leverage their social network through the app. This requirement stems from primarily our interviews and survey data analysis. We have decided to include a social component because users have expressed that they typically find hikes and try new outdoor activities based on their network. In order to support this, we believe users should be able to leverage their social network.

III.   Priority III

Our tracking functionality must be able to be implemented across the mobile and web apps. Through primarily our user interviews, we realized that people typically plan or search for outdoor activities using web apps, and when they navigate or track hikes, they will utilize a mobile app. Therefore, TOTAGO's application must be able to cross platforms seamlessly.

Our tracking solution must maintain functionality when users are offline. Our research findings indicated that offline map capabilities, as well as access to databases on trail information, are features that complement the overall user experience. Since internet connectivity may be limited in trails, this is an important implementation requirement as it is in line with TOTAGO's broader goals of facilitating outdoor activities.

Appendix

I.   Competitive Analysis

	TOTAGO	**AllTrails**	**Hiking Project**	**Ride with GPS**
Competitor Type	CLIENT	Direct	Direct	Indirect
Founded	2015	2010	N/A	2007
HQ Location	Seattle, WA	San Francisco, CA	N/A	New York, NY
Activities Offered	Hike, Bike	Hike, Bike, Camp	Hike	Bike
Price				
Free	✓	✓	✓	✓
Paid	✓	✓		✓
App Type				
Web App	✓	✓	✓	✓
Mobile App	✓	✓	✓	✓

Partnerships	- Vancouver Trails - U.S Forest Service - Washington Trails Association - ModernHiker - Washington Hometown - Tahoe Regional Planning Agency - King County Metro - Parkbus	National Geographic	REI Co-op	- Wahoo - Garmin - Strava - Relieve
Offline Maps	✓	✓		✓
Custom Maps	✓	✓		✓
Add A Trail	✓	✓	✓	
Route Alerts		✓		
Social Integration		✓		✓
Activity Log		✓	✓ ("Check-ins")	✓ ("Ride Reports")
User Stats		✓	✓	✓
Forum			✓	
Videos			✓	
Calendar				✓
Events				✓
Lodging				
Gear				

Transit				
Internal	✓		✓	✓
Third-Party	✓ Google Maps	✓ Google Maps	✓ Google Maps	
Trail Features				
Ratings/ Reviews		✓	✓	
Photos	✓	✓	✓	✓
Information	✓	✓	✓	✓
Trail Map	✓	✓	✓	✓
Filterable		✓	✓	✓
Save/ Favorites	✓	✓	✓	✓
Weather/ Trail Conditions		✓	✓	
Notes/ Comments			✓	

	The Outbound Collective	**Outdoor Project**	**Natural Atlas**	**Komoot**
Competitor Type	Indirect	Indirect	Indirect	Direct
Founded	2012	2012	2015	2014
HQ Location	San Francisco, CA	Portland, Oregon	Cody, WY	Berlin, Germany
Activities	Hike, Camp,	Hike, Camp,	Camp, Hike,	Hike, Bike

Offered	Surf, Bike, Dive, Fish, Kayak, Raft, Climb, Ski/ Snowboard, Swim, Fitness	Kayak, Swim, Ski	Climb, Boat, Fish, Ski/ Snowboard, Sled, Run, Travel, Horseback Ride, Wildlife Watch, Forage, Hunt, Swim, Surf, Fitness, Sky Dive	
Price				
Free	✔	✔	✔	✔
Paid			✔	✔
App Type				
Web App	✔	✔	✔	✔
Mobile App	✔		✔	✔
Partnerships	Run 4 All Women	- Access Fund - Adventures Without Limits - Big City Mountaineers - Columbia Land Trust - Conservation Colorado - The Nature Conservancy - Outdoor Mindset - Leave No Trace - National Forest Foundation - Save Our Canyons	- Bureau of Land Management - The National Park Service - US Forest Service - US Fish and Wildlife Service	- Beuth University - Wahoo - Garmin

Offline Maps		✓		✓
Custom Maps				✓
Add A Trail	✓			✓
Route Alerts				✓
Social Integration	✓	✓	✓	✓
Activity Log	✓	✓		✓
User Stats				
Forum	✓	✓		
Videos		✓		
Calendar				
Events	✓			
Lodging	✓	✓		
Gear		✓		
Transit				
Internal				✓
Third-Party	✓ Google Maps	✓ Google Maps	✓ Open Street Map	
Trail Features				
Ratings/ Reviews	✓			✓
Photos	✓	✓		✓
Information	✓	✓		✓
Trail Map		✓	✓	✓
Filterable		✓	✓	✓

Save/ Favorites	✓	✓	✓	✓
Weather/ Trail Conditions		✓		✓
Notes			✓	

II. Surveys & Survey Data

A. User Feedback Survey (2016)

1. What is your age?
2. What is your gender?
3. Where exactly did you first hear about TOTAGO?
4. How would you describe TOTAGO to a friend? (Please write the exact words you would use.)
5. How likely are you to recommend TOTAGO to a friend?
   a. Very Likely
   b. Likely
   c. Somewhat Likely
   d. Not Likely
6. What would you miss the most if you could not use TOTAGO anymore?
7. What's the one big thing TOTAGO is missing?
8. Do you have any questions about TOTAGO? If so, what?
9. Would you use TOTAGO to help get kids outdoors?
   a. Yes
   b. No
10. Would you be willing to speak more in-depth with a TOTAGO representative? If so, please enter your email here, and we will be in touch.

B. Early Adopters Feedback Survey

1. Which TOTAGO app(s) are you giving feedback on?
   a) iOS app
   b) Android app
   c) Web app (https://www.totago.co/app)
2. What feature of the app do you like most or find most useful?

3. Have you found a bug or issue with TOTAGO? If so, please describe below. Please indicate which app is relevant.
4. Please share any general feedback you have on TOTAGO? Please indicate the relevant app.
5. How did you hear about TOTAGO?
    a) Word-of-mouth
    b) Searching the web
    c) Searching Google Play
6. Please give us your e-mail so we can follow-up with you.

C. *TOTAGO Web and Mobile App Feedback (Results Database)*
    1. Email
    2. Name
    3. Context/Source (optional)
    4. Location
    5. Platform Used
    6. App version
    7. Summarized feedback
    8. Detailed feedback notes
    9. Follow-up action requested (if any)

D. *React Native app feedback - TOTAGO and Partner apps Survey (Results Database)*
    1. Modern Hiker Feedback Sheet
        a) Date
        b) From
        c) Device type
        d) App version
        e) Feedback Notes
        f) Follow-up action (if any)
        g) Summarized feedback take-aways
    2. Snowmobile WA Feedback Sheet
        a) Date
        b) From
        c) Device type
        d) App version
        e) Text
        f) Action
        g) Summarized feedback take-aways
    3. Summarized feedback on ModernHiker iOS beta - Dec 2019
    4. Summarized feedback on initial release v1.8.8

        a) To improve

        b) Misc. points

        c) What's good

5. Vancouver Trails

        a) Key take-aways from VancouverTrails Android Reviews (as of Jan 6, 2018)

        b) Key take-aways from VancouverTrails iOS Reviews (as of Jan 6, 2018)

E. *Vote for TOTAGO Improvements Survey*

1. Which features/improvements are you most interested in?

        a) More tools to filter/browse/search for trips

        b) Ability to add/contribute my own trips or trails to TOTAGO (or modify existing trips)

        c) More trip types beyond day hiking (e.g. bicycling, camping, backpacking)

        d) More trips or more detailed information for existing trips

        e) Support for more cities / regions

        f) Ability to get personalized trip recommendations and tips from experienced hikers in your region

        g) Better offline maps

        h) Improve the trip planner tool

2. Please include your email address so we can follow up. If you give us your email we will give you the opportunity to test new TOTAGO features before they are released.

III. Interview Scripts

A. Current User Interview Script

Introduction

I really appreciate you taking the time out of your day to talk with us. As our senior capstone project with the University of Michigan School of Information, we have been working with TOTAGO to better understand how users engage with technology outdoors and how they feel about technology as a part of the outdoor experience. Anything you say will be completely anonymous and if you're not comfortable with question or feel like you want to skip one, you are more than welcome to do so. You might not have an answer to everything we ask, and that is

completely okay. I just appreciate the opportunity to talk to you and learn from you. Do you have any questions?

[Ask for consent]

Script Questions

1. How often are your outdoor activities planned?

2. Which online resources *other than TOTAGO* do you utilize when planning an outdoor activity, such as a hike or bike ride?

3. What methods do you use *outside of the TOTAGO application* to track hikes you have completed?

4. What specific feature(s) compelled you to use TOTAGO to plan your hiking route instead of other resources?

5. Can you walk us through an experience you've had when using TOTAGO?

6. What process do you go through when searching for hiking trails on TOTAGO?

7. How do you feel using TOTAGO has impacted your outdoor experience?

8. How would you define the term "completed hike"?

9. Do you typically keep track of hikes and/or trails you completed? Why or why not?

10. How do you determine which hiking trails featured on TOTAGO you have already completed?

11. If searching for a hiking trail on TOTAGO, would you be more likely to select a trail you have already completed or a new trail?

12. Have you ever used an outdoor activity application that allowed you to log completed hikes?
    a. If so, on a scale from 1 (almost no effort) to 5 (a lot of effort), how would you determine the amount of effort required to log completed hikes within the app? Explain your choice.

13. Do you find it important to be able to view an activity log of completed hikes within the TOTAGO app? Why or why not?

B. Non-User Interview Script

Introduction
I really appreciate you taking the time out of your day to talk with us. As our senior capstone project with the University of Michigan School of Information, we have been working with TOTAGO to better understand how users engage with technology outdoors and how they feel about technology as a part of the outdoor experience. Anything you say will be completely anonymous and if you're not comfortable with question or feel like you want to skip one, you are more than welcome to do so. You might not have an answer to everything we ask, and that is completely okay. I just appreciate the opportunity to talk to you and learn from you. Do you have any questions?

[Ask for consent]

Script Questions
1. In what situations in your day-to-day life do you use technological devices?

2. Are there any situations in your day-to-day life that you try to avoid using technology?

3. What activities would be more difficult for you without access to technology?

4. How often do you use public transportation such as a bus, subway or train?

5. What modes of public transportation do you use most?

6. What is public transportation like in your area?

7. Does the convenience of public transportation near you impact your hobbies? If yes, how so?

8. How do you feel about outdoor recreation and why do you feel that way?

9. What type of outdoor activities are you interested in?

10. How would you describe your current outdoor recreation habits?

11. Describe the last time you participated in outdoor recreation.

12. What are some outdoor recreation activities available to you?

13. How did you hear about these activities?

Conditional: *Only if they hike or participate any other applicable activities*

The past few questions have been designed to better understand you as well as your interaction with technology and outdoor activities. The next set of questions will aim to understand your hiking activities and how you track your progress.

14. Tell me about the last time you went on a hike. Can you walk me through the process from the beginning?

15. Do you plan ahead of time when hiking? If so, what method(s) do you use to plan your hikes?

16. What technology, if any, do you use to plan hiking trips?
   a. Have you ever used an outdoor activity application (such as AllTrails)?

      b. Have you ever used an outdoor activity application that allowed you to log completed hikes?
          i. If so, on a scale from 1 (almost no effort) to 5 (a lot of effort), how would you determine the amount of effort required to log completed hikes within the app? Explain your choice.

17. How do you currently track your hiking progress?

18. How do you feel about using mobile devices during outdoor recreation, both for planning & during the activity?

19. At what points during your outdoor activity do you use technological devices?

IV. Heuristic Evaluation
    A. Web Evaluation

Heuristic Evaluation Sheet

Device: Laptop

Evaluator: Destiny

Date: 1/20

Task: plan a trip in Ann Arbor

- **0** I don't agree that this is a usability problem at all.
- **1** Cosmetic problem only: need not be fixed unless extra time is available on project
- **2** Minor usability problem: fixing this should be given low priority
- **3** Major usability problem: important to fix, so should be given high priority
- **4** Usability catastrophe: imperative to fix this before product can be released

1. Visibility of system status
The system should always keep users informed about what is going on, through appropriate feedback within reasonable time

0   1   2   3 (X)   4

Issue & Location: not really clear what's going on a lot of static elements

Recommendation: show progress of planning let users know when plan is complete

2. Match between system & the real world
The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Information appears in a natural and logical order.

0   1 (X)   2   3   4

Issue & Location: Language is fine map is helpful

Recommendation: adjust icons

3. User Control & Freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

0   1   2   3 ✓   4

Issue & Location

This was there but really hard to find too much going on on one page

Recommendation

add money pages sep. things by steps

4. Consistency & Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

0   1   2   3   4 ✗

Issue & Location

everything is on one page and a lot of things appear to be the same thing

Recommendation

↓

5. Error Prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

0   1 ✓   2   3   4

Issue & Location

✓ guided process notice of unwanted

Recommendation

More help along the way

6. Recognition Over Recall

Minimize the user's memory load by making objects, actions, and options visible.

0   1   2   3 ✗   4

Issue & Location

things are TOO visible. ✓ difficult to not get mixed up

Recommendation

use icons more sparingly

7. Flexibility & Efficiency of Use

Accelerators may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

0 ✓   1   2   3   4

Issue & Location

mostly fits 1 user

Recommendation

N/A

8. Aesthetic & Minimalist Design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

0   1   2   3   4 ✓

Issue & Location

Very overloaded

Recommendation

minimize amt on page(s)

9. Help Users Recognize, Diagnose, and Recover from Errors

Error messages should be expressed in plain language, precisely indicate the problem, and constructively suggest a solution.

0 1 2 3 4

○ ○ ○ ○ ✓ (4)

Issue & Location

There are no tech error messages

Recommendation

add guidance

10. Help & Documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

0 1 2 3 4

✓ (0) ○ ○ ○ ○

Issue & Location

N/A

Recommendation

N/A

11. Activity Tracking

Interface provides a feature where users can document and track activity history.

0 1 2 3 4

○ ○ ○ ○ ✓ (4)

Issue & Location

currently not avail

Recommendation

add feature

12. Outside Action

Interface encourages user to pursue action off the app.

0 1 2 3 4

○ ✓ (1) ○ ○ ○

Issue & Location

yes if other changes made

Recommendation

refer to other changes

13. Trustworthiness

Does the language, design, and layout build trust with users?

0 1 2 3 4

○ ○ ✓ (2) ○ ○

Issue & Location

Language does but interface does not

Recommendation

make changes to interface/ more minimal

B. Mobile Evaluation

Heuristic Evaluation Sheet

Device	iPhone

Evaluator Julia Lauer

Date 1/23/20

Task

Use the TOTAGO-branded Modern Hiker (beta) app to find and save a hiking trail.

0 I don't agree that this is a usability problem at all.

1 Cosmetic problem only: need not be fixed unless extra time is available on project

2 Minor usability problem: fixing this should be given low priority

3 Major usability problem: important to fix, so should be given high priority

4 Usability catastrophe: imperative to fix this before product can be released

---

1. Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time

0　1　**2**(X)　3　4

Issue & Location

Downloads: blank page

Home button: does not change page

Download Hike Button: does not tell users where download has been saved to

Recommendation

System message: "You do not have any saved downloads. Here is how to download something ..."

With "Complete" message, include directions to "Downloads"

---

2. Match between system & the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Information appears in a natural and logical order.

0　1　2　**3**(X)　4

Issue & Location

Home icon is redundant; there is only one "main" page

Recommendation

Only show Home button when user has navigated away from main page to a trail page/downloads

---

3. User Control & Freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

0(X)　1　2　3　4

Issue & Location

Recommendation

"Re-do search here" button easily directs users to an exit from current search; List/Map button enables users to quickly switch between views

---

4. Consistency & Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

0　1　**2**(X)　3　4

Issue & Location

Difficult to distinguish between filters: Beginner, Easy, Moderate, Challenging, Strenuous, Expert

Recommendation

Include mile or elevation ranges for each filter to help users determine which difficulty level is most appropriate

---

5. Error Prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

0　1　**2**(X)　3　4

Issue & Location

Search feature enables users to select locations at which there is no available trail information

Recommendation

Highlight populated areas in green, make unpopulated areas unable to select for search?

6. Recognition Over Recall	Issue & Location	Recommendation
Minimize the user's memory load by making objects, actions, and options visible. 0 ⊗ 1 ○ 2 ○ 3 ○ 4 ○		

7. Flexibility & Efficiency of Use	Issue & Location	Recommendation
Accelerators may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions. 0 ○ 1 ⊗ 2 ○ 3 ○ 4 ○	Map search: zooms in too close and requires users to zoom out to view all possible trails	Map search returns wider result, less zoomed in

8. Aesthetic & Minimalist Design	Issue & Location	Recommendation
Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility. 0 ⊗ 1 ○ 2 ○ 3 ○ 4 ○		

9. Help Users Recognize, Diagnose, and Recover from Errors	Issue & Location	Recommendation
Error messages should be expressed in plain language, precisely indicate the problem, and constructively suggest a solution. 0 ○ 1 ○ 2 ○ 3 ⊗ 4 ○	Downloads: if a user has no downloads, there is no error message, just a blank screen with no title	Label the Downloads page Create a message for cases of empty downloads

10. Help & Documentation	Issue & Location	Recommendation
Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large. 0 ○ 1 ○ 2 ○ 3 ○ 4 ⊗	No "Help/Documentation" page No ways for users to seek additional information/help The only method of contact appears on error messages, provides email	Create "Help/Documentation" page to offer support for users Create a "Contact Us" page to allow users to contact the TOTAGO team with questions or issues

11. Activity Tracking	Issue & Location	Recommendation
Interface provides a feature where users can document and track activity history. 0 ○ 1 ○ 2 ○ 3 ○ 4 ○	The only available way to track activity is to access previously downloaded trail information via the "Downloads" page	Implement a system to allow users to track completed hikes Follow up with users re. downloaded hikes – prompt users to self-report completed hikes

12. Outside Action

Interface encourages user to pursue action off the app.

0 1 2 3 4

Issue & Location

Recommendation

Reiterate or emphasize that downloaded trail information can be accessed when offline

Enable users to save downloaded trail information outside of the application?

13. Trustworthiness

Does the language, design, and layout build trust with users?

0 1 2 3 4

Issue & Location

Recommendation

Add "Verified" labels to user-provided hiking information that has been vetted for accuracy
Be transparent with the source of trail information (user-provided, parks, etc.)