Who's on the Trail: Identifying Trail Uses with Affinity Diagrams

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People spend time on trails for a great many reasons. Often their reasons overlap - sometimes in positive ways but occasionally in conflict. This position paper describes a brainstorming session that identified different reasons that people use trails, and a follow-up affinity diagramming session that identified commonalities in goals for trail use. We speculate on directions for another session, toward ultimately identifying design opportunities for encouraging community and defusing conflict.

Examples of overlap and conflict can be seen between the goals of day hikers and of long distance hikers. Both benefit from well-maintained paths, shelters, water sources, and restroom facilities. But these hikers may differ in their ability to plan for when they arrive at a point (relevant in the nature of campsite reservation systems), and their needs in a store along the trail (e.g., highly portable food Vs. bulky luxury food). Similar overlap and conflict occur across different types of trail users such as hunters (e.g., bow hunters, rifle hunters, and deer hunters and duck hunters) [Su and Cheon 2017], as well as among different types of technology users and uses (e.g., use of Fitbits, and of headphones) [Anderson, Lusk, & Jones 2017], and of naturalists (e.g., those who study plant propagation and those who eradicate invasive species).

The goal of this initial effort was to identify the various users of a trail and to then cluster these users into subgroups (e.g. hikers: day, through, multi-day, etc) so that later analyses could explore the goals, tensions and commonalities among these trail users. A workshop activity asked an estimated 25 participants first to identify types of trail users on Post-It notes, then to cluster them on the wall in subgroups of their choosing. Clusters “subgroups” were generated by participants who identified 132 unique types of trail users (excluding exact duplicates, while retaining singular/plural differences like scout and scouts). Participants spent a great deal of time crafting the notes, leaving little time for clustering--but establishing the opportunity for the follow-up activity described here.

Our follow-up activity shifted the focus from people to their goals. We assembled a group of 9 people (2 professors and 7 graduate students) to take part in a 2-hour affinity diagramming session. We gave around 10-15 notes to each person and asked them to familiarize themselves with the notes. The first author then led a series of three phases:

1. Cluster affinities based on perceived goals of the type of user identified on the post-it note
2. Label the clusters and reorder affinities as needed

3. Identify axes of interest that help order and differentiate cluster items

Quantitative Summary

- 9 participants (2 professors, 7 graduate students)
- 132 total notes
- 7 affinities formed from the first round of clustering
- 12 affinities formed from the second round.

OBSERVATIONS

A. Cluster Amenities

Participants took turns in placing each note they had in a cluster they deemed to be appropriate – discussing their rationale of why they chose to put a note in that particular category. After which the participants discussed the overall note placements, and if the resulting clusters made sense.

It was clear that some of the notes did not fit the clusters they were placed in. This was made evident when participants considered all the clusters and the emergent patterns on holistic viewing. Mismatched notes were then moved around to a group with closer affinity and at the end of this exercise, 7 clusters of different sizes emerged, with a consensus that cluster overlap yet remained.

B. Cluster Labeling

Participants were then asked to consider what the notes in each cluster had in common and then to recommend a cluster name that would best describe all the notes in each cluster. Some clusters were easy to label, while the ones identified to have overlaps were more difficult to label. The seven clusters were labeled: *Management/Maintenance (Job), Passive/Active/Thrill-Seeking Recreation, Socialize, Gatherers, Discovery/Research, Recreation, Exercise, Discovery/Learning (Organization)* respectively.

It was clear both from observing the cluster labeling and from the resulting discussion that the clusters with multiple labels had a lot of overlap and could be further refined. There was consensus on clusters labeled with mononyms as being satisfactorily descriptive. The remaining clusters, it was agreed, would benefit from further fine-tuning.

Out of this refinement exercise, 12 clusters emerged in total. New clusters tended to be a split of the original title and placed close to the parent cluster, the distance between clusters being arbitrary. The final clusters were labelled: *Volunteer, Job, Thrill-Seeking Recreation, Anti-Society Sentiment, Mental Health, Family Connection, Ad-Hoc Socializing, Formal Socializing, Active Recreation, Sight-seeing, Training,* and *Passive Recreation*.

The clustering exercises also made evident the order/hierarchy of hikers within a cluster: The likelihood of having single hikers, hikers with dogs or machine (bicycles, ATVs for example) in a specific group easy to determine.

C. Axes of Interest

We then considered the relationships between clusters by contemplating possible axes placement with which the clusters would fit: An axis ranging from **Anti-social Vs. Extremely social** quickly emerged, as it naturally followed two broad intentions: Broady, *tasks to complete in isolation on the trail* Vs. *people to meet while hiking on the trail*. The "Gatherers" (e.g *mushroom gatherers*) group was placed towards the A*nti-social* extreme on the axis, while *families* and *dog walkers* groups were placed towards the *extremely social* end.

An axis of **Opportunists vs Intentionalists** also had a general consensus, one participant posited that it was because the axis was naturally goal oriented - the two labels forming the extreme end of the axes. *Sightseers, time-killers* and *Picnickers* were considered opportunists, while *through-hikers, spelunkers* and *birdwatchers* were considered intentionalists. "**Accidental**" was a midpoint axis label suggested to represent spontaneous hikers - the *Ad-Hoc Socializing* cluster that contained *dog walkers* for example, fit this categorization.

On considering what a hiker gains, two possible axes emerged from the discussion:

> **Monetary vs altruistic**: Monetary describing hikers who would not be on the trail if there was no incentive. Those grouped under the "job" affinity: *Trail markers*, *forest rangers* etc., were considered towards the monetary end, while "Volunteer" hikers: *Trail Angels*, *firemen,* and *National Park Service (NPS) volunteers* were placed towards the altruistic end.
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> **Mental Vs. Physical** axis considered internal (invisible) gains - made up of hikers positioned explicitly under the "Mental" affinity that included *Solo day-hikers, Nature Lovers, Thinker* and *Rehab* Vs. external goals (those with identifiable/visible results) for example - *Trail Markers, Loggers* and *Herbalists*.

Experiential vs Task Oriented was also discussed as a potential axis, but was ultimately rejected on the basis of the fact that it was too connected: an experiential goal could turn into a task-oriented goal. Other axes considered but not discussed included: Active Vs. Passive, Random Vs. Non-Random and Good Vs. Evil.

The axis placement exercise aided in determining/making connections between clusters, the distance between clusters having some meaning that was not apparent from the clustering exercise.

FUTURE DIRECTIONS

The insights gained from the affinity exercise and discussion provide a launching point in considering future directions:

- Having an understanding about the dynamics of hikers within a group, and the relationship between different groups can reveal gaps that present design opportunities for encouraging community and defusing intra and inter-group conflict.
- Opportunities emerge for reaching out to specific groups or individuals within a group to aid our understanding of both the dynamics and the context of these hikers.
- When considering design opportunities in general, we have different levels of abstraction to explore: Designing for a group, for intra-group hierarchy, for a group size and for different combination of axes.
- Future work might also consider which affordances available from current technologies (e.g. gps tracking, biometric sensing) are relevant to specific groups and which are not.

A secondary session

REFERENCES

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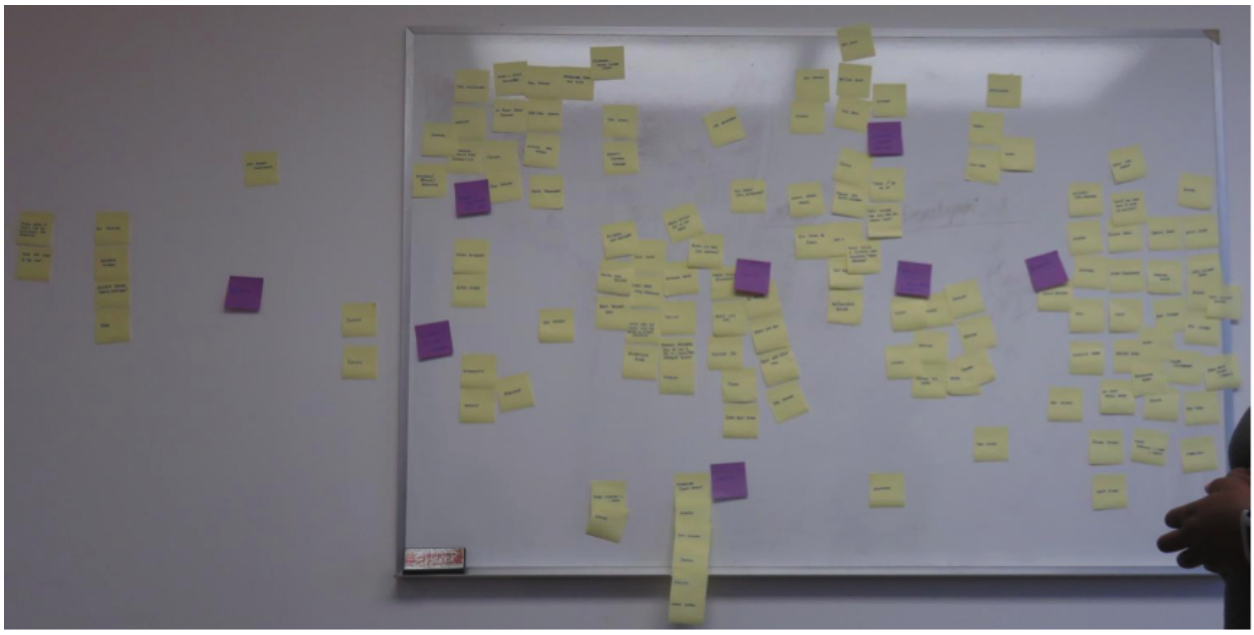

Figure 1: Clusters that emerged from the second affinity-diagramming exercise

Figure 2: Affinity Diagramming activity for the second exercise on goal clustering

Figure 3: Clusters that emerged from the original workshop exercise