Executive summary

We are brought together today due to a cause, that cause is backcountry skiing. Backcountry skiing is the act of skiing in unpatrolled areas, which means you have to be extra cautious in order to protect yourself. As anyone who has ever skied in the backcountry will tell you, avalanche awareness is essential to having a great experience. There are many forms that an avalanche can take, according to an article by Backcountry Magazine. Some of them are Wind Slabs, Loose Dry Snow, and Cornice Glide Avalanches (Hardesty, 2015). According to the National Ski Patrol, a federally-chartered 501(c)(3) nonprofit membership association which has over 31,000 members and serves 650 patrols, some of the things that you can do to protect yourself are to take an avalanche awareness class, research the route and snow conditions, call your local avalanche warning center and check the weather. The organization mentions more things you need to do before you get to your destination and even when you are there.

However, this paper exists to propose a solution to a problem, but what is that problem? The problem is rather three problems, how to prepare potential skiers for avalanche safety by providing weather reports, how to help skiers who are hurt in the backcountry, and keeping family members of skiers in the know. The problem with the current means of avalanche preparedness is that the information one needs to gather come from many sources, such as the National Ski Patrol, Backcountry Magazine, and others, none of them provide up-to-date weather reports. The second problem is contacting search and rescue, or any other such authority for help quickly and efficiently for backcountry skiers who do so solo. The only solution to this problem is the avalanche transceiver, which only works if there are other skiers present.

Therefore, there needs to be a system where a rescue team is alerted as soon as the skier is in the way of an oncoming avalanche. The third problem is giving family members peace of mind. The family members in mind are those that worry about their relatives getting into an unwanted situation. There needs to be a system where those family members can know where their relative is and whether they are ok or have been harmed.
**Industry-wide problem**

Even though, there are multiple ways for people to communicate through different methods such as Twitter, Facebook, Instagram and many more. There are only a few applications that provide instantaneous real-time updates and with everything being digitized on a day to day basis, it is important that the people are not left being in today’s digital age.

As technologies continue to advance, applications will also become more complex thus making it difficult for people to adopt. The most widely adopted applications are simple to use and requires no experience to use correctly. It is imperative that the application is intuitive to clients in order to promote a wide adoption.

While we may be in a digital age, there are still many areas in the world that are not covered by the network. When people travel to areas that do not have network coverage, they are essentially isolating themselves from the rest of the world. Granted sometimes that is what their intentions are, but what if something happens? Such as missing person or accident. Without the proper channel to communicate with the outside world can be dangerous.

Avaloon is seeking to fill in the gap that connects the civilization to the wild unknowns, provide our clients with peace of mind knowing they are safe and secure, even in the wild wild west.

**Existing solutions and drawbacks**

Our previous conversations with interviewees have mentioned that the best way they communicate is just by yelling. One of the interviewees mentioned that it is not an effective way but due to lack of technology and cell service they are limited to verbal communication. Berman says that skiers that do this more often or professionally do carry a two-way radio system which is good until the batteries die due to the cold temperature. This means that skiers have to pack extra fully charged batteries. Using a radio requires pre-planning which is testing a channel at the beginning of the day so that everyone is on the same wavelength. Another way to keep track of their ski buddy is to use binoculars. Having the visual of your ski buddy moving or not moving can make a difference between life and death. They are not only good to know the approximate location of your partner but also look out for bigger alpine terrain and recognizing areas of concern (Berman, 2015). The issue with binoculars is that it makes it really difficult
to keep track of more than 2 people at once. Binoculars for location tracking is no help to skiers going on a solo adventure. Radios and Binoculars might work in the backcountry but does not help skiers when they are in danger or when hit by an avalanche. Further research and interviews have led us to the conclusion that there is no current system that helps friends and family keep track of their loved ones. Berman mentions that groups often strategize on how to communicate throughout the day. Plans need to be amended according to what surprises come along the way. “Creating a mental map of the group’s location in relation to known hazards will help remain in a good position for a potential rescue.” Despite all the basic tools, heightened awareness is the biggest safety tool one can bring (Bernam, 2015).

**New, improved solution**

We live in a modern world with modern solutions. Where skiers once had to rely on outdated analog technology, there is no longer any reason they shouldn't be able to use a digital interface.

Communication between individuals on the slopes has evolved. Where way back in the day skiers would have to simply scream across the mountain to communicate. Now, they have the option to use more advanced means of communication. They can use walkie-talkies or even cell phones. Now with the proliferation of smartphones to the general populace, a dedicated application can be utilized for messaging while on the slopes.

While backcountry skiing, it has always been imperative that one has situational awareness of the location of one's fellow skiers. Where once it was standard practice to either stay close by, or by just using binoculars. These more simplistic means are no longer needed. These days we have geo-tracking applications that allow one to know their relative location to the globe. With that in mind, it then makes sense that this kind of location tracking technology could be implemented to assist skiers with keeping track of their own location, as well as that of their companions.

It can always be a real pain not knowing when or where the emergency services will arrive after one becomes buried.
in a pile of snow. However, the same software used to track ones friends on the slopes, can it also be used to track the current location of the emergency rescue team. Software like this can bring piece of mind to skiers that are stuck in even the most dire of situations.

**Case study**

According to the Colorado Avalanche Information Center, approximately 27 people have died each year in avalanches over the last 10 winters in the United States. They say that non-fatal accidents are never reported, therefore it is difficult to track that (Forecasts). Another source mentions that a record 46 people have been caught in an avalanche (Blevins, 2019).

This following data comes from interviews with 2,000 backcountry skiers who range from mainly skiing alone to mainly skiing in groups. The data suggests that Avaloon to be the best solution to the problem.

![Map Image](image1.png)

**The Solution**

One of Avaloon’s purposes is to make the location of a skier who is being afflicted by an avalanche known. The way this works is by having Avaloon constantly monitoring the skiers location and their condition. This function of Avaloon was

![Map Image](image2.png)

![Effectiveness Chart](image3.png)
designed with the safety and security of skiers in mind.

**Outcomes**

- One user, a mother of a skier, was able to sign up with her email and know where her child is
- Another incident involved Search and rescue and they were alerted to the condition of a skier immediately and got to the skier in time to save them
- One user said that Avaloon alerted them in enough time that they were able to deploy their backpack and stay above the avalanche

The graph above denotes the markedly shorter time that skiers who get caught in an avalanche who Avaloon spend under the snow.

After these skiers used the Avaloon application they said that the App was a recommend, some venturing to say a necessity, to having a safe experience while backcountry skiing.

**Conclusion**

Avaloon seeks to provide a safety net for outdoor communities that travel to different parts of the world and enjoy their respective activities where network coverage is often not available. It is our duty to provide our clients and their respective communities with the utmost security and safety lifeline that connects our clients to the nearest rescue responders. We aimed to give our clients a peace of mind, knowing that no matter where they are, they will always be in safe hands. Overall we are satisfied with the capabilities of our application to provide a safety net for our client, granted there are many similar applications that provide the same experience, only a few are aimed at connecting the client to the first responders.

**About the company**

Avaloon is a mobile application that is created by 4 Computer Science students from the University of Alaska. The team has been formed as part of the CS371 which is...class project. 3 out of the 4 team members know of friends that are avid backcountry skiers and have faced life-threatening situations due to lack of communication and not knowing their whereabouts. The creators feel passionate about this cause, and working to make it better and help the backcountry skiing community. We continue to dream, discover and develop new ways to improve on past designs, and make the experience better for
our users. If you would like more info on ways you can help bring Avaloon to the market, please contact us at info@avaloon.com.

References:


