
Crowd Control

Business Plan

Bowtaps

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Executive Summary

Bowtaps is a software development company focused on technological innovation. We aim to provide mobile solutions that alleviate the stresses of modern life. Our passionate and experienced developers strive to create products that will change the way users go about their daily lives.

Our flagship product is Crowd Control, a mobile application designed to ease the experience of going out. Crowd Control will accomplish this through integrated group messaging, GPS mapping, and group status updates. It will provide users with a reliable and easy way to track their friends and fellow users at events of any kind, while providing local businesses a platform to showcase their venue.

Currently there is nothing on the market that meets the same set of needs that we are targetting. As we will detail later on, other existing services only implement one key aspect of our app whereas Crowd Control brings all of these core features together into a single product.

Our initial market entry plan is to keep the app free to download in order to lower the barrier of entry for users. Sponsored ads, or "suggestions", will be our primary revenue source. Suggestions are a way to give users ideas for possible events for their group to attend in their area.

Ad space will be priced based on the population of users in the area. Since this price is essentially demand-driven, advertisement prices will be calculated based on user growth in the area. It is important to note that our advertisements are not traditional banner ads; rather, they are sponsored event suggestions made available to users that are searching for events in their area. We believe this is especially attractive to users as it is unobtrusive while adding value and content. Advertisers would also benefit from our unique approach to advertising as it would entice more impressions from users.

In the app market, the entry into the marketplace is crucial, especially as a start-up company. Currently, without other released products to generate revenue, it is important that user base grow as quickly as possible. A strong entry into the marketplace will help fuel further development and allow us to expand Crowd Control with additional features. Targetting local high-traffic events as our beachhead markets will aid in early growth and provide us the insight needed to plan expansion to new markets.

As our user base dictates our finances, our goal is to minimize development costs up until the launch of Crowd Control. To accomplish this, all backend services we utilize implement a scalable pricing plan that is free for low usage amounts. As our usage exceeds one million unique server requests per month, costs will increase and must be maintained in the release phase. Additionally, Crowd Control was programmed in such a way that, if needed, we can transition away from our current back-end services with relative ease.

General Company Description

2.1 Company Summary

Bowtaps is a software development company focused on a complete user experience. The company founded the mobile application Crowd Control. As a start-up company we have a closely connected group of people that have the shared goals of changing how people use mobile applications for the better.

2.2 Mission

Our mission at Bowtaps is to develop innovative mobile software applications to provide solutions to inconveniences that trouble the everyday user. Through the products we create, we aim to change the mobile environment by creating applications with easy-to-use features, intuitive interfaces, and reliable services that our customers can depend on.

2.3 Goals

- Reduce everyday inconveniences through software
- Build easy-to-use, well-designed applications
- Generate revenue to fund future growth

2.4 Keys To Success

- Establish our presence in the marketplace
- Build trust with users through strong customer relations
- Utilize the latest features in mobile technology
- Apply user feedback to develop improved products
- Continue to create innovative solutions to modern inconveniences

2.5 Company History

Bowtaps was created from an idea of our flagship product Crowd Control. It spawned out of a competition called the Butterfield Cup. In May of 2015, when our team took first place with Crowd Control, we realized that we could take our idea from concept to reality. During the summer of 2015 we attended the Business Accelerator by the Enterprise Institute and hosted by the South Dakota School of Mines and Technology. From there, we went on to compete in the Student Pitches competition at the Rapid City Innovation Expo and took second place. We started development on Crowd Control in September of 2015 and since then have been working towards building both a strong company and a solid product.

2.6 Milestones

Milestone	Due Date
Butterfield Cup Competition	2015-05-08
Business Accelerator	2015-06-22
Reserve web domain	2015-08-18
Innovation Expo	2015-09-29
SDSM&T CEO Program	2015-12-05
SD Governor's Giant Vision submission	2016-02-19
File for LLC	2016-02-26
Alpha testing for Crowd Control	2016-03-04
Senior Design Fair	2016-04-19
Beta testing for Crowd Control	2016-04-26
Crowd Control Release	2016-08-01
Crowd Control Feature Update	2016-10-01
Crowd Control Feature Update	2016-12-01

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The Product

3.1 Introduction

Crowd Control is a mobile application designed to "ease the experience of going out" by providing simple yet powerful group communication tools. Crowd Control seeks to help users with easy-to-use group messaging and organizational features. The product is most useful in loud and crowded places where direct communication with group members is difficult, such as concerts, festivals, and amusement parks.

3.2 Third Party Requirements

Crowd Control is designed to be a background tool. It has to handle instant messaging, retrieving and securely distributing GPS data to other group members, and doing so while minimizing power consumption and network access. The information must be kept up-to-date and be quickly accessible. Additionally, all of this personal user information must be stored and communicated securely. Using capable third party services for storing and transmitting data and well-designed user interfaces, Crowd Control is capable of meeting all of these requirements.

For storing data, we are using Parse as our back-end service. Data stored on Parse servers is encrypted while simultaneously being easily accessible using the provided developer APIs. For instant messaging, Crowd Control will be using the Sinch messaging service. Sinch also uses encryption to protect app-to-app messages.

The goals of our user experience designs are to keep the app simple to learn, easy to use, and fun to experience. We accomplish these goals by employing modern UI design techniques, keeping the application as responsive and straightforward as possible, and by streamlining and simplifying important tasks. For example, Crowd Control only requires the user to sign up or log in one time, remembering who the user is from that point on. Another example is automatically displaying only the most relevant information; when a user is currently part of a group, the context of the application will change to be entirely focused on the group.

Parse

Parse is a back-end database service that is the backbone of Crowd Control. Parse provides data storage and retrieval services, cloud functionality, and customizability that will allow our application to function exactly as intended. The entirety of the data stored in Parse is encrypted for our users' protection. Additionally, our own database designs allow user messages and geolocations to be encrypted end-to-end, meaning that no one other than group members—not even ourselves—can view messages and location data shared between our users.

Sinch

Sinch is a back-end messaging service that allows us to provide group messaging to our users without needing to reimplement such a system ourselves. Instant messages sent through Sinch are encrypted end-to-end, meaning that even if the data was intercepted, it would be unreadable except by those whom the message was intended for. Fast message passing, push notifications, and secure communication are the features promised by this service, and Crowd Control will be making full use of Sinch to give our users the best experience possible.

3.3 Development Requirements

One of the most critical decisions to make when building a mobile application is to choose the target platform. Applications built for as many platforms as possible can reach a wider market, but such projects can be expensive and technically challenging to successfully undertake. There exist tools that allow applications to be developed for multiple platforms simultaneously, but they bring with them a different set of difficulties and limitations. The chart on the next page displays information pulled directly from uxmag.com that outlines the key differences,

strengths, and drawbacks of multi-platform development using native technologies versus cross-platform tools.

Our Decision

There is no question that Crowd Control must exist on multiple platforms; the combined popularity of the top smartphone platforms creates a target market that we cannot afford to ignore. This boils our decision down to choosing between developing Crowd Control using native technologies and building it using cross-platform tools and services. Both approaches certainly have their share of benefits as well as drawbacks. A long-term strategy would seem to favor web-based over native apps, but no matter which approach is taken, a well-orchestrated user experience is the best defense in the rapidly evolving world of mobile platforms and devices. Additionally, cross-platform tools would carry an additional development cost and applications built with these tools are subject to feature limitations that native applications are not bound by.

Weighing the pros and cons between developing a native application or a cross-platform application, we have determined that Crowd Control should be developed natively. Despite the additional time and potential effort that this would require, it will enable us to build an overall better experience for our users and will avoid a potentially risky dependency on another project that lies outside of our control.

Native App Strengths

Speed.	1.1 Native apps tend to be faster and more responsive. Because the code that runs the app is stored locally on the phone, there is no time spent waiting for static content (such as images and text) to be downloaded from the web. While dynamic content may still need to be accessed from the web, it's an improvement over the web-based model in which everything needs to be downloaded each time.
Local Storage	1.2 Native apps can run asynchronously, meaning dynamic information can be stored locally on the phone temporarily and synced with the central web-based server later. While new technologies and features (such as those in Xamarin) will allow for this to also be done in cross platform environment it is not as reliable as native.
Killer Features	1.3 Going with the native app approach gives you access to that platform's hardware features allowing interesting functionalities such as taking photos, accessing GPS information, making phone calls, leveraging near field communication (NFC), etc. Because web-based apps are platform agnostic, they do not have access to the device's hardware features.

Native App Draw Backs

Coding	2.1 The biggest drawback to developing a native app vs. a cross platform one is that a separate code base must be created and maintained for each individual platform. For example, if you decided to initially build an iPhone app, you would have to design, code, and deploy an iOS app to the App Store. If you then decide down the road that you also want an Android version, you will have to redesign the app for the Android device, code and deploy it to the Android app store—likewise for other platforms. From a development perspective, the code bases are two entirely different languages and will have to be completely rewritten simply to mimic the original app's functionality.
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Cross Platform Strengths

Single Solution	3.1 The biggest upside to a cross platform development approach is, of course, the biggest downside to a native one. When developing a cross platform you are centralizing your offering. Single-source means that there is a single version of the code base that all users across all platforms access and use.
Single Code Updates	3.2 With the language being written in a single language allows for faster updates and new features to be added.

Cross Platform Draw Backs

Hardware	3.1 With cross platform development does not always properly implement the features of the native language. For the things that require specific native code you have to create translators to go between the cross code and the native code.
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3.4 Product Description

3.4.1 Overview

Crowd Control is a mobile application that aims to ease the experience of going out by providing group management, group messaging, and GPS tracking features. All of these useful tools are bundled into a single, easy-to-use mobile application that is easy to set up, simple to learn, and enjoyable to use. With Crowd Control, users will be able to keep in communication and find each other, even when in loud and crowded places.

3.4.2 Features

The application is built to provide the following core features:

- Event-based group management
- Integrated group instant messaging
- Optional periodic location updates

These features, while essential to the product, are far from the only features that are in development. Crowd Control is built to grow with its customers, and future versions will contain additional features that will complement the rest.

Group Management

Crowd Control will allow users to create temporary "groups" that they can invite their friends and family to join. Once joined, members of this group can take advantage of the other features of the app for as long as the group is in use. After an amount of time specified by the group leader or if the group becomes inactive and unused for several hours, then the group will be "disbanded", removing all users from the group and unlinking their profiles from one another. Leaders can manually disband a group whenever they desire.

The flexible nature of group management will allow users to join groups without concern for who might also be in the group, as personal data will never be automatically shared with the other users in the group without consent. This offers several advantages over, say, exchanging phone numbers.

Instant Messaging

Crowd Control will feature integrated instant messaging, which removes the need for users to resort to alternate communication platforms such as SMS to communicate with group members. This also contributes towards the overall goal of ease of use because it eliminates the need for members to use multiple apps to stay in contact;

all the needed features in a single bundle. Additionally, because the messaging is group-based and built right into the application, there's no need for group members to exchange permanent contact information with other members they may not know.

GPS Locating

In many social situations, noise levels and other factors can distract people so that they cannot hear or respond to phone calls or messages from those they are with. Crowd Control solves this problem by automatically sharing each user's geographical location with the other members of the group. This way, if the group cannot find or contact another group member, they could use this application to locate them.

Because personal privacy is one of the top priorities of Crowd Control, individual location gathering is performed on each user's own device and encrypted so that no one but the other members in the group can read the information. Additionally, location tracking features are entirely optional and can be disabled on a per-user and per-group basis.

Many third-party applications use the GPS feature to help track other users. Our GPS tracking is designed with battery life in mind; it is important that Crowd Control can operate without significant power use, as the target use cases involve users straying far from any power source. Our implementation is less demanding on the user's battery by only sending location updates at customizable time intervals or when requested. Because the groups are temporary, tracking stops after the group is disbanded or if the user force-closes the application.

Strategy and Implementation Summary

The initial release of Crowd Control will be in conjunction with local businesses in the Rapid City and Black Hills area. This will allow those businesses to gain promotion from our app, and widen our user base.

4.1 Market Strategy

As there are many alternatives to our product, our primary mission is to show that Crowd Control can be the all-in-one package that users will need. Since no apps currently encapsulate all the things that our product will, it is important for us to play to our strengths.

We will be working closely with local businesses to help promote events and use those events as opportunities to showcase what our app does and why Crowd Control is their next necessary tool when going to these events.

The Rapid City/Black Hills area is perfect for an initial release, as it has a large tourist influx and hosts many local events in and around the hills. The spaciousness of the area is another opportunity to showcase our GPS location features, and help validate that, if this app is in a larger city, it will scale well.

It is critical to keep the relationship with businesses strong, as this is one of the features that will set us apart from our competitors. Many different services that do focus on event management don't promote businesses.

4.2 Sales Strategy

Crowd Control's largest barrier to entry (as is with most mobile applications), is the price; our app must remain free to retain the largest amount of users, as most people will not download an app if they have to pay for it beforehand.

Since Crowd Control will be free, revenue will come from the connection we have with businesses and different event coordinators. The business-sponsored suggestions we serve to our users will be the primary source of revenue, as this will connect our users with our sponsors.

4.2.1 In-App Pricing

Although Crowd Control is a free-to-download application, users can purchase access to customized styles and other cosmetic enhancements, such as layouts, emojis, and icons.

Additionally, since the the maximum number of people allowed in a group is 8 people, users can choose to make a one-time purchase to double the capacity to 16 people for the lifetime of their account. To further expand group sizes, users can purchase instant group capacity upgrades to expand beyond their current limit. For example, if a user wanted to host a group of 25 people but their current limit is 8 people, they could purchase the instant group capacity upgrade. This would extend their capacity to 25 people for the duration of the group. After the group disbands, that capacity will be reduced back to their original capacity. The group size pricing will increment by 5 people at a rate of \$0.20 per person.

4.2.2 Advertisement Pricing

Our advertisement model is based on a CPM (cost-per-thousand impressions) model. According to marketingterms.com, the total price paid in a CPM deal is calculated by multiplying the CPM rate by the number of CPM units. For example, one million impressions at \$10 CPM equals a \$10,000 total price. This is illustrated in the example below:

$$\begin{aligned} 1,000,000/1,000 \text{ impressions} &= 1,000 \text{ units} \\ 1,000 \text{ units} \times \$10 \text{ CPM} &= \$10,000 \text{ total price} \end{aligned}$$

Using the CPM model, our advertisement prices will scale from the number of users in a given area. We don't currently have a set CPM rate, but plan to start around \$3.00.

Personnel Summary

5.1 Personnel Plan

As our team consists solely of developers, we are able to evenly divide tasks amongst one another depending on necessary feature sets and other constraints that may come up in the product's development and testing phases.

In an effort to keep investment costs low, each of the five developers in Bowtaps has elected to not take a wage that exceeds our revenue flow. This, of course, means that no wages will be taken for the entirety of the product's development and pre-release, and possibly for a time into the full release phase.

5.1.1 Charles Bonn



Charles is the founder of the mobile application idea that evolved into Crowd Control. As the acting CEO of Bowtaps he acts as the intermediary between the company and the rest of the app development community. With past experience in both GUI and database development through personal projects and class assignments he is currently working on Crowd Control's database, code to communicate with the database, and database handling code.

5.1.2 Johnathan Ackerman



Johnathan is a founding member of Crowd Control. He helped in the brainstorming of the application and the creation of Bowtaps. In the company perspective he is in charge of quality assurance and customer relations. When Crowd Control is released, he will be managing user feedback and coming up with ways to improve the application and manage errors that happen to pop up. During development Johnathan has been, concentrating on the look and feel of the interface and implementing messaging into Crowd Control.

5.1.3 Daniel Andrus



Daniel along with also being a founding member has taken on the roll of project manager. He is in charge of managing the progress, repositories, and checking code to make sure it follows our coding standards. Along with being the project manager, during developement he also takes on the task of creating and implimenting services and background processes. These services and background processes allow for a more streamlined experience. With past experience in game design and graphical layouts, Daniel brings structure and knowledge to help set the team up for success.

5.1.4 Evan Hammer



Evan, another founding member, has taken on the role of managing sales and marketing for Bowtaps. He keeps track of expenses and funding, develops advertisement strategies, and connects us with local businesses to promote our suggestion-based advertisement strategy. During developement, Evan is creating systems to implement both advertisements and mapping features of Crowd Control. His experience in mobile development helps create an efficient and smooth experience for the users.

5.1.5 Joseph Mowry



Joseph is the last (but not least) of the founding members of Bowtaps. On the business side, Joe takes charge of creative developement and implementation. With this, he is in charge of researching new additions and helping the team implement them in Crowd Control. During development Joe has been working on core features such as joining, leaving, and creating groups, as well as working with Evan to help create mapping features. Joe's experience with object-oriented programming allows him to create modular code which aids in the development and maintainability of Crowd Contol.

5.2 Future Personnel Expansion

Our future expansion plans consist of exploring the talent available from the South Dakota School of Mines & Technology. Bowtaps plans on attending SDSM&T career fairs to search for both intern and full-time employees. Additionally, we plan on utilizing the Dakota Seeds program to help fund early intern possibilities.

As our company grows, we plan to make use of the students here in South Dakota to build fantastic apps while furthering their education. By establishing a strong market presence, we will be in a unique position to bolster South Dakota's place in the technology sector. We look forward to expanding Bowtaps with the talent found at SDSM&T and schools throughout the region.

Part I

Financial Resources

Market Analysis

1 Market Segmentation

Market segmentation is a marketing strategy, which involves dividing a broad target market into subsets of consumer, businesses, or countries that have, or are perceived to have, common needs, interests, and priorities, and then designing and implementing strategies to target them. Market segmentation strategies are generally used to identify and further define the target customers, and provide supporting data for marketing plan elements such as positioning to achieve certain marketing plan objectives. (Wiki)

In order to understand a very diverse market, analyzing the demographics of the market is very helpful. The target market for Crowd Control is young adults, between the ages of 21 and 29 years old. The following information will validate the reasoning behind the company's choice of target market

2 Demographics

According to a survey by RJI Mobile in 2014, 53% of smartphone owners are male and 47% of smartphone owners are female. The average age of male smartphone users is 41. 24% of male users are 55+ years old, 35% of male users are 35-54 years old, and 41% of male users are 18-34 years old. The average age of female smartphone users is 42. 25% of female users are 55+ years old, 38% of female users are 35-54 years old, and 38% of female users are 18-34 years old. The following chart breaks down smartphone market share by age, operating system and gender.

According to Google (Appendix XXX), age groups 18-24 and 25-34 tend to notice mobile advertisements more than older age groups, which is good news for our sponsors. The target market fits our app well, due to the likelihood of user interaction with sponsors. In order to stem growth, we need to promote as much interaction between our users and our sponsors as possible.

Our team will be very selective early on when choosing sponsors for our mobile app. In order to make sure the app promotes growth, our team needs to make sure we understand our customer's interests and income so we can't tailor the app to our target market.

According to Pew Research Center in 2015 smartphone ownership is highest among young adults with high income and education levels. In terms of education level: 52% of HS graduates or less own a smartphone, 69% of people who took some colleges course own a smartphone, and 78% of college graduates own a smartphone. In terms of income level: 50% of people that make \$30,000 per year or less own a smartphone, 71% of people that make \$30,000-\$49,999 per year own a smartphone, 72% of people that make \$50,000-\$74,999 per year own a smartphone, and 84% of people that make \$75,000 or more per year own a smartphone.

3 Sizing up the Market

The following chart was built to estimate the overall market size of smartphone devices in the United States for 2015 through 2020. According to the United States Census Bureau (Appendix XXX), the United States is projected to have a population size of 321,369,000 by the end of 2015 and population size of 334,503,000 by the end of 2020. The population will continue to increase at a decreasing rate. Considering the given projected population size at the end of 2015 and the given projected population size at the end of 2020, the yearly population percent changes were assumed to be: .82%(2016), .81%(2017), .80%(2018), .80%(2019), and .79%(2020). The previously listed percentages were used to estimate the population size of the United States from 2016 to 2019. According to Statista's projections (Appendix XXX), 70.1% of US citizens will own a smartphone in 2015, 75.3% will own a smartphone in 2016, and 79.7% will own a smartphone in 2017. Considering the users projections from Statista, the following assumptions were calculated to estimate the user percentage change in the US from 2018 to 2020: 3.5%(2018), 2.6%(2019), 1.7%(2020). The previously listed percentages were used to estimate

the total percent of smartphone users from 2018 to 2020. By using the all of the previously listed assumptions the following chart was built.

Understanding the overall market size of smartphone devices is very important for strategic planning. The following chart will narrow down the data to fit our target market, 21-29 year olds. According to the Nielson demographic chart (Appendix XXX), 85% of 18-24 year olds own a smartphone and 86.2% of 25-34 year olds own a cell phone. Due to the fact our target market is for 21-29 year olds, based on the data from Nielson, we will assume, conservatively, 85.5% of 21-29 year olds own a cell phone. According to the United States Census Bureau (Appendix XXX), the United States is projected to have a population size of 22,740,000 of 20 to 24 year olds by the end of 2015 and a population size of 22,059,000 of 20 to 24 year olds by the end of 2020. Due to the fact the Census Bureau included 20 year olds in the projections, we will assume if we take each project multiplied by 80% we will have an accurate forecast of 21 to 24 year olds. According to the Census Bureau the United States is projected to have a population size of 22,473,000 of 25 to 29 year olds by the end of 2015 and a population size of 23,722,000 by the end of 2020. We can combine the projections for 21 to 24 years olds and 25 to 29 year olds to form a population projection for 21 to 29 year olds for 2015 and 2020. Considering the projection size of 21 to 29 year olds for 2015 and 2020 the yearly population percent change for the age range was assumed to be: .35%(2016), .35%(2017), .34%(2018), .34%(2019) and .34%(2020). The previously listed percentages were used to estimate the population size for 21-29 year olds from 2016 to 2019. The percentages were also used to calculate the estimated percentage of 21 to 29 year old smartphone users, starting with the base amount of 85.5%, the percent we assumed above, based on the Neilson demographic chart. This is shown below:

4 Assessment of competition

5 SWOT Analysis

A SWOT Analysis is a useful technique for understanding and identifying the Strengths, Weaknesses, Opportunities and Threats of a business.

SWOT:

Strengths

- Human Resources
- Low Barriers to Entry
- Low Startup Costs
- Low Fixed Costs
- Synergy with SDSM&T

Weaknesses

- Rapid Industry Change
- User's Cost of Switching
- Rivalry Among Existing Competitors
- Shifting Threat of new Entry
- Shifting Threat of Substitution
- Generating Profit From New Innovations
- Evolving Industry
- Financial Resources
- Physical Resources

Opportunities

- Complementary Products and Services
- Technological Innovation
- Capacity
- Forecasted Industry Growth Rate
- Many Potential Sponsors
- No Substitute Products
- Building Alliances
- Technological Resources

Threats

- Threat of new Entry
- Expected Retaliation from Competitors
- New Technology
- Radical Industry Change: from Threat of Obsolescence