

## J's Messaging Service

### Research Idea

Addiction treatment can often be expensive for individuals. For those who have the means to get treatment, some may find it hard to fit a full treatment schedule into their lives. I am proposing a bot platform that will be deployed by treatment centers to their patients to help ease some of the barriers previously mentioned. This bot platform will send messages through text message (SMS), Facebook Messenger, and Kik. All of these platforms were chosen to coincide with the increase reliance in message platforms, the macro trends of shrinking SMS usage while Internet-based messaging has increased, and to capture the attention of specific demographics who feel comfortable with each platform. Examples of messages that can be sent are motivational statements, new or reinforcement of existing coping strategies, surveys to determine how the patient is doing outside of the treatment center, and reminders for upcoming appointments with a counselor or group sessions.

My hypothesis is that treatment facilities who utilize my platform will not only see an increase in the number of patients, but also a greater variety of socio-economic patients. This diversity will become apparent as treatment centers offer a tiered pricing model, allowing those who could not afford existing treatment options, to embrace a cheaper limited in-person treatment with unlimited access to the bot platform.

Another hypothesis that will be tested is that patients who actively engage with the bot platform, will stick with treatment and are less likely to relapse. The daily reminders of the different components for their treatment in the patient's home will help remind the patient of the different coping mechanisms to handle their disease in an intimate setting. This should help appease the patients who have trouble fitting a traditional treatment into their lifestyle.

To measure my success with the platform, treatment centers will need to report monthly anonymous data to my business that includes: cost and amenities for various levels of treatment to the patient, number of patients who sign up for each level of treatment, and number of patients who sign up for the bot platform. I can measure which messaging services are popular, how many messages are sent, and number of active patients per treatment center. Optional measurement would be a survey that treatment centers could ask patients to fill out on behalf of my business that determines the socio-economic backgrounds of the patient.

A long-term goal of my company is to use the infrastructure that I have outlined above to further advance research at universities and appropriate government branches. This would be done by gathering permission from treatment centers and patients who are already a part of my platform on behalf of a research study. This could include sending surveys to certain demographics, studying the effects of one treatment choice over another with long-term success rates, or studying in home behavior of a patient through my platform with scans done at a health facility.

### Team

1. Jonathan Dharmaraj
  - a. Currently freelance developer with expertise in bots, web, and Android
  - b. Undergraduate Biophysics at Benedictine University
    - i. Research in cellulosic ethanol production

- c. Master of Engineering in Bioinformatics at University of Illinois at Chicago (un-completed)
- d. Winner of NASA Challenge: Software Applications using NASA's Delay/Disruption Tolerant Networking (DTN) Protocols
- e. Winner of AT&T Mobile App Hackathon – Chicago 2016

## **Business Model**

The overall business model is for me to license a software solution that allows a treatment facility to create a bot for three platforms: SMS, Facebook Messenger, and Kik. This bot can send out scheduled messages to patients, handle answering basic questions about the treatment facilities, and forward more advanced questions to the appropriate person at the treatment center for further follow up. Some of the scheduled messages to existing patients could be motivational statements, new or reinforcement of coping strategies, surveys to determine how the patient is doing outside of the treatment facility, and reminders for upcoming appointments with a counselor or a group session. Some of the initial research has already been done supporting regular messages through SMS (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4537651/>).

Youth have already responded well to aftercare through SMS (<https://www.drugabuse.gov/news-events/nida-notes/2015/06/text-messaging-aftercare-intervention-cuts-youths-risk-relapse>). Rather than just settling with SMS like the cited article, I have chosen to embrace the macro trend of people no longer using SMS in favor of Internet-based messaging services ([http://bits.blogs.nytimes.com/2012/11/12/text-messaging-declines-united-states/?\\_r=1](http://bits.blogs.nytimes.com/2012/11/12/text-messaging-declines-united-states/?_r=1)). WeChat has become synonymous with the Internet in China and some United States Internet companies have been preparing for a similar trend here with their own platforms, services, and frameworks (<https://digit.hbs.org/submission/wechat-how-a-chinese-messaging-app-is-winning-the-internet/>) ([https://blogs.msdn.microsoft.com/uk\\_faculty\\_connection/2016/04/05/what-is-microsoft-bot-framework-overview/](https://blogs.msdn.microsoft.com/uk_faculty_connection/2016/04/05/what-is-microsoft-bot-framework-overview/)). Kik leads with the 14-17 and 18-20 demographics and Facebook leads with the 21-25 demographics (<https://www.kik.com/magid-study-press-release>). There are other messaging platforms I could deploy to as well, however I think that starting here is enough for a minimum viable product (MVP) and will explore other platforms like Telegram and Skype in the future.

Treatment centers, especially those with aftercare programs, will see the greatest benefit with my platform. They will be able to engage with patients in an automated manner and collect data from patients on how they are doing with their treatment. Currently I am not recommending delivering aftercare exclusively through this bot platform, but I am recommending that some treatment centers may want to explore a tiered pricing model for their patients. For example: tier 1 gives full access to my bot platform and 3 hours per month of in person counseling, tier 2 gives full access to my bot platform and 6 hours per month of in person counseling, and so on. This recommended pricing model is based on cellular companies that give unlimited talk and text messages for all tiers and then increase the price based on the smartphone data used. Cellular companies do this because talk and text messages are very cheap for them and it simplifies things for consumers on deciding which plan to purchase. This tiered pricing model should allow treatment centers to sign up more people especially if the high initial price was a barrier and help serve a more diverse socio-economic patient population. This of course assumes that the base tier with the limited in person counseling has a reasonable cost and I can offer my platform to treatment centers for a low marginal cost.

I would charge treatment centers a monthly fee for administration and for each patient that is signed up for the platform through their center. The administration fee was created so that non-patients can send messages through the bot to get answers like hours for the treatment center, location, etc.

### **Minimum Viable Product**

My MVP will be a cloud service that allows treatment centers to create a bot that can send out scheduled messages to patients, handle automatic answering basic questions about the treatment facilities, and forward more advanced questions to the appropriate person at the treatment center for further follow up. The treatment center would create these bots with a simple drag and drop interface to mimic a conversation. This administration interface will be accessed through a website. Messages that require further follow up would be sent from my platform to an appropriate email that the treatment center has designated. The administration interface will also have a form to send just one user a message one time so that the treatment center can answer advanced questions through the preferred messaging platform of the user.

I will also be creating templates for treatment centers to pull into their bots in the drag and drop interface. These templates could be a user asking the bot the hours for the treatment center and all the treatment center has to do is insert their hours into the template. Another template could be a series of motivational quotes to send to patients at a regular interval. The treatment center would just have to alter the schedule of when the quotes go out and add/subtract to the quotes if desired. These quotes could be in the form of just text, an image, an animated image (gif), or a video. The concept of templates is so that treatment centers can get started faster with their bots by re-using interactions.

Finally, I would create a way for treatment centers to create a new patient for my platform, stop a patient from receiving personalized treatment (the patient has chosen to stop treatment with this center), and to restart an existing patient (a patient has returned to treatment after some time away).

For any information that could be sent from the bot to the patient that is very specific (reminding the patient to take buprenorphine, etc.) would be performed through a special method. For this the bot would send a message to the patient through message platform stating that he/she has a special message at a specific URL. The patient would click on the URL, go through a user name/password authentication process, and then they would be able to view this message. This is so that I do not create an unintended HIPAA violation on behalf of the treatment center. As part of the MVP, I will create tutorials on how to handle these special cases.

Patients would be able to stop messages through this bot platform if they deem it not to be useful and more of a burden. From our businesses point of view, they would no longer be counted as an active user, which is an important measurement to have. They would also be able to change the time of the day when they receive their messages. This will be useful if a patient works a third-shift job and needs to receive their morning motivational messages at night to coincide with their sleep schedule. This would all be performed with bot commands such as "Stop" or "Change Schedule."

### **Sales**

After the MVP has been created, I will begin selling at the various aftercare treatment centers in the Chicago area. This will be done by sending cold emails and calls. Simultaneously I will be going to various founder meetup events in the city of Chicago. In my experience going to these

meetups in the past, there is a much higher ratio of sales/business minded professionals compared to the tech professionals. With the aid of my MVP, I hope to find a sales minded co-founder to help with on boarding new treatment centers while I focus on the technical aspects of the business.

I am not certain how much I want to charge for this platform. The reason for this is because I want to develop the MVP first so that I can get an estimate on how much it costs me in computing charges. From there, I will further analyze the competition and come up with a sales price that includes a healthy margin so as to cover development, marketing, sales, computing, and a profit.

I have talked to Professional Consultations in Geneva, IL about my concept and they did think it was interesting. However, I do not want to get overly excited until they actually sign up for my platform. Their interest mostly peaked at the prospect of serving more clients while not having to significantly increase staff to handle all the new clients with the tiered pricing concept.

While the initial approach is to sell my platform at aftercare drug/alcohol treatment centers, this same platform could be used to engage at home patients through mental health facilities (stress coping techniques, appointment reminders, etc.), better manage chronic diseases through a primary care physician (medication reminder, motivation to exercise, etc.), or really any health provider that wants to engage with personalized care in their patient's home.

### **Competitors**

This is not a comprehensive list and I have listed the companies that have some sort of focus on rehabilitation centers. The main thing I have noticed with the general health text messaging software services is that most do not offer to connect with Internet-based messaging services. This exclusion could mean leaving behind a whole generation of patients who prefer these Internet-based messaging services.

1. Mediware
2. Upland Software

Appointment reminders are also currently being done through phone calls, email, and post cards in the mail.

### **Future Development**

While it is hard to anticipate all the features I want to add beyond those listed in the MVP, here are some that I know will be needed for long term success:

1. EMR/billing integration to allow for an easy workflow for treatment centers
2. More analytics tools so that treatment centers can see which patients are successful/unsuccessful and why. With the why, treatment centers can alter their approach for new patients or patients who come back to the center.
3. Add more messaging services such as Telegram and Skype.
4. When product market fit has been achieved with treatment centers and their patients, begin to explore partnering with outside researchers at universities and appropriate government branches to further advance their research goals.