

MindSphere

Executive Summary

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Imara Research

One in four adults – approximately 61.5 million Americans- experiences mental illness in a given year¹. Depressive disorders account for close to 41.9% of the disability from neuropsychiatric disorders among women compared to 29.3% among men². Serious mental illness has significant consequences in the form of lost earnings, hospitalization, chronic illness, higher drop-out rate and higher risk of suicide. We propose MindSphere, a simple smartphone application to track mental health status.

The Company: Imara Research ('the Company') is an LLC located in Shawnee, OK. Renita Murimi, the CEO, has a PhD in Electrical Engineering from New Jersey Institute of Technology and is an Assistant Professor of Computer Science at Oklahoma Baptist University. She has prior experience in founding startups for mobile applications. The Company focuses on research in network science and is led by a committed Board of Advisors that has extensive experience in the financial and software programming. Rajani Yejella is a Quality Assurance (QA) Team Lead at Time Warner Inc. with around 13 years of experience in financial software at firms including BNY Mellon, PNC Global Investment Servicing and JP Morgan Chase. Sharmila Yejella is a QA Analyst at the New York Stock Exchange and brings with her experience in financial securities. The plan for Imara Research is to raise \$1 million in funding from an investor. The investor will receive two seats on the board and an independent chairman will be appointed.

Products and Services: Imara Research's featured product will be a simple smartphone application, MindSphere, for tracking mental health. The user interface is a ball with three color-coded sections (red, green and blue). These colors stand for the following emotions (a) Red: antagonistic (b) Green: pleasant and (c) Blue: manageable stress. A user can only click on any one button at a time. A press of a button generates data (timestamp and mental state) that is logged in to the MindSphere database. The MindSphere database has read-only features. The ease of use and versatility of MindSphere make it useful for individual and corporate settings. Aside from having the potential to identify people with mental health issues, MindSphere can be used to identify and mitigate stressful environments. Access to quantitative data in the form of the MindSphere database logs can help us engineer our home, school and workplace environments for better mental health outcomes. Women can track their mental health over time and its correlation with season changes, life events, professional and personal changes and environmental attributes. The outcomes of monitoring based on the MindSphere data can be used to establish organization-wide incentives to help women manage the causes and symptoms of their mental health issues.

Market and opportunity: MindSphere lies at the intersection of two growing US markets: smartphone applications and wellness. The smartphone industry is projected to be a \$77 billion industry by 2017³. The average mobile app user spends about 30 hours a month on around two dozen mobile apps⁴. The mobile health market will grow at a compound annual growth rate of 61% to reach \$26 billion in revenue by 2017, with the bulk of the growth in this market occurring through mobile health apps.

Customers: MindSphere has two primary customers: individual users and corporations. MindSphere will target individual users through the mobile app markets available on Google Play and the Apple Store, which is projected to represent 90% of global app downloads by 2017. In the US, there are currently 7 million establishments⁵ with varying numbers of employees. Each of these establishments represents a potential audience for corporate MindSphere usage. MindSphere has also potential to identify people with violent tendencies as a result of mental illness. An example of this is the recent spate of shootings on school, college and work campuses. A majority of the perpetrators of these crimes have shown symptoms of mental illness and have left behind digital trails of evidence in the form of social network posts. Often this evidence is uncovered and pieced together in the wake of a tragedy. MindSphere represents a simpler, faster, proactive mechanism to detect these tendencies before a tragedy.

Competitors: Current smartphone applications for mental health are complex. Apps such as WhatsMyM3, DBT Diary Card and Skills Coach, Optimism that are featured in the top ten list of apps for mental health have questionnaires that are filled out by users from where responses are analyzed to assess mental health. Other apps such as BellyBio, DeepSleep, Magic Window and Relax Melodies focus on offering solutions in the form of breathing, meditation, sleep and other relaxation techniques. In contrast, MindSphere offers a simple user interface that is synced with a database to record mental health data. MindSphere will be offered to individual users for free and to corporations for a fee-based service to meet the needs of its employees.

Marketing Strategy and Start-Up Plan: Imara Research's marketing efforts are centered on strategic partnerships, advertising and presence in the Google Play and iTunes App stores. MindSphere's marketing campaign will also focus on driving traffic to its website and converting visitors to buyers. MindSphere will follow a three-phase start-up plan. The first phase will focus on creating a website, demonstration and alpha test among focus groups of individual users. The second phase will focus on establishing partnerships with corporations to test the usability in a corporate setting. During this phase, Imara Research hopes to raise the required venture funding of \$1 million to launch the integrated website for corporate and individual usage. To meet the objectives of the first two phases, in the third phase the Company plans to incrementally hire additional staff and outsource the initial development of the website.

Background

Mental health is an area of growing concern. Along with significant issues for individual health and productivity, mental illnesses have come to underline a bulk of behavioral and socioeconomic challenges for communities around the world. The World Economic Forum projections for the economic costs of mental illnesses is dire: Data obtained on mental illnesses in the year 2010 showed that the economic costs of mental illness was \$2.5 trillion, thereby comprising the largest cost driver of the global economic burden. The projection for the year 2030 is \$6 trillion, with mental illness accounting for higher economic burden than cardiovascular disease, diabetes, chronic respiratory disease or cancer. Additionally, mental illnesses are the largest causes of disability adjusted life years and pose high risk for the development of other illnesses related to cardiovascular disease, diabetes, chronic respiratory disease or cancer.

The impact of mental illness on women is significant. Common mental health disorders such as depression, anxiety and somatic illness affect women more than men. Depression alone is the largest mental health disorder among women, with women experiencing depression at roughly twice the rate of men. Approximately 12 million women in the United States experience clinical depression each year. About one in every eight women can expect to develop clinical depression during their lifetime. Many factors in women may contribute to depression, such as developmental, reproductive, hormonal, genetic and other biological differences and social factors. Gender-specific differences impact women's mental health at various stages of their life. Social pressures relating to career responsibilities, family roles as caregivers to children, spouses and parents, as well as general concerns about work-life balance resulting from economic and social policies have significant impacts on mental health in women. Depression in women is misdiagnosed approximately 30 to 50 percent of the time. Fewer than half of the women who experience clinical depression will ever seek care. More than one-half of women cited denial as a barrier to treatment. Depression also affects children, with higher rates of depression found in children than diabetes and asthma.

The impact of mental illness reaches beyond individual health and productivity concerns. Multiple accounts of mass shooting rampages and similar other criminal behavior have their roots in mental illness. In the wake of these tragedies, investigative procedures often show that the perpetrators of such crimes have chronic, unaddressed mental illness which manifests itself in the form on extreme anti-social behavior. Investigations also reveal that the perpetrators leave behind logs of their mental health, either in the form of journal entries or social media posts. The socioeconomic burden of mental illness is a crucial element that has found an unfortunate recurring place in our social discourse, and the lack of comprehensive strategies to address this issue of underlying mental illness is a major contributor to the continuing stigma and lack of awareness around mental illness.

Our proposed solution is MindSphere, a simple smartphone application to track the mental health of individuals. The MindSphere interface is a color-coded ball with three colors: red, green and blue. The user interface is shown in Figure 1.

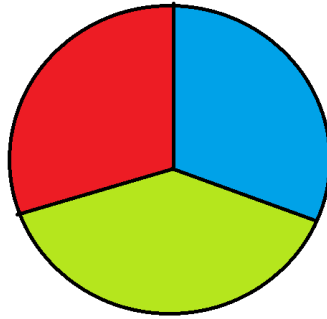


Figure 1: The MindSphere Interface

Each of the three colors in the MindSphere interface represent a certain spectrum of emotions. Red stands for frustrated, enraged, humiliated, vengeful, depressed, withdrawn or similar other antagonistic emotions. Blue stands for manageable stress that can handle with some form of therapy, for e.g. meditation, medical interventions or similar techniques. For example, the launch of a product or an upcoming deadline may cause an employee to be stressed or anxious, but she may use certain strategies such as cognitive therapy, exposure-based therapy, meditation, exercise or similar modes to cope with that stress until the project deadline. Green stands for happy, serene, or similar other pleasant emotions.

A user can click on any of these colors at a time. Button clicks are mutually exclusive, i.e. a user can click on only one button at a time. Multiple button clicks are allowed, and so a user can click on any of the buttons as many times as she intends to. Each button click generates two pieces of data: the emotion and the time stamp. This data is stored in the MindSphere database, which represents the core of the application (Figure 2). Users can access their database through secure a login mechanism to access their data over time. For security purposes, the database is read-only. All data entered in the MindSphere database can only be viewed, and write-protection is invoked throughout. Thus, individual users are not able to edit the data once it has been recorded in the database. This feature enables security and integrity of data, and preserves the simplicity of the application. Unlike contemporary applications in mental illness which require users to fill out questionnaires in order to assess their mental health, MindSphere relies on users' instinctual responses in everyday situations. This eliminates the need for algorithms to interpret user responses from surveys with multiple-choice questions or Likert-scale options. The simplicity of MindSphere is an important feature that sets it apart from other smartphone applications for mental health.

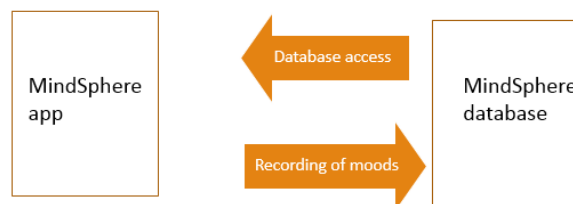


Figure 2: MindSphere application and database

The data in the MindSphere database is presented to the user in an easy-to-understand format on the dashboard. Users can view their mental health data in multiple formats. In addition to providing the ability to view a daily log of timestamps and emotions, an analysis of the count of the button clicks can show the frequency of a certain spectrum of emotions. For example, if a user clicks on the red button five times, the blue button seven times and the green button three times, the dashboard presents a visual of these for daily timestamps. Users thus have the ability to compare the pattern of emotions represented in the visuals and draw correlations. Are certain times of the month corresponding to the menstruation cycle more conducive to stress and anxiety? Do green button clicks peak during certain months of the year, probably around better weather? In the days leading up to major holidays, what kind of button clicks dominate? Similar other correlations can be drawn based upon the data in the dashboard. The MindSphere database can provide visuals for the data for daily, monthly and yearly records of the user's mental health data. MindSphere also represents a simpler way to track emotions of extreme anti-social individuals who hitherto resorted to creating logs of their mental health using journal entries or social media posts. Instead, MindSphere represents a one-stop application for recording mental health status. Figure 3 shows an example of the monthly analysis of the MindSphere data for the month of October. In October, the user clicked on the green button 16 times, clicked on the blue and red buttons 10 times, and clicked on all three buttons 4 times.

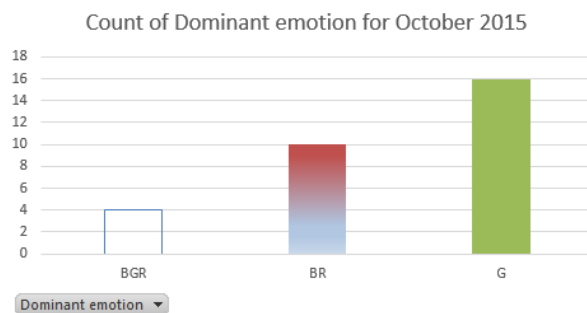


Figure 3: Monthly dashboard data for MindSphere

Figure 4 represents a comparative analysis of a user's mental health data using the dashboard. Users have the ability to compare the mental health for any two days. In Figure 3, a user's data for May 1 and November 1 are presented, showing that the user was in a better mental health state on May 1 than on November 1.

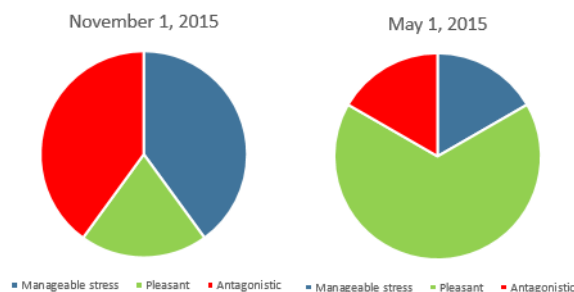


Figure 4: Comparative analysis of MindSphere data in the dashboard

Finally, Figure 5 represents daily logs of timestamps and button clicks. A user can select any day and view the data generated for that day. Circadian patterns in mental health can thus be deduced from the data present in the MindSphere database.

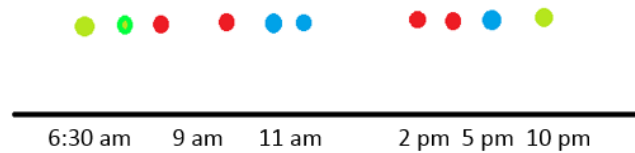


Figure 5: MindSphere daily log

MindSphere can be used in individual and corporate settings. Users can download the MindSphere application on their smartphone and record the data. Users also have the option of accessing their MindSphere account through a dedicated website which will have a secure logon process to authenticate the user (Figure 6).

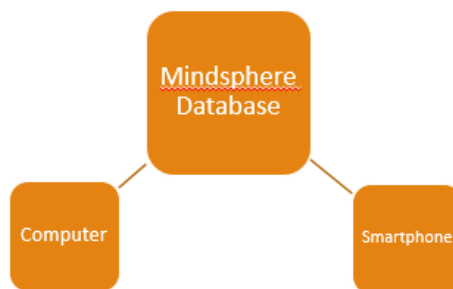


Figure 6: Access to the MindSphere database and application

Thus, the MindSphere database represents a mental health account available to individuals similar to an email account or a bank account. The data in MindSphere, over time, presents a powerful tool for analysis and intervention to achieve optimal mental health outcomes.

MindSphere also offers immense potential for use in corporate settings. Organizations such as companies, education institutions, and any workplace in general can use the MindSphere to provide better workplace environment for their employees. In a corporate setting, the MindSphere database would be administered and managed by a central department or data controller that also manages other human resource initiatives for the organization. The MindSphere database for corporate settings would be anonymized, so that users will not experience penalties or peer pressure for reporting less than optimal mental states. The data controller's office can view the logs of mental states reported by employees, students, faculty, or staff and establish corporate initiatives to improve the workplace or learning environment. For example, a period of prolonged stress reported by students around the week of finals can help the university provide campus-wide resources for students to seek help and support, thus changing the pre-dominant button click from red to blue on the corporate database.

The potential for MindSphere is immense. MindSphere can help identify and mitigate stressful workplace and learning environments. It also has the ability to identify individuals with unaddressed mental health

issues. A user who finds that the dominant emotion spectrum on his MindSphere database is red now has evidence in the form of dashboard data. Most women cite denial as a primary factor in not seeking care for mental health issues. Evidence in the form of MindSphere data can be used as the first step in comprehensive treatment options. A user can seek professional help in the form of therapies, medication or other modes to engineer her environment for better mental health outcomes. Access to quantitative data can help us engineer our home, school and workplace environments for better mental health outcomes. Women can track their mental health over time and its correlation with season changes, life events, professional and personal changes and environmental attributes. Outcomes of monitoring based on the MindSphere data can be used to establish organization-wide incentives to help women manage the causes and symptoms of their mental health issues.

Market Opportunity

MindSphere lies at the intersection of two growing US markets: smartphone applications and wellness. The smartphone industry is projected to be a \$77 billion industry by 2017³. The average mobile app user spends about 30 hours a month on around two dozen mobile apps⁴. The mobile health market will grow at a compound annual growth rate of 61% to reach \$26 billion in revenue by 2017, with the bulk of the growth in this market occurring through mobile health apps. The mobile health market is proliferating at a rapid pace, with apps providing a range of mobile health services: Epocrates gives doctors basic information about drugs. Apps such as Uptodate and Isabel provide reference materials to doctors for treatment approaches and therapies. Other apps such as AliveCor (to monitor a user's heart rhythms) and Ihealth Wireless Pulse Oximeter use a wireless sensor and app to record data. Apps such as ResolutionMD (to study X-rays when they become available) and CellScope Oto (for diagnosing ear infections) are used to record images and videos for aiding doctors in their diagnoses. Iscrub is another app for infection control (used in about 20 US hospitals) that sends information about employees' hand-washing patterns to a central database. MindSphere fits squarely into the intersection of the smartphone applications and mobile health market. The ease and simplicity of use of the MindSphere database, and the lack of external sensors or use of special hardware in the smartphone make it appealing for a wide range of users in individual and corporate settings. Other apps in the fitness market that uses smartphone applications are becoming popular. Activity trackers such as Fitbit and UP comprise two of the largest wearable smart activity tracker market. In the first quarter of 2015, the number of wearable sold worldwide increased 200% from that in the first quarter of 2014.

MindSphere has two primary customers: individual users and corporations. MindSphere will target individual users through the mobile app markets available on Google Play and the Apple Store, which is projected to represent 90% of global app downloads by 2017. In the US, there are currently 7 million establishments⁵ with varying numbers of employees. Each of these establishments represents a potential audience for corporate MindSphere usage.

Industry analysis and Marketing plan

Smartphone apps for mental illness are available for download on the Google Play and iTunes App store. Table 1 shows a competitive diagram that presents features of these apps, costs and mode of operation and targeted mental illness.

Name	Cost	Mode of operation	Feature
MindSphere	Free/Paid for corporations	Button click logs	General mental health
mym3	\$2.99	Checklist	Depression and anxiety
Sad scale	\$0.99	Questionnaire	General depression, depression scale for children, post partum scale, geriatric scale
Health through Breath- Pranayama	\$3.99	Breathing strategies	Guided breathing and relaxation strategies
eCBT	\$0.99	Maintaing logs	Cognitive Behavioral therapy
Moodifi	\$1.99	Self-rating and writing a diary page	Tracks dozens of symptoms in 3 different clusters: depression, mania and anxiety
Live Happy	\$0.99	Journaling	Activity based - journals, photobooks, goal setting
CodeBlue	Free	Social support	A list of contacts on the phone is alerted when the patient suffers depression or bullying
Lantern	\$75/month	Assessment test	Provides daily exercises and matches with professional coach
Talkspace	\$49/week	Connect to a therapist via messaging	Therapists are available for additional help.
Equanimity	\$4.99	Meditation	Meditation tools

Table 1: Comparison of mental health apps

In comparison to the above apps which require users to fill out assessment tests in the form of questionnaires or write journal entries, MindSphere has a simple user interface that only requires users to click on colors representing a spectrum of emotions. The simplicity and ease of use offered with MindSphere provides its distinct competitive advantage. The MindSphere database provides simple data analytics tools that help users by providing access to quantitative data over a period of time.

MindSphere will be available free of charge to individual users. For use in corporate settings, the corporation will be required to pay a yearly subscription fee which will be pro-rated based on the number of employees. Small organizations with fewer than 100 employees will be charged a fee of \$1000 per year. Medium-sized organizations with 100 – 500 employees will be charged a fee of \$5000 per year. Large

organization with more than 500 employees will be charged a fee of \$10000 per year. This fee covers the costs of administering the database, server and backup costs as well as maintenance.

Marketing plan

MindSphere will be hosted on a dedicated website and will also be available as a smartphone application. The smartphone app will be available for download on the Google Play, iTunes App store and Windows and Blackberry store. Potential uses for MindSphere are immense – it is the first of its kind to represent a mental health account (similar to an email account or bank account) for users in individual and corporate settings. The app will be extensively marketed over social media. MindSphere will be made available to all Internet search engines. School and college campuses, as well as physician groups will be made aware of MindSphere through email. We also plan to present demo versions of the app at local, regional and international conferences and workshops in mobile health (mHealth). Presenting at such venues uniquely helps MindSphere by targeting niche markets in mobile health. The app is competitively priced for individual users, and corporations are provided support for maintaining and administering the database for a yearly subscription fee. In order to achieve this, MindSphere will have a three phase development plan. In the first phase, we will focus on creating a website, demonstration and alpha test among focus groups of individual users. The second phase will focus on establishing partnerships with corporations to test the usability in a corporate setting. We will incrementally hire additional staff and outsource the portions of the development of the app and website.

Company and Management

Renita Murimi has a PhD in Electrical Engineering from New Jersey Institute of Technology. She is currently as Assistant Professor of Computer Information Science at Oklahoma Baptist University and is founder and CEO of Imara Research, LLC based in Shawnee, OK. Renita's research interests are in network science – specifically wireless networks, mobile health (mHealth) networks and digital social networks. She is the recipient of a prestigious Bill and Melinda Gates Foundation (BMGF) grant in 2011 for developing a smartphone application to tackle the global health concern of yellow fever and dengue fever spread by the Aedes Aegypti mosquito. Imara Research is led by a committed Board of Advisors that specializes in software development for a range of applications. Rajani Yejella is an IT Manager at Warner Music Group, with around 15 years of total experience in Project Management, delivering projects with quality in budget and on time. She has an extensive experience in working in all phases of Software Development Lifecycle and has lead teams at firms like JPMorgan Chase, Citigroup, Bank of America and Bank of New York Mellon. Sharmila Yejella is a Quality Assurance Analyst at FINRA, with 8 plus years of experience in SoftwareTesting and QA implementation for Client Server and Web based applications. She was responsible for implementation of long term quality strategies at firms like Verizon.

Financials

MindSphere will be available for the Google Play, iOS, Windows and Blackberry platforms in addition to being available on its own website. We will use both internal developers and an external agency for development of the app and website. In order to provide mobile access without the need for user-side hardware, the MindSphere database will be available through the cloud and data from the cloud application interface (API) will be used for custom dashboards. The app will have multiple screens for authentication, data generation (user interface) and the dashboard. User management will be handled using email and password combination, social media accounts and LDAP, which is a light weight application protocol for accessing and maintaining distributed directories. The cloud will store user data from the MindSphere database in the form of structured data (timestamps and button clicks) as well as unstructured data. For a future version, the app will have the ability to use location data for location queries. Emails and push notifications will be used to keep users engaged. Users will also have the option to publish their data to a social media account. User data will be secure through encryption and the ability to remotely wipe the data. Detailed analytics will be available for the user data and user activity. Servers will be regularly scaled and backed up.

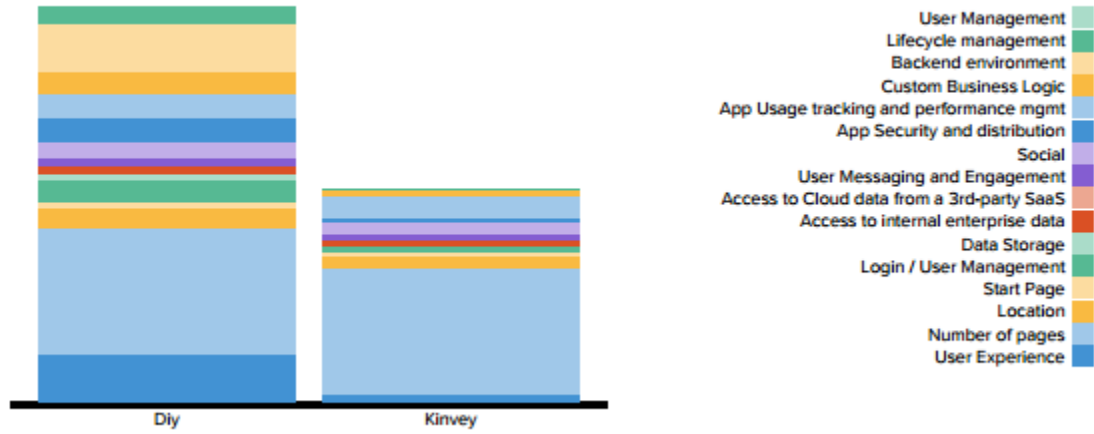
A summary of the financials is below for both DIY as well as outsourced mobile backend as a service (mBaaS). The mBaaS model is obtained from Kinvey, a firm that specializes in providing platform architectures optimized for web and mobile applications. We plan to raise \$500,000 based on the estimates for outsourcing the development of MindSphere to Kinvey for the development of the app and the website.

DIY Summary

	Cost	Person days	Person months
Frontend Development	\$541,875	625	20.8
Backend Development	\$161,262	186	6.2
Infrastructure costs	\$133,650		
Total:	\$836,787	811	27

Kinvey Summary

	Cost	Person days	Person months
Frontend Development	\$313,918	375.5	12.5
Backend Development	\$21,736	26	0.9
Kinvey BE	\$84,000		
Total:	\$419,654	401.5	13.4



Division of labor (detailed breakdown)

Frontend

Access to internal enterprise data			User Experience		
1 SOAP Interface	47	7	<input checked="" type="checkbox"/> Network and battery optimized data syncing	29	7
			<input checked="" type="checkbox"/> Online/Offline Data Access	45	6.5
Person days = (DIY) 47 (Kinvey) 7			Person days = (DIY) 74 (Kinvey) 13.5		
Location			Start Page		
<input checked="" type="checkbox"/> Integration with a Location Service	17	8	<input checked="" type="checkbox"/> Splash Screen	9	9
<input checked="" type="checkbox"/> Location-based POI search	11	7			
Person days = (DIY) 28 (Kinvey) 15			Person days = (DIY) 9 (Kinvey) 9		
Login / User Management			Data Storage		
<input checked="" type="checkbox"/> Login via LDAP or Active Directory	42	9	<input checked="" type="checkbox"/> New large file store and CDN for large files	55	11
<input checked="" type="checkbox"/> Login via Username / Password	16	9			
<input checked="" type="checkbox"/> Login via Facebook (OAuth)	18	18			
<input checked="" type="checkbox"/> Login via Twitter (OAuth)	34	24			
Person days = (DIY) 110 (Kinvey) 60			Person days = (DIY) 55 (Kinvey) 11		
Number of pages			User Messaging and Engagement		
6 Approximate time / page - design, code, test, iterate	192	192	<input checked="" type="checkbox"/> Generate Emails	2	2
			<input checked="" type="checkbox"/> Receive Push Notifications	11	7
Person days = (DIY) 192 (Kinvey) 192			Person days = (DIY) 13 (Kinvey) 9		
Social			App Security and distribution		
<input checked="" type="checkbox"/> Push to Facebook Open Graph	24	20	<input checked="" type="checkbox"/> On-demand deletion of user's client-cache	7	2
			<input checked="" type="checkbox"/> Encryption of data on device (client-side)	22	2
Person days = (DIY) 24 (Kinvey) 20			Person days = (DIY) 38 (Kinvey) 4		
App Usage tracking and performance mgmt					
<input checked="" type="checkbox"/> App Usage Analytics	10	10			
<input checked="" type="checkbox"/> App Performance Management	17	17			
<input checked="" type="checkbox"/> App Crash Reporting	8	8			
Person days = (DIY) 35 (Kinvey) 35					

Frontend time estimate

Backend

Login / User Management

<input checked="" type="checkbox"/> User auth, roles, and session management	10	3
Login via Username / Password	15	1
<input checked="" type="checkbox"/> User-based Data ACLs, data sharing, etc.	10	2

Person days = (DIY) 35 (Kinvey) 6

Data Storage

<input checked="" type="checkbox"/> File Store + CDN to store/stream large files	10	1
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Person days = (DIY) 10 (Kinvey) 1

Access to internal enterprise data

<input checked="" type="checkbox"/> SOAP Interface	10	10
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Person days = (DIY) 10 (Kinvey) 10

Custom Business Logic

<input checked="" type="checkbox"/> Trigger-based Emails	10	2
<input checked="" type="checkbox"/> Trigger-based Push Notifications	10	3
<input checked="" type="checkbox"/> Business logic versioning	1	1
<input checked="" type="checkbox"/> Trigger-based business logic (e.g. - for data validation)	15	1

Person days = (DIY) 36 (Kinvey) 7

Backend environment

Person days = (DIY) 70 (Kinvey) 0

Lifecycle management

<input checked="" type="checkbox"/> Backend environment versioning (Dev / Staging / Production)	10	1
<input checked="" type="checkbox"/> API versioning	15	1

Person days = (DIY) 25 (Kinvey) 2

Infrastructure

Total person days: (DIY) **811** (Kinvey) **401.5**

Backend Time Estimate

Web Developer

(Kinvey) **1** (DIY) **1** developers at \$ **1000** daily rate with **100** % focus

Backend Engineers

(Kinvey) **1** (DIY) **2** engineers at \$ **1000** daily rate with **100** % focus

Project Manager

(Kinvey) **1** (DIY) **1** managers at \$ **1000** daily rate with **30** % focus

Hybrid App Developer(s)

(Kinvey) **1** (DIY) **1** developers at \$ **1000** daily rate with **100** % focus

Designer

(Kinvey) **1** (DIY) **1** designers at \$ **500** daily rate with **30** % focus

QA

(Kinvey) **1** (DIY) **1** qa members at \$ **250** daily rate with **75** % focus

Team size: (Kinvey) **6** (DIY) **7**

Team Composition

Total price estimate for both DIY and Outsourced Development

Frontend

Access to internal enterprise data

					Days	X	Cost/day	=	Total	
SOAP Interface	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$5,852	(DIY)	\$40,749
Total feature cost = (Kinvey) \$5,852 (DIY) \$40,749										

User Experience

					Days	X	Cost/day	=	Total	
Network and battery optimized data syncing	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$5,852	(DIY)	\$25,143
Online/Offline Data Access	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$5,434	(DIY)	\$39,015
Total feature cost = (Kinvey) \$11,286 (DIY) \$64,158										

Location

						Days	X	Cost/day	=	Total
Integration with a Location Service	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$6,688	(DIY)	\$14,739
Location-based POI search	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$5,852	(DIY)	\$9,537
Total feature cost = (Kinvey)										\$12,540 (DIY) \$24,276

Start Page

					Days	X	Cost/day	=	Total	
Splash Screen	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$7,524	(DIY)	\$7,803
Total feature cost = (Kinvey) \$7,524 (DIY) \$7,803										

Login / User Management

						Days	X	Cost/day	=	Total	
Login via LDAP or Active Directory	X	(Kinvey)	\$836	(DIY)	\$867			(Kinvey)	\$7,524	(DIY)	\$36,414
Login via Username / Password	X	(Kinvey)	\$836	(DIY)	\$867			(Kinvey)	\$7,524	(DIY)	\$13,872
Login via Facebook (OAuth)	X	(Kinvey)	\$836	(DIY)	\$867			(Kinvey)	\$15,048	(DIY)	\$15,606
Login via Twitter (OAuth)	X	(Kinvey)	\$836	(DIY)	\$867			(Kinvey)	\$20,064	(DIY)	\$29,478
Total feature cost = (Kinvey) \$50,160 (DIY) \$95,370											

Data Storage

					Days	X	Cost/day	=	Total	
New large file store and CDN for large files	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey)	\$9,196	(DIY)	\$47,685
Total feature cost = (Kinvey) \$9,196 (DIY) \$47,685										

Number of pages

			Days	X	Cost/day	=	Total
Approximate time / page - design, code, test, iterate	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$160,512 (DIY) \$166,464
Total feature cost = (Kinvey) \$160,512 (DIY) \$166,464							

User Messaging and Engagement

			Days	X	Cost/day	=	Total
Generate Emails	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$1,672 (DIY) \$1,734
Receive Push Notifications	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$5,852 (DIY) \$9,537
Total feature cost = (Kinvey) \$7,524 (DIY) \$11,271							

Social

			Days	X	Cost/day	=	Total
Push to Facebook Open Graph	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$16,720 (DIY) \$20,808
Total feature cost = (Kinvey) \$16,720 (DIY) \$20,808							

App Security and distribution

			Days	X	Cost/day	=	Total
On-demand deletion of user's client-cache	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$1,672 (DIY) \$6,069
Encryption of PII data in the backend data store	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$0 (DIY) \$7,803
Encryption of data on device (client-side)	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$1,672 (DIY) \$19,074
Total feature cost = (Kinvey) \$3,344 (DIY) \$32,946							

App Usage tracking and performance mgmt

			Days	X	Cost/day	=	Total
App Usage Analytics	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$8,360 (DIY) \$8,670
App Performance Management	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$14,212 (DIY) \$14,739
App Crash Reporting	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$6,688 (DIY) \$6,936
Total feature cost = (Kinvey) \$29,260 (DIY) \$30,345							

Backend

Login / User Management

			Days	X	Cost/day	=	Total
User auth, roles, and session management	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$2,508 (DIY) \$8,670
Login via Username / Password	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$836 (DIY) \$13,005
User-based Data ACLs, data sharing, etc.	X	(Kinvey)	\$836	(DIY)	\$867	=	(Kinvey) \$1,672 (DIY) \$8,670

Total feature cost = (Kinvey) **\$5,016 (DIY) \$30,345**

Data Storage

				Days	X	Cost/day	=	Total
File Store + CDN to store/stream large files	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$836 (DIY) \$8,670	
Total feature cost = (Kinvey) \$836 (DIY) \$8,670								

Access to internal enterprise data

				Days	X	Cost/day	=	Total
SOAP Interface	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$8,360 (DIY) \$8,670	
Total feature cost = (Kinvey) \$8,360 (DIY) \$8,670								

Custom Business Logic

				Days	X	Cost/day	=	Total
Trigger-based Emails	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$1,672 (DIY) \$8,670	
Trigger-based Push Notifications	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$2,508 (DIY) \$8,670	
Business logic versioning	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$836 (DIY) \$867	
Trigger-based business logic (e.g. - for data validation)	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$836 (DIY) \$13,005	
Total feature cost = (Kinvey) \$5,852 (DIY) \$31,212								

Backend environment

				Days	X	Cost/day	=	Total
Secure Rest API	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$0 (DIY) \$17,340	
Auto-scaling / Failover	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$0 (DIY) \$8,670	
Data archiving	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$0 (DIY) \$13,005	
Backend environment install and updates	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$0 (DIY) \$8,670	
DoS Protection	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$0 (DIY) \$13,005	
Total feature cost = (Kinvey) \$0 (DIY) \$60,690								

Lifecycle management

				Days	X	Cost/day	=	Total
Backend environment versioning (Dev / Staging / Production)	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$836 (DIY) \$8,670	
API versioning	X	(Kinvey)	\$836 (DIY) \$867	=		(Kinvey)	\$836 (DIY) \$13,005	
Total feature cost = (Kinvey) \$1,672 (DIY) \$21,675								

Infrastructure

On-Premise CapEx

	Days	X	Cost/day	=	Total
Networking	(Kinvey)		\$0 (Dir)		\$38,050
Servers	(Kinvey)		\$0 (Dir)		\$32,000
Total feature cost = (Kinvey)					\$0 (Dir) \$70,050

Large Cloud - Development

	Days	X	Cost/day	=	Total
CDN (\$100/mo.)	(Kinvey)		\$0 (Dir)		\$1,200
Load Balances (\$100/mo.)	(Kinvey)		\$0 (Dir)		\$1,200
Linux AppServer (\$600/mo.)	(Kinvey)		\$0 (Dir)		\$7,200
Cloud MySQL DB (\$200/mo.)	(Kinvey)		\$0 (Dir)		\$2,400
Total feature cost = (Kinvey)					\$0 (Dir) \$12,000

Large Cloud - Production

	Days	X	Cost/day	=	Total
CDN (\$100/mo.)	(Kinvey)		\$0 (Dir)		\$1,200
Load Balancers (\$200/mo.)	(Kinvey)		\$0 (Dir)		\$2,400
2 Linux AppServer (\$3k/mo.)	(Kinvey)		\$0 (Dir)		\$36,000
Cloud MySQL DB (\$1k/mo.)	(Kinvey)		\$0 (Dir)		\$12,000
Total feature cost = (Kinvey)					\$0 (Dir) \$51,600

Kinvey

	Days	X	Cost/day	=	Total
Basic	(Kinvey)		\$24,000 (Dir)		\$0
Advanced	(Kinvey)		\$60,000 (Dir)		\$0
Total feature cost = (Kinvey)					\$84,000 (Dir) \$0

Total app cost estimation: (Kinvey) **\$419,654** (Dir) **\$836,787**