SPATIAL ALARMS

The Location Based Alarms Company

Business Plan

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1. Executive Summary

Time based alarms are commonplace with users setting alarms such as "Give me a wake up call at 7 am in the morning". These are often used by people to remind themselves to do what can be considered as the right task at the right time. However, tasks are often associated with not just time, but also with place or location. For instance, often one would want to be reminded about the list of items to purchase while at a grocery store. Such a task is hard to associate purely with time, since it is not always certain when a user would be at the grocery store. Instead, if the reminder could be associated with the location (grocery store in this case) the right task can be performed. Our venture, Spatial Alarms, LLC extends the idea of reminders by letting users associate reminders with physical locations, leading to the notion of performing the right task at the right place at the right time.

Our state of the art technology, based on research and a working prototype developed at the Georgia Institute of Technology's College of Computing, relies on using user's mobile devices such as cell phones and PDAs to deliver the location based reminders. The number of mobile subscribers is on the rise: US cell phone companies had 220 million subscribers in 2007 as opposed to 180 million in the year 2005. Industry research[1] estimates that the number of cell phones capable of handling Location Based Services (LBS) will be 9 million by 2011. Currently, the cell phone based location services market has several small players and we believe entering now would be the right time. With this popularity of LBS capable cell phones, interest shown by cell phone operators[2], and our innovative solution, we believe our product will have a significantly large market.

Our primary product offering will be (a) The Spatial Alarms framework – the core software library that can be installed on mobile devices to add, delete and deliver alarms and (b) The personal assistant application – a software based user friendly solution built using our framework to deliver location based reminders for users. Our framework can also be used to build a whole suite of other alarm based applications such as 'Personal Navigation systems', 'Fleet tracking systems' and 'Industry Safety warning systems'. Any application that involves tasks that require an action to be taken at a particular location can be easily modeled using our framework. We would also be exposing our framework through an Application Programming Interface (API) for third party developers to build their own applications to increase our revenue stream.

Our business to consumer applications such as the 'personal assistant' (priced at $5 per month) and 'personal navigation system' (priced at $10 a month) would be targeted towards our primary customer base, the individual consumer, to help them manage their day to day activities. In order to be able to reach the masses, we intend to partner with cell phone operators to package our product with their default set of applications. Our business to business applications, such as the cost effective 'Fleet tracking system' (priced at a mere $25 per month) would be targeted at small business owners, while our 'Industry Safety warning system' priced at $10 per device would be targeted at improving safety for workers at industrial plants. We believe our competitive pricing (a lot cheaper than existing solutions), superior quality (energy efficient design and the framework approach) and the product distribution through cell phone operators would offer us a significant competitive advantage in the market.

Our firm's primary capabilities would be the technology and partnership. Three of the five co-founders of our venture would be graduate alumni of the College of Computing, two of them having specialized in the field of location based services. To complement the technological capabilities, the team intends to hire a VP of Sales with extensive contacts in the telecom industry to help forge ties with the cell phone providers. We also intend to hire a CEO to run the fledgling company.

Our company has been estimated to have positive cash flows starting in the year 2009. Our estimates also indicate that our business would be earning a net profit of $50 million in the year 2011 with revenues close to $150 million during the same year. A key aspect of our business is the low operating expenses due to very few servers required to help clients deal with location based alarms (primarily due to the highly scalable technology coming out of the research at Georgia Tech). We further estimate the top negative cumulative cash flow to be around $2 million. We wish to seek funding of $200,000 by the end of the first year through angel investment, followed by VC funding of $2 million by the end of the second year. Our projected strong financial results with an Internal Rate of Return of 313% make us strongly believe in the financial success of the company.

[1] Harris Report - Location Based Services and Presence Technology – Feb 2007
www.**harris**interactive.com/news/newsletters/**HarrisReport**/HI_The**HarrisReport**_2007_v02_i01.pdf

[2] Finders Keepers: Carriers Realize Potential of Location-Based Services - http://www.su.com/br/telecom/feature_finders.html

2. BUSINESS DESCRIPTION

THE VENTURE : The Company was started based on the research ideas of one of the co-founders at the college of computing at Georgia Institute of Technology. We intend to start our company as a ***Limited Liability Company (LLC)*** due to the tax benefits and associated savings. This form of organization has also been proven successful for start-up technological ventures. Anand Murugappan would serve as the interim CEO of the firm till we hire a more experienced CEO (at the end of 2008). At the end of the second year we also intend to register as a C Corporation in order to make it more lucrative to attract venture investment.

BACKGROUND : Our products fall under the wide umbrella of technology referred to as Location Based Services (LBS). LBS is a subset of context aware computing which revolves around enhancing the mobile user's experience by exploiting context information such as time, location, mood, speed etc. These services empower the user by offering her the ability to lookup maps from the mobile device, make queries such as '*Show me the five nearest restaurants that serve Italian food*' etc. Mobile devices are particularly powerful in being able to perform these tasks because they are generally carried around by the user and have the ability to identify their current location using in-built GPS receivers, WIFI triangulation, cell id information or cellular company's assistance. These features also make the mobile device a suitable hardware to deploy a '*Location Based Reminder*' software system.

UNIQUENESS OF OUR PRODUCT : Currently, the market has several but small LBS firms and a few closely related location based reminder companies (such as Geominder[3] and Geofencing[4]). The related location based reminder companies currently offer energy inefficient solutions making them hard to use (due to quick battery drain outs), expensive and further none of these offer it as a framework. We differentiate our product from the competition by (a) offering an inexpensive solution (due to our scalable system design and technology) (b) energy efficient solution (battery life of up to 10 times higher) and (c) as a framework. Offering it as a framework will help a whole new suite of location based reminder applications such as 'Inventory tracking', 'Mobile navigation systems', 'Friend locators' and 'Virtual Sign Board builder' to be built by not just our company but third parties as well, thus improving our revenue streams.

PRODUCT AND TECHNOLOGY

Our product offerings are twofold – (a) Framework (b) Applications. Our first major product offering would be the ***Framework*** in the form a software library installable on the mobile devices. This would represent the core of the system. It would support addition, removal and delivery of alarms in an energy efficient manner [5]. The functionalities would be exposed as an Application Programming Interface (API)[6] to application developers who can then use the framework to develop Applications such as 'Personal Assistants', 'Navigation Systems' etc. It is important to note that the existence of the framework would be transparent to the consumers and visible only to developers. The consumers would interact with the system purely through the applications. Nevertheless, the framework would be a critical part in our product offerings because it would help create a platform that third party developers can leverage resulting in a synergistic co-existence for the third party companies and our venture. With more applications being built around our framework we would have (a)

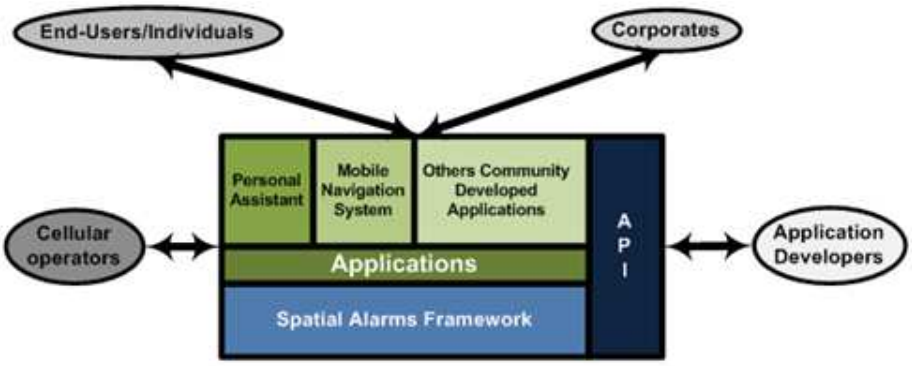


Figure 1 Products, Customers and Partners

[3] Geominder™ – a product for creating location based reminders - http://ludimate.com/products/geominder/

[4] Geofencing - Restricting the movement of a vehicle or other object to within a specified area. The location of the vehicle is monitored by telemetry and an alarm is raised if it goes outside that area.

[5] *An Energy Efficient Middleware Solution for Supporting Location Based Alarms* – Anand Murugappan and Ling Liu, College of Computing, Georgia Institute of Technology. (Research paper submitted to Conference Middleware'07)

[6] Application Program Interface (API) - A set of calling conventions (in the context of programming) defining how a service is invoked through a software package.

enhanced the overall value proposition of our product (b) introduced a dependency on our product (framework) and substantial[7] switching costs for customers to switch to competitor's products. We believe that by exposing our framework, it will become easier for the third party developers to focus on the application level details and not worry about how alarms would be set and delivered. This would in turn help them develop their product at a faster pace thus resulting in a mutually beneficial relationship. The framework would consist of two components – (a) A software library installable on mobile devices capable of addition, deletion and delivery of alarms (b) Exposure of this software library in the form of an API to developers. The API would be published with examples and necessary documentation to assist third parties in building applications using our product.

Setup Step 1.
Personal Assistant Application

Setup Step 2.
Lookup Location on Map

Setup Step 3.
Mark Alarm Area

Setup Step 4.
Enter Reminder Content

After a while, when the user enters the alarm area the reminder pops up →

User is Reminded!

Our next product offering dimension would be home grown ***Applications*** using our framework. We intend to release two B2C applications – (a) Personal Assistant (b) Turn by Turn Navigation System in the first two years followed by two B2B applications – (a) Fleet tracking systems (b) Industry Safety systems. In the rest of this section we shall describe the usage scenarios for each of these applications.

APPLICATION 1. PERSONAL ASSISTANT (B2C)

Objective: Help users keep track of tasks not just in terms of "when" but also along the "where" dimension.

Example Scenario: John is out of milk. However, he does not want to go all the way up to the grocery store immediately and instead wants to be reminded about it when he drives back home from office that evening so that he can buy it at the grocery store on the way. Since, he is unsure when he might head back home he can simply set a 'Spatial or Location Based Alarm' around the grocery store (located between his office and home) using his mobile phone/PDA. Later, in the evening when he drives near the grocery store he gets an alarm on his mobile device, reminding him about the need to purchase milk. Thus, his mobile device acts as a personal assistant and he is able to perform the task.

We have a working prototype for this application and screenshots of the prototype are shown below. In the prototype, we demonstrate another similar example where a student (Georgia Tech in this case) is trying to use the product to assist him with

[7] Switching to a competitor's product will require applications to be rewritten and recompiled for a different framework. This would require considerable effort from the third parties (in terms of code modifications and testing) and release of their software updates to the end users.

administrative activities. He needs to be reminded to drop a filled course registration form (shown as CS8903) at one of the offices (CoC in this case). He initially, looks up the area of interest (Georgia Tech. in this case) using the map software, marks the alarm area. Later when he passes by the alarm area he is automatically reminded.

APPLICATION 2. TURN BY TURN NAVIGATION SYSTEM (B2C)

Objective: A software based navigation tool that can guide user's get from one point to another by offering turn by turn assistance. Such a system would be of great assistance while driving. We believe that though our product would be limited in functionality as compared to navigation systems embedded on automobile dash boards but it would form a much cheaper alternative[8].

Example Scenario: John wants to get to his bank from his home. He punches in the source and destination. The application uses the map software to plot a route. It places alarms (shown as red boxes in the Figure) along the junctions where direction changes are required. A voice based navigation system directs John towards the destination. At each junction where a direction change is required the alarms are triggered and a voice directs the user to make the necessary direction change. By simply following the directions (and without having to look into the device each time) John is able to find his way to the bank.

Using our alarms framework makes implementation of turn by turn navigation software extremely easy and also reduces the energy consumption[9] for the end user, there by allowing the user to have longer battery lives.

APPLICATION 3. FLEET TRACKING SYSTEMS (B2B)

Objective: Automatically, notify a central authority once the company vehicle enters/leaves a checkpoint and also deliver vehicle location information in real time to the central authority.

Example Scenario: A small business owner wishes to track his fleet and be notified whenever his vehicles enter or leave a designated checkpoint along the route. He installs our product on each of the driver's spatial alarms capable[10] cell phone device and marks each of the checkpoints along the route. These are automatically translated and stored as spatial alarms and when the vehicle (with the driver carrying the mobile device) enters or leaves the checkpoint area, the alarms are triggered. The associated action would be to notify the central authority (server) about the entry/exit of the vehicle (proactive vehicle tracking). The owner can thus track whereabouts of his vehicles as and when the leave or enter checkpoints along the route. Further, the owner can send a probe over to the mobile device requesting for its location, there by enabling reactive vehicle tracking. The latter would be useful to track vehicles that miss checkpoint reporting deadlines or move significantly out of the designated route. We believe that such a service would be of interest to small business owners due to the low costs involved for them by choosing our product. Our vehicle tracking software priced at a mere $25 per month per device would be a lot more economical as opposed to current solutions[11] which cost a little lesser than $500 per month.

APPLICATION 4. INDUSTRIAL SAFETY WARNING SYSTEMS (B2B)

Objective: Product that would warn workers at industrial and manufacturing centers of potentially hazardous areas to avoid.

Example Scenario: A chemical plant dealing with hazardous chemicals wants to ensure worker safety. The plant management installs our product on the Spatial Alarms capable mobile devices handed out to each of the workers. Potentially, hazardous areas are marked as alarms (shown as red boxes in the figure) and should a worker venture into any of those areas an automatic

[8] On board navigation systems cost about $1000 but our product would be available for as low as $10 per month subscription fees.

[9] Simulation results described in "*An Energy Efficient Middleware Solution for Supporting Location Based Alarms* – Anand Murugappan and Ling Liu, College of Computing, Georgia Institute of Technology (Research paper submitted to Conference Middleware'07)" show that there is an improvement in battery lifetimes by about 6.5 times. So a device battery which would last for only 2 hrs using the conventional alarm delivery technique would now last 13 hrs with our framework.

[10] Spatial Alarms Capable cell phone device would have the ability to identify its location either using (a) GPS or (b) trilateration or cell phone based triangulation or (c) Wifi based triangulation and ability to exchange data with the Spatial Alarms server over the internet or through cell phone providers' data channels or satellite.

[11] http://www.gpsfleetsolutions.com/

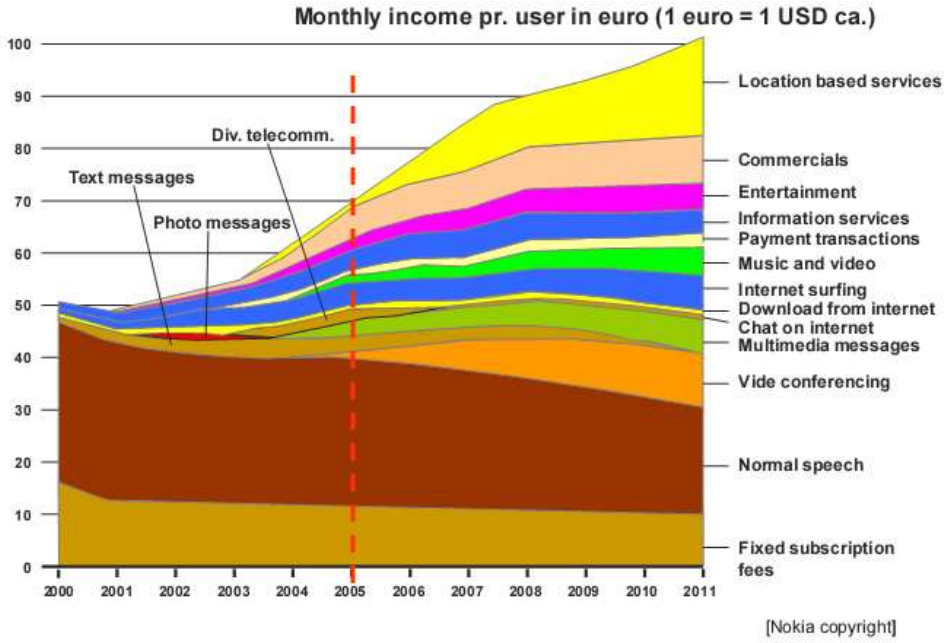
message is sent to the central plant safety authorities who can be ready in case of a mishap. More importantly, the device would beep and notify the user of impending danger advising him/her to get to safe location. Since, this is a software based product the hazardous areas can be changed in real time. For instance, if there is a toxic spill at one of the units, the safety officials can remotely install a new alarm on each of the worker's devices. We believe our product will greatly enhance the safety of workers at industries and hence will be of interest.

We believe that our technology would be one of our strongest capabilities. First, unlike most of our competitors, we would be offering our product as framework in order to build a community of developers who build location based services based on our platform. Also our technology is based on the latest research (as discussed earlier) in location based services and would be offering significant energy savings to users (there by making our product useable) as opposed to the conventional techniques which are very rudimentary. Also our current technology which is built on distributed architecture also helps us operate the system with very little server hardware there by helping us reduce costs as compared to the competition. We further believe that our future products that focus on alarm sharing would help build a collaborative environment based on user generated content.

3. Market Analysis

Target Market

Our products are intended to be targeted at several types of customers with the primary customers being individual consumers. With the expected growth in revenue from Cell Phone users in general and Location Based Services market[12] in particular as shown in the graph to the right. We believe the need for our applications such as *Personal Assistant* and *Turn by Turn Navigation systems* will be common place among the general population and it is this market that we wish to penetrate. Apart from targeting individual users we also hope to target corporations, factories and industrial units. We believe such organizations would be interested in applications such as *Spatial Warning Systems* and *Fleet Tracking Systems* due to our low priced products. We also hope to forge partnerships with Cell Phone operators to bundle our product with their packages and finally partner with external developers and third parties to build additional applications.



[12] Harris Report - Location Based Services and Presence Technology – Feb 2007
www.**harris**interactive.com/news/newsletters/**HarrisReport**/HI_The**HarrisReport**_2007_v02_i01.pdf

MARKET SIZE AND TRENDS

The first years of m-commerce were disappointing as e-commerce at the beginning, because the first generation of wireless application protocol (WAP) telephones and services did not have much success in the marketplace. Slow connection speeds, high airtime charges, poor quality screens, awkward user interfaces, and limited content and services all were likely contributors to the lower than anticipated usage of such services. Nonetheless, interest in location based services remains strong. One reason is the higher number of cellular phones than personal computers in service. In 2005, mobile phone operators counted 180m of subscribers, and 220m in 2007. Increasingly, these cellular handsets are capable of connecting to the Internet, and in some countries such as Japan and South Korea, mobile Internet use is growing rapidly. In Japan for instance, the subscription number of i-mode users is almost half of the total number of cellular phone users.

Concerning the tracking system, the Wireless Communications and Public Safety Act of 1999 (also known as the E911 or Enhanced 911 mandate) in the US, and the similar E112 initiative in Europe calls for the technical capability to locate mobile callers for emergency purposes. This regulatory environment, coupled with the continuously dropping price of GPS chips is greatly in a favor of an increasing market share for location-enabled cell phones. IMS Research estimates that these causes will result in a compound annual growth rate in cellular GPS revenues of 40% until 2010. In-car and handheld Personal Navigation Devices are currently selling between $200-1000 (depending on functionality), and are currently the largest and most profitable segment of the LBS market. However, this price point is currently under much pressure from cell-phone based GPS applications. Current GPS chip prices are as low as $3-10, with the newest products going as low as $1. While the current number of GPS-enabled cell phone users is only about 12 million, this is expected to rise to 315 million by 2011, according to ABI Research. Market forecast suggest worldwide revenues from LBS will increase from $2.6 billion in 2005 to $9.9 billion in 2010. Another forecast indicates that LBS will account for over 40 percent of mobile data revenues worldwide in 2007. Some of these predictions may be overly optimistic, but it demonstrates an overall expectation that most cellular subscribers in the near future will unwittingly be using a location determination technology[13].

With the introduction of several simple location-based services in 2006 by Verizon, Boost Mobile, Helio, Disney Mobile and other mobile operators, and the expected increase in the inclusion of GPS chips in cell phones in 2007, customers are increasingly exposed to a new use of their mobile phones: accessing context-sensitive information that is relevant to the user's physical location. With a favorable regulatory and technical environment, and some awareness already built in the market, we feel that the time is ripe for mass adaptation of cell-phone based location services. While some competitors are already active in the market, the user base is fragmented by a multitude of incompatible substitute services. A new player can capture both the existing and the untapped market by providing high service quality products that are based on new technology. The window of opportunity might not remain open for long, as more and more companies move into this space.

COMPETITION

There are several companies we consider as our competitors since they are in the business of publishing related/substitute applications in the Location Based Services space (even though none of them offer a framework specifically designed for location based alarms). Among several companies *Networks in Motion* and *TelNav* are well established players, offering a variety of services through several mobile operators. *uLocate* and *WaveMarket* are quickly moving in and are threatening the growth potential of the former two companies. *Autodesk* has the potential to become a major player, but it is not clear whether the company will further pursue this market, which is not in its major business area. *AccuTracking*, *Wherify*, *Ludimate, Remember The Milk* and *GuardianLion* are only one-shot players, and seemingly lack the capabilities to overcome their limitations.

Networks In Motion, Inc.

Networks In Motion, Inc. (NIM), founded in 2000 provides navigation solutions for GPS-enabled phones. The company's offerings are classified into Personal, Team and Developer Solutions. Personal Solutions are AtlasBook (real-time audible turn-by-turn directions, and mapping with points-of-interest display), PhotoFinder (location-tagger for photos taken with a camera-phone) and FamilyFinder (a location-tracking tool for family members). Team Solutions are AtlasLink (a mobile workforce management application), and the coupled Map Messenger and Atlas Track (fleet tracker). Developer Solutions are NAVBuilder Solution (LBS tools and services for wireless application developers) and TotalMap (pre-rendered maps). The company has established

[13] Charles Steinfield, Harry Bouwman, and Brigitte Preissl: E-life after the dot.com bust; Springer, Berlin

partnerships with several mobile operators: AtlasBook is branded as VZ Navigator for Verizon users, TELUS Navigator for TELUS users, Axcess Mobile Guide for Alltel users. FamilyFinder is branded as TELUS Kid Find for TELUS users.

TeleNav, Inc.

TeleNav, Inc., founded in 1999, is the self-proclaimed "global leader in location-based services". The company's main products are TeleNav GPS Navigator (for personal and business use), and TeleNav Track. TeleNav GPS navigator provides turn-by-turn instructions, voice-prompted directions, detailed color maps and access to 13 million points-of-interests for cell phone users, accessible on several mobile operators (Alltel, Cingular, Nextel, Qwest, Sprint, SouthernLINC, T-Mobile and Verizon), for a monthly fee of $9.99. TeleNav Track is a mobile workforce management solution, available on the Cingular and Sprint/Nextel networks for $9.99-21.99. The company does not offer an open LBS framework. The company has business agreements with several cellular operators (eg. Sprint/Nextel, SouternLINC) to offer TeleNav GPS Navigator on mobile phones with built-in GPS but the service is also available without the active cooperation of cellular operators when the user has an external (Bluetooth-connected) GPS device and a data plan (eg. T-Mobile).

uLocate Communications, Inc.

uLocate Communications, Inc. is the self-proclaimed "North America's leading publisher of mobile location services". The company's main products are Location Gateway (consolidating diverse location technologies currently in place), People Locator (personal location determination and history), Place Locator (queries for localized information) and Photo Locator (camera phone photo location tagger). People Locator is used in MapQuest Find Me, and Trackem. Photo Locator is used in GeoSnapper and WHERE/94373. The company developed the Buddy Beacon service for Helio.

WaveMarket, Inc.

WaveMarket, Inc. is a startup company that provides location-based solutions, and is financed by Draper Fisher Juvertson, BlueRun Ventures (formerly Nokia Venture Partners), Qualcomm Ventures and Intel Capital. The company's products are Family Finder, Resource Finder, Navi.Me, Mobile Local Search and Friend Finder. Family Finder allows family members to see each others' locations on a mobile phone or web site, and receive geofence alerts. The product is branded as Sprint Family Locator for Sprint Nextel users, and as Bell Seek & Find for Bell Canada users. Resource Finder is mobile asset manager application, available as Sprint Precision Locator for Sprint Nextel users, and as Bell GoTrax for Bell Canada users. *Navi.Me* is a turn-by-turn navigator. Mobile Local Search helps find local businesses and points of interest, available as *Near.Here* for Sprint Nextel users, and as Bell MapMe for Bell Canada users. Friend Finder is a friend locator and location-tagged information sharing service, available as StreetHive for Cingular users.

Autodesk, Inc.

Autodesk, a company primarily active in the CAD business, has several LBS offerings. Autodesk Insight is a mobile resource management solution for small businesses. Family Minder is a location-tracking tool for family members. Autodesk runs a co-marketing program, and as a result Family Minder is branded as Chaperone for Verizon users and Family Locator for Disney Mobile users.

Remember the Milk

Remember The Milk was created by a small Australian company consisting of two people residing in Sydney. They created it in order to help people managing tasks by gaining time. They wanted people to no longer have to write their to-do lists on sticky notes, whiteboards, random scraps of paper, or the back of their hand. They began work on *Remember The Milk* in August 2004 and developed it as a web application with a variety of features. However, they do not offer it is a location based services capable or running entirely on the cell phone. The service was launched in October 2005. Remember The Milk is now a free, task management application, downloadable on line[14]: it manages, locates and reminds users of their tasks.

AccuTracking, Inc.

AccuTracking Inc., founded in 2004, aims to provide low-cost tracking applications for Motorola iDEN GPS-enabled phones that are used on a Nextel network (Nextel, Boost, SouthernLINC). The company's versatile AccuTracking software allows viewing maps,

[14] www.rememberthemilk.com

doing phone-to-phone tracking of users, setting geofence alarms, sharing locations on the web, aggregating mileage statistics and trail history. The light and advanced versions of the service are available for $5.99 and $7.99, respectively.

Wherify Wherifone

Wherify Wireless Inc. is a Mobile Virtual Network Operator (MVNO) on a GSM network, developer of wireless location products and services for family safety and communications, law enforcement and security technology solutions. The company's core product and service offering is the Wherifone, a GPS-enabled cell phone primarily marketed for its location capability to be used by children, elderly people, or in businesses where tracking is relevant. Monthly plans cost $19.95-64.95.

Ludimate GeoMinder

Ludimate is a small mobile game developer company based in Portugal. The company's GeoMinder product for Nokia's Symbian S60 mobile phones allows the user to set reminders attached to places. The software is available for download for a one-time $19.95 fee.

GuardianLion

GuardianLion is a small startup that offers a GPS child locator device in a wristwatch form-factor, with geofencing capability. The company has not started sales of its product, and might be defunct.

The table below summarizes the different services provided in the LBS segment:

Table 1: Services in the cellular LBS segment available on the North American market

Functionality	Service Name (and Rebranded Service Name)
mapping only	MapQuest Find Me, Helio Google Maps, Google Maps Mobile
navigator	NIM AtlasBook (Verizon VZ Navigator, Alltel Axcess Mobile Guide, TELUS Navigator), TeleNav GPS Navigator, Trimble Outdoors, uLocate People Locator (MapQuest Find Me), ALK Technologies PC*Miler|Mobile, Garmin Mobile, WaveMarket Navi.Me
business finder	WaveMarket Mobile Local Search (Sprint Near.Here, Bell MapMe), Helio Google Local Search
fleet tracking	NIM AtlasLink, TeleNav Track, Autodesk Insight, Map Messenger+ Atlas Track (Nextel Mobile Locator), WaveMarket Resource Finder (Sprint Precision Locator, Bell GoTrax)
family tracking	Autodesk Family Minder (Verizon Chaperone, Disney Mobile Family Locator), NIM FamilyFinder (TELUS Kid Find), WaveMarket Family Finder (Sprint Family Locator, Bell Seek & Find), GuardianLion, Wherify Wherifone
friend finder	Helio Buddy Beacon, Boost Loopt, WaveMarket Friend Finder (Cingular StreetHive), Jaiku, Mologogo, Kamida Socialight
photo geo-tagging	NIM PhotoFinder, uLocate Photo Locator (GeoSnapper)
geo-fencing	Autodesk Family Minder (Verizon Chaperone with Child Zone), AccuTracking, WaveMarket Family Finder (Sprint Family Locator, Bell Seek & Find)
geo-reminders	Ludimate GeoMinder

MARKET SHARE

Considering the market trends and the results of our survey one notices that we have a high number of potential customers. Most end-users already own cell phones capable of location identification, and with time more and more mobile phones are shipping with GPS capabilities. According to the existing huge market we have, we estimate we have the potential to acquire nearly 25% of the mobile phones with LBS capability, five years after the firm's launch.

ATTRACTIVENESS

To Consumers: As mentioned earlier we intend to offer several useful applications to the consumers. Among these, survey results[15] show that the Personal Assistant product would be of greatest interest to end users. 80% of individuals surveyed, often or sometimes forget to perform planned tasks while at a particular location. Majority of the participants currently either make an effort to mentally remember the tasks or use scratch paper which do not guarantee reminders and hence the problem. These

[15] See Appendix for survey results

numbers also reveal a need for a system that would guarantee reminders. Our service is precisely intended to address this problem. One-third of the user's surveyed also ranked a 'Turn by Turn Navigation system' as an application they would be most interested in. This along with the popularity of online map software such as Yahoo! Maps and Google Maps makes us believe that consumers would be interested in these applications.

To Businesses (Small Businesses and Industries): Real time Fleet tracking in the past has involved use of expensive satellite phones and is often inaccessible to small business owners who typically do have the capability to invest in expensive systems. However, with our technology the same can be achieved with inexpensive cell phones at a nominal monthly price of $25 per unit. Our product would definitely lack the functionality of a full-fledged fleet tracking system but would be value for money. The initial investment to use our product would just involve a LBS capable cell phone which is substantially cheaper than the $460 devices charged by companies such as S&L Services Inc. Further, the cell phone would double as communication device. This we believe would be strong motivation for small business owners to use our product. Further, as described in the 'Product and Services' section we offer enhanced safety for plant workers and operators in industries. By using our industry safety warning system product these industries can save precious lives and reduce the number of accidents. At the same time our product would merely require LBS capable cell phones to operate and hence would offer a feasible solution. This again, makes us believe that our product will be of use to industries.

To Developers: In order to harness the strengths of the developer community we plan to open up the framework to external and third party developers by exposing it through the APIs. We believe that it would encourage the developers to develop more applications that work on our framework, leading to a virtuous cycle of interdependency. Another core attractiveness of our framework approach is its flexibility and therefore increased adaptability to market changes. The progress and success of the development will be significantly influenced by the close relations with developers. We believe our framework will be of interest to developers because our framework abstracts out the complex operations of setting, deleting and delivering alarms. With such an abstraction the developers would be able to concentrate on the high level application logic/customer needs and not worry about the fine details. This would eventually lead to faster product development times for the third party developer company. Further, our optimized framework with its energy efficient model is far superior in comparison the conventional approaches giving developers who use our framework significant advantage over others who do not. These reasons make us believe that third party companies would be interested in using our framework.

To Cell Phone Operators: In order to distribute our consumer product and penetrate a huge customer base we hope to establish partnerships with major cell phone operators such as AT & T Mobility (Cingular), T-Mobile etc. We believe cell phone operators would be interested in bundling our product and framework with their plans for several reasons. First, we intend to offer a significant portion (20 to 50%) of our profits to cell phone operators in return for their cooperation in exposing our product to their large customer base. Apart from this overwhelming monetary benefit our consumer products add significant value to a wide range of consumers on a daily basis. This would further enhance the value added to their customer base, there by improving customer satisfaction. Recent reports[16] indicate that Cell phone operators do realize the importance of Location Based Services and are likely to put in significant effort to encourage development of LBS by third parties. This further, enlightens the window of opportunity that currently exists. All these factors make us believe that our offering introduces a win-win situation for both the cell phone operators and us.

Scope for Future products: 55% of the participants surveyed expressed interest in sharing alarms with others, which makes us believe that the cooperative alarm platform might indeed be a useful product. We intend to pursue this as our initiative for the next product release.

Location Based Advertisements: Most of the individuals also preferred that the service be offered for free but did not mind being shown advertisements. We believe there is a substantial market for location based advertising but due to the high expenses involved in internet connectivity on a cell phone, lack of current technology and a few big market players such as Google and Yahoo! in the online advertising arena we do not believe the time is right for serving location based advertisements immediately.

Market Education: Finally, results also indicate that about 72% of the participants surveyed do not currently possess a GPS enabled mobile device. This reflects the lack of exposure to Location Based Services amongst the survey population (mostly in the age group 21 to 25). Hence, we believe substantial investment in market education would be required to make this venture

[16] Finders Keepers: Carriers Realize Potential of Location-Based Services - http://www.su.com/br/telecom/feature_finders.html

successful. However, at the same time results indicate that the product idea was well understood despite lack of prior experience with such technology since very few individuals selected choices like '*Don't know/Not Sure'* on several of our questions. In essence the survey seems to indicate that there is substantial value add for the customer and future growth of the product/technology in related streams but at the same time requiring investment in market education.

To help create a balanced assessment of the opportunity, a SWOT Analysis was performed:

Table 1 SWOT Analysis

Strengths	Weaknesses
Our framework and solutions are highly energy efficient, approximately 10 times more efficient than existing services High potential market (i.e. strong mobile phone and maps user customer base) Leverage developments and market education undertaken by existing players in the Location Based Services field.	Lack of Brand Identification Market Education Low amount of starting capital results in low barriers to entry Untested Application Diverse market targets (individuals, developers, corporate) Initial lack of control of the market
Opportunities	**Threats**
Partnership with developers Partnership with cellular operators Entry into Location Based Advertising Arena Acquisition by major internet/software companies like Yahoo, Google, IBM, Microsoft	Reluctance of Cell Phone operators to bundle our product in their default package Excessive control of the market by Cell Phone operators Product releases by popular companies such as Yahoo!, Google etc

Additionally, the attractiveness of the industry was assessed using Porter's Five Forces:

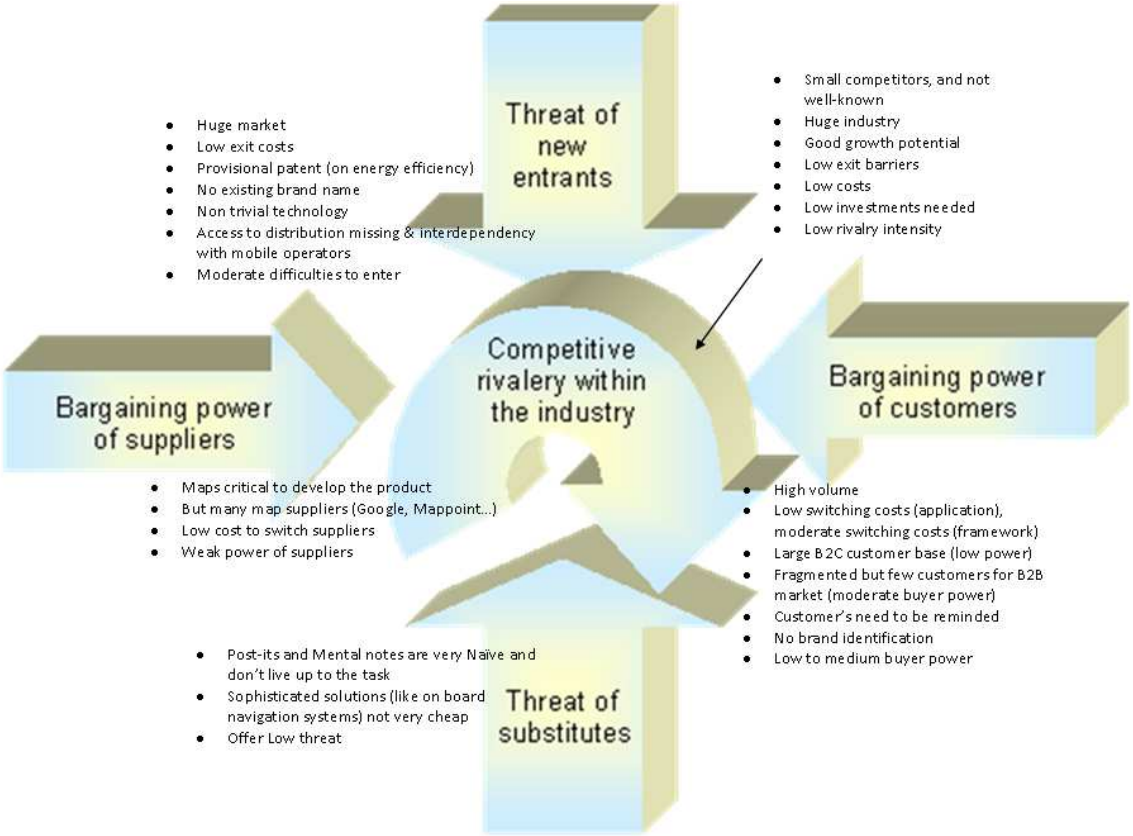


Figure 2 Porter's Five Forces

Both the SWOT analysis and Porter's Model provide a general view of the attractiveness of the industry and market. The analysis reveals that we benefit from a huge market with a good growth potential. Also, the analysis reveals that the competitors are currently few in number and not really even known. However, due to the low entry cost we believe this field will have a large number of fresh entrants with time. Further, the threat of substitutes is low. For applications such a 'Personal Assistant' few substitutes such as post-it notes, time based alarms are available. These however, lack the functionality our product offers. At the same time, one of our difficulties will be to educate the customers about using Location Based Services in general, as well as building our own brand name. The main challenge we believe we will have to confront is to be able to get access to a strong distribution channel. We believe this can be solved by establishing close relationships with both mobile phone operators and developers. Further, the mobile phone operators are few in number which makes them powerful. The success of our business revolves around establishing a sustainable relationship with the cell phone operators.

MARKETING PLAN

Distribution

We intend to distribute our products through two primary channels – (a) cell phone operators and (b) online store. We believe distributing through cell phone operators will help us co-brand our product and additionally also help us reach a wider audience. Online store support would be available to encourage customers of cell operators with whom we do not have partnerships yet, users of non-cellular mobile devices (such as PDAs) and B2B applications.

Pricing

Table 2 Pricingsummarizes the prices for our different products. In order to get the highly fragmented user base for B2C products interested in our product we intend to offer our B2C products free of charge for the first month. After the initial trial period they would be charged a monthly subscription fees as shown. The values were determined based on a combination of what the user's were willing to pay (based on the market survey results) and what the competition currently charges its customers. Our B2B solutions are intended to compete primarily on the cost basis and hence our B2B solutions are also priced very low (in comparison to the competition). We believe that with such low prices we would be able to attract small business owners (for fleet tracking systems). Finally, in order to earn revenues from third party developers who use our framework, we would charge them a nominal price of $1 for every instance of product that they ship. We believe such a low pricing will not hinder third parties from using our framework but will also ensure that we gain from third parties building upon our solutions.

Table 2 Pricing

Type of Application	Product	Discounts	One-time Installation fees	Monthly subscription fees	Intended Customer Base
B2C	Personal Assistant	1st month free	0	$5	Individual Users
B2C	Turn by Turn Navigator	1st month free	0	$10	Individual Users
B2B	Fleet Tracking System	none	0	$25	Small Business
B2B	Industrial Safety Warning System	none	0	$10	Industries
	Framework API to developers	$1 for every instance of product the developer ships that uses our framework (as a library)			

Advertising

Given our limited marketing budget for the first few years, we intend to market our B2C products through "sponsored search" or "search engine based advertising" by bidding for keywords on popular search engines such as Google and Yahoo. We believe the approach would fit our budget and at the same time help market our products amongst users who are likely to use Location Based Services. Further, we believe that the pay per click model offered by the search engine companies will be worthy enough investment in getting the right attention. Apart from the sponsored search channel, we also intend to market our products in trade magazines and trade shows. Further, by submitting our product to various product innovation contests which are popular in the field we hope to gain popularity.

4. OPERATIONS

KEY COMPETITIVE ADVANTAGE

Our foremost key competitive advantage is the availability of a technology that enables the creation of consumer-grade convenience and usability in mobile location-based applications, by reducing the additional battery power requirement to acceptable levels, while continuing to ensure location precision. Further capabilities of our company are displayed on Figure 3:

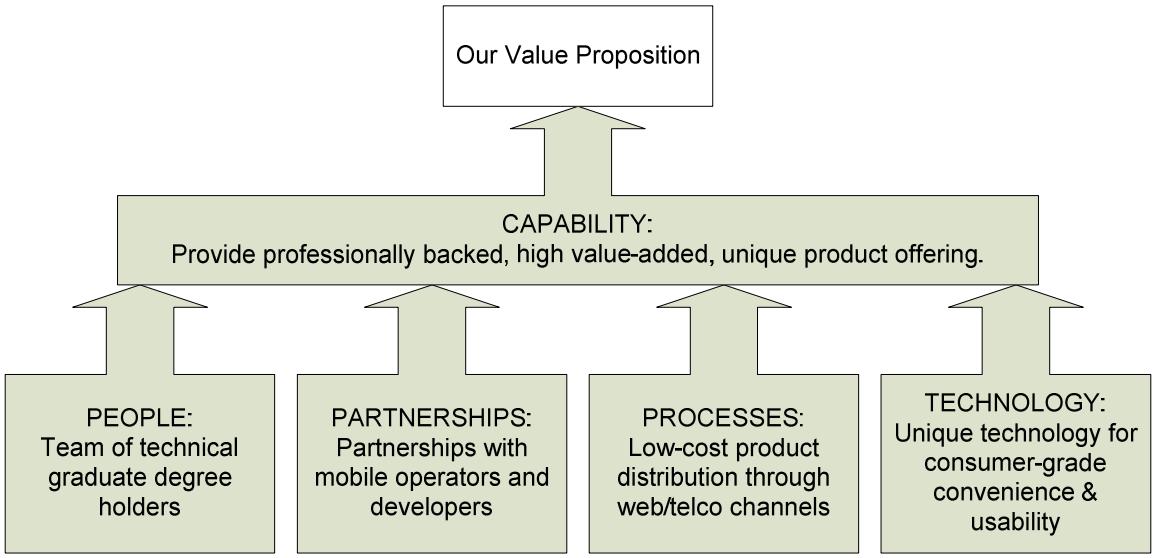


Figure 3: The capabilities of our company

Table 3: Major business milestones

6/7/2007	Incorporation
8/1/2007	Securing angel funding
12/3/2007	First two employees hired
12/24/2007	Open beta testing begins
4/25/2008	VP of Sales and CEO hired
10/10/2008	Securing VC Phase I funding
1/2/2009	Partnership established with first small mobile operator partner
5/15/2009	Initial product launch
5/28/2010	Partnership established with first major mobile operator partner
10/8/2010	Product launch on first major mobile operator partner's network
5/18/2012	Exit event

Figure 4: Business milestones and operational periods for the first 5 years

The value creation chain of our business is showcased on Figure 5 Value creation chain of our business. Using the intellectual property of the research on the Spatial Alarms framework, our business creates an open framework for location-based mobile services, and several related applications running on this framework. Third party developers also add value by creating applications on our framework. The created services are distributed to the end-user through our co-branding and distribution partnerships with mobile operators, and through the alternate channel of our online store.

5. Production Plan

Our applications offerings will be distributed to end-users through several parallel channels:

1. Pre-loaded and co-branded on cell phones for partnering mobile operators.
2. Downloadable and co-branded from partnering mobile operators' application stores over the air, using the operator's application shopping interface.
3. Downloadable from our website using the mobile phone's web browser. This method doesn't need the explicit cooperation of a mobile operator. Our online store will also offer the opportunity of selling services built on our framework to third party developers.

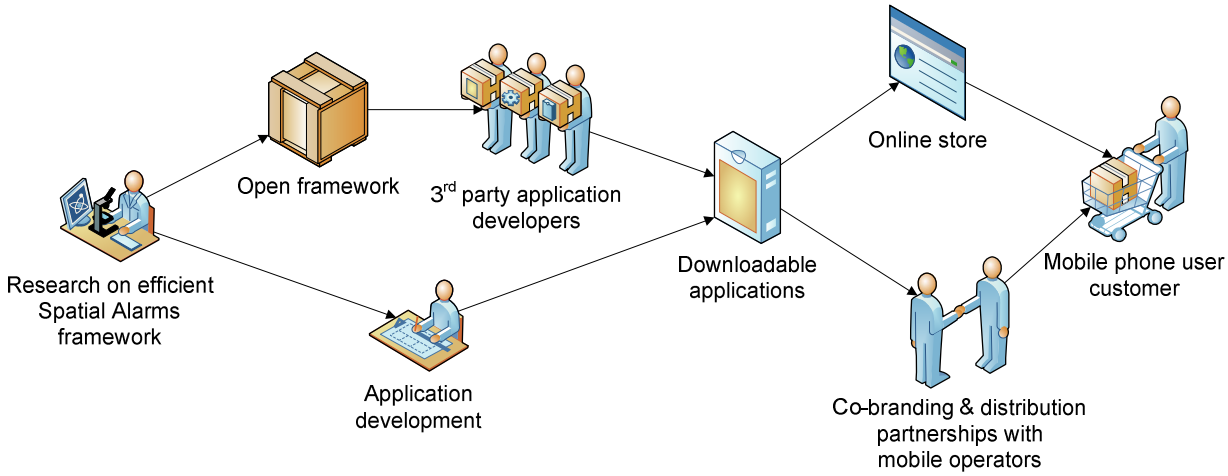


Figure 5 Value creation chain of our business

Our primary targets for major mobile operator partners are AT&T Mobility (Cingular Wireless) and T-Mobile, as these companies do not currently have any partnerships to offer location-aware applications. However, we will initially approach and launch our services with several local network operators to improve the perceived value of our company to these large companies. A team made up of our VP of Sales, CTO and VP of Finance will initiate a discussion with potential partners. Our VP of Sales will be hired in most part for his or her extensive connections and relationship with key people in these target companies. Soliciting mobile operators will commence immediately when an application prototype is available. Our applications will be pre-launched as individual downloads once they reach a beta development stage, to allow for early community feedback and facilitate adoption. Our framework will be opened to developers as a "production beta", i.e. not finalized, but fully usable. Product support will be limited to online forums, and initially there will be no dedicated support staff.

Our user location-information servers will be either installed at each operator's server room, or hosted at an external location (depending on specific technical circumstances). Services will be interoperable between the different operator co-branded and the extra-operator versions, made possible by dedicated high speed data connections between the various sites.

Our application uses third-party maps to display location information on high-end mobile devices. Obtaining maps will not require special negotiations, as several online map providers are available that allow automated web-based signup. The map data is obtained from Microsoft MapPoint's web service, through a monthly subscription model.

Our framework will be made available to developers on a dedicated part of our website. Access to documentation and examples will be granted after a free registration, which enables us to keep a contact list of interested parties. Access to the services of the

framework will be free for development purposes through a "Developer Account", whose licensing terms will prohibit commercial use. Once development by these third parties is completed, they can sell their service by using our for-fee "Usage Based Account".

6. MANAGEMENT

Our management team consists of capable and talented people for handling various facets of organizational responsibilities. In addition to the roles described below, all of us will be initially part of the development team. At present, the positions will be held as follows between us:

TEAM

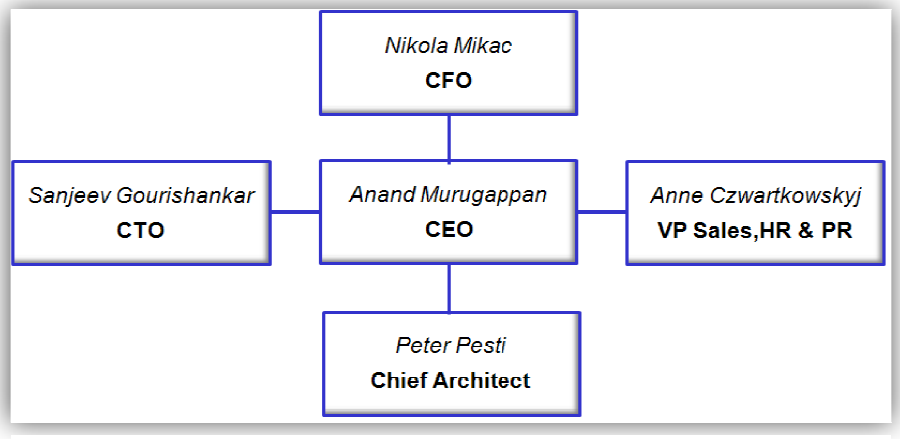


Figure 6 Current Team Organization Structure

CEO – Anand Murugappan

Anand Murugappan holds a Bachelor's degree in computer engineering and is currently enrolled on a graduate level in computer science at the Georgia Institute of Technology. Throughout his academic and professional experience he had the opportunities to strengthen his knowledge both as an individual and also as part of teams. He independently conducted research for Microsoft and Yahoo that lead to the submission of several patent invention disclosures. His strong computer skills, industrial experience and patent submission know-how enable him to become responsible for the overall management of both the technological processes and the organizational processes involved in setting up our organization as our CEO.

VP Sales , HR & PR - Anne Czwartkowskyj

Anne Czwartkowskyj brings in a strong experience in conducting research and an academic background in electronics and electromagnetism, including computer science and telecommunications. Her professional training in industry in Europe demanded a high level of engagement to succeed in the competitive environment. These experiences shaped her strong goal-oriented approach towards new projects. During her professional projects, she especially focused on new technologies and their introduction to markets. This makes her to a great extent knowledgeable about the transition from the laboratory to markets as a VP of Sales. She has also made many presentations on her work at various companies and has very commendable soft skills. This also makes her an ideal candidate for handling the HR and PR departments of our organization.

CTO – Sanjeev Gourishankar

Sanjeev Gourishankar has an academic background in information technology and studies towards a Master's degree in computer science from the Georgia Institute of Technology. In addition to wireless research projects at his university he is a certified IBM DB2 user and worked on several database projects in industry. His projects vary over a range of technologies from web services to application development. He is also going to complete a Graduate certificate in Management, the MOT from the Business School at Georgia Institute of Technology. This makes him the ideal candidate to perform the role of the CTO and help us in managing the technology aspect of our venture.

Chief Architect – Peter Pesti

Peter Pesti is a PhD student in Computer Science at the Georgia Institute of Technology. His research projects received recognition in Europe and won prizes in the US. Strong determination and the drive for performance make him an energetic individual. His experiences make him skilful in leading the creation of an efficient cost structure for the IT operations and also in taking care of the organizational issues critical for the completion of the project. He will be the Chief Architect of our organization and will work in conjunction with Sanjeev to create a vicious cycle involving the platform and applications supported by the platform, in order to increase dependence of people on our framework and services.

CFO – Nikola Mikac

Nikola Mikac is pursuing a Master's degree in Industrial Engineering at the Georgia Institute of Technology. Professional projects in the automotive industry in Europe and Japan have paved his development. Especially, two projects with a leading automotive supplier in Japan enabled him to gain expertise in marketing and pricing strategies of new products in a highly competitive environment. In addition, during his academic training he required a strong understanding of finance issues and the successful collaboration in multi-cultural teams. Those qualities foster his drive for team efforts and the responsibility of the CFO.

When a prototype of our product has been completed, we plan to hire two developers with industry experience in the mobile computing domain and who have experience in building mobile frameworks and applications. We are also looking to hire a VP of Sales at that point of time to facilitate the process of forming partnerships and ties with cell phone companies. The VP is expected to have a good amount of experience in working with start-up companies and companies in the mobile devices and applications domain. After the process of acquiring at least one partnership agreement, we plan to hire an experienced CEO to head our operations and help us in gaining a good foothold in the market.

BOARD OF DIRECTORS

Currently, all five founding members of the team will be part of the Board. After our Phase 1 investments, the VC will also be given a seat on the Board. We also are planning to invite in a neutral third person for arbitration and negotiation purposes. Other decisions will be made as and when a situation gives rise to a new accountable position.

BOARD OF ADVISORS

We are also planning to get people with both industry and technological expertise to help us in an advisory position. At present, Professor Ling Liu (College of Computing, Georgia Institute of Technology) and Kipp Jones will be joining us as part of the Board of Advisors.

Dr. Ling Liu[17] is an associate professor in the College of Computing at Georgia Tech. There, she directs the research program in the Distributed Data Intensive Systems Lab, examining research issues and technical challenges in building distributed mobile information management system that can grow without limits. She has published over 100 international journal and conference articles. Her research group has produced a number of software systems that are either open sources or directly accessible online. Dr. Ling Liu is also an internationally recognized expert in the areas of Database Systems, Distributed Systems, Internet Systems, and Web Services. With close to 20 years research experience we believe we she will be valuable in the advisory role, helping the team architect scalable products.

Kipp Jones[18] holds a masters degree from Georgia Tech and currently works at Skyhook Wireless™ a wireless positioning service. He brings in commendable experience with startups having been the CTO and co-founder of nuBridges™, a company that builds modular products to help companies launch, expand and scale their eBusiness. He has also been involved in the sale of a small company and prior work experience at Pathfire™ (a media software company) and Harbinger™ (supply chain communications solution firm). We believe his industry and startup experience will be of significant help to our venture.

PROFESSIONAL SUPPORT

We plan to hire accountants, lawyers, bankers, tax specialists, a public relations consultant, a marketing consultant, technical consultant etc. on an on-demand basis as and when need arises.

7. CRITICAL RISKS

On performing a SWOT analysis (Table 1 SWOT Analysis), we found the following to be the major risk factors that our organization might face:

1. Lack of brand recognition
2. Customer's lack of knowledge with regards to Location Based Services
3. Relationship with cellular operators and developers
4. Venture team's lack of entrepreneurial experience

[17] http://www.cc.gatech.edu/~lingliu

[18] http://www.cc.gatech.edu/~kippster

The lack of an established brand name is a potential risk in our venture. We are entering a market with no recognized name attached to us, which hugely increases the risk. In addition to co-branding with household names, we also intend to rely on other strategies like extensive advertising through search engine ads (for e.g., AdWords from Google), advertising through the cellular phone operators etc., so that our brand gains a visible public face.

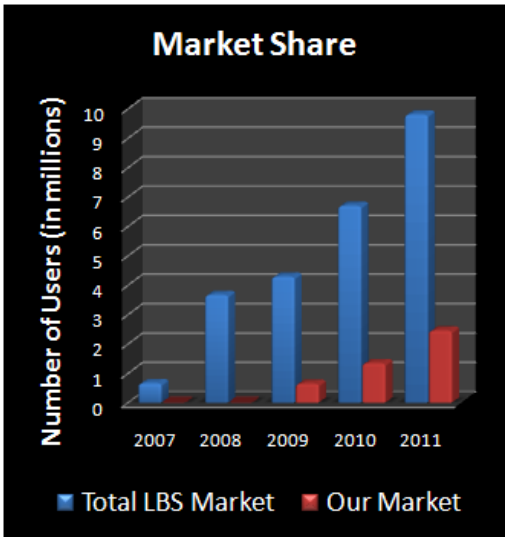
Another potential risk in our venture is the customer's lack of knowledge on the usefulness of GPS and Location Based Services. GPS as such is currently gaining popularity among the public through applications such as navigation systems. The same is the case with Location Based Services. We plan to mitigate this risk by encouraging use of our product and framework. We will provide a free trial to the customers so that they can find the use of these technologies in the everyday life. We also plan to host podcasts and webinars on the advantages of our product and GPS technology. This will also provide us a good launching platform by growing a sense of need to use our framework and range of applications that can be built on top of our framework.

Another risk is associated with forming a relationship with cellular phone operators and other potential business clients. We plan to mitigate this risk by educating them of the competitive advantage they can establish by shipping our framework on their network. Their investment is almost zero. The only need is that they need to host our framework and applications on their servers. We will share the monthly fee paid by the customers for using our services. This means they would earn revenue for just hosting our framework. We will approach them once we have a working prototype on our hands. This would add to the confidence in our framework, so that any fears on the quality of our applications and framework get alleviated. We are well aware of the extreme control of mobile operators as the uncontested holders of the distribution channel for any mobile application that wishes to reach the general public. As such, it is nearly impossible for us to approach major US mobile operators initially. However, local network operators looking to differentiate their offerings from that of the big players are likely to be much interested in our proposition. We plan to first gain credibility and recognition by establishing a foothold in a few of the many local mobile markets, and start negotiations with major US mobile operators after proving the value of our company to network operators with a successful product launch.

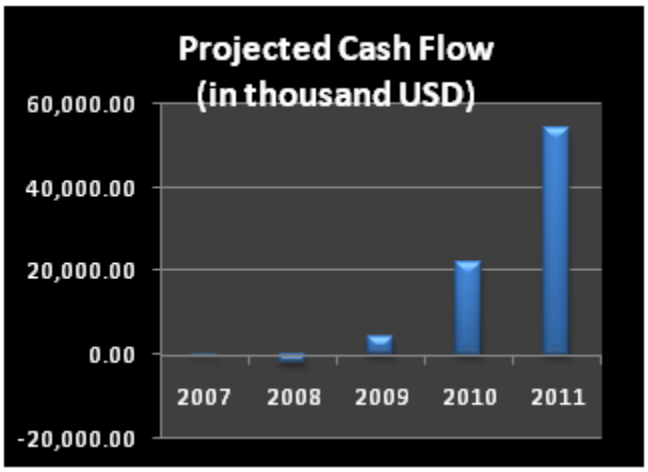
The final risk in our venture is the lack of experience in our venture team in handling real world businesses. All of us are highly skilled engineers in a diverse range of fields. We have management and business experience to handle the firm up to the point of seeking out an operator partner. That is exactly when we would like to hire experienced personnel to handle our sales and marketing. We also will be hiring a CEO to guide our organization once we become successful in acquiring at least a single customer mobile network. This will give us the required experience at the required time, without putting too much of a burden on our organization's finances in hiring experienced people when our own experience and expertise suffice.

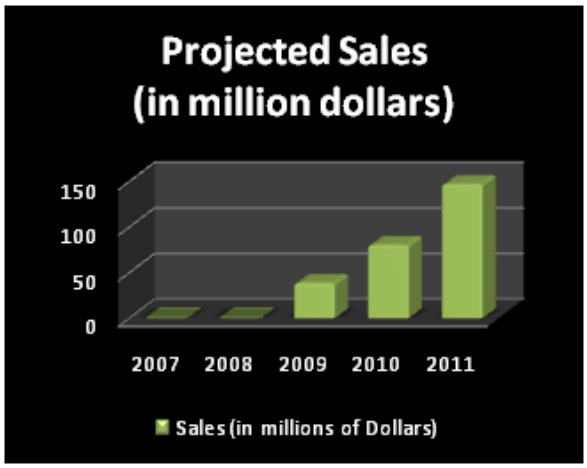
8. Financial Plan

Our pro forma financial projections are based on our estimates of the current and future market. We aim to control 25 percent of the cell phone reliant location based services (LBS) market by the year 2011, and expect the location based services market to contain a total of 9.8 million subscribers in the US.



Based on our pricing scheme, the monthly subscription fee will be USD 5, and we expect to realize USD 147.06 million in revenue and USD 46.7 million in net income by the year 2011. Our venture will have a net present value of USD 7.2 million and a return on investment of 66 percent in 2011. In the first year of operation in 2007, the entrepreneurial team will invest USD 100K of its own resources through bootstrapping. In addition we are seeking USD 2 million from Angels in the same year and USD 2 million from Venture Capitalists in the year after. Given the net present value, the external funding will lead to a total of 30 percent ownership held by the investors. Especially the funding from Venture Capitalists is crucial to finance our operations. We expect positive cash flow in 2009.





Revenue Projections

The conservative subscription numbers are based on the estimates of Gartner's industry report and the strong determination of the team to reach a market share of 25 percent in this business sector. The following table shows the market estimates for location based services in the US.

(in million)	2007	2008	2009	2010	2011
Cellular Subscriptions	220	229	238	248	258
LBS enabled phones	132	183.2	214.2	223.2	245.1
LBS Subscriptions	0.66	3.664	4.284	6.696	9.804
Market Share	0	0	0.15	0.2	0.25
Sales	0	0	38.556	80.352	147.06

Table 1: *Sales Estimation*

The forecast in table clearly shows the strong growth of the location based services market from 2007 to 2011. This gives our venture the unique opportunity to capture our part of the market share and translate it into revenues of USD 147.06 million by 2011.

Financial Overview

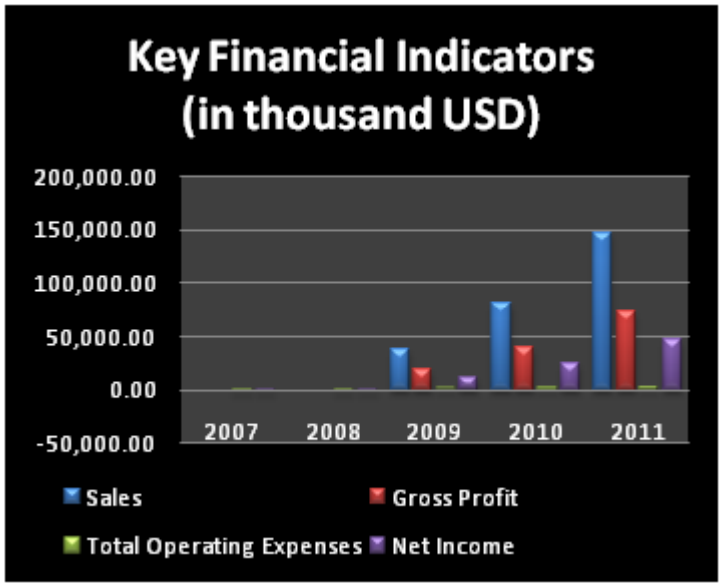
Table 2 summarizes the main financial figures from our venture, including the expenses, which contain the entrepreneurial team income and the salaries of external staff we intend to bring into our company.

Year **Year (relative)**	**2007** **1**	**2008** **2**	**2009** **3**	**2010** **4**	**2011** **5**
Sales	0.00	0.00	38,556.00	80,352.00	147,060.00
Direct Cost of Sales	0	0	19,278	40,176	73,530
Other	0	0	0	0	0
Total Cost of Sales	0	0	19,278	40,176	73,530
Gross Profit	0	0	19,278.00	40,176.00	73,530.00
Expenses					
Salary	175.00	490.60	692.84	709.95	727.52
Sales and Marketing expenses	0.00	247.20	640.18	1,065.77	1,740.72
R&D	10.00	10.00	10.00	10.00	10.00
Depreciation	0	0	71.40	160.68	265.26
Equipment	5.00	5.00	5.00	5.00	5.00
Rent	0	26.65	27.30	32.25	33.00
Total Operating Expenses	190.00	779.45	1,446.72	1,983.65	2,781.50
Operating Income	-190.00	-779.45	17,831.28	38,192.35	70,748.50
Interest Expense	0	0	0	0	0
Taxes	0	0	6,063	12,985	24,054
Net Income	-190.00	-779.45	11,768.64	25,206.95	46,694.01
Cash	-300.00	-1,818.90	4,232.96	21,857.31	54,084.78

Our team comprises five members, but we need to hire additional staff in order to successfully launch and maintain the business. The external staff will be two application developers in 2007 and a VP of sales and sales staff in 2008. We are also seeking to hire an experienced CEO for the venture in 2008. The table 3 summarizes the expenses we will have, including rent, which is based on office rates in the Atlanta area.

Salaries	2007	2008	2009	2010	2011
Team	350,000	357,000	364,140	371,423	378,851
VP Sales		103,000	106,090	109,273	112,551
Sales staff		144,200	148,526	152,982	157,571
Application dev.		81,600	166,464	169,793	173,189
CEO		156,000	162,240	168,730	175,479
Rent					
sqft	0	1,300	1,300	1,500	1,500
Atlanta yrl cost	20	21	21	22	22
Total Cost	0	26,650	27,300	32,250	33,000
Server Req.	1 serv/500000 people				

Table 4 Salaries, Marketing & Rent Expenses



Key Financial Indicators

The following graph shows our key financial indicators for the venture over a period of five operating years. It shows a strong increase in gross profit, while at the same time the expenses remain stable due to our distributed product technology which requires minimal investment in server hardware.

Sensitivity Analysis

For the sensitivity analysis we estimated four different scenarios and their outcomes in terms of cash flow and net present value. The first scenario, highlighted in blue in table 4, corresponds to the forecast we finally used for the calculation of our financial projections.

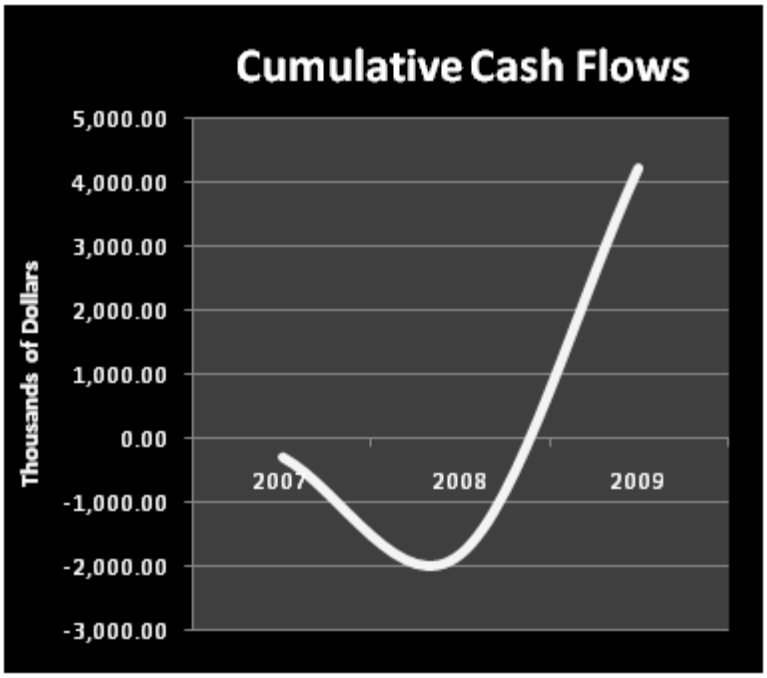
The parameters we changed for the sensitivity analysis were market share and subscription fee. For example scenario 2 predicts a lower market share than scenario1, which yields to less cash flow and lower net present value compared to scenario 1. Scenarios 3 and 4 follow the same logic, with scenario3 being the most optimistic in terms of market share.

Sensitivity	2007	2008	2009	2010	2011	
Price	5	5	5	5	5	Scenario1
Market Share	0	0	0.15	0.2	0.25	
Cash	-300	-1,819	4,233	21,857	54,085	
NPV	7,244					
Price	5	5	5	5	5	Scenario2
Market Share	0	0	0.1	0.15	0.2	
Cash	-300,000	-1,818,900	135,061	11,304,476	34,050,291	
NPV	2,280					
Price	5	5	5	5	5	Scenario3
Market Share	0	0	0.15	0.25	0.35	
Cash	-300	-1,819	4,163	27,923	78,322	
NPV	10,316	0	0	0	0	
Price	10	10	10	10	10	Scenario4
Market Share	0	0	0.15	0.2	0.25	
Cash	-300	-1,819	16,246	58,894	136,946	
NPV	28,528					

Figure 7 Sensitivity Analysis

CUMULATIVE CASH FLOWS (IN THOUSAND USD)

The cumulative cash flow graph shows the amounts of funding required in the first two years of operations, before the business turns cash flow positive. The maximum amounts that will be required are USD 2 million in 2008. We hope to rely on personal funds, angel investments and funding from Venture Capitalists.



APPENDIX

APPENDIX A

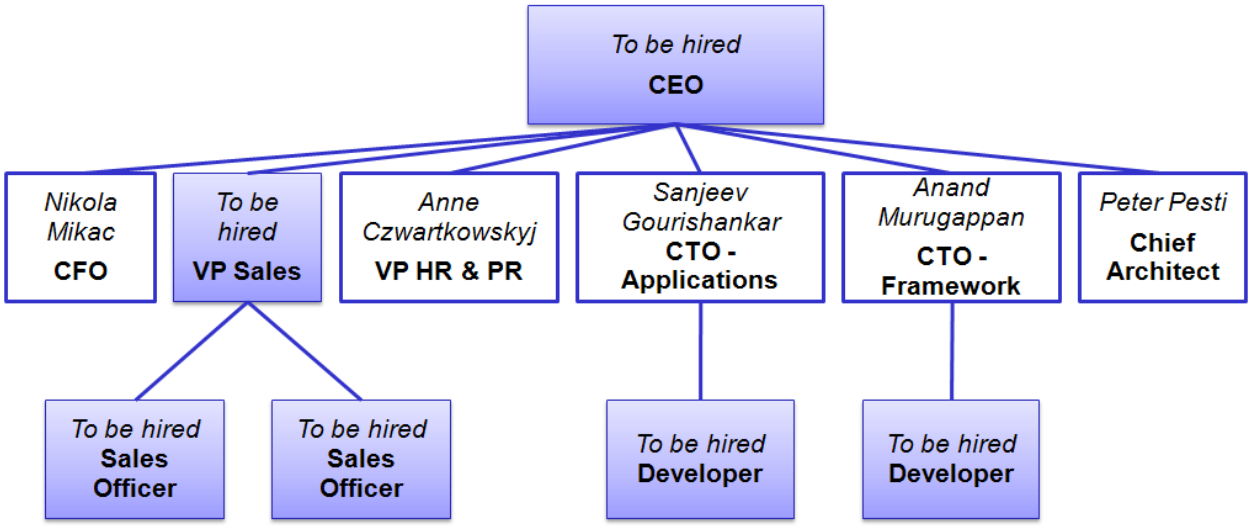


Figure 8 Organization Structure at the end of the fifth year

APPENDIX B – SPATIAL ALARMS MARKET SURVEY

Location Based Alarms Questionnaire

This survey is to analyze the potential market interest for a student venture course product. Please read the short product description before answering the survey questions.

Product description: Most of you are likely familiar with time based reminders such as *'Give me a wake up call at 8:00 am in the morning'*. The product extends that to space where you as users can set **'location based reminders'** on locations using map software (like google maps, yahoo maps etc). The next time you enter or leave the marked areas you will get a reminder, so that you can take the required action.
Example scenario: You want to buy something from the grocery store but it is not important enough to require you to head out immediately. With this product you look up the near by grocery stores on the map and set a location based alarm in the area around the store. The next time you pass by the store you automatically get reminded of the item you wanted to buy. You buy the item and go ahead with the rest of your work happily. :)

1. Which Age Group best describes you? [Please tick one]
   ☐Below 21 ☐21 – 25 ☐Above 25

2. Major – _____

3. Have you had industrial experience before? [Please tick one]
   ☐ Yes ☐ No

4. Does your cell phone/PDA have GPS or any other location tracking capability? [Please tick one]
   ☐ Yes ☐ No ☐ Don't know

5. How often do you use maps on your *cell phone*? [Please tick one]
   ☐Don't have one ☐Never ☐Once a month ☐Once a week ☐More than once a week

6. How often do you use maps on your PDA/Blackberry? [Please tick one]
   ☐Don't have one ☐Never ☐Once a month ☐Once a week ☐More than once a week

7. How often you used maps on your laptop? [Please tick one]
   ☐Don't have one ☐Never ☐Once a month ☐Once a week ☐More than once a week

8. How often do you use a Navigation system in a car? [Please tick one]
   ☐Don't have one ☐Never ☐Once a month ☐Once a week ☐More than once a week

9. For what tasks do you use maps most frequently? [Please tick one]
   ☐Vacations ☐Work ☐Meeting friends ☐Others - _____

10. How do you keep track of important tasks (rank them from 1 to 5 1-most often … 5-least often)?
    __Post-its __Mails to self __Other software __Calendar __Mentally remember

11. How often have you been to a place before and forgotten to do something important?
    ☐Often ☐Sometimes ☐Never

12. Given software that you can install on your mobile device (**assume the hardware is sufficient**) that would give you location based reminders like described at the beginning of the survey, what would be the applications you would like to use? [Rank them 1-most important 4/5-least important]
    a. __ Personal Reminders like notifications while passing near grocery stores
    b. __ Turn by turn navigational assistance while driving
    c. __ Reminders related to work
    d. __ Notification when a friend/family member passes by or enters/leaves a location
    e. __ Others - _____

13. If the alarms were shareable would you take the trouble to share alarms with others on your social network? ***Example scenario:*** There is free pizza at the computing building and you want to share the information with your friends who are in the campus. To do so you could set a location based alarm that spans the campus geographically and mark it as shareable. As a result the alarm will get automatically set on all your friends' mobile devices and it would notify them immediately (only your friends) about it. Given such a feature would you be willing to put in the effort to share it and conversely be open to getting alarms from your friends (only your friends)?
    ☐ Yes ☐ No ☐ May be/Don't know

14. What kind of fee structure would you prefer? (Rank them from 1 to 3 where 1-most preferred)
    __Monthly flat fee __Usage based fee __No fees but don't mind being shown advertisements

15. If such a software product is available for download, what would be the **maximum** amount you will be willing to pay on a monthly basis to use the service?
    ☐ Nothing ☐ $5 ☐ $10 ☐ More - $_____

    Thanks for your time filling the questionnaire!

APPENDIX B

1	**Age splits (Demographics)**	
	Below 21	1
	21 to 25	40
	Above 25	6
2	**Major**	
	ME	9
	ECE	16
	EE	9
	CS	4
	Chem. Engg.	3
	IsyE	3
	Building and Construction	1
	CSI	1
	CEE	1
3	**Industrial Experience**	
	Yes	31
	No	15
	No Answer	1
4	**Location tracking capability on cell phone/PDA**	
	Yes	11
	No	34
	Don't know	2
5	**Frequency for using maps on cell phone**	
	Don't have one	12
	Never	32
	Once a month	1
	Once a week	1
	More then once a week	1

6	**Frequency for using maps on PDA/Blackberry**	
	Don't have one	27
	Never	20
	Once a month	0
	Once a week	0
	More then once a week	0
7	**Frequency for using maps on laptop**	
	Don't have one	2
	Never	4
	Once a month	10
	Once a week	16
	More then once a week	15
8	**Frequency for using maps onGPS Navigation System**	
	Don't have one	31
	Never	10
	Once a month	5
	Once a week	1
	More then once a week	0
9	**Maps used for which tasks (This question had multiple options checked)**	
	Vacations	22
	Work	6
	Meeting Friends	16
	Others	11 Shops, restaurants, directions, going places, misc.

10	**How do you remember tasks?**	**Most often**	-	-	-	**Least Often**
	Post-it/Scratch paper	8	13	4	2	2
	Emails to self		4	4	13	8
	Calendar	9	8	10	4	1
	Mentally remember	13	6	8	3	
	Others	2			2	12
	Other methods	Planner, Others tell me, Friends, Google schedule, alarms, cell phones				

11	**How often do you forget to do things when you are at a location?**					
	Often	4				
	Sometimes	23				
	Never	7				
12	**Prefered Applications**	**Most prefered**	-	-	-	**Least Prefered**
	Personal Reminders like notifications while passing near grocery stores	14	10	6	3	1
	Turn by turn navigational assistance while driving	10	5	10	5	1
	Reminders related to work	6	15	10		1
	Notification when a friend/family member passes by or enters/leaves a location	3	2	5	18	2
13	**Willing to take the trouble to share alarms with others**					
	Yes	19				
	No	7				
	May be/Don't know	8				
14	**Fee structure prefered**	**Most Prefered**		**Least Prefered**		
	Monthly flat fee	6	10	10		
	Usage based fee	4	12	11		
	No fee but don't mind being shown advert	22	4	4		
15	**Maximum amount willing to pay on a monthly basis**					
	Nothing	15				
	$5.00	15				
	$10.00	4				

Income Statement (in thousand USD)

Year	2007												2007	2008	2009	2010	2011
Year (relative)	1												1	2	3	4	5
Month	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	12 months	12 months	12 months	12 months	12 months
Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38,556	80,352	147,060
Direct Cost of Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,278	40,176	73,530
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost of Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,278	40,176	73,530
Gross Profit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,278	40,176	73,530
Expenses																	
Salary	0	0	0	0	0	0	29.17	29.17	29.17	29.17	29.17	29.17	175.00	490.60	692.84	709.95	727.52
Sales and Marketing expenses	0	0	0	0	0	0	0	0	0	0	0	0	0.00	247.20	640.18	1,065.77	1,740.72
R&D	0	0	0	0	0	0	1.67	1.67	1.67	1.67	1.67	1.67	10.00	10.00	10.00	10.00	10.00
Depreciation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71.40	160.68	265.26
Equipment	0	0	0	0	0	0	5	0	0	0	0	0	5.00	5.00	5.00	5.00	5.00
Rent	0	0	0	0	0	0	0	0	0	0	0	0	0	26.65	27.30	32.25	33.00
Total Operating Expenses	0	0	0	0	0	0	35.83	30.83	30.83	30.83	30.83	30.83	190.00	779.45	1,446.72	1,983.65	2,781.50
Operating Income	0	0	0	0	0	0	-35.83	-30.83	-30.83	-30.83	-30.83	-30.83	-190.00	-779.45	17,831.28	38,192.35	70,748.50
Interest Expense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,063	12,985	24,054
Net Income	0	0	0	0	0	0	-35.83	-30.83	-30.83	-30.83	-30.83	-30.83	-190.00	-779.45	11,768.64	25,206.95	46,694.01

Balance Sheet (in thousand USD)

Year	2007												2007	2008	2009	2010	2011
Year (relative)	1												1	2	3	4	5
Month	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	12 months	12 months	12 months	12 months	12 months
Cash	0.00	0.00	0.00	0.00	0.00	0.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-300.00	-1,818.90	4,232.96	21,857.31	54,084.78
A/R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,284.00	8,928.00	16,340.00
Inventory	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Current Assets	0.00	0.00	0.00	0.00	0.00	0.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-300.00	-1,818.90	8,516.96	30,785.31	70,424.78
Equipment	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	3.00	3.00	3.00
Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.40	160.68	265.26
Total Fixed Assets	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	74.40	163.68	268.26
Total Assets	0.00	0.00	0.00	0.00	0.00	0.00	-45.00	-50.00	-50.00	-50.00	-50.00	-50.00	-295.00	-1,813.90	8,591.36	30,948.99	70,693.04
Current Liabilities	0.00	0.00	0.00	0.00	0.00	0.00	13.33	13.33	13.33	13.33	13.33	13.33	80.00	40.00	83.33	83.33	83.33
Long Term Liabilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Liabilities	0.00	0.00	0.00	0.00	0.00	0.00	13.33	13.33	13.33	13.33	13.33	13.33	80.00	40.00	83.33	83.33	83.33
Equity	0.00	0.00	0.00	0.00	0.00	0.00	-58.33	-63.33	-63.33	-63.33	-63.33	-63.33	-375.00	-1,853.90	8,508.02	30,865.66	70,609.71
Total Liab. And Equity	0.00	0.00	0.00	0.00	0.00	0.00	-45.00	-50.00	-50.00	-50.00	-50.00	-50.00	-295.00	-1,813.90	8,591.36	30,948.99	70,693.04

Cash Flow Statement (in thousand USD)

Cash Flow Statement (in thousand USD)																				
Year							2007							2007	2008	2009	2010	2011
Year (relative)							1							1	2	3	4	5
Month	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec		12 months	12 months	12 months	12 months	12 months
Cash Flow from Operations																		
Net Income	0	0	0	0	0	0	-31.67	-31.67	-31.67	-31.67	-31.67	-31.67		-190.00	-779.45	11,768.64	25,206.95	46,694.01
Depreciation	0	0	0	0	0	0	0	0	0	0	0	0		0	0	71.40	160.68	265.26
A/R	0	0	0	0	0	0	0	0	0	0	0	0		0	0	-4,284.00	-5,952.00	-12,255.00
A/P	0	0	0	0	0	0	13.33	13.33	13.33	13.33	13.33	13.33		80.00	40.00	83.33	83.33	83.33
Cash Payments																		
Invest	0	0	0	0	0	0	0	0	0	0	0	0		0	0	214.20	53.64	45.89
Salary	0	0	0	0	0	0	29.17	29.17	29.17	29.17	29.17	29.17		175.00	490.60	692.84	709.95	727.52
Sales & Marketing	0	0	0	0	0	0	0	0	0	0	0	0		0	247.20	640.18	1,065.77	1,740.72
Rent	0	0	0	0	0	0	0	0	0	0	0	0		0	26.65	27.30	32.25	33.00
Equipment	0	0	0	0	0	0	5	0	0	0	0	0		5.00	5.00	3.00	3.00	3.00
R&D	0	0	0	0	0	0	1.67	1.67	1.67	1.67	1.67	1.67		10.00	10.00	10.00	10.00	10.00
Interest	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Taxes	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Total Cash Payments 1	0	0	0	0	0	0	31.67	31.67	31.67	31.67	31.67	31.67		190.00	779.45	1,587.52	1,874.61	2,560.13
Net Cash from Operation:	0	0	0	0	0	0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00		-300.00	-1,518.90	6,051.86	17,624.35	32,227.47
Net Cash other Activities	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Cash at beginning	0	0	0	0	0	0	0	-50.00	-100.00	-150.00	-200.00	-250.00		0	-300.00	-1,818.90	4,232.96	21,857.31
Net change Cash	0	0	0	0	0	0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00		-300.00	-1,518.90	6,051.86	17,624.35	32,227.47
Cash	0	0	0	0	0	0	-50.00	-100.00	-150.00	-200.00	-250.00	-300.00		-300.00	-1,818.90	4,232.96	21,857.31	54,084.78

Performance Ratio

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Acid Test Ratio} = \frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}}$$

$$\text{ROI} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

	2007	2008	2009	2010	2011
Current Rattio	-3.75	-45.47	102.20	369.42	845.10
Acid Test Ratio	-3.75	-45.47	63.91	296.97	836.22
Net Profit Margin	0	0	0.305	0.314	0.318
ROI	0.644	0.430	1.370	0.814	0.661

Break-Even Analysis

Total Fixed Cost	2,414,170
SP per Unit	10
VC per Unit	6
Break-Even	603,543

APPENDIX D - DIRECTORY OF CELLULAR LBS SERVICES

Verizon VZ Navigator

Verizon Wireless is a joint venture of Verizon Communications and the Vodafone Group, with 59.1 million customers as of January 2007, being second only to AT&T Mobility's (Cingular Wireless) 61 million on the US market. The company's telecommunications services use the CDMA2000 1xEV-DO (3G) standard. Verizon Wireless' LBS offerings use GPS-equipped handsets to determine the location of a device. The accuracy of the service is limited by the GPS technology to "50 to 150 meters in most cases but may be affected by terrain, satellite visibility or other conditions".

Verizon Navigator, launched in December 2005 provides real-time audible turn-by-turn directions, mapping with points-of-interest on the user's cell phone, using software developed by Networks In Motion, Inc. (the downloadable VZ Navigator). The service is available for a $9.99 monthly access fee, or a $2.99 daily (24-hour) access fee. Currently there is a selection of 23 phones (from Kyocera, LG, Motorola, Nokia and Samsung) in the $49.99-$199.99 price range (with a 2-year contract) for use as a client (ie. child) phone with Chaperone.

Verizon Chaperone

"Locate your family member's phone via handset or PC" for a $9.99 monthly access fee. The service allows family members to see each other's physical locations. A family member whose location can be queried (eg. child) must carry a GPS-enabled cell-phone, the phone must be on, must be in Verizon's data services coverage area ("National Enhanced Services Coverage Area"), and must be able to acquire a GPS fix. The family member who queries the other member's location (eg. parent) can use a webpage on a

computer, or a downloadable application ("Chaperone Parent") on her mobile phone. Access to the location information is protected by an account password. The service was launched in June 2006 by Verizon Wireless. Currently there is a selection of 11 phones (from Kyocera, LG and Motorola) in the $19.99-$129.99 price range (with a 2-year contract) for use as a client (ie. child) phone with Chaperone.

Verizon Chaperone with Child Zone

An extension of the basic Chaperone service, which allows a user to "locate your family member's phone & get alerts when they enter or exit specified areas" for a $19.99 monthly access fee. The parent is able to create scheduled location boundaries, which designates a place where the child is supposed to be at a certain time. The creation of the Child Zone is done using a website from a computer. The child must have a GPS-equipped cell phone for tracking. The parent's cell phone only needs to be able to receive SMS messages for the service to be able to send an alert ("Child Zone Alert") when the child is outside her expected area. A maximum of 10 "Child Zones" can be defined for any mobile device. The creation of "Child Zones" can be rejected by the device to be tracked, and an SMS message alerts the user of the tracked device whenever its location is being queried. The service was launched in June 2006 by Verizon Wireless.

Verizon's LBS solutions are available in its "National Enhanced Services Coverage Area"

Nextel Mobile Locator

Sprint Nextel Corporation is the third largest US telecommunications company with 53.7 million subscribers, behind Verizon Wireless' 59.1 million. The company was created in 2005 by the merger of NEXTEL Communications into Sprint Corporation. The network formerly operated by Sprint uses the CDMA2000 1xEV-DO technology, while Nextel's network uses Motorola's iDEN technology. Many similar, but incompatible services exist in the two networks. While both technologies continue to be supported, the company is expected to push its iDEN users towards CDMA over the course of several years.

Networks In Motion Inc.'s Map Messenger and Atlas Track mobile workforce management system is branded as the Nextel Mobile Locator, and is available for a $15/month fee and $0.15/message additional cost. Nextel offers five different navigation systems for GPS-enabled cell phones: TeleNav GPS Navigator, Trimble Outdoors, MapQuest Find Me, PC*Miler|Mobile by ALK Technologies, and Garmin Mobile. Garmin Mobile's Lite version offers turn-by-turn directions and 6 million points of interest for $4.99/month, while the full version add real time traffic, weather and gas station price information for $9.99/month. MapQuest Find Me offers mapping for $3.99/month when using a data plan, and $5.99/month without a data plan.