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I. Executive Summary

The objective of the report is to analyze location-based services (LBS) from the industrial and business aspects. The current applications of LBS are introduced, with the focus of the report on the Business-to-Consumer implementations, especially on the new emerging integration of LBS and social networking. Then the opportunities and impacts of LBS to the mobile and social networking industries are analyzed. Despite the intriguing potential of LBS, the report also examines the concerns and risks in the industry from both the technical and social aspects.

After macro-analysis of the LBS industry, the report then investigates the business model and strategies of LBS businesses. As researches on the evaluation of LBS business and strategy are limited, no mature evaluation model is available. Thus an evaluation model specific for LBS was designed by the project team, which consists of six components: Service contents, profit model, ease of implementation, organizational capabilities, positioning and risk evaluation.

The evaluation model was implemented on three typical LBS providers, Yelp, Foursquare and Google Latitude, each of which represents a type of LBS applications. Then the three providers are compared and evaluated regarding each component of the model. The evaluation was conducted using both quantitative and qualitative supports, from financial data to company cases.

Eventually, a conclusion is provided to summarize the outcomes of the report and possible future works.
II. Introduction

Definition
Though not unified, a common definition of Location-Based Services (LBS) is that “Location-Based Services are information services provided to mobile devices through mobile networks, which may utilize the location information recorded by mobile devices to various value-adding services” (Virrantaus, K., Markkula, J., Garmash, A., Terziyan, Y.V., 2001). This project focuses on the recently emerged Location-Based Services that integrated other technological features, especially the social networking aspects, compared against traditional LBS with sole location identification and routing purposes.

Technology Architecture
The definition gives the hint that LBS is not a disruptive technology, but rather an intersection technology that sits on some existing solutions. As is shown in right chart, LBS could be considered as a combination of Geography Information System, Internet services, and Mobile services (Brimicombe, 2002). Therefore, the basic components of LBS should be a combination of the components derived from the three areas.

III. Application and Impact

Location Based Services and Mobile Industry
First introduced to the mobile industry in early 2000s, location based services has become one of the most heated fields as the leap in mobile hardware enables comprehensive software applications provided to consumers at a relatively low cost (SY.Ho, 2010). The convergence of location based services and mobile devices enable many possibilities over the services that can be provided based on location information. By exploiting knowledge of mobile users’ location data, service providers can create great value for both business and consumers. Direct usage of location data by business in data analysis, network control and other aspects have been relatively mature, thus the project will emphasis on the emerging consumer areas (Minakakis, 2004).

Location Based Services and Social Network
Within the scope of the “Personalization” LBS, the emergence of LBS and social network integration is leading a new direction in the development of both services, which will be one focus of the project. With the rapid growth of specialized location-based social network providers, such as Foursquare and Gowalla, traditional social network giants, such as Facebook and Twitter, have been widely adopting LBS services as well. Through building a real-time locational connection between users’ real life and virtual life, LBSs not only reinforce the concept of social network,
but also provide great potential for growth and profit making. Through exploiting the vast opportunities, some even argue that LBS will reshape the mobile industry and “become the heart of future mobile data offerings” (D. Tilson, 2004).

IV. Evaluation Model

To analyze the rapid establishment and development of Location-based Services businesses, this report aims at evaluating typical business models adapted by current LBS providers. As the industry is still in the exploration and developing stage, researches on the topic are limited and immature, thus the project team designed the following evaluation model targeted for LBS business.

Methodology

The original business framework is adapted from a framework for the selection of LBS strategy and service portfolio, combined with classic business evaluation components such as Porter’s five forces on the business environment (Tilson, Lyytinen, & Baxter, 2004). Yet general business frameworks failed to cover and emphasize the critical aspects of technology business, thus we have integrated several tailor-made LBS evaluation criteria that has been regarded as important by researches (Pateli & Giaglis, 2003). These aspects include the unique Privacy, Regulations, Intellectual Property Rights and Industry Trend, which we included in the risk evaluation part of the model (Dao, Rizos, & Wang, 2002). As profitability and sustainability have been major challenges for many technology start-ups, and even major players, we incorporated the financial analyses into the model to provide a more comprehensive view of the performance of the company (Osterwalder & Pigneur, 2002).

Model Components

Our evaluation consist six components:

1. **Service Contents:** To begin with, we first analyze the core of the products/services of the company: the value proposition. Through listing the value the company generated or attempt to generate to its customers/users, we obtain the objectives of the LBS service. Then we evaluate the opportunity size of the value the company proposes to generate by studying the market impact. As a common criterion for IT services, the amount of current and potential user base can reflect the market-perceived value for a LBS service, which also enjoys positive externality and network effects (D. Tilson, 2004). Moreover, the social and behavioral impacts of the service will determine the feasibility and constraints for the proposed service concept to be realized.

2. **Profit Model:** After we obtain an overview of the service contents and opportunity size, we next evaluate the service’s ability for commercial success. Typical features in financial analyses are adapted, including revenue generation and cost structure, the former of which again evaluates the financial values generated by the service,
while the latter determines the profitability and financial risks of the project. It should be noted that IT companies usually experience an exploration and accumulation phase with large investments, which may be up to a few years, before becoming profitable and financially mature, thus both current and future potential profitability should be considered as well (Osterwalder & Pigneur, 2002). As the return of investment often becomes long-term, we need to take more concern into the sustainability and growth potential of the business.

3. **Ease of Implementation**: This aspect mainly covers the technical and financial implementation issues involved with the initial stages of LBS. As we previously analyzed, the hardware and platform components of LBS are usually standardized, thus the focuses of LBS mainly lie in service content, application development and data analysis. The technical implementation challenges become rather minor for current businesses (D. Dao, 2002). On the other hand, stable and continuous financial supports seem to be a more major threat as IT start-ups business often failed to meet requirement in financial returns to attract investors. Also, many IT projects involve significant amount of long term investments, whose high risks and slow return drive investments away.

4. **Organizational Capabilities**: Organizational capabilities include both the capabilities of the organization and its value chain, and for LBS business organizations specific, the value chain usually contains technology suppliers and partners. It should be mentioned that partnership plays a crucial role in the success of LBS businesses as we have concluded that LBS is usually integrated other technology components. For example, Google’s search engine generates half of Yelp’s traffic flow (Blommberg, 2011).

5. **Positioning**: The LBS business, similar to any other booming IT business, is new yet fast evolving. Due to the network effect and positive externality of the business, LBS services usually provide free services to users to accumulate customer base. Thus users’ switching costs become minimal, boosting the fierce competition in the industry. As most LBS users are those relative young and tech-savvy, their quick acceptance to new services and adventurous consumer behavior result in low customer loyalty, creating higher pressure on the services contents (SY.Ho, 2010).

6. **Risk Evaluation**: For LBS-specific risks, we have identified the following four areas which LBS may be vulnerable to. The first is customer privacy protection. As we have previously analyzed, data generated by LBS are more private than other services due to the real-time and real-life features, thus any leak or misusage of such data can significantly impact user’s life, and thus damage the business. Regulation risks are also a major concern as the industry is still very new with limited references and policies are not set or stable. For such a R&D oriented technology industry, Intellectual Property Right (IPR) may also be a common issue. At last, the uncertain industry trends will challenge companies to adapt and adjust their strategies.
V. Model Implementation

V.I. Yelp

Founded in 2004, Yelp sprouted as a location-based service provider which aimed to enable information sharing about local businesses such as restaurants, bars, hair stylists, etc. The major services provided by Yelp include local search and reviews, local online community, content listing, and online advertising. The business of Yelp spreads over 13 countries worldwide and attracts more than 60 million unique visitors per month, which makes the company one of the most popular online service providers in the world.

Service Contents

(1) Value Proposition

The customers of Yelp can be segmented into three major groups: yelpers (visitors and reviewers), business owners and paying advertisers. Yelp provides different values to different customer segments.

For Yelpers, Yelp provides a convenient way of information sharing and social networking through location-based technology. For Business Owners, Yelp helps companies to grow their business through word-of-mouth or to collect improvement information through customer reviews. For Paying Advertisers, Yelp provides a huge customer base. By the end of 2011, Yelp has attracted more than 60 million unique visitors per month, which creates substantial opportunities for advertising industry.

(2) Opportunity Size

According to the Yelp’s official website, the unique visitors of yelp.com reached 61 million per month in Q3 2011 (Yelp, About Us, 2011). Furthermore, the number of local reviews has almost doubled since the end of 2010, reaching 22 million in total. The number of monthly visitors that rely on Yelp mobile applications to make a decision (Yelp, About Yelp, 2011) is greater than 5 million. In recent years, Yelp has maintained a growing momentum due to the network externality effects generated by combining location-based service with social networking concept. As more users employ Yelp applications, both the existing users and new entrants enjoy greater benefits through information sharing. And since Yelp adopts a rapid growth strategy and is trying to expand its business to more cities, the number of users would continue to grow quickly at least in the near future.

Profit Model

(1) Revenue Generation

The revenue of Yelp mainly comes from three sources: local subscriptions, online advertising and daily deals. In the local subscription model, business owners pay Yelp for preferred placement in search result, tracking visitors to their Yelp pages, highlighting reviews, etc. Yelp also works as advertiser that generates revenue through posting advertisement for businesses. In daily deals model, business owners that publish deals through Yelp will pay 30% of
the deal price to Yelp (Yelp, Business Support, 2011).

(2) Cost Structure
The cost of Yelp can be subdivided into two major categories: operating expenses and sales & marketing expenses. Operating expenses include the rent cost, technical staff salaries and other overheads. Sales & marketing expenses include the commissions paid to sales staff and other advertising activities. One problem with Yelp’s current model is that the growth of revenue mainly relies on the advertisements and subscriptions generated by hundreds of sales staff. The more revenue generated by a sales staff, the more commissions Yelp would pay. As a result, the cost increases proportionally to revenue and it would be difficult to lower cost without affecting the growth of revenue if Yelp continues to adopt the current model.

(3) Sustainability & Growth
The growth of Yelp is rapid since its establishment. By the end of September 2011, the total revenue of Yelp increased about five times compared with that of 2008. As Yelp keeps expanding, the revenue would continue to grow in the following years. However, with the increase of revenue, the total cost also increased proportionally. As a result, the losses of Yelp kept increasing substantially. If Yelp cannot figure out a viable way to lower the total expenses without affecting its revenue growth, the company would have difficulty raising capitals and the sustainability would be questionable.

Ease of Implementation
The technical infrastructure mainly involves website building, database maintenance, mobile applications development and GPS integration, which are basic technical elements for online service. With a professional technical team, there is no great difficulty in building such applications. The only problem lies in how to utilized GPS or other location technology to improve location accuracy in the future.

Positioning
The competition in location-based local search industry is fierce. The direct competitors of Yelp include Google Places, CitySearch, InsiderPages, etc. Compared with other location-based local search companies such as CitySearch and InsiderPages, Yelp distinguishes itself through well-established social networking functionalities and diversified technological platforms. In other words, combining location-based technology with social networking element is one of the key success factors for Yelp. From 2009 to 2011, CitySearch and InsiderPages lagged far behind Yelp in terms of unique visitors. However, the establishment of Google’s location-based local search website Google Places has brought about new threats to Yelp. Compared with Yelp, Google has implemented a more comprehensive batch of technology including locating, payment and social networking, which enables Google to provide more services than Yelp in the future.
Apart from competitors, Yelp also needs to fight against substitutes. The substitutes for Yelp include social networking websites that have embedded location-based technology as well as deal-of-the-day websites such as Groupon. Since the business of Yelp enjoys the network externality effects, the new entrant threat is not of great concern.

**Risk Evaluation**

The most important risk that Yelp has to deal with involves legal risks. In March 2010, Yelp was accused of extortion by nine small businesses. (Ali, 2010) Plaintiffs argue that bad reviews reappeared after they terminated subscription while Yelp claimed that business owners did not understand the working mechanism of the website. The lawsuits badly affected the reputation of Yelp and the company needs to be more careful about legal issues while working with small businesses (Jeremy, 2010).

Furthermore, security problems might bring about serious risks to Yelp. Since a great proportion of Yelpers employ Yelp applications on mobile phones, their information might be more easily eavesdropped by hackers. Yelp needs to take effective actions against potential customer data losses.

**V.II. Foursquare**

**Service Contents**

(1) Value Proposition

Foursquare places itself as a unique service provider who sits in the intersection of location-based service, mobile gaming and social networking. One principal feature of Foursquare’s service is the idea of “check in”. By selecting a nearby venue and checking in, the user is awarded some points or badges. When a user has checked in enough times at a certain venue (i.e. collect enough points or badges), he will be crowned the title of “mayor” and receive corresponding privileges, such as special deals.

Unlike many competitors, Foursquare not only focuses on rewarding loyal patrons but also devoted to helping merchants discover business opportunities and integrating location element into real life to explore users’ own living space.

(2) Opportunity Size

As the leader in the location service domain, Foursquare has attracted a large amount of attention and impact. Many major organizations have utilized Foursquare’s service to cater to customized demands as well as to promote their own products. In 2010, an effort has been made by declaring April 16 as a “Foursquare Day”, started in Tampa, Florida (Techcrunch, 2011). This event is held on a yearly-basis and some cities, including Atlanta, Miami, and New York City. Foursquare is also expanding its social impact by consistently synchronizing with latest society hot topics and news. For example, president Barack Obama joined Foursquare, with the intention that the staff at the White House will use
the service to post tips from places the president has visited.

(3) **Quality: Business & Technical capabilities**

Foursquare has generated multiple features into their service to increment its user base and loyalty. It introduced gaming elements into the location service from which users could enjoy a brand new experience of interacting with their friends. Moreover, such mechanism is helpful to form the sense of competition and motivation among users, which is critical to enhance their local advertising value for merchants.

Another big movement that Foursquare has made recently is adding the new “Radar” feature into their mobile apps. This feature pulls a to-do list to recommend users for activities that they may be interested in based on the given location. The suggestions may include interesting things to explore, friends’ satisfied experience and people nearby, it pops out automatically in aim to create the richness in interacting with the real environment.

**Profit Model**

(1) Revenue Generation

Foursquare is still in the phase of accumulating and consolidating user base, which is a common strategy in the industry to please and attract enough users first, then consider possible revenue model. So it is understandable that current revenues are scant, mainly coming from online advertising.

Other than the above-mentioned attempt, Deals have also proven to be a key part of Foursquare and will also be a key part of Facebook Places, a major competitor of Foursquare. There is a potential revenue model “Location-based Deals” that Foursquare is likely to develop its current business model into for more solid revenue generation. “Location-based Deals” is a model that when a user checks in at certain stores, he will exclusively receive deals that cannot be obtained in other ways. This will stimulate both the customers and retailers, and ultimately contribute to the growth of Foursquare. For example, merchants that partner with Foursquare will release deals on specific date and time. When a user checks in at a certain venue, he will automatically receive deal on that physical store.

One unique advantage that Foursquare owns is that it offers more such deals than other competitors, in fact, a lot of users shift to Foursquare from other services like Gowalla (interesting, just acquired by FB on 02th, Dec) for this reason.

(2) Cost Structure

Foursquare is keep updating and upgrading their applications both in the PC terminal and mobile device terminal. The cost structure for Foursquare is very straightforward: just virtually the same as the cost structure of an IT project: personnel expenditure, server maintenance, security breach detecting as well as database management.

**3. Ease of implementation:**
(1) Technical

Foursquare locates users based on GPS hardware in the mobile device or network location provided by the application. Foursquare has made itself a cross-platform service which support all mainstream mobile operating systems, it currently has iPhone, Symbian, Android, webOS, Windows Phone 7 and BlackBerry applications.

(2) Financial

Foursquare is principally funded by Union Square Ventures, Andreessen Horowitz, and O’Reilly AlphaTech Ventures. The company raised $1.35 million in its Series A and $20 million in its Series B round. On June 24, 2011 Foursquare raised $50 million on a $600 million valuation (TechCrunch).

4. Positioning:

(1) Competition

Foursquare has positioned itself quite differently with the competitors, who uphold a belief to create the LBSNS (location-based + social networking service) experience for users in a way that only Foursquare can. As a result of such value proposition, Foursquare has achieved some notable position in the industry. However, the competition is not over yet, in fact, it may be just the beginning.

“Foursquare’s ten million users are impressive for a mobile app, but small compared to numbers of other major social networks”. (Techcrunch) The leader position in the location service business does not guarantee Foursquare’s absolute advantage over competitors. First, location based service is a new domain in social media field and incumbents (including Foursquare itself) and other possible entrants are all trying to craft a feasible path in this business. The idea of “check-in” is surely a great one but many companies trying to implement this idea are now out of the game.

Risk Evaluation

(1) Privacy

There has been concerns about the application for unintentionally reveal the pictures of the location. “Foursquare’s location pages display a grid of 50 pictures that is generated randomly, regardless of their privacy settings”, and although Foursquare has fixed that issue later, there are still many privacy concerns.

Integration with other social networking services such as twitter, facebook could arouse privacy concerns. For example, when a user check-in at Foursquare, the system may post a tweet or status on their other social networking sites, which sometimes is not what user would like to do. It could also accidently reveal who are you with, since other people may check in at the same place in a close time point. Behavior could be tracked online, followed by spam advertisements, harassment messages, etc.
V.III. Google Latitude

Service Contents

(1) Value Proposition: Value generation

Let users visually capture where their friends and family are on Google Map, and easily keep in touch with them.

(2) Opportunity Size:

Now Google Latitude has 3 million users, thanks to the brand power of Google itself. But unfortunately, a quarter of them have zero friends. Latitude actually could be seen as a component of Google Map, so its social/behavior impact is to help users better navigate their life using Google services.

(3) Quality: Business & Technical capabilities

Google Latitude offers check-in and check-out feature. Check-in is similar with that in Foursquare, in terms of the check out feature, Google Latitude could tell if you’ve left a place long enough and are active at other places, it will automatically check you out so that your friends won’t go somewhere after you’ve left (or, they wish to be there right after you’ve left)

3. Profit Model:

(1) Revenue Generation

Google Latitude is a free service, and it could be anticipated to remain free of charge, just like most of the Google services. The strategy behind such free offering is keeping delivering users the best experience on web with the help of Google, so that Google could keep dominating the searching market and online advertising business, which contributes to almost all of their revenue.

(2) Cost Structure

Similar to Foursquare, most of the cost for Google Latitude is in application development and maintenance.

(3) Sustainability & Growth

As a supplementary component of the comprehensive service package provided by Google, the financial impact of Latitude service is difficult to evaluate as is dependent on its integration with other Google services.

3. Ease of implementation:

(1) Technical

Google Latitude uses the Geolocation API to retrieve the geographical location information for a client-side device. In
the mobile device side, Google Latitude uses Cellular positioning, Wi-Fi Positioning, and GPS. The iPhone platform is a key for location based service due to the number of users and capability of the hardwares, so before Latitude app could run on iPhone, it took some time to establish its service among users.

Google Latitude is accessible from all mainstream mobile operation platforms, such as iOS, Android, Blackberry, Windows Mobile and Symbian.

4. Positioning and Risk Evaluation

(1) Competition

Google Latitude is viewed by some analysts as a private version of Yahoo Fire Eagle. It does not offering as many features as its competitors, however, Google Latitude is reportedly planning adding more features to its service.

The competition that Latitude is facing mainly comes from Foursquare and Places by Facebook, who just acquired another LBS provider Gowalla on December 2, 2011, for an undisclosed sum. (TechCrunch, 2011) It seems that the competition between Google and Facebook has extended from online advertising, social networking to the area of location-based services. But there is a difference between the services that both companies are providing. Google Latitude focuses on the exploration of current location and friends, making their life easier and more interactive. On the other side, Facebook cares more about establishing the link between where users have been and what stories they have to share (apparently this is exactly what Facebook is good at), then use it as a supplemental feature to their major revenue sources, such as advertisements, online investigation, and other value-adding services.

(2) Risk Evaluation

Google Latitude has put a lot of efforts to protect the user privacy. For example, user could control the accuracy of their location. Also, their location will not be disclosed unless the user has explicitly approved it. Google Latitude now optionally records the location data such as where the user has visited, how many times for statistical purpose. The activity history will not be visible to other Latitude friends, and user has the flexibility of deleting the entire history or just part of it. Even after accepting invites, users still have complete control over privacy.

You can even enter a false location so the privacy is controlled on a very granular, contact-by-contact level.

VI. Evaluation & Impact

Value Proposition

To compare the value proposition of these three products, firstly we need to identify the customer groups that are targeted by them. Yelp has three categorizes, namely, visitors/reviewers (Yelpers), business owners and advertisers. Foursquare’s customers are divided into two parts: business partners and registered users. Google Latitude, however, does not differentiate its customers and all registered users are provided the same service.
For Yelp, the difference between business owners and advertisers is that the former one receives feedback about their service from Yelpers and advertisers receive direct revenue from Yelpers. Foursquare, on the other hand, provide a set of tools (e.g. what deals do users like and the specific amount and type) to help its business partners be better positioned in the local market and thus grow their business. It should be noted that, unlike Yelp, in which advertisers are charged fees for posting commercials, Foursquare does not charge for its business partners for releasing deals, at least for now. All these three location based service providers are providing check-in feature and helping its general users with more options and opportunities to explore their surrounding places. But there is a difference between Yelp and Foursquare/Google Latitude, Yelp allows its users to use the service without registration (which they call them “visitors”), so users could leave recommendations and comments anonymously. In this sense, Yelp is more like an open platform that collects a wider range of data.

In sum, Yelp is trying to facilitate the information sharing about local business based on their location based service. Foursquare aims to make the exploration of places not only interactive, but also enjoyable. Google Latitude’s value proposition is to help users visually stay in touch with friends by sharing where they are in addition to what they are doing.

2. Profit model

Online-Advertising

The major type of revenue generation model for location-based services is online advertising. Particularly, location-based service works to set up a substantial user base first. Large user base can be further deployed for online advertising services. Online advertising is a major revenue source which proves to be effective for Yelp, Foursquare and Google. One specific advantage of location-based services in advertising industry lies in their capability of customer segmentation. By its nature, location-based services can segment their customers based on their location information, preferences, reviews, customer profile, etc. Among the three companies, Google and Yelp has already done a pretty good job in online advertising business. As the bellwether of online advertising industry, Google has taken up about 50% of market share. The introduction of Google Latitude services will help to strengthen the leadership position in online advertising market. Yelp is also aggressive in promoting online advertising. Different from Google, Yelp targets on a more specific customer group and sells advertising based on location information. Specifically, Yelp has set the selling point of its advertising as location specific. Large groups of localized business seek help from Yelp targeting on customers in a particular place. Foursquare has also set online advertising as a major revenue source. But as a startup with only two years’ history, it is difficult to generate significant revenue.
without a large customer base.

Local Subscription
Apart from online advertising, Yelp has adopted another effective way for revenue generation. Particularly, business owners pay a monthly local subscription fee to Yelp and would be able to enjoy some additional benefits. For example, users would be able to rank their reviews, highlight reviews, get placed in a better position in search result, etc. If users stop to pay the monthly subscription fees, the bad reviews might appear at their original position and might have bad results on local businesses. In this way, Yelp maintains a endurable and substantial amount of monthly revenue. By the end of 2011, local subscription has become the most important revenue resource for Yelp. This is also a good revenue source for other location based service that works as mediator between businesses and customers.

Daily Deals
A third way of profit generation for Yelp is through daily deals. In this way, Yelp provides deal information on its application and charges 30% of the discounted price. However, this method has not been proved an effective way for revenue generation. Actually, daily deals only generate a tiny proportion of revenue for Yelp. This might be because that the charging for providing daily deals through Yelp is too high for most small businesses. An effective way of taking advantage of this method might be charging about 10% of the discounted price, attract more customers and get revenue from a larger market. Other location based services can learn lessons from Yelp’s experience and take better advantage of this method.

Location Based Deals
Location based deals is an emerging revenue generation model in recent years. Through location based deals, users get discounts if they log into a particular application at particular locations. Although there is still no explicit evidence that location based deals contribute to revenue, it is regarded as a promising revenue generation method for location-based services such as Foursquare. In fact, Foursquare has already implemented a wide spread location-based deals system. Foursquare users would be able to enjoy discounts at lots of great places. This method will have two major impact on Foursquare’s bussiness. In the first place, Foursquare would be able to get more user participation and user information, which is beneficial to online advertising business and future development. In the second place, as long as Foursquare get a large enough customer base or community, it will be able to charge business owners for subscription fees to attract customer through Foursquare. Location based deals is a promising way of revenue generation in the long run and is worth trying by other location-based services.
Cost Structure

A major source of cost for location-based services is operational expense. Commonly, the first and foremost expense involves the salaries paid to technical staff. Since qualified technical staff are required to maintain the core of location-based services, this part of expense cannot be reduced significantly.

Another significant source of cost involves the sales and marketing cost. More than 40% of Yelp’s costs goes into sales & marketing activities. Particulary, sales staff in Yelp earn commissions based on the total amount of advertising and subscriptions they sell. This method drives the revenue up quickly and makes the company promising. However, adopting such method also involves disadvantages. Since Yelp pay commissions based on the total advertising and subscriptions a staff sells, the cost will go up proportionally with revenue. In other words, if the cost is cut, revenue will be affected adversely. And if revenue is not able to cover cost for the moment, the loss will continue to growth as the revenue goes up. As a result, Yelp would run into capital shortage. A possible improvement for this method is to postpone the payment of commission for about a month. In this way, Yelp would be able to investment the current revenue and postpone the cost payment to the moment when their is more income. For the moment, Foursquare and Google Altitude has not adopted any aggressive sales & marketing action. While Google Altitude could push its product through built-in advertising services and applications, Foursquare could adopt the improved version of Yelp’s sales & marketing method and improve recognition.

3. Popularity

Having launched for 7 years, Yelp now is capable of attracting 61 million unique visitors per month. The number of local reviews has almost doubled since the end of 2010, with the number of nearly 22 million in total. On mobile apps, there are approximately 5 million users making their decision such as dining, shopping according to the information provided on Yelp. Although there are many new entrants trying to provide similar services, Yelp maintains its dominate position in the domain. Since Yelp is not vigorously expand their business to more cities, it is reasonable to believe that Yelp will continue to gain the popularity from the mass.

Foursquare, in essence lives in a different domain, in which it focuses more on incorporating the gaming element into its service. If Yelp could be viewed as a practical tool, Foursquare is mainly for entertainment. The founder of Foursquare, Dennis Crowley, founded dodgeball.com, one of the first mobile social services in the US, and Foursquare is an advanced version of Dodgeball. Now Foursquare it is the most used location-based service, 3 million check-ins happen on Foursquare every day and the community now has over 10 million members.
Google Latitude, a service adapted from Dodgeball, owns 3 million registered users. But if we exclude inactive users, the number may vary greatly. Given that Google Latitude has just been brought into peoples view, it is hard to rate the popularity of its service. But we are optimistic about that, relying on Google’s leading searching technique, Latitude could become most people’s indispensable app in the future.

VII. Conclusion
Location based service is an emerging and exciting area in the Information Technology and Telecommunication industry. Although LBS is gaining popularity day after day, there are still many problems need to be identified and solved. The report introduced the concept and applications of Location-based services (LBS), followed by an industrial analysis on the impact of the technology.

To investigate the business model and strategies of LBS providers, an evaluation model consisting of six components is designed for the task. The model was implemented on three typical LBS providers, Yelp, Foursquare and Google Latitude. To summarize, all these three products are based on location based service, but they have different extensions so that fall into different subcategories. Little has been done regarding key issues such as profit model, privacy protection and position accuracy, the improvement of the whole industry relies on technology innovation as well as marketing strategy. Yelp, Foursquare and Google Latitude are competing with each other in some way and also facing the challenges from substitutes and new entrants.

Continuous work may involve more quantitative analysis on the financials, exploration on the possible trends of LBS and the extension of LBS providers into other field of businesses.

We have the confidence in the potential of LBS, and are curious to see how this new service will shape our future life.
Appendix: tables

Figure 1. History of location-based service

Figure 2. Daily unique visitors of Yelp

Figure 3. Yelp Revenues vs. Expenses
Figure 4 Network externality effects
Reference