Business Models of Information Aggregators

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Submitted to the System Design and Management Program
in Partial Fulfillment of the Requirements for the Degree of

Master of Science in Management and Engineering

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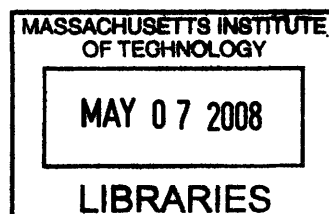Thesis Supervisor

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ABSTRACT

This thesis identifies the specific characteristics of information aggregators, and proposes nine business models appropriate for information aggregators. These nine models are: advertising, brokerage, subscription, licensing, infomediary (information intermediaries), referral/click-through, customized/personalized service, professional service/consulting, and application service provider. The thesis then looks into various companies who base their businesses on information aggregation and analyzes the development of their business models in the context of competition. The financial and social performances of these companies are studied and reasons are explored. In the end, the thesis summarizes findings from case studies, lists the widely used business models and the rarely used ones, and explores reasons for this phenomenon.

The conclusion of this research is that information aggregation is a start point for a company to develop differentiated product or services. Companies can develop into an independent information aggregators; they can use information aggregation as a platform; they can partner with aggregatees or customers to provide customized information. Eventually, many will be integrated into end-to-end solutions, or penetrate into traditional businesses by leveraging information aggregation.

The research can be used by companies who develop information aggregation products or services. It can also be used to evaluate the viability of information aggregation initiatives.

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1 Introduction

1.1 Information Aggregation Overview

Information aggregators are entities that collect information from a wide range of sources, with or without prior arrangements, and add value by providing post-aggregation services.[1] Usually information aggregators collect information from various sources, such as the Internet, diverse databases, company websites, and results of searching engines.

Aggregation is not a new word in business world; we can say almost every company somehow aggregates either product or service. Information aggregation is not a new phenomenon, either. For example, real estate brochure aggregates all the on-market homes in one area and presents it to potential buyers. However, the horizon of information aggregation is largely changed due to the emergence and prosperity of the Internet.

Using a recently popular information aggregator as an example, we can see the big effects imposed by information aggregators on the industries they are in. Zillow presents home information of more than 70 million homes nationwide[2]. The company's website – www.zillow.com, provides collected information of home facts, value estimation, historic price, comparable homes, and a set of real estate tools. Best of all, the information is free to all users – buyers, sellers, and agents. Zillow launched its website in February 2006.[3] After the start of Zillow.com, a handful of sites cropped up offering similar services. Within a month, even the giant Realtor.com had a new feature on its front page giving consumers a starting point to assess their property values.[4] Moreover, all the agents who make money from owning home valuation information will have to face the competition from Zillow, who offers the information for free, through a more convenient way – the Internet.

Even search engine giant Google made some attempt at information aggregation on top of its search result. In general, Google just plainly lists the search result of viewers' interest, ordered by relevance, but without any further analysis. Scholar.google.com, however, not only lists the original contents from other sources, but also presents summary of the works of interest, such as number of versions and number of citations (see Figure 1-1). In this way, actually Google does analyze and presents it to end users and becomes an information aggregator to some degree.

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[1] S. Madnick , Seizing The Opportunity: Exploiting Web Aggregation, MIS Quarterly Executive 2002

[2] www.zillow.com, the data is as of April, 2007.

[3] Zillow.com reveals venture, Knight-Ridder Tribune Business News: NA, February 08, 2006

[4] Forget Gimmicks: Buyers Want Numbers, New York Times: 1, February 11, 2007.

Business Models for Electronic Markets - all 4 versions »
P Timmers - Electronic Markets, 1998 - imse.hku.hk
... simulation . Figure 1 **Internet business models** - 1. Information brokerage ... projects.
Figure 2 **Internet business models** - 2. Classification of ...
Cited by 546 - Related Articles - Cached - Web Search - Get it from MIT Libraries - BL Direct

Figure 1-1: Google Scholar Search

According to S. Madnick, information aggregators have following characteristics[5]:

❖ *Access Transparency – An aggregator appears to be a normal user to a data source – simply accessing the information.*

❖ *Contextual Transparency – An aggregator resolves contextual differences so it can make effective comparisons.*

❖ *Analysis – Instead of simply presenting data as is, an aggregator uses post-aggregation analysis to synthesize value-added information.*

Information aggregations are usually initiated by lead users. According to E. Hippel, lead users are those who have advanced needs which are not fulfilled by current market and by inventing solution by themselves they can benefit.[6] Many information aggregation companies were started by their founders the same way lead users try to find the solution for their own needs. For example, two founders of Zillow started real estate information aggregation after they became frustrated trying to figure out the market value of homes they were considering.[7] RedRoller.com, a website comparing various shipping carriers in order for users to save money and time, was started by eBayer who does business on eBay and wanted better shipping solutions.[8]

1.2 Research Motivation

Almost every company is affected by information aggregation, by either being aggregated or being an aggregator. With advanced information technology and ubiquitous information source, it seems not hard to start a website to collect whatever public information one is interested in. However, as many high-tech CEO alleged *"Achieving consistent sales results is the most difficult thing. Developing world-beating technology has always been easier for us.[9]"* It's easier to create value, but harder to

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[5] S. Madnick , Seizing The Opportunity: Exploiting Web Aggregation, MIS Quarterly Executive 2002

[6] E. Hippel, Democratizing Innovation, the MIT Press 2005

[7] The mark of Zillow, Knight-Ridder Tribune Business News: NA, February 26, 2006

[8] https://www.redroller.com/shippingcenter/home

[9] A survey done by MIT Entrepreneurship Center, they surveyed hundreds of high-tech CEO's, most of whom were engineers.

capture value. In other words, it's easier to generate value to customers, but it's much harder to capitalize the created values.

How did information aggregators start their business? What advantages and disadvantages do they have? How do they perform in financial perspective? What business models did they employ and whether they're successful? Compared with traditional company and general e-commerce company, are there any unique aspects in business models which information aggregators should be aware of and prepare for?

1.3 Research Scopes

Three criteria are used to clarify whether an entity is an information aggregator and whether it's of interest to this thesis:

* The company has to deal with information, or at least the business differentiation or leading part of the entity has to deal with information, instead of physical goods. In special, the thesis is only interested in information aggregation using the Internet technology; others, like newspaper, booklet, and etc are not in the scope of this thesis.

* At least part of the information has to come from outside of the entity itself. In this way, we can say that this entity is an aggregator.

* There must be derived value from the built-up information stack, which in turn, requires that the aggregator has to find latent customer needs, using new technology and viable business models to set up the frame, so that customer can benefit from that.

The boundary between a traditional e-commerce company and an information aggregator is very fuzzy. It's hard to totally exclude almost every company from information aggregation. For any company with a website, there are hyperlinks which lead to an outside resource, and thus the company becomes a simplified information aggregator. On the other hand, very few information aggregators restricted their business in purely collecting publicly available information. Some partnered with other companies; some developed product other than information aggregation; still some other leverage their information to get into traditional business. This thesis will focus on those companies whose competitive advantages are in information aggregation and those who start their businesses with information aggregation, but later develop different products/services. For the second category, this thesis will mainly focus on their business development phase in information aggregation.

Aggregators mainly fall into following categories: [10]

* Relationship Aggregation. Yodlee (www.yodlee.com) empowers its customers to mange all their financial relationships.

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[10] The first two types are from S. Madnick , Seizing The Opportunity: Exploiting Web Aggregation, MIS Quarterly Executive 2002
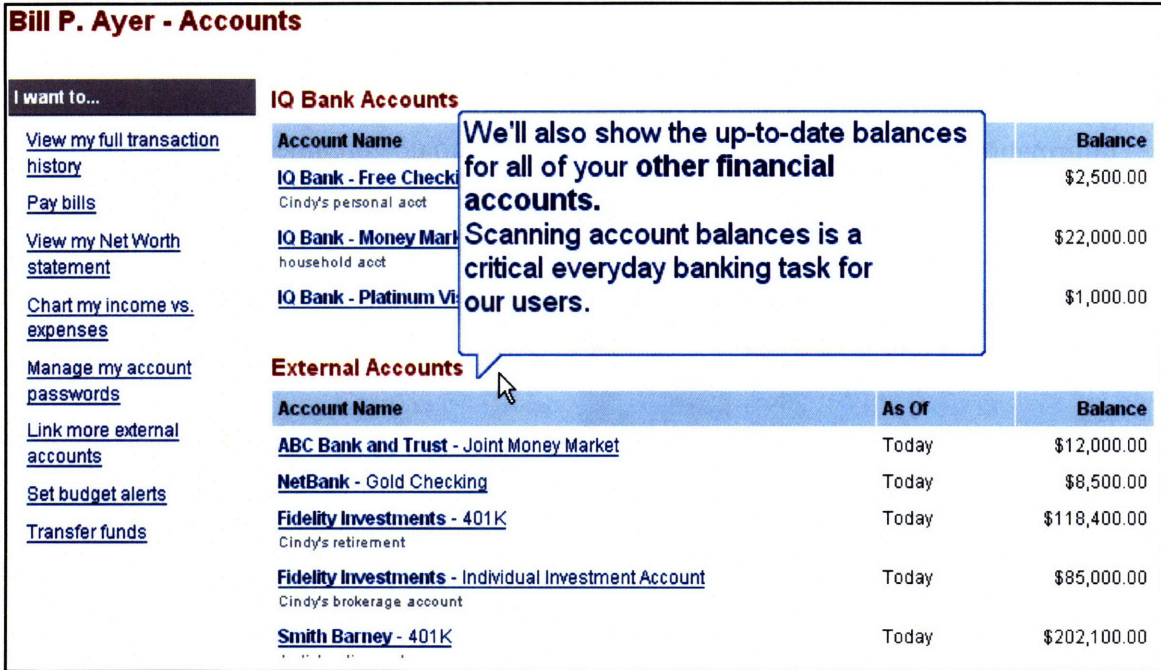
Figure 1-2: Relationship Aggregation

❖ Comparison Aggregation. Shopping (www.shopping.com) compares commodity prices of various online storefronts.

Figure 1-3: Comparison Aggregation

❖ Relevance Aggregation. Zillow (www.zillow.com) integrates text information (street, state, and zip code), satellite photo map, and real estate data (layout, sales data, and general market trends). This kind of aggregation generally combines pertinent information around one core value and allows user to do combined search of all the layers of information.
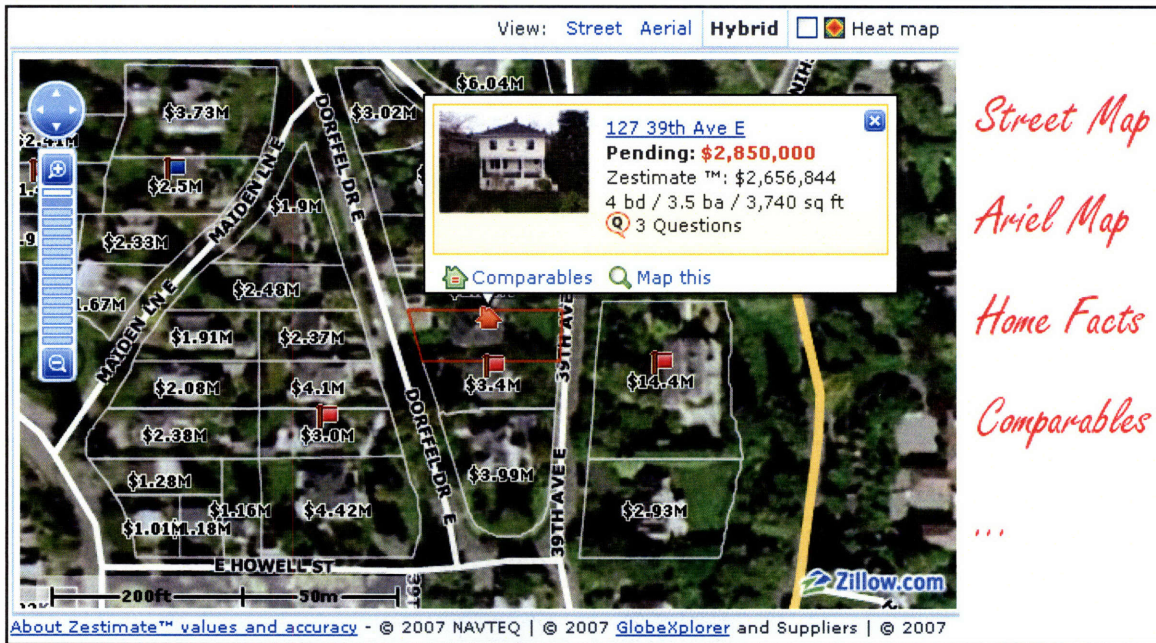
Figure 1-4: Relevance Aggregation

1.4 Research Objectives

The overall objective of this thesis is to establish a business model framework which can be used by information aggregators. The research can also be used to evaluate the viability of information aggregation initiatives.

1.5 Research Approach

Business environments of information aggregators are very dynamic and ever evolving; empirical observations and analysis of information aggregators in various industries are adopted. The thesis will study three cases, in shipping, financial service, and real estate industry separately. For each case study, its deployed business models are evaluated and the path of business model evolvement is examined. Then, based on the proposed business model framework, other suitable business models are suggested. Figure 1-5 illustrates the structure of each case study.
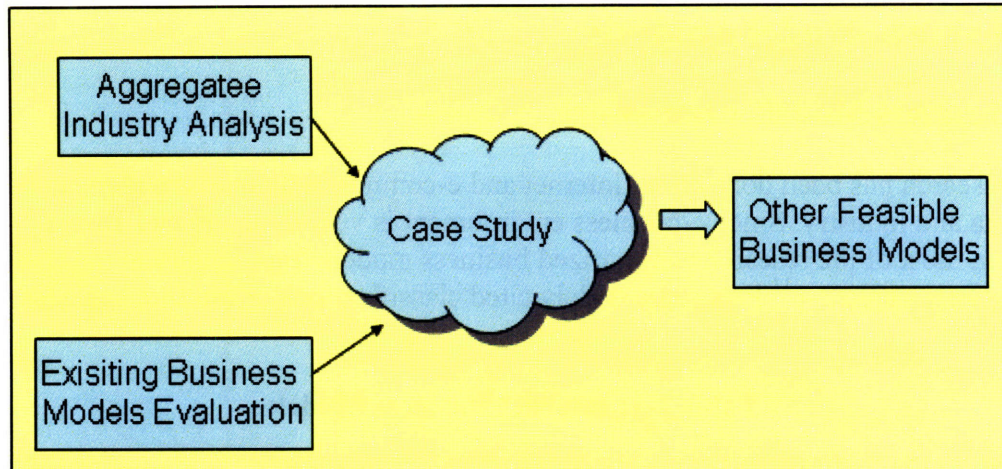
Figure 1-5: Research Approach

Information for case studies mainly comes from following resources: E-Business journal, industry analysis report, commercial business databases, company website, and financial report from public companies.

1.6 Thesis Organization

Chapter 2 first reviews research done in information aggregation; then analyzes the distinct characteristics of information aggregators and the value proposition they provide to their service recipients. Based on that, a list of business models suitable for information aggregators is suggested. The chapter is concluded with an analysis of attractiveness of the information aggregation by using Five Force's methodology.

Chapters 3 through 5 present three case studies of information aggregators from various industries - shipping, financial, and real estate. In each case study, the aggregatee industry is analyzed; one or more aggregators are examined in detail regarding their aggregation initiatives, revenue model, and the evolvement of their models. Also, other aggregators are gone through briefly in order to present the competition horizon. Even further, competitors other than aggregators are examined in order to present a complete picture. Finally, each case is examined against the business models proposed in Chapter 2, and those models they didn't adopt but might be practicable in their case are recommended.

Chapter 6 summarizes the findings in the case studies, revisits the business models proposed in chapter 2, and analyzes the reasons why some models are widely used and some are rarely used. The chapter concludes with the prediction of information aggregator development.

2 Business Model Analysis

2.1 Business Models Framework

Much research has been done about Internet and e-commerce business models, in both academia and industry. Since e-business environment is very dynamic and always evolving, most of the research summarized business models from empirical observation and analysis. Table 2-1[11] lists some widely cited classifications of Internet business models.

Table 2-1: Internet Business Models

Author of Taxonomy	Number of Models in Taxonomy	Classification Schemes of Internet Business Models
Michael Rappa (2000) From observation of internet commerce trends	9	• Brokerage • Advertising • Infomediary • Merchant • Manufacturer (Direct) • Affiliate • Community • Subscription • Utility
Anajana C. S. (2001)	6	• Advertising - banner and direct marketing • Subscription sites • Customer services • Directory services • Content providers • Product sales
Paul Bambury (1998)	6	• Freeware Model • Library Model • Information Barter

[11] http://digitalenterprise.org/models/models.html#Infomediary

http://www.stylusinc.com/website/business_models.htm

http://www.firstmonday.org/issues/issue3_10/bambury/index.html

http://www.firstmonday.org/issues/issue8_6/wang/index.html

http://highered.mcgraw-hill.com/sites/0072511664/student_view0/chapter6/chapter_outline.html

Sugato Bagchi and Bill Tulskie, e-business Models: Integrating Learning from Strategy Development Experiences and Empirical Research, *20th Annual International Conference of the Strategic Management Society, Vancouver, October 15-18, 2000*

		- Access Provision - Web Site Hosting & Other Internet Services - Digital Products & The Digital Delivery Model
Thomas Eisenmann (2002)	8	- Online Retailers - Online Portals - Internet Access Providers - Online Content Providers - Application Service Providers - Online Brokers - Online Market Makers - Networked Utility Providers
Afuah & Ch. Tucci (2000)	7	- Commission-Based - Advertising-Based - Markup-Based - Production-Based - Referral-Based - Subscription-Based - Fee-for-Service-Based
Sugato Bagchi & Bill Tulskie (2000) e-business building blocks from empirical analysis of over 600 e-business initiatives worldwide	7	- Online information exchange - Electronic execution and delivery of services - Customized (or personalized) services - Resource pooling - Business intelligence - Online collaboration - Offering aggregation
Peter Weil & Michael R. Vitale (2001)	8	- Content Provider - Direct to Customer - Full-Service Provider - Intermediary - Shared Infrastructure - Value Net Integrator - Virtual Community - Whole-of-Enterprise/Government

Some of the above listed business models can directly generate revenue, such as advertising, brokerage and web site hosting. However, many others are actually ways to build up brand name or increase customer base so that companies can apply other

revenue models on top of that. Freeware model, third party marketplace, and virtual communities are in this category.

Most of the taxonomies are for general Internet business models. In order to find out what business models are applicable to information aggregators, we need to revisit the definition of information aggregators in Chapter 1. Information aggregators are entities that collect information from a wide range of web sources and other sources, with or without prior arrangements, and add value by providing post-aggregation services. From the definition, we know that information aggregator has following characteristics. [12]

- ❖ Transparency
- ❖ Retrieve publicly available information
- ❖ Multi-source information
- ❖ Analysis

On the other hand, information aggregators don't have following characteristics.

- ❖ Not provide source information by itself
- ❖ Not involved in physical product transaction

In his popular book *Place to Space*, Peter Weil points out that generally corporations own part or all of three customer assets.[13] *Relationship* with customers gives firm power of *influence*; customer *data* gives firm *insight*; and *transaction* generates *revenue* for firm. So what assets do information aggregators have? According to the definition, information aggregators collect information from various sources, organize it, and present it to end customers. They serve as the primary interfaces to end customers by selectively choosing source information and by influencing the end uses' choice. In this sense, we can say that information aggregators own the relationships with customers. Some information aggregators even own part of the customer data. For example, a financial account aggregator knows what accounts a customer hold and the amount in each account. Owning customer accounts data gives the aggregator insight on where the customer stands in financial perspective and what products/services might interest the customer. Traditionally revenue comes from transaction, be it purchase/sell, lending/borrowing, or many others; this imposes a big challenge on revenue models of information aggregators. How can they make money from owning customer relationship and customer data? To answer this question, we need to look at the values provided by information aggregators. Generally, information aggregators provide following value propositions to their service recipients.

- ❖ Increased diversity of information
- ❖ Broader service availability
- ❖ Improved searching ability and reduced searching cost
- ❖ Comparison between alternative choices

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[12] S. Madnick , Seizing The Opportunity: Exploiting Web Aggregation, MIS Quarterly Executive 2002

[13] Peter Weill, Michael Vitale, Place to Space, Harvard Business School Press

❖ Better customized to user wants and needs

❖ Reduced transaction time

Based on above analysis, several criteria are chosen to pick up relevant business models for information aggregators. They are as following:

❖ The business model shouldn't require major infrastructure investment except that the investment is related to information aggregation. According to this, we can exclude internet access providers.

❖ The business model should be self-sufficient, instead of be supplementary to existing product/service system. According to this, we can exclude merchant, manufacturer (direct), customer services, content providers, product sales, freeware model, digital products & the digital delivery model, online retailers, business intelligence, and online collaboration.

❖ The business model has to be based on retrieving multi-source information and providing value-added post-aggregation analysis. According to this, we can exclude online portals, library model, and resource pooling.

After excluding irrelevant business models, and combining the rest, the author believes following business models are appropriate for information aggregators.

❖ Advertising – an extension of traditional media broadcast model. An information aggregator provides text or banner ads for various businesses and charges them per view or per click.

❖ Brokerage – bringing together buyers and sellers and facilitate transactions. Broker charges fees or commissions per transaction it enables.

❖ Subscription – fee for service/content model. Subscription fee can be periodic – daily, monthly, or annual. Usually information aggregators combine free service with premium services that requires subscription.

❖ Licensing – the sale of a product that involves only the transfer of usage rights to the buyer, in accordance with a "terms of use" agreement.[14] It is widely used regarding software products.

❖ Infomediary (information intermediaries) – an information aggregator has collective data. It can assist buyers and/or sellers understand a given market by providing data about consumers and their consumption habits.[15]

❖ Referral/click-through – an information aggregator receives fee from merchants if it generates sale for them by bringing in customers.

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[14] Business models on the web, Michael Rappa,
http://digitalenterprise.org/models/models.html#Subcription
[15] Business models on the web, Michael Rappa, http://digitalenterprise.org/models/models.html#Subcription.

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❖ Customized/personalized service – an information aggregator provides users tailored services by monitoring their actions and requesting their preferences. This approach is usually combined with advertising and subscription.

❖ Professional service/consulting – owning customer relationship and part of customer data gives information aggregators advantage to provide professional service/consulting. It is related to infomediary, but more complicated. Informediary only involves data, while professional service/consulting involves data and consulting projects.

❖ Application service provider – an information aggregator hosts the application and data center and provides on-demand service to their clients via network.

In order to be profitable and sustainable, information aggregators should employ one or more abovementioned business models.

2.2 Information Aggregation Industry Analysis

Information aggregators emerge in almost every industry. Although the dynamics of different industries and the competition horizon are quite different, information aggregators share several attributes in terms of business environment. In the rest of this chapter, an industry analysis is done using Five Forces' framework (Figure 2-1).
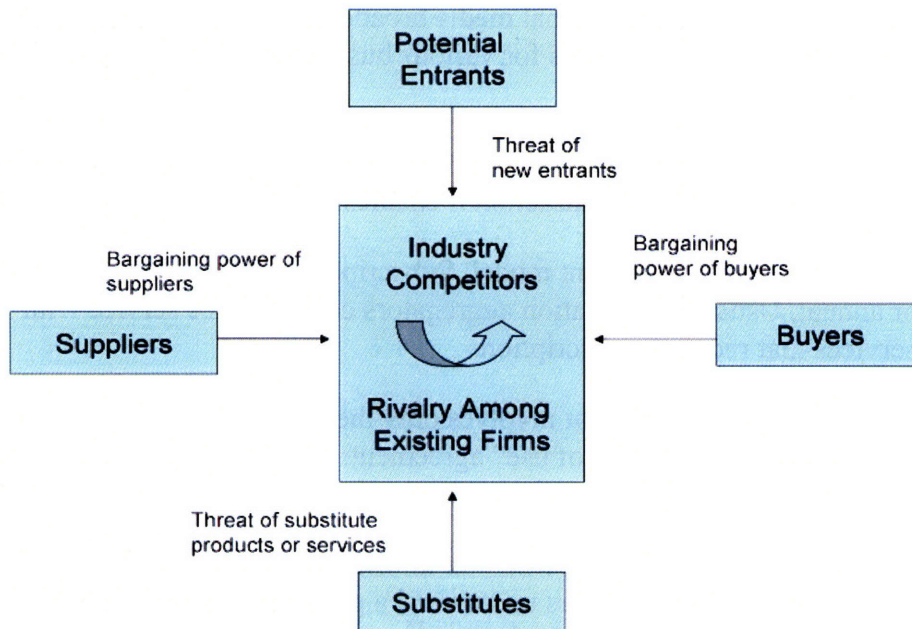
Figure 2-1: Five Forces

DEGREE OF RIVALRY

- Number of firms: not really a large number. If business model is brokerage, however, information aggregators have to compete with existing traditional firms. On the other

hand, information aggregators usually complement current industry players, and integrate information from different industries, so their relationship is not pure competition.

- Market growth: usually fast market growth. Information aggregators usually create a new market. For example, Zillow's annual growth from 2005 to 2006 is 132.1%.

- Fixed costs: almost no fixed cost. Information aggregators have sunk cost, though, including the cost to develop technology such as Zillow's Zestimate (see chapter 5) and iShips' Price it, Track it, and Sell it (see chapter 3). Sometimes aggregators have to invest in data center and computer servers.

- Storage cost and perishable products: N/A

- Switching cost: usually low in the beginning. Depending on the product/service itself and user experience, switching cost could become higher or stay low.

- Levels of product differentiation: low in the beginning. An information aggregator has to differentiate itself as fast as possible either through partnership or by becoming at least one source of information.

- Strategic stakes: low. Usually an information aggregator starts as an independent entity. If an aggregator is bought by another company later, the stakes will become higher, such as shopping.com to CNET.

- Identity: low in the beginning. In general, an information aggregator is a newly started independent company, so it doesn't have brand name. Later it might be bought by large, established company, but usually that company keeps the aggregator's original name because of organizational issue or because the aggregator has set up reputation to some degree.

- Exit barriers: low. Generally it's easy for information aggregators to exit because their main assets are technology, information, and talent skills. All these are easily transferable. Their major sunk cost is technology they developed (see analysis in fixed costs). For example, the management team of Zillow was a group of former executives of Expedia, an earlier aggregator.

- Diversity of rivalry: yes. Since an information aggregator retrieves information from various sources, aggregatees are potential rivals. Also, established internet companies may also penetrate into this market. Section *the competitive horizon* in chapter 3, 4, 5 talks more about the diversity of rivalry in real world in different industries.

- Industry shakeout: N/A

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THREAT OF SUBSTITUTES

-Switching costs: low. Many information aggregators provide free services. The user interface is normally simple, which implies smooth learning curve. However, the network effect is huge and install base is important.

-Buyer inclination to substitute: no. Usually information aggregators are lead users and technology savvy, who have advanced needs than general users.

-Price-performance trade-off of substitutes: poor. Compared with traditional players, information aggregators have a better price-performance trade-off.

SUPPLIER POWER

- Supplier concentration: low. An information aggregator can retrieve from many resources. But if the aggregator is in a closed and concentrated industry, things might be different (see chapter 3).

- Importance of volume to supplier: N/A

- Differentiation of inputs: high. An information aggregator can decide to retrieve from different resources.

- Impact of inputs on cost or differentiation: N/A on cost; big on differentiation. Information source is essential.

- Switching costs of firms in the industry: low. Usually aggregatees are not aware of the aggregation at all.

- Presence of substitute inputs: plenty.

- Threat of forward integration: generally high. An information aggregator can easily be aggregated. Layered information would be harder to be aggregated. Also, it's easier to integrate text information, but more difficult to integrate pictures and the back-end databases.

- Cost relative to total purchases in industry: N/A. An information aggregator retrieves publicly available information, so it's always free.

BARRIERS TO ENTRY

- Absolute cost advantages: low.

- Proprietary learning curve: low. Information aggregators usually use standard information technology such as web wrapper, database, and semantic web; it's easy to transfer the knowledge.

- Access to inputs: easy. The Internet is open standard. Also, there is no law to protect data reuse in U.S.[16] , so there is no need to establish partnerships with providers of various data sources.

- Government policy: There is no law to prohibit data reuse in U.S.

- Economies of scale: tremendous. Once technology problems are solved, information aggregators can pick almost every similar data sources and websites, so they can expand at marginal cost.

- Capital requirements: median.

- Brand identity: no established brand, at least in the beginning.

- Switching costs: low. For consumers and information suppliers, both are low. Information aggregation is web based (hosted), usually consumers don't need to install software.

- Access to distribution: ubiquitous. The Internet is almost everywhere.

- Expected retaliation: high. An information aggregator has to prevent being aggregated.

- Proprietary products: no, at least in the initial phase.

BUYER POWER

- Bargaining leverage: weak. Most aggregators provide service to consumers for free.

-Buyer volume: N/A. For fee service, volume might be reflected by membership type, though.

- Buyer information:

> - Brand identity: not so important.

> - Price sensitivity: high.

> - Threat of backward integration: unlikely. For aggregators serve businesses, there is possibility, but for aggregators serve consumers, it is unlikely to happen.

-Product differentiation: high.

- Buyer concentration vs. industry:

> - Substitutes available: yes. Smart users can find info by themselves, but it's more time consuming

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[16] Hongwei Zhu, Stuart E. Madnick, Michael D. Siegel, The Interplay of Web Aggregation and Regulation

- Buyers' incentives: high. Information aggregators deliver attractive values to customers (see previous part of this chapter).

Table 2-2 summarizes the analysis.

Table 2-2: Five Forces' Analysis

Five Forces	Attractive (+) or Not (-)	Attributes
DEGREE OF RIVALRY	+ in the beginning, - as more competitors enter	• <u>number of firms</u>: not many since information aggregators usually enter as a lead user • <u>market growth</u>: usually fast • <u>fixed costs</u>: almost no fixed cost • <u>storage cost and perishable products</u>: N/A • <u>levels of product differentiation</u>: low in the first place • <u>strategic stakes</u>: usually information aggregators start as an independent entity • <u>exit barriers</u>: low, information and skills are transferable • <u>diversity of rivalry</u>: yes
THREAT OF SUBSTITUTES	-	• <u>switching cost</u>: low • <u>buyer inclination to substitute</u>: no, lead users and technology savvy have advanced needs than normal users • <u>price-performance trade-off of substitutes</u>: poor, generally no charge to consumers
SUPPLIER POWER	+	• <u>supplier concentration</u>: depends on the industry where the information source locates • <u>importance of volume to supplier</u>: N/A • <u>differentiation of inputs</u>: high • <u>impact of inputs on cost or differentiation</u>: N/A on cost; big on differentiation • <u>switching costs of firms in the industry</u>: low • <u>presence of substitute inputs</u>: plenty • <u>threat of forward integration</u>: high, can easily be aggregated • <u>cost relative to total purchases in industry</u>: N/A
BARRIERS TO ENTRY	-	• <u>absolute cost advantages</u>: low • <u>proprietary learning curve</u>: low, standard web

		technologies and transferable
		• <u>access to inputs</u>: easy
		• <u>government policy</u>: no law to prohibit data reuse in U.S.
		• <u>economies of scale</u>: tremendous, traffic creates opportunities, can expand at marginal cost
		• <u>capital requirements</u>: median
		• <u>brand identity</u>: no established brands
		• <u>switching costs</u>: low, usually web-based
		• <u>access to distribution</u>: ubiquitous, the Internet
		• <u>expected retaliation</u>: high, can be aggregated
		• <u>proprietary products</u>: no in the initial phase
BUYER POWER	+	• <u>bargaining leverage</u>: weak, most aggregators provide service to consumer for free
		• <u>buyer volume</u>: N/A
		• <u>buyer information</u>:
		o brand identity: no
		o price sensitivity: high
		o threat of backward integration: unlikely
		• <u>product differentiation</u>: high
		• <u>buyer concentration vs. industry</u>:
		o substitutes available: yes
		o buyers' incentives: high.

Above analysis shows that basically information aggregation is an attractive market with minimal competition in the beginning, however, because of the low entry barrier, competition will become fierce in a very short period. For companies to make sustainable profit, they not only need to choose the initial business models, but also need to find out optimal evolvement of their business models.

Figure 2-2 depicts entry and exit scenarios of information aggregation. According to empirical observations, there are mainly three entry scenarios. Some information aggregations are initiated by lead users, such as Zillow and RedRoller (see 1.1). Some are started within an existing organization to fulfill the organization's own needs or to capture new market trends, such as Intershipper and iShip (see chapter 3 for detail). Some others are initiated to compare services and prices of online storefronts.
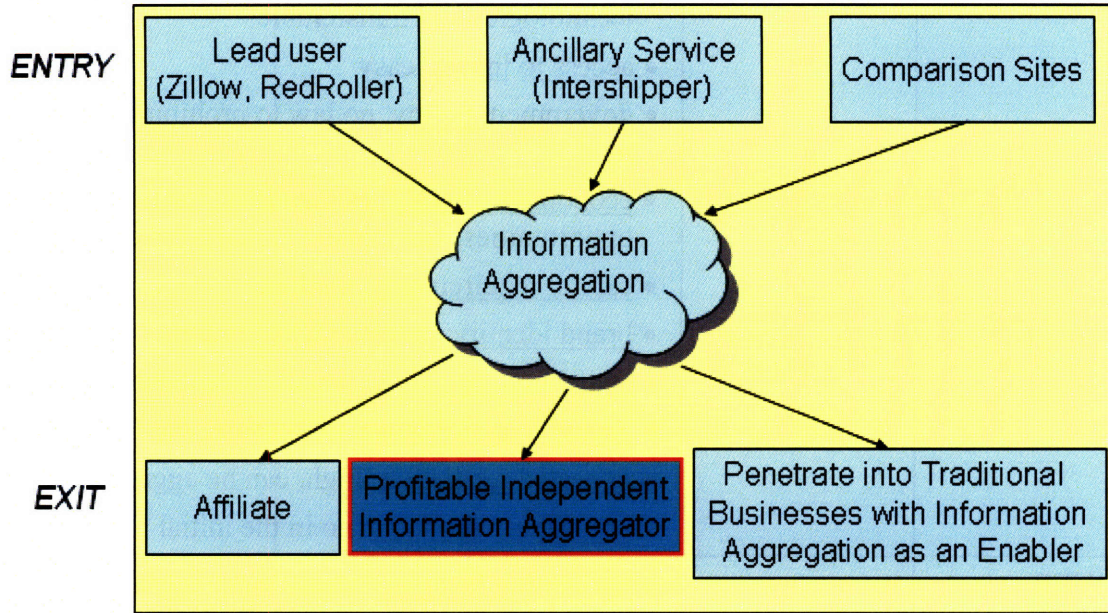
Figure 2-2: Entry/Exit Scenarios of Information Aggregation

Similarly, information aggregators can develop several exit scenarios. Some information aggregators are bought by other companies and become an integrated unit within the organization, such as iShip (see chapter 3 for details). Some optimize their business models according to their own competences and the industry dynamics and become profitable independent aggregators, such as Yodlee (see chapter 4 for details). Still others totally change their business models, enter traditional businesses by utilizing information aggregation as an enabler, and continue to use information aggregation as a tool for their traditional operation (see CTrip case in chapter 6 for details).

Information aggregators have to differentiate themselves as they evolve their business models. In the following chapters, several case studies in various industries will be analyzed. The business models of each aggregator are analyzed. Supplementary business models will be suggested whenever appropriate. Also, we might see that some information aggregators become no longer a pure information aggregator by choosing other internet business models or penetrate into traditional businesses.

3 Aggregatee Industry: Shipping Industry

3.1 Industry Overview

According to a research done by Forrester, online retail sales will grow from $172 billion in 2005 to $329 billion in 2010. Online sales will enjoy a solid 14% compound annual growth rate (CAGR) over the next five years. [17] And, of course, as online sales increase, package shipments also increase. E-commerce companies and consumers demand shipping convenience and choices. Many shipping carriers have e-commerce shipping solutions, to name some, UPS, FedEx, DHL, and Airborne. Usually these solutions can be categorized into two types – for individuals and for e-commerce companies. Individuals are concerned about shipping price and service convenience, while e-commerce companies are concerned about not only abovementioned two, but also ease of integration into their entire solutions. Most carriers provide online shipping solutions for free, but within own shipping system. If users want to compare offerings of different carriers, they need to find multi-carrier shipping solutions. This is where shipping information aggregators come to play.

Shipping industry has following characteristics.

❖ A few and powerful players have significant market share. For example, USPS and UPS account for more than 85% of the entire E-Commerce shipping market[18]. These few aggregatees are very powerful.

❖ Aggregatees in the industry hold close and strong about their profit position. They refuse to give up control of any of three customer assets: relationship, data, and transaction. This way, they prevent products and services they provided from becoming commodity. In contrast, passenger airlines industry is pushed by Internet-inspired wars and becomes open.

In the following part of this chapter two case studies of information aggregators in shipping industry will be presented to illustrate how business models of information aggregators in a closed and concentrated industry evolve in order to make profit.

3.2 Intershipper and iShip

3.2.1 Intershipper

Intershipper was founded in 1992 as a spin-off of BITS Inc., which sells network equipment online and hosting online storefronts for various merchants. It's a publicly listed company on Canada TSX stock exchange market[19]. Intershipper provides web-based shipping management services to small Internet storefronts. In fact, the company

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[17] Carrie A. Johnson , http://www.forrester.com/Research/Document/Excerpt/0,7211,37626,00.html

[18] Stamps.com Scoops Up iShip.com To Corner Online Shipping Mkt, Newsbytes News Network, October 25, 1999

[19] www.tsx.com

provides API (application programming interface) to more than ten different shopping cart software products, such as Click Cart Pro, CoolerBiz, and X-Cart (a full list of supported shopping cart software programs can be found in appendix 1). These shopping cart solutions, in turn, are used by various online merchants. The shipping module supports major carriers like FedEx, USPS, and DHL, and provides multi-carrier shipping choices, with package pricing, shipping and tracking functionalities.

The public/manual shipping inquiry is free. That is, by inputting package information such as weights, source zip code, destination zip code and desired shipping services, one can find prices and service details of multi-carriers. For example, if a user wants to ship a 10-lbs package from Cambridge, MA (02139) to Urbana, IL (61801). The website will display available shipping methods from various carriers with their prices. In this case, the price ranges from less than $10 to more than $100 (see Table 3-1).

Table 3-1: Intershipper Shipping Comparison Information

Quick Quote
Summary

From Zip: 01239	To Zip: 61801
Delivery: Business	Weight: 10 lbs

Results

Carrier	Service	Rate
Federal Express	FDX 2nd Day	$32.69
Federal Express	FDX Express Saver	$22.31
Federal Express	FDX First Overnight	$100.11
Federal Express	FDX Priority Overnight	$71.74
Federal Express	FDX Standard Overnight	$66.29
Federal Express	FDX Ground	$8.04
United Parcel Service	UPS 3 Day Select	$21.57
United Parcel Service	UPS 2nd Day Air	$32.69
United Parcel Service	UPS 2nd Day Air AM	$38.37
United Parcel Service	UPS Next Day Air Saver	$66.29
United Parcel Service	UPS Next Day Air	$71.74
United Parcel Service	UPS Next Day Air Early AM	$104.08
United Parcel Service	UPS Ground	$10.05
U.S. Postal Service	USP Express Mail	$45.25
U.S. Postal Service	USP Parcel Post Machine	$16.01
U.S. Postal Service	USP Parcel Post Non-Machine	$16.01
U.S. Postal Service	USP Priority Mail	$16.95
DHL World Wide Express	Next Day Air 10:30 AM	$66.53

However, if customers want to use Intershipper's shipping module in their E-Commerce solution, they have to pay Intershhhipper a monthly fee, which covers a certain amount of transaction, depending on the type of their memberships. If they exceed the transaction amounts, they need to pay overage charge for each package. The members are usually shopping cart software developers, who sell their products to E-commerce companies and auction sites. The cheap entry-level membership allows these small companies, especially start-ups to spend a modest investment before they can test their entire solution. The company charges membership fee from $9.99 to $144.99 per month. Available plans are shown in Table 3-2. [20]

Table 3-2: Intershipper Membership Fee

Plans	Users	Transactions	Overage Rate per Transaction	Charge per Month
Bronze	1	100	$0.1	$9.99
Silver	1	300	$0.09	$24.99
Gold	1	600	$0.08	$44.99
Platinum	1	1200	$0.07	$84.99
Diamond	1	2400	$0.06	$144.99

Note: monthly fees billed by Intershipper are based on the number of shipping rate lookups performed (lookup, instead of actual sales, will incur fee).

One user here means one account. If many users in a business want to use the service simultaneously, the business has to register many user accounts. It's hard to share resource, which is inconvenient for a business unit. While at the same time, enterprise shipping accounts for the largest portion of the entire online shipping industry. The reason why Intershipper didn't develop enterprise solution is not clear. It might be related to the company's origination, which was to support small online storefronts; it might also be because of lacking of key competitive advantages such as marketing and product development, as we can see Intershipper has always been struggled financially (see Figure 3-2).

It is usually anticipated that early movers will get higher market share and have a bigger influence. However, many players compete in this field. Figure 3-1 shows how the entire online shipping market is divided by different channels. Some big E-Commerce companies have their in-house shopping cart solutions, and others use commercial shopping cart software. Some shopping cart software companies develop shipping module by themselves, and yet others integrate publicly available shipping modules, provided by companies like Intershipper. So basically, Intershipper is on the bottom of the chain, competing in a rather small market, and at the same time facing strong competitions from many other companies who provide similar services. Along the chain,

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[20] www.intershipper.com

every decision is based on the benefit-price trade-offs, which imposes big pressure on Intershipper's revenue module. 3.3 The competitive horizon will talk more about competitions Intershipper faces.

Even in the small market, Intershipper is in a disadvantageous position because it can not provide information of some major carriers like UPS. UPS strongly objects any attempt to compare shipping prices, especially when it's done by an outsider. On the other hand, as we can see in 3.2.2, iShip, a whole subsidiary of UPS, also compares shipping prices. In any case, UPS is strong and stubborn enough to inhibit independent aggregators from listing UPS's service into their aggregated offerings. This is also the case of RedRoller (see 3.3.1).
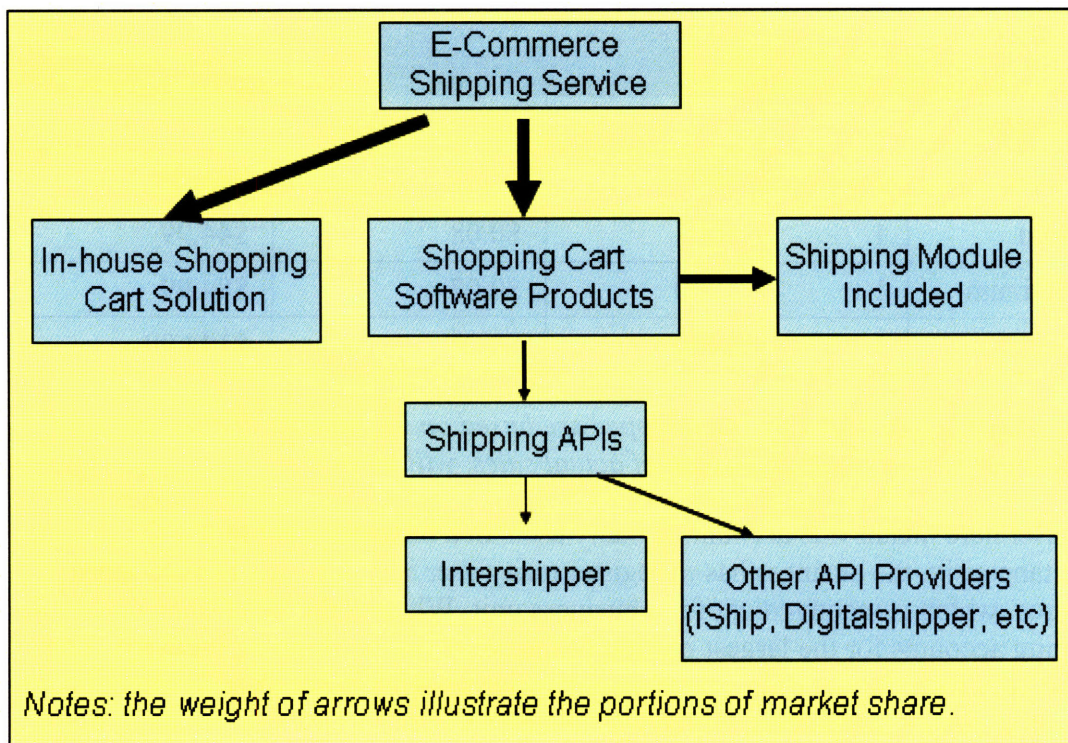
Figure 3-1: Positioning of Intershipper in Online Shipping Service

Since Intershipper actually provides technology solutions to commercial software, following issues are critical to Intershipper's success.

❖ Whether the interface is open and standardized; if it's standardized, Intershipper can develop one universal module for each shopping cart software product on the market. In reality, the interface is not standardized.

❖ Whether major shopping cart software use Intershipper's module or not, which in turn depends on following criteria:

• How many carriers does Intershipper support?

- The software's quality, such as stability, ease-to-integrate, support service, and upgradeability.

A very active shopping cart community: VirtueMart gives us some insight regarding Inthershipper's product and service[21]. Following are some comments copied from the *Shipping, shipping modules & related sub-forum.*

❖ *I have directly contacted Intershipper for help, but they do not offer any support for either the original version of phpShop or Soeren's Mambo port of phpShop.*[22]

❖ *Intershipper is a special module, which I never used and which never really worked for me. I just ported it to Mambo.*

❖ *Original phpShop now threw the Intershipper module out of their distribution v. 0.8.0. I think mambo-phpShop will too don't support Intershipper in the future...*

❖ *There's a UPS webservice available... I think this will be a great alternative to Intershipper for mambo-phpShop...?!!*

❖ *As for Intershipper... You can signup for a free 30 day account with them. This will get you the username and password you need to test your current Intershipper module. Granted, after 30 days if you want to keep the account you would have to pay around $10 USD per month to continue to use their service. A small price to pay to actually get a usable shipping system for your port of phpShop.*

Although it's not a full coverage of the usage of Intershipper shipping module, it is clear that Intershipping solution is mainly used by small businesses because it provides free test account and charge a modest fee for them to deploy the entire shipping solution. On the other hand, the company doesn't provide good services and fast upgrade. The reason might be that the company is short of resources because of ever accumulated operation loss (see Figure 3-2, detailed data can be found in appendix 2)[23]. Actually, in 2003 the company outsourced its software development to iMSR[24].

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[21] http://www.virtuemart.com/

[22] Mambo is a Content Management System (CMS). It is the engine behind websites that simplifies the creation, management, and sharing of content. In the hands of a custom developer, Mambo is a powerful platform for a wide variety of Internet applications that go far above and beyond the simple creation of content. http://www.mamboserver.com/index.php?option=com_content&task=view&id=81&Itemid=86

[23] http://www.tsx.com/

[24] Intershipper Quarterly Report, 5/31/2003
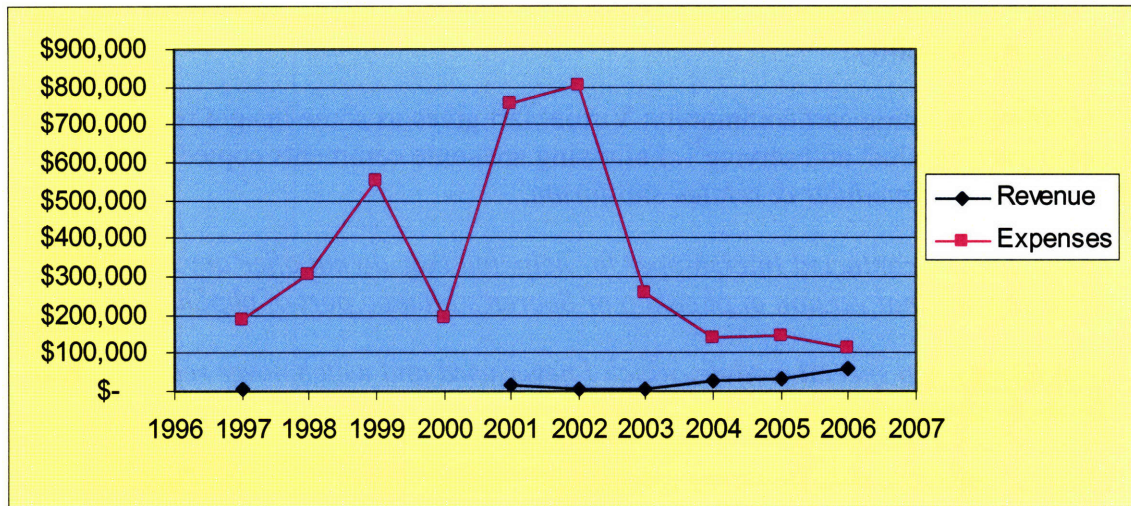
Figure 3-2: Intershipper Revenue vs. Expense 1997-2006

In 2006, Intershipper's annual revenue is $56,553. [25] Its major customers are small website storefront. Suppose that all of their customers are bronze registered users, so each package sent using Intershipper's service contributes $0.1 to the annual revenue. Annual revenue of $56,553 means altogether there are 565,530 packages sent using Intershipper's service. Assume each package costs $16 on average, so the actual market size of the shipping using Intershipper's service would be $9,048,480 (= 565,530 * $16). If the entire online shipping market is 1 billion dollars[26], the market share of Intershipper would be 0.9% (=$9,048,480/1,000,000,000) (see Table 3-3).

Table 3-3: Intershipper Market Share in Online Shipping

	A	B	C	D
1				Comments
2	I	Annual Revenue ($)	$ 56,553	year 2006
3	n p	Fees Intershipper Charge Per Package ($)	$ 0.1	assume all users are Bronze users (*note 1*)
4	u	Average Cost Per Package ($)	$ 16	
5	t	E-Commerce Shipping Service Market Size ($)	$1,000,000,000	
6	O u	Packages Sent Using Intershipper's Service	565,530	=C2/C3
7	t p	Market Size of Shipping Service Using Intershipper's Service ($)	$ 9,048,480	=C6*C4
8	u t	Market Share of Intershipper in E-Commerce Shipping Service	0.90%	=C7/C5
9				
10		*note 1* : if not all users are Bronze users, the calculated market share will be even lower.		

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[25] http://www.tsx.com/

[26] Services Compare Shipping Costs Instantly, InternetWeek: 9, June 12, 2000

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3.2.2 iShip

iShip, Inc.'s founders got their start in the shipping business in 1993, when UPS (United Parcel Service) contracted with them to develop UPS OnLine Professional. [27] In 1997, iShip.com was founded to provide Internet shipping service, and signed MBE (Mail Boxes Etc.) as the first customer.

In October 1999, Stamps.com purchased iShip.com in the hope to provide Internet-based end-to-end shipping services. Stamps.com introduced the iShip Enterprise Service for corporate customers in May 2000. Also, Stamps.com deployed iShip's services at MBE stores. However, the business with MBE was severely impaired when UPS bought MBE in March, 2001 and announced not to continue using iShip's services. Eventually, in May 2001, UPS acquired iShip.com to enhance its Internet shipping capacity.

Today, iShip is an independent, wholly-owned subsidiary of UPS. Its mission is to give customers shipping insight through Internet-based, multi-carrier shipping services. [28]

iShip provides free online services like Price It, Track It, and Sell It. When users input package weight, source zip code, destination zip code, they can get a list of services from various carriers with their list price (see Table 3-4). The functionality is similar to that of Intershipper, but with a more intuitive interface. Users can also track multi-carrier packages online. In 1999, eBay entered a 5-year deal with iShip. At that time, eBay users send 150,000-200,000 items daily, responsible for almost 5% of all packages shipped between people in the US[29].

Table 3-4: iShip PriceIt
10-lbs package, source zip code – 02139, destination zip code – 61801 [30]

iShip also provides UPS and MBE stores with similar services, helping these retail stores to price, ship and track packages with multi-carriers. In 2000, when Stamps.com owned the company, it charged customers 75 cents for each package shipped.[31] At that time

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[27] http://www.iship.com/about_history.htm

[28] http://www.iship.com/about_history.htm

[29] EBay Plans To Provide Integrated Shipping, Newsbytes News Network, April 12, 1999

[30] www.iship.com

[31] Stamps.com To Unveil Web Services To Ship Packages, Information Week: 140, June 05, 2000.

Stamps.com was deploying iShip's services at 1,400 Mail Boxes Etc locations. However, when UPS bought MBE in March, 2001, UPS announced that it would stop deploying iShip's service in MBE stores[32]. According to 2000 annual report of Stamps.com, *United Parcel Service has informed us that it is unlikely to have Mail Boxes Etc. USA, Inc. continue to use our online shipping services in the future. These events bring into doubt the realization of revenue from our investment in iShip.com, Inc.* Stamps.com eventually reduced their valuation of iShip and sold the company to UPS in May, 2001. Now, the product is deployed in over 4,200 UPS Store franchises, Mail Boxes Etc. franchises and over 1,000 UPS Customer Centers nationwide to ship tens of millions of packages annually[33]. The fee is now unclear. UPS might provide this service for free to these stores. By doing so UPS actually adds the switching cost of these stores, and eventually binds them closer to it.

For enterprise customers, iShip provides a Web-based shipping solution that allows users to centrally manage shipping activities across multiple carriers and corporate locations. iShip doesn't disclose carriers included in enterprise solution. The overall number of supported carriers might be large. On the other hand, carriers for each client might be highly customized, which means, iShip may add or remove carriers based on enterprise customers' real business needs, depending on their own relationship and contracts with various carriers. Because iShip's service is tailored and complement the real-world business relationships between enterprises and their shipping service providers, shipping service providers should be willing to cooperate with iShip. In the end of 2000, while iShip was owned by Stamps.com, it had 17 committed enterprise customers, with estimated annual shipping transaction volume of four million packages[34]. Current number of customers is unclear, but it's unlikely that iShip provides it for free since this product provides aggregated information of multi-carrier.

Based on above analysis, it is estimated that in 2000, annual revenue of iShip was near $20 million, divided by following categories.

❖ E-Commerce: $5.5 million

Table 3-5: iShip E-Commerce Revenue

	A	B	C	D
1				Comments
2	Input	Number of Items eBay Users Send Daily	150,000	year 1999
3		Fees iShip Charge Per Package ($)	0.1	same as Intershipper
4	Output	E-Commerce Revenue ($)	5,475,000	=C2*C3*365

❖ Enterprise Service: Product, the basic revenue $3 million

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[32]Stamps.com, Form 10-K, for the fiscal year ended December 31, 2000

[33] iShip shipping solutions – Retail, http://www.iship.com/solutions_retail.htm

[34] Stamps.com Sees Losses Mount… Online Reporter, November 06, 2000

Table 3-6: iShip Enterprise Service Revenue

	A	B	C	D
7				Comments
8	Input	Annual Number of Shipping Transactions	4,000,000	
9		Charges Per Transaction	0.75	year 2000
10	Output	Enterprise Service Revenue ($)	3,000,000	=C8*C9

❖ Retail Service: $11.5 million

Table 3-7: iShip Retail Service Revenue

	A	B	C	D
13				Comments
14		Number of Franchise Stores	1,400	year 2000
15	Input	Packages Send Per Store Per Day	30	assumption
16		Charges Per Package Shipped ($)	0.75	price starts at $0.3
17	Output	Retail Service Revenue ($)	11,497,500	=C14*C15*C16*365

Figure 3-3 depicts the revenue distribution of e-commerce, enterprise service, and retail service.
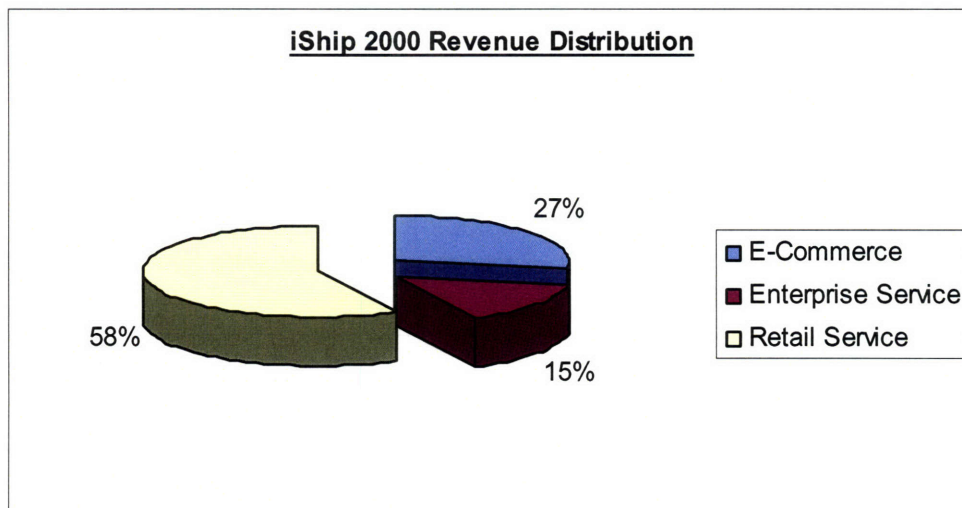
Figure 3-3: iShip Revenue Distribution

Based on above data, it is clear that potentially iShip can make good profit, especially from retail service. However, as mentioned above, when UPS acquired MBE and announced discontinuing of iShip's service, the revenue of this part was severely impaired. On the other hand, after UPS bought iShip, it actually expanded iShip's service to all MBE stores and its own stores. It is not clear how UPS charges for this. UPS might

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just see iShip as a strategic existence, which gives UPS the leverage to own the three customer assets: relationship, data, and transaction. Only data itself would be very valuable to UPS because that data has shipping information of multi carriers. UPS can mine the data to find out customer shipping patterns. Also, it can find out potential market growth and adjust its strategy to capture it. It can even monitor performance of its competitors and carry out more guided competition.

Table 3-8 listed major events happened on iShip's history. It's interesting to notice that UPS actually gave birth to iShip. iShip then grew on its own in the Internet boom and provided powerful tools in online shipping. Companies tried to integrate iShip's service into their end-to-end solutions. During this course, iShip's worth fluctuated along with its relationships with major players in this industry. In the end, it was purchased by the most powerful player in shipping industry – UPS, and became part of UPS's total solution to its all types of customers.

Table 3-8: iShip Business Development

Time	Event	Comments
1997	Founded as Internet Shipping Service Center	iShip, Inc.'s founders got their start in the shipping business in 1993, when UPS contracted with them to develop UPS OnLine Professional.
April, 1999	eBay Inc, talk with iship to offer its customers online shipping service through a 5-year deal	eBay users send 150,000-200,000 items daily responsible for almost 5% of all packages shipped between people in the US.
October, 1999	Stamps.com purchased iShip.com for $305 million[35]	Planned to deploy iShips Internet shipping service to 3,500 MBE franchises. Stamps.com charges 75 cents per transaction.
March, 2001	MBE was bought by UPS	Finished deploying iShip multi-carrier shipping services in 1,400 MBE franchises UPS said it was unlikely that MBE continued to use iShip's multi-carrier shipping service
May, 2001	UPS bought iShip for $2.8 million[36]	After acquisition, UPS deployed iShip's multi-carrier shipping services in its

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[35] Stamps.com agrees to acquire Iship.com, New York Times (National Edition), CXLIX (51,687): C4, October 26, 1999

		4,200 MBE franchises and UPS franchises and more than 1,000 customer centers.

In 2005, iShip achieved revenue of $5 million[37]. It is safe to assume that UPS is not very eager to advertise or deploy multi-carrier services because it might cannibalize its own business. On the other hand, online shopping is increasing dramatically in recent years, and so does online shipping. In 2005, for example, online shopping increased 22 percent, extending a seven-year trend of double-digit growth.[38] UPS can definitely just leverage iShip to acquire this market share without requiring iShip itself to be profitable. For example, with the data from multiple carriers, UPS can get a better understanding of the market trend and its own advantages and disadvantages, and therefore adjust accordingly. Also, knowing information of other carriers gives UPS more insight and bargain power when negotiating with E-commerce companies.

3.2.3   Comparison between iShip and Intershipper

It is clear that iShip has a better performance than Intershipper. The reasons are as following.

❖ iShip is the subsidiary of major E-commerce shipping players, first Stamps.com, and then UPS, which gives it bigger leverage to negotiate with E-Commerce companies. For example, UPS can give shipping discount to those companies if they choose to work with iShip. It's a win-win situation.

❖ iShip can integrate almost all the major carrier information, while Intershipper can't provide shipping information of UPS, possibly due to UPS's objection (see 3.3.1 for UPS' comments on RedRoller. UPS might have similar attitude towards Intershipper).

❖ Technology didn't play an important role here, at least in the beginning. As time goes by, iShip may get its product better because it has more budget, resources and leverages.

❖ The only chance for independent information aggregator Intershipper to win is to be technically strong enough to acquire significant market share of online small storefronts shipping service. When it achieves this, it has power to negotiate with shipping carriers such as UPS, or UPS will ask to be added into Intershipper's list. If Intershipper can't achieve this, it will go through a deteriorating cycle.

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[36] Stamps.com Form 10-K, year ended at December 31,2001

[37] Hoovers Online

[38] UPS Annual Report 2005

3.3 The Competitive Horizon

3.3.1 Other Aggregators

There were many other information aggregators, especially in late 1990s, when Internet boomed. However, most of them didn't make good profit, and later either changed their courses or were bought by other companies (see Table 3-9).

RedRoller, a newly established company, boasts software by eBayer and for eBayer. Established in 2006, the company plans to make profit from advertising and click-through to major carriers. RedRoller doesn't aggregate information from UPS. Actually, UPS made following comments on RedRoller, "*We don't have any issues with companies that want to compare shipping prices. We feel like we offer a great value, and we offer the best technology to support it.... We resist companies that attempt to insert themselves between us and our customers.*"[39] UPS is a behemoth in shipping industry and as it stated, it offers a complete portfolio of products and services to its customers, and it is very alert to any attempt to take from them the three customer assets: relationship, data, and transaction. RedRoller has to face the animosity between UPS and itself.

Table 3-9 shows a list of shipping information aggregators[40]. It in the other perspective indicates the fierce competition in this area. Some of them did very good job in collecting source information, for example, TanData can provide the price of shipping for more than 700 major carriers. Some promoted standard in this industry, such as GoShip.

Table 3-9: Other Shipping Information Aggregators

Company	Setup time	Developments	Current status
TanData	1980	Its software can provide the price of shipping for more than 700 major carriers, from FedEx to Yellow Freight.	In 1995, entered internet shipping market. Bought by ConnectShip, Inc., a wholly-owned subsidiary of UPS on August 15, 2001.
GoShip.com	1999	The company tried to boast the standard in this industry. The company made money by	Not a shipping information aggregator anymore.

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[39] www.redroller.com

[40] UPS Acquires iShip.com Assets, Online Reporter, May 28, 2001

OKLAHOMA'S TANDATA SOFTWARE A HIT WITH MICROSOFT, Tulsa World (OK), December 21, 1996

		charging online merchants a transaction fee that range from 50 cents to a dollar per order depending on volumes.	Not in shipping industry.
RedRoller	2006	The company plans to make money selling ads and shipping supplies and by charging "click-through" fees to some shipping firms. Consumers who compare shipping prices aren't charged. The service is free to the more than 7.9 million small businesses in the US and can save them as much as 25%-50% on annual shipping costs.	Carriers include U.S. Postal Service, DHL, FedEx, Eastern Connection and Overnite Express.

It is interesting to notice that RedRoller employs different business models.

- Selling ads. When navigating through RedRoller's website at http://www.redroller.com (see Figure 3-4), I found that there are no clear advertisements. Since RedRoller just started in June 2005, it might have not recruited many advertisers.

- Selling shipping supplies. Figure 3-5 shows RedRoller's shipping supplies webpage. RedRoller's homepage (Figure 3-4) shows that the major functionality/value presented to customers is shipping service comparison. Although it's a good idea to present shipping supplies together with shipping comparison services, selling shipping supplies is a totally different business, requiring different competitive advantages in areas such as marketing and operation. Even if RedRoller only intends to aggregate online shipping supplies information, it requires an entire set of different assets and competencies. For example, in comparison services, aggregatees are shipping firms; while in shipping supplies, aggregatees are shipping supply online stores. In any case, shipping supplies is a serious business in its own right. My own experience suggests that RedRoller hasn't put much effort in this aspect. As an example, I selected three items on the website - 2 Boxes and 1 Binder Clips; for all three products I was re-directed to the same website: http://www.discountofficesupplies.com/. If RedRoller doesn't provide value-added services, it's hard to convince customers to use its services instead of going directly to shipping supply online stores.

- "Click-through" fees to some shipping firms. Because RedRoller didn't disclose this information, it's hard to estimate whether it's successful or not. On the other hand, due to power balance between RedRoller and shipping firms such as USPS, DHL, and FedEx, it's safe to assume that RedRoller has very little bargain power to negotiate a lucrative contract.

Figure 3-4: RedRoller Homepage

Figure 3-5: RedRoller Shipping Supplies

Nevertheless, if RedRoller can accumulate a large customer base, it can definitely thrive from these three business models. In fact, accumulating customer base is exactly RedRoller's strategy. RedRoller's homepage (see Figure 3-4) clearly conveys the signal that it's on customers' side – to serve end customers, saving their money and time, and

for free. RedRoller's strategy and objective are similar to Zillow's; see Zillow case study in chapter 5 for what techniques it employs to accumulate customer base.

3.3.2 Competitors Who Are Not Information Aggregators

As mentioned in the earlier part of this chapter, all major carriers provide free service package to their customers. Usually, these services are less attractive than those of aggregators because carriers usually only provide information of their own services. On the other hand, carriers can provide more sophisticated functionalities because they have more resources and own the entire three customer assets: relationship, data, and transaction. In order to compete with carriers, information aggregators have to present a good ROI (return on investment). Besides shipping carriers, ERP software vendors are another kind of competitors because some of them integrate shipping and logistics management functionality into their products. In addition, some companies provides stand-alone off-line software products to small businesses, for example, UPSS (Universal Parcel Shipping Software), a multi-carrier packaging and shipping software company, supports UPS, FedEx, USPS, and DHL[41]. It can also integrate those carriers free online service interface. The company charges $499 for the software product.

In summary, shipping information aggregators face competition from following parties:

❖ Free service package provided by major carriers

❖ ERP software vendor's shipping and logistics module

❖ Stand-alone off-line software programs

3.4 Conclusion

Shipping information aggregators, by providing comparison aggregation, mainly focus on acquiring customer relationship. Depending on what carriers aggregators include in their comparison and what criteria they compare, aggregators actually influence customers' shipping choices. Some information aggregators also own customer data. For example, UPS can get customer shipping data via iShip's multi-carrier enterprise solution. In Interhshipper's case, shopping cart solution providers, instead of Intershipper, own the data. As to transaction, because actual shipping services require substantial infrastructure, shipping carriers, not aggregators, own transaction. On the top, no matter who owns what customer assets, in shipping industry, a few powerful aggregatees resist losing the control of any customer asset.

In a closed and concentrated industry like shipping industry, information aggregators can build their business models by integrating into carriers' vertical solution, like iShip has done. In order to achieve that, the information aggregator has to partner with traditional players to get company specific information. Aggregator also needs to acquire and integrate customized information such as negotiated shipping rate and company shipping

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[41] www.upss.com

policies. Compared with independent aggregators, partnership aggregator has following advantages:

- ❖ Richer information source – not only publicly available information, but also proprietary information, such as information of specific discount rate.

- ❖ Can be easily integrated into the end-to-end solution.

- ❖ Can easily provide tailored service to its customers - for example, can tailor the shipping service based on the company's shipping policies.

The relationship with a few powerful aggregatees is critical to the success of information aggregators. Without powerful aggregatees' backup or at least consent, it's very hard for information aggregators to provide a complete solution, to acquire market share, and ultimately to make profit.

Business models analysis in this industry is as follow:

- ❖ Advertising – RedRoller plans to use it. Right now, RedRoller's website doesn't clearly show any advertisements, so whether it's effective is still a question. Most aggregators didn't adopt this revenue model. Shipping information is dynamic, based on many parameters such as package weight, delivery date, and distance. It's hard for carriers to advertise. Also, there is little value for them to advertise because many service charges are actually customized.

- ❖ Brokerage - it's not used by any aggregator. Shipping service providers and service recipients directly connect with each other.

- ❖ Subscription – Intershipper charges its users monthly subscription fee.

- ❖ Licensing – it's used by TanData. UPS marketed software built around TanData's Transportation API, and license the API to other software developers.

- ❖ Infomediary - not used.

- ❖ Referral/click-through. GoShip.com made money by charging online merchants a transaction fee. RedRoller also plans to use it.

- ❖ Customized/personalized service – iShip provides this service in their enterprise software products.

- ❖ Professional service/consulting – iShip provides this service to enterprise users.

- ❖ Application service provider – not used.

4 Aggregatee Industry: Financial Service Industry

4.1 Industry Overview

As of mid-2002, there were 7,966 commercial banks, 1,500 savings institutions in U.S., accounting for over 90% of the assets of the banking system[42]. Many of the financial institutions offer online banking service. Online banking usually offers such features as[43]:

❖ *Bank statements*

❖ *Electronic bill payment*

❖ *Funds transfer between a customer's own checking and savings accounts, or to another customer's account*

❖ *Investment purchase or sale*

❖ *Loan applications and transactions, such as repayments*

❖ *Account aggregation to allow the customers to monitor all of their accounts in one place whether they are with their main bank or with other institutions.*

There are at least five benefits of online banking:

❖ Convenience

❖ Ubiquity

❖ Transaction Speed

❖ Efficiency and Effectiveness

❖ Cost Reduction. On average, an in-branch transaction costs $1.50, an ATM transaction costs 55 cents, and an Internet transaction costs just 1 cent[44].

The flourish of online banking formed base for account aggregation development. As number of accounts and types of accounts one user owns increase, the need for an integrated account management system increases. More and more complicated online transactions like bill payment, investment purchase or sale, and loan management also require such a system. On the other hand, account aggregation improves capacity of complex online transaction by pulling all relevant information to the same place at the same time.

Account aggregation solution providers emerged in late 1990's. They initially provided account aggregation, which integrates user's email accounts, reward accounts, bank accounts, and others into a single web-based interface. As this chapter will show, later they penetrated into almost all aspects of online banking, such as electronic bill payment,

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[42] Commercial Banking Forecast Q2, 2004, BMI research

[43] http://en.wikipedia.org/wiki/Online_banking

[44] The Internet and Beyond: Banking in the Next Millennium, Calvin D. Johnson

funds transfer, and investment management. User base, number of clients, and partners of account aggregators have increased greatly since their inception.

Bank's attitude toward account aggregation is mixed. In the early phase, banks were skeptical about the service, mainly out of privacy and security concern. The early adopters are primarily web portals such as AOL, YAHOO, and MSN. Although later many banks provide account aggregation services in its online banking solutions, banks usually don't promote the service very much. One example magnifies the mixed feeling of banks towards account aggregators. Citibank's My Accounts service was one of the first major account aggregation services, though this service ended in late 2005 without explanation from Citibank. [45] Citibank's customers strongly complained about the inconvenience, [46] yet Citibank didn't resume the service. While banks hesitated to adopt account aggregation service, aggregators realized in the very early phase that they have to work together with banks because customers trust their relationships with their banks the most. Currently, many big financial institutions provide account aggregation services through their online banking offers, to name some, BankofAmerica MyPortfolio, HSBC EasyView, Fidelity FullView, and Wachovia OneStop.

The following part of the chapter will study aggregators and explore answers for following questions:

❖ Why do banks want to use aggregator's service; has the investment of banks paid off?

❖ What's the relationship between aggregator and aggregatee?

❖ How do products and services provided by aggregators change along time?

4.2 VerticalOne and Yodlee

4.2.1 Yodlee

Yodlee is a leading account aggregator. It was founded in February, 1999. Since then, Yodlee has greatly increased its user base and struck deals with various clients, including 30 of the top 50 global financial institutions. Yodlee partnered with security companies such as Arcot Systems Inc. and PassMark Security Inc. in order to comply with higher security standards and requirements. Also, Yodlee partnered with internet banking software and services providers like S1 to utilize their distribution channels. In 2005, Yodlee's achieved annual revenue of $16.5 million[47].

Yodlee experienced several stages during its development. The first phase is between its inception and August, 2003. In this phase, Yodlee mainly developed and marketed its account aggregation product. Web portals and financial service providers (FSP) paid Yodlee licensing and per-user fees for the aggregation service, which can range from

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[45] Yodlee Gets Discover Pact, Loses a Citi One. American Banker, 170 (127): 11, July 05, 2005. ISSN: 0002-7561

[46] http://www.fatwallet.com/forums/arcmessageview.php?catid=52&threadid=511100

[47] Hoovers http://premium.hoovers.com/subscribe/basic/factsheet.xhtml?ID=hcchjyjx

$100,000 to $300,000. [48] The growth of the company was indicated by the increasing number of adopters, both end user wise and web portal/FSP wise. Yodlee did a good job in this period. The initial adopters were web portals like AOL, MSN, and AltaVista. Portals had been quicker to accept the account aggregation tools because their structures and recent genesis enabled them to move faster. Later Yodlee signed up with some major FSPs like Bank of America, CitiGroup, Chase Manhattan, and Wells Fargo. Yodlee eventually became the market leader, and merged with the second runner VerticalOne in January, 2001[49]. The new merged company had 88 clients with altogether 425,000 end users. After the merge, Yodlee continued to increase its customer base. Till November, 2002, the number of end users was 3,300,000 and the number of clients was 150. The company managed to grab account information from more than 7,000 websites[50]. Figure 4-1 depicts the growth of end users and company clients (detailed data can be found in appendix 3).
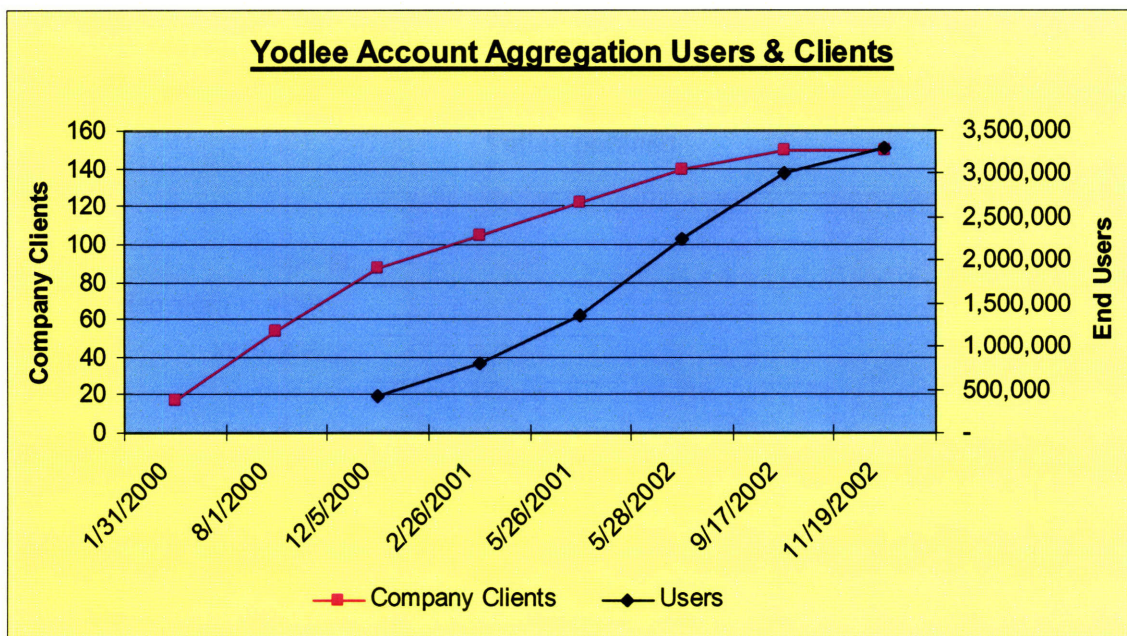
Figure 4-1: Yodlee Account Aggregation Adoption Curves

In the first phase, although the number of users grew very fast, Yodlee actually didn't bring direct revenue to FSPs. Generally FSPs provide the service for free. So what is the motivation behind all these financial institutions? To answer this question, one thing comes into the view. While Yodlee provides software to large web portals and banks, it also provides free account aggregation services on its own website. Banks usually license one version of the software and keep using it, while Yodlee always has the newest version on the website. So what's the motivation of Yodlee doing this, in spite of possible

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[48] First Union to Offer Aggregate Service to Show All Accounts, Charlotte Observer (NC), November 07, 2000

[49] Top 'screen-scrapers' agree merger, Retail Banker International: 1, December 12, 2000

[50] Fidelity Taking Yodlee Aggregation In-House, American Banker, 167 (222): 19, November 19, 2002. ISSN: 0002-7561

cannibalization to its clients? To answer this question, we need to look deep into the relationships between Yodlee, FSPs, and end customers. As mentioned above, FSPs initially didn't like Yodlee's service. On the other hand, end customers like the services and pushed their FSPs to provide this service. So basically the small ecosystem here is customer driven. By providing free aggregation service on its own website, Yodlee can achieve at least two benefits. First, it can set up brand name; second, it can educate customer and accumulate customer base, which then gives Yodlee more leverage in its market efforts. The essential base here is that customers actually like the product/service. That's exactly the case. The solution Yodlee provides is very sticky. Once the consumers use it, they tend to depend on it. Eventually, consumers will be the big promoter of Yodlee products to their banks. Figure 4-2 shows how Yodlee's product might affect customer acquisition[51].

Q: If a financial institution--other than one you already have a relationship with--offered Yodlee BillPay and Yodlee PersonalFinance, how likely would you be to establish an account at that bank to use the online banking suite?
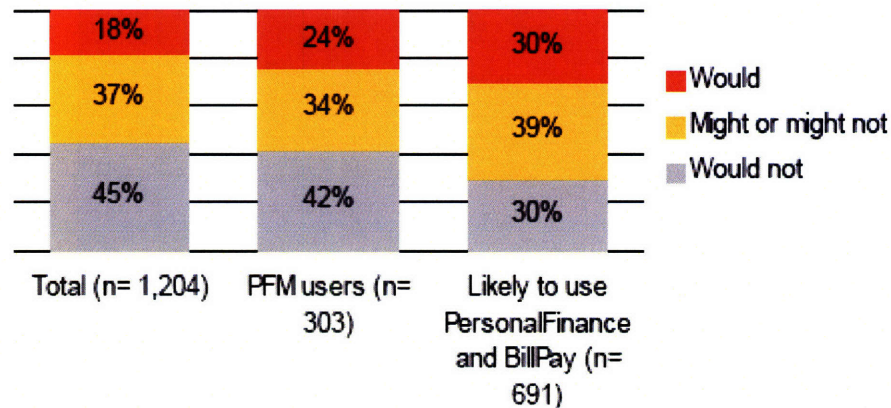
Figure 4-2: Enhanced Functionalities as a Customer Acquisition Factor

Although end users and clients grew very rapidly, Yodlee's business model was weak because of two reasons:

- ❖ The service is free for end constomers, so no direct revenue for FSPs, while FSPs have to pay Yodlee license fee.

- ❖ Except for higher customer retention rate, FSPs see no direct business opportunities from this service. To benefit from aggregated data, FSPs have to do data mining. However, in this phase, both customer base and customer activity level are relatively low for any single FSP, so data mining is not very meaningful. Also, data mining itself requires big investment, and doesn't guarantee success.

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[51] Aite's white paper on Next-Generation Online Banking and BillPay, http://corporate.yodlee.com/, November 2006

In this phase, Yodlee marketed the service as stand-alone. There are two characteristics of this approach: the solution itself is stand-alone, and the distribution channel is independent.

The second phase is between August, 2003 and April, 2006. In this phase, on top of its account aggregation, Yodlee developed bill payment and presentment product BillPay and fund transfer product FundsTransfer. Yodlee charges $2 per user per month for BillPay[52]. According to Yodlee[53], *BillPay gives financial institutions the lowest total cost of ownership by: 1) additional interchange revenue and interest on carried balances for bills paid by credit or debit cards, 2) shared savings from least cost routing, and 3) increased overall profitability per customer.* Yodlee estimates that BillPay can bring over $40 in revenue to FSP per user per year. [54] The average number of bills one user pays per month is 3, and the average charge per bill is $62.5, so the total monthly amount one user pays via BillPay is $187.5. If a user uses credit card to pay the bills, FSP gets an interchange fee[55] of 1.8 percent of the entire transaction amount, that is, an interchange fee of $3.375 per month, so the annual revenue is $40.5 (see detail in Table 4-1). Meanwhile, BillPay brings annual revenue of $24 per user to Yodlee (see detail in Table 4-2).

Table 4-1: FSP's BillPay Annual Revenue Per User

	A	B	C	D
1				**Comments**
2		Bills Per User Per Month	3	
3	**Input**	Average Charge Per Bill ($)	62.5	
4		Percent of Interchange Revenue if Using FSP's Credit Card	1.8%	
5		**Total Amount Paid Via BillPay Per User Per Month ($)**	187.5	=C2*C3
6	**Output**	**BillPay Revenue Per User Per Month ($)**	3.375	=C4*C5
7		**Annual BillPay Revenue Per User (FSP) ($)**	40.5	=C6*12
8				
9	*Note: in case of debit card, the rate of interchange revenue would be 0.8%, so annual revenue would be $20.*			

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[52] EBP&P: Yodlee Leaps into Tough E-Billing Game. Ready?: Yodlee's BillDirect puts it in direct competition with the likes of Wells Fargo, BofA and CheckFree. Some hail it as groundbreaking. Others doubt its usefulness. US Banker, 113 (10): 17, October 2003. ISSN: 0148-8848

[53] Yodlee BillPay brochure, http://corporate.yodlee.com/

[54] Yodlee BillPay brochure, http://corporate.yodlee.com/

[55] Definition of interchange fee and the approximate rate in the United States. http://en.wikipedia.org/wiki/Interchange_fee

Table 4-2: Yodlee's BillPay Annual Revenue Per User

	A	B	C	D
9				Comments
10	Input	Charge Per User Per Month ($)	2.0	
11	Output	**Annual BillPay Revenue Per User (Yodlee) ($)**	**24.0**	=C10*12

FundsTransfer greatly boost customer activities on the website of FSP, resulting in deeper relationships and higher retention. Also, it brings more deposit. According to Yodlee, 70% of fund transfers are in-bound[56].

We can see Yodlee's strategy in developing these two products – to develop revenue generating applications for FSPs. Compared with the products Yodlee provided in first phase, obviously second phase products are more sustainable. Another big change in this phase is that Yodlee partnered with major internet banking solution providers like S1. Yodlee did this for two reasons: to integrate its own product into the entire online banking solutions; to utilize the established delivery channels. This phase marked Yodlee's transition from providing stand-alone solutions to providing a more integrated solutions.

The third phase is after April, 2006. This phase is about product reorganization and optimization. Many FSPs prefer in-house development, so Yodlee provides Software Development Kit (SDK) tools. Also, Yodlee tried to integrate its product with more partners to provide end-to-end solutions in a wide area. For example, Yodlee partnered with EISI (www.eisi.com) to import aggregated financial information into EISI's financial planning application. Equipped with Yodlee's aggregated account information and EISI's financial planning functionalities, EISI financial professionals are able to perform better services for their clients.

- EISI professionals understand their clients' financial situation thoroughly with the access to clients' multiple accounts, and therefore can provide sound investment suggestions.

- EISI professionals can present their clients more choices.

- The aggregated information facilitates better communication between EISI professionals and their clients and makes real transactions more efficient.

In addition to abovementioned benefits, such kind of alliance creates value for Yodlee as well. For example, even if Yodlee can develop similar products as EISI's, it takes long time to develop the product and huge efforts to market the product. By bundling its product with established companies like EISI, Yodlee can not only gain revenue from sales or licensing, but also achieve bigger market share.

Aligning with its move towards better integration with third-party solution providers, in this phase Yodlee focused on SDK, platform, and customer care development. In this

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[56] Yodlee FundsTransfer brochure, www.yodlee.com

way, Yodlee becomes a platform or at least a valuable interface for various software vendors. Figure 4-3 depicts Yodlee's current solution portfolio[57].
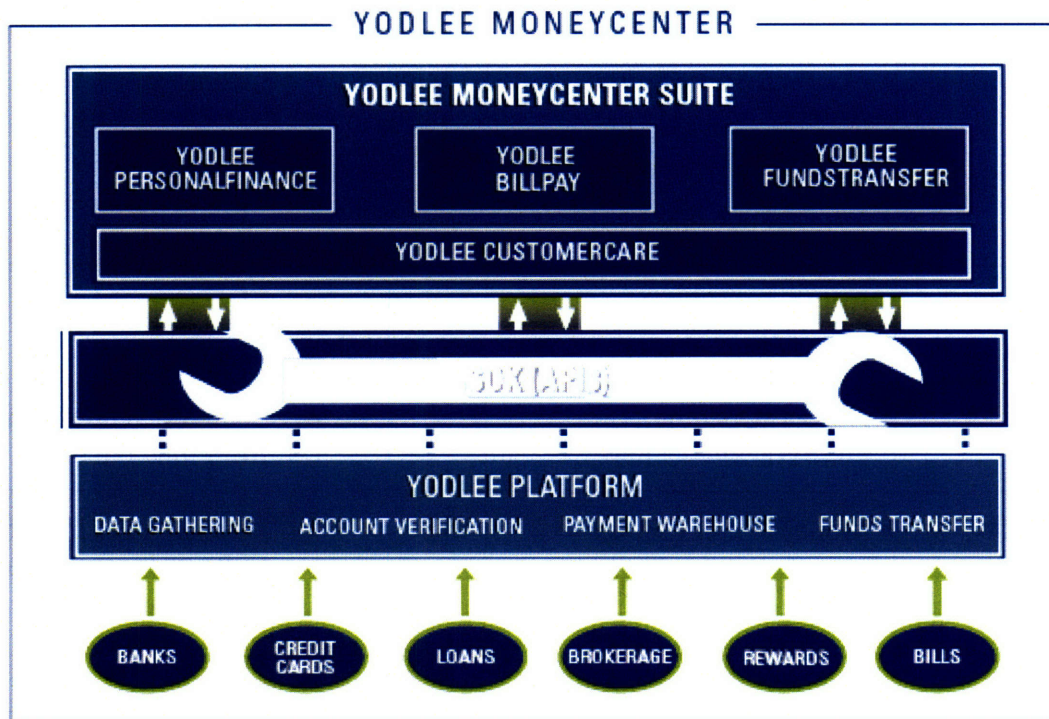
Figure 4-3: Yodlee MoneyCenter

In fact, there are mixed development in each stage. For example, already in January, 2001, Yodlee partnered with WealthMetrics.com to provide an integrated solution for investment management and financial planning tool[58]. The three-stage presentation just gives an approximation of how Yodlee actually sees itself in the internet banking solution market and how its strategy is formed and implemented.

In May, 2002, Yodlee tried to mine users' financial data[59], but it's not clear whether this attempt was successful or not. The author guesses that it was failed. [60] Several factors might contribute to this failure. Firstly, banks were not happy about data mining because of interest conflicts and security concern. Secondly, data mining requires big investment.

Table 4-3 summarizes the phases Yodlee experienced.

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[57] Yodlee MoneyCenter, http://corporate.yodlee.com/solutions/personal_finance/yodlee_moneycenter.htm

[58] WealthMetrics.com and Yodlee form an alliance, Private Banker International: 3, January 16, 2001. ISSN: 0953-7031

[59] Screen Scraping, Part 2, American Banker, 167 (101): 1, May 28, 2002. ISSN: 0002-7561

[60] The author can't find any coverage regarding the result of this effort. If it's an ongoing activity, Yodlee must want to capitalize mining results, but there isn't this information in Yodlee's portfolio of products and services.

Table 4-3: Yodlee Business Development Phases

Time Period	Major Products/Services	Partners	Revenue Model
February, 1999 to August, 2003	• Account Aggregation (2000) • Yodlee2Go (2000) • Advisor Pro (2002)	Various security companies	• Licensing • Per-user fee
August, 2003 to April, 2006	• Bill Direct (2003) • Card Direct (2003) • AccountOpening, FundTransfer (2005)	Billers, S1, Corrilian	• Licensing • Per-user fee • Shared revenue with Bank from funds transfer
April, 2006 on	• MoneyCenter (2006) • BillPay AccountAccelerator (2006)	EISI	• Licensing fee from both FSPs and internet banking solution providers • Per-user fee • Shared revenue with Bank from funds transfer

Besides dealing with various partners and clients, Yodlee needs to pay attention to value conflicts between end users and FSPs. One product provided by Yodlee is BillPay AccountAccelerator. With this product, customers can port their BillPay set-ups from one FSP to another in just a few simple steps. Contents which can be ported include payee information, payment schedules, and configurations. [61] Before this product, if users want to switch between FSPs, they have to delete all billing information in one FSP and set up the accounts manually in another FSP. Although Yodlee claims that this is a sticky solution which helps FSP attract customers and retain them, obviously it decreases users' switching cost between FSPs.

4.2.2 VerticalOne

VerticalOne was founded in 1998. It offered similar services as Yodlee - account aggregation. VerticalOne was clearly a second player in this area. In February, 2000, VerticalOne had 30,000 users[62] (the merged company had 425,000 users).

Besides their similarity in products and services, Yodlee and VerticalOne developed their businesses in similar way. VerticalOne struck deals mostly with portals, and later with to

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[61] http://corporate.yodlee.com/solutions/personal_finance/billpay_accountaccelerator.htm

[62] Two More Sites Set to Add Account Aggregation, American Banker, 165 (40): 10, February 29, 2000. ISSN: 0002-7561

banks. Moreover, VerticalOne also partnered with security companies to be compatible with their softwares.

On the other hand, VerticalOne adopted a different approach on how they make money. VerticalOne made money by attracting people to company Web sites. Discover Card, for example, pays VerticalOne for the extra customers VerticalOne's service draws to its site. VerticalOne also takes a cut of the ads sold on the Web pages containing the customer account information[63].

VerticalOne was bought by S1 in September, 1999, for $163 million in stock, in the hope that VerticalOne's product will complement S1's offerings in internet banking[64]. S1 didn't perform well during the next one to two years, and VerticalOne wasn't integrated into S1's product very well. In January 2001, S1 sold VerticalOne to Yodle.com, Inc. in a stock-for-stock merge, with an approximate loss of $85.7 million.[65] The merger reinforced Yodlee's leader position.

4.2.3 Comparison between VerticalOne and Yodlee

VerticalOne and Yodlee had exactly same products and same development trajectory before their merge. Because the account aggregation was a new service, both of them grew very rapidly. The problem of VerticalOne is that it was bought by S1 and was sold only one year after the purchase due to the bad financial performance of S1.

4.3 The Competitive Horizon

4.3.1 Other Aggregators

In account aggregation area, Yodlee is the undisputed leader. For funds transfer, CashEdge is much stronger because it entered the market much earlier and already established partnership with many banks when Yodlee entered the market. For bill payment and presentment, Yodlee faced competition from CheckFree and Metavante. Yodlee charged $2 per user per month, while CheckFree and Metavante charged $4 - $6[66]. Similarly, CheckFree was already an established company when Yodlee entered the market. Yodlee had its advantages from aggregated data and a large customer base. On the other hand, the fact that Yodlee entered the market later than major competitors

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[63] Atlanta Company Tries to Make Personal Information on the Web Manageable, Atlanta Journal & Constitution (GA), July 28, 1999. ISSN: 0093-1179

[64] Security First to Buy Web Site Builder VerticalOne for $166 Million, American Banker, 164 (185): 18, September 27, 1999. ISSN: 0002-7561

[65] FORM 10-K, S1 CORPORATION 2000 annual report.

[66] EBP&P: Yodlee Leaps into Tough E-Billing Game. Ready?: Yodlee's BillDirect puts it in direct competition with the likes of Wells Fargo, BofA and CheckFree. Some hail it as groundbreaking. Others doubt its usefulness. US Banker, 113 (10): 17, October 2003. ISSN: 0148-8848

places it in a disadvantaged position. For example, till now, Yodlee has only two bill payment clients[67].

4.3.2 Competitors Who Are Not Information Aggregators

For online banking, other competitors include ERP vendors whose primary customer segment is banking industry, and Internet-banking software provider.

For personal finance management, Yodlee competes with Intuit Quicken and Microsoft Money. Table 4-4 compares functionalities of these three products. All the information is from their product description. [68]

Table 4-4: Comparison Among Quicken, MSN Money, and Yodlee

Quicken Basic	Microsoft Money Essentials	Yodlee
	Balance your checkbook	
Download and track your checking, savings and credit card accounts — in one place	Download Transactions	Giving users one secure place to manage their money and bills
Create and follow a budget	Automatically track spending	Automatically tracks transactions from thousands of held and held away financial accounts and billers
Schedule payments and pay bills right from Quicken	Effortlessly keep your bills in order	Giving users one secure place to manage their money and bills
	View charts and reports	Gain insight into users' personal financial picture, including detailed charts that reveal trends in savings, spending, investments and budget variance.
Verify accuracy of your bank statements and avoid any inappropriate fees or charges		Automated spending and transaction alerts give users a constant view into their financial affairs to help guard

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[67] http://corporate.yodlee.com/customers/consumers.html, there are more than a dozen of account aggregation clients, while only two bill payment clients.

[68] http://www.microsoft.com/money/ProductDetails.aspx?pid=004&active_tab=Compare, http://quicken.intuit.com/personal-finance/basic-personal-budget.jhtml?lid=site_banner, http://corporate.yodlee.com/solutions/market_research/Yodlee_MoneyCenter_606.pdf

		against fraud.
Simplify tax prep, find hidden tax deductions and transfer information directly to TurboTax® software	Transfer data to tax preparation software	

There might be wording or product feature variances, but it's very clear that these three products provide similar functionalities. While Yodlee can extract account information on-the-fly, Quicken and Microsoft reply on downloading and importing bank statements into their software, though it could be done automatically. Yodlee's service is free, but users pay $19.99 for the most basic version of Microsoft Money and $29.99 for Quicken. [69] Besides the fee and product features, the competition is largely about number of FSPs and billers each product supports. Also user base is very important since users usually don't like to switch product once they are familiar with the one they are using.

4.4 Conclusion

Yodlee doesn't own relationship with end customers. The relationship remains in aggregatees, namely FSPs and billers. End customers trust their service providers, and always seek advices from them instead of from Yodlee.

As an aggregator, Yodlee aggregates many kinds of information, from account information and bills to personal investment information. Yodlee has the data, but it's not necessarily means that it owns the data, because FSPs and billers might set some restrictions on how Yodlee can use the data. The author thinks Yodlee owns partial of the data, that is, Yodlee owns end customers' overall financial situation, such as overall savings, loans, investment, and net worth; Yodlee also owns information of end customers' overall financial network, such as what relationship customers have with what FSPs and billers. As the owner of these data, Yodlee has leverage in almost all businesses which either produce these data or use these date as inputs. On the other hand, since Yodlee only owns partial and the high level of these data, it becomes a supporting role in almost all businesses other than its own core business - aggregation. For example, for personal wealth management, Yodlee's data supports EISI core business – private wealth management service.

Yodlee doesn't own transaction, either. Although Yodlee can gain some revenue from transactions, like it has done in BillPay and FundTransfer, it's more like that Yodlee does a good job in saving money by choosing least cost routine and get bonus from that, than that Yodlee owns the transaction. Transaction remains in aggregatees – FSPs and billers.

Business models analysis in this industry is as follow:

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[69] http://www.microsoft.com/money/ProductDetails.aspx?pid=004&active_tab=Compare, http://quicken.intuit.com/personal-finance/basic-personal-budget.jhtml?lid=site_banner

❖ Advertising - it is used by VerticalOne. But it's not major revenue, because the financial products and services are not commodity. Usually account aggregation service providers act as back-end, so advertising is not a choice at all. If in the future, majority of end users register through account aggregators' websites instead of through their FSPs, account aggregators can definitely employ advertising model by providing information of interest rate, loan rate, and etc. But before that, aggregators have to overcome the trust issue.

❖ Brokerage - it's used by VerticalOne. No big revenue. Yodlee shares revenue with FSPs through providing *least cost routine* for bill payment. Financial industry is a highly regulated industry, the interchange and transaction fees are standard.

❖ Subscription. It could be used by account aggregators since they clearly create value for end users. In reality, it is not used by any account aggregator, because aggregators want to build customer base. In the future, though, Yodlee may charge subscription fee. Yodlee Terms of User says: *Yodlee MoneyCenter tools and services are currently free of charge. Yodlee reserves the right to charge fees for these services in the future*[70]. There are at least two reasons that Yodlee might try this. Firstly, not all major FSPs deploy Yodlee's product or similar product, while many end customers of those FSPs want to use this kind of service. Secondly, by providing services directly to end customers, Yodlee can free itself from difficult balance games it has to play between FSPs and billers and end customers, such as in the case of BillPay AccountAccelerator. Yodlee can develop two product lines, each for FSPs and end customers separately. The product line for FSPs focuses on increasing stickiness of FSP online banking, and the one for end customers focuses on increasing convenience and choices. In adopting this approach, Yodlee has to be cautious because it won't want to cannibalize its revenue from FSP. However, if there is big customer base, it is worth trying. In this case, other business models such as advertising and brokerage will also become possible.

❖ Licensing - it's widely used in this industry. Because account aggregators are solution providers; their products can be integrated into FSPs in-house solution and third party products/services; it's very natural to develop licensing fee model. For example, Yodlee charges up-front licensing fees ranging from $100,000 to $300,000 and a per-user fee. [71]

❖ Infomediary – Yodlee tried to mine customers' financial data, but it might be unsuccessful because it only owns the data partially. If Yodlee starts to try subscription model and becomes independent from FSPs and billers, and eventually owns customer data entirely, it can consider this model. Before actual

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[70]

https://moneycenter.yodlee.com/moneycenter/tnc.moneycenter.do?is_popup=1&_flowId=tncFlow&c=csit_
key%3AN%2FpPfhIB9FZg2JHR%2FDvEzcteixI%3D&l=is_popup:_flowId:u

[71] First Union to Offer Aggregate Service to Show All Accounts, Charlotte Observer (NC), November 07, 2000

implementation, though, the customer base has to be big in order for the result to be meaningful.

❖ Referral/click-through. VerticalOne used this. VerticalOne and S1 didn't disclose revenue from this. After Yodlee took over VerticalOne, though, it abandoned this approach, replacing it with its own licensing model.

❖ Professional service/consulting - Yodlee provides this service. For example, when Fidelity developed in-house solutions, Yodlee provided this service.

❖ Customized/personalized service - although it's used by account aggregators, it's integrated into the entire solution. No extra charges are made because of this.

❖ Application service provider - Yodlee provides this service, [72] but most FSPs don't adopt this approach. FSPs usually license a certain version of the product and continue using it. One guess is that FSPs are concerned about security and stability issue, so they would rather have the application run in their premises. If customers use application service provider mode, the aggregation is done in Yodlee's data center. If customers license one version and use it in-house, the aggregation is done in their premises.

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[72] http://corporate.yodlee.com/technology/key_capabilities.html

5 Aggregatee Industry: Real Estate

5.1 Industry Overview

From April, 2005 to February, 2006, 15% of the active Internet population visited a real estate or apartment site, up 26% from a year earlier[73]. Research shows that as many as 80% of consumers begin their search for property online. As more and more people use the Internet as a tool for their property management, it's very natural that many real estate companies provide services and information online, either to educate people or help them acquire information.

The majority of real estate websites are operated by real estate companies or loan companies. These websites provide home information, usually those listed for sale, for a fee. Sometimes, the websites serve as interfaces to agents and brokers. In this case, customers might get free information, after giving out their personal information such as the location they live, their income, and their buy/sale intention.

The Internet also changes the way regional realtors do their businesses. For example, more than half or the business of Corus Home Realty, which covers Washington and its suburbs, comes in through the Internet. Most of the Internet businesses come through its partnership with RealEstate.com and RealtyNow.com, and the rest from advertising links on Google and Yahoo![74]

5.2 Zillow.com

Zillow was founded in February, 2006 by two former executives of Expedia - Richard Barton and Lloyd Frink. Actually, before that, both were trying to buy homes for their own families. Frustrated by huge efforts to find the right homes and the market value of the homes they were interested in, the two started a website to display a vast amount of homes nationwide, both on sale and not. The website not only provides basic home information such as size, location, and price, but also provides high resolution maps and the comparable homes in the same area. Best of all, all the information are free.

We've done the legwork for you by getting huge amounts of data from many sources and creating something unique that the public sources don't provide — a Zestimate of your home based on the public data[75]. This is Zillow's first blog, posted by the company's CEO Rich Barton on February 7th, 2006, to introduce the company's proprietary housing estimation tool Zestimate. Interestingly, this description actually reflects three core characteristics of information aggregation: collecting publicly published information

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[73]Online Home-Hunting Gets More Sophisticated; A new site called Zillow allows consumers to find key data about neighborhoods and calculate the value of their homes. Information week: NA, February 27, 2006

[74] Online Home-Hunting Gets More Sophisticated; A new site called Zillow allows consumers to find key data about neighborhoods and calculate the value of their homes. Information week: NA, February 27, 2006

[75] http://www.zillow.com/howto/Zestimate.htm

from various sources, retrieving transparently, and providing unique value-added services.

Zillow's logo is 'Your edge in real estate." The company's philosophy is that by providing comprehensive housing information for free to various real estate stakeholders, including buyers, sellers, owners, and professionals, it can attract big traffic, and eventually attract advertisers. This is also clearly stated as Zillow's business model by its CEO Richard Barton: *I'd like to make a comment on our business model… Zillow.com will make revenues from advertisements on the site. We will always be crystal clear about what is content and what is advertising … We see the process for buying and selling homes as … one that incorporates a huge amount of information...* [76] The company's websites showcase this philosophy by putting advertisements at various noticeable spots (see Figure 5-1 for an example).
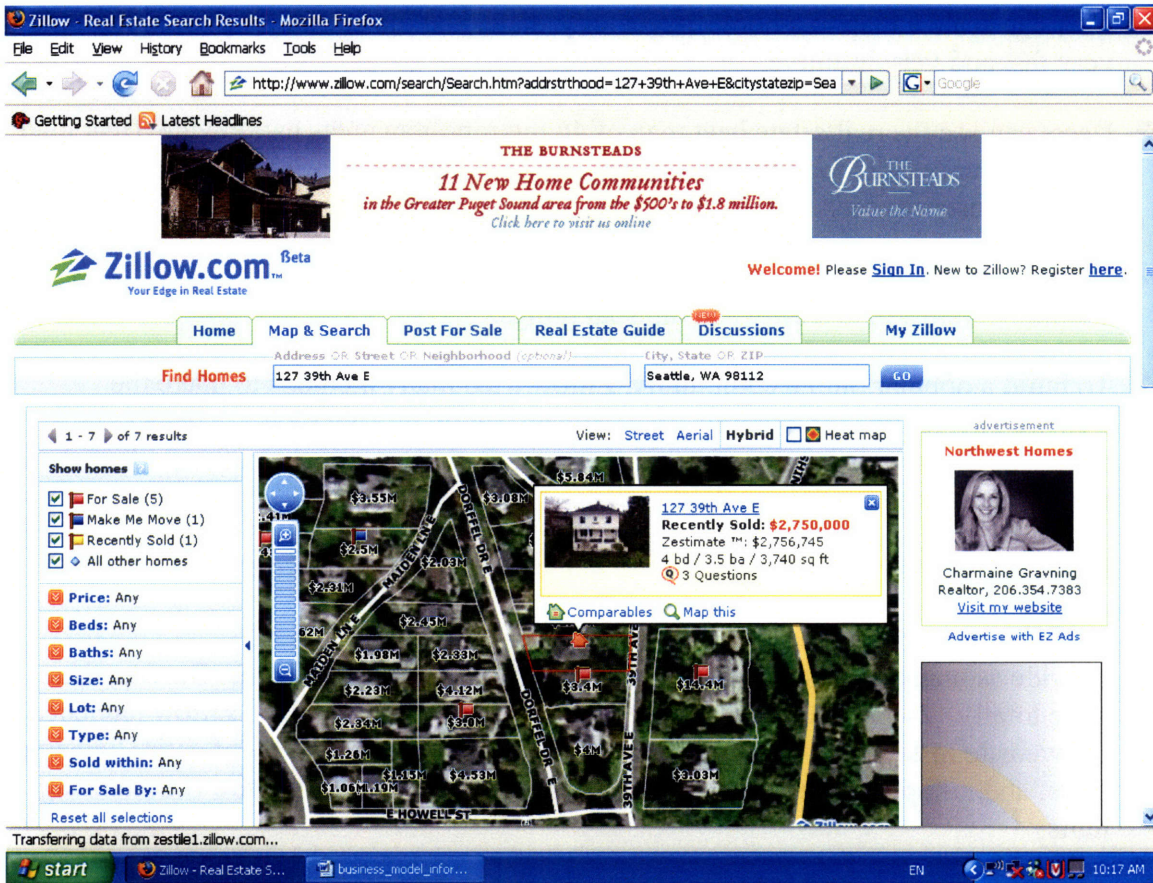
Figure 5-1: Zillow WebPage 1 (Map & Search)

Although Zillow's objective and business models are always clear and consistent as it grows, it actually experienced several stages developing its capacity, both in contents and in user experiences. The first stage is read-only website. In this stage, it provided home information online; it also gave APIs to popular web portals such as Yahoo! for free. The major objective of this phase is to get enough exposure in order to accumulate user base.

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[76] http://www.zillowblog.com/zillow_blog/2006/02/were_live_wwwzi.html

In second stage, it added write functionality by utilizing Web 2.0 mash-up capacity, allowing home owners to claim their homes, edit home facts concerning home improvement projects, and to alter home specifications. Both stages are about content improvements. The third stage starts when Zillow allowed user to post and answer questions regarding home facts. This stage is not only about content completeness, but also about interactive communication, which drove Zillow along the way toward an online community – one of Zillow's ultimate objectives. There is one same theme along the different stages - improving user experiences. In order to achieve that, Zillow did many nice jobs for various stakeholders; following are some examples:

❖ Make the site easy to navigate for all the stakeholders like buyers, sellers, and agents.

❖ Put advertisement tag clearly on top of every advertisement.

❖ User can scale a map to a home, street, city, state, and the nation. The zoom in/out is very fast and very intuitive.

❖ Users can see the real estate heat map of 46 metropolitan areas nationwide. Heat map uses different colors to indicate different levels of home unit price, making it much easier for users to sense which neighborhoods are more or less expensive.

❖ Display some interesting homes such as famous homes and scary homes to fulfill people's interest in celebrity and unusual things.

❖ To build a popular online community, Zillow tried many methods to make the website interactive. For example, the company set up its own blog; it created Q&A page where agents, buyers, and sellers can communicate with each other; it launched mobile feeds of home information;

❖ Launch Carnival of Real Estate, where real estate bloggers can communicate and cooperate.[77]

❖ Provide as many homes as fast as possible. According to U.S. Census Bureau, there were totally 124 million housing units nationwide in 2005.[78] When Zillow launched the website in early 2006, it had 60 million U.S. homes, about 48% of entire housing units; and it hoped to have data on 110 million, roughly 89% of entire U.S. housing units.[79]

❖ Provide as much home information. Zillow collects housing information from many sources, including public records, recent sales, comparables, and tax information (see Figure 5-2 for an example); the company even encourages its employees to solicit

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[77] http://www.zillow.com/corp/Timeline.htm

[78] 2005 American Housing Survey for the United States, http://www.census.gov/hhes/www/housing/ahs/ahs05/tab1a7.html

[79] Zillow.com reveals venture, Knight-Ridder Tribune Business News: NA, February 08, 2006

information from acquaintances. [80] Zillow then uses a complex algorithm to estimate home value.

❖ Provide Zillow gadgets. For example, 'my net worth' is a gadget you can display on your computer desktop, and it gives weekly and monthly changes of your home value.

To conclude, Zillow strived to be a competitive content provider by offering as much information in as many dimensions as possible; meanwhile, it strived to be a popular virtual community website by offering excellent user experience. In return, Zillow accumulated critical mass in a very short period. Here are some facts:

❖ House lists increased from 60 million to 70 million one year after the launch of the website.

❖ Started advertisement in April, 2007, and accumulated 3,000 advertisers within 6 weeks[81].

❖ Three to four million viewers per month, with eight pages per view[82].

Besides excellent content and user experience, Zillow's success also owed to the unique way it collects source information. To start with, Zillow collected publicly available information, as any aggregators have done. As the website traffic increases, though, Zillow took an unusual move – asking viewers, especially home owners to contribute to housing information. This move is very smart, because it at least brings in two benefits:

❖ Increased customer involvement. Deeper customer involvement with Zillow community gives customers motivation to visit the site more and promote the site;

❖ Better differentiation from its competitors. Zillow becomes the original source of some part of aggregated information, instead of retrieving everything from others. This is very powerful because this can differentiate Zillow and increase the barrier for others to compete with it.

While in previous two case studies of shipping and financial service, aggregated information are totally from aggregatees, Zillow's information are from various sources. Zillow collects on-sale home datas from real estate companies, both nationwide and regional; it collects sale history and tax information from local governments (see Figure 5-2 for an example). The rest of the information is from either home owners or real estate professionals, as mentioned above. On top of that, Zillow creates Zestimate, price trends and comparison both community wide and state wide. Finally, Zillow combines all the information with commercial maps software, such as *Bird's Eye View* data from Microsoft Virtual Earth,[83] and *aerial, satellite, and parcel map* data from GlobeXplorer[84].

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[80] The mark of Zillow, Knight-Ridder Tribune Business News: NA, February 26, 2006

[81] http://www.zillowblog.com/

[82] Advertising on Zillow brochure, www.zillow.com

[83] http://www.microsoft.com/virtualearth/default.mspx

Zillow presents all the information in a managed way, with no single type of information dominates the others (see Figure 5-1 and Figure 5-3).

489 Green St UNIT 3, Cambridge, MA 02139

Property Database Search Results

489 Green St, Unit 3

Sale History

Sale History

08/13/1999: $170,000

No other sale data is available

Tax Information

	2005	2006	2007
Total property tax paid:	$1,849	$1,849	$1,913
Assessed value bldgs:	$250,600	$250,600	$255,800
Assessed value land:	+ --	+ --	+ --
Total assessed value:	= $250,600	= $250,600	= $255,800

http://www.zillow.com/Charts.htm?chartDuration=5years&zpid=56431551

Property Information:

Property Class:	CONDOMINIUM
State Class Code:	102
Zoning (Unofficial):	
Map/Lot:	119-106-3
Land Area:	0

Property Value:

Year of Assessment:	2007
Tax District:	R12
Residential Exemption:	Yes
Building Value:	$255,800
Land Value:	$0
Assessed Value:	$255,800
Sale Price:	$170,000
Book/Page:	30541/271
Sale Date:	August 13, 1999

http://www.cambridgema.gov/fiscalaffairs/PropertyDetail.cfm?PropertyId=8978

Figure 5-2: Zillow Information Source

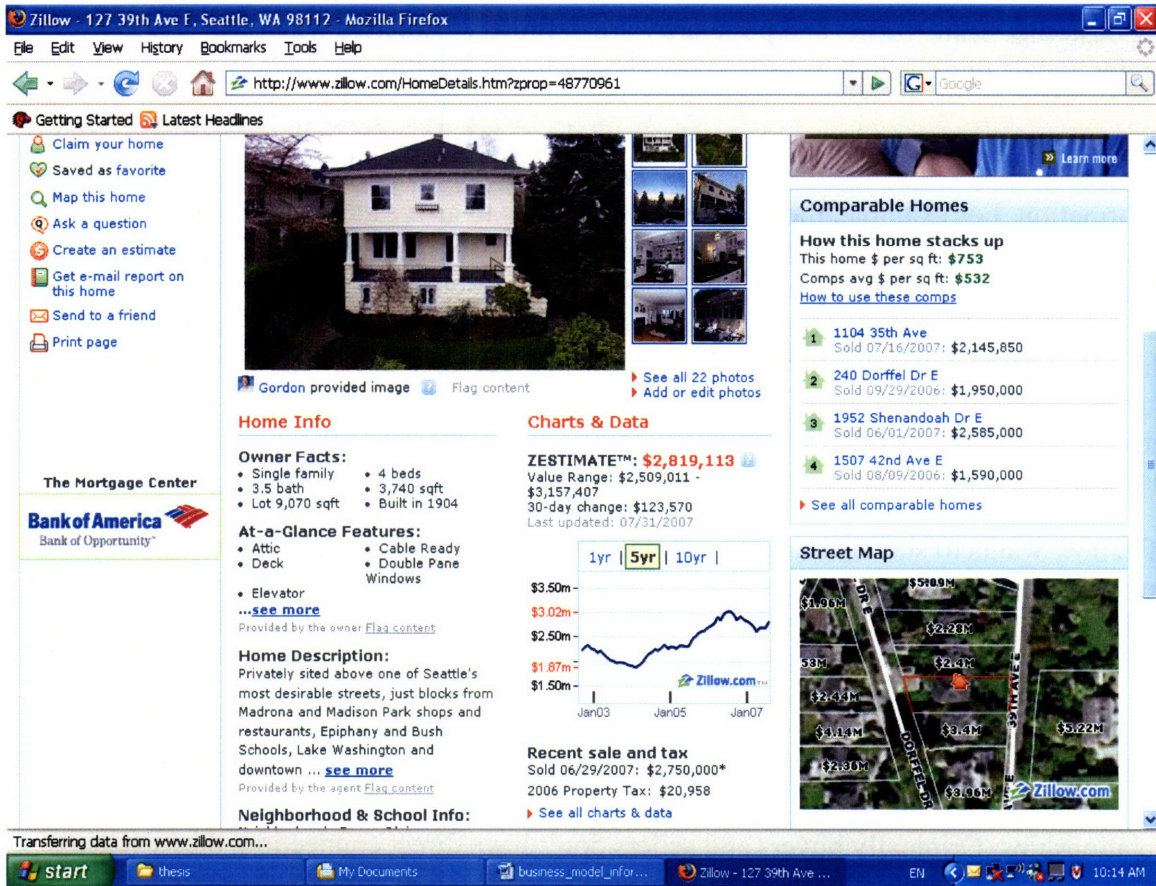[84] http://www.globexplorer.com/company/zillow.shtml

Figure 5-3: Zillow WebPage 2 (Home Details)

Real estate companies and local governments are aggregateees. For local governments, as long as Zillow cites the online information without distorting, there should be no problem, because the information is exactly for public welfare. For real estate companies, however, their reactions are similar to those in shipping industry and financial service industry. Zillow poses threat to professionals such as appraiser and agent, so it caused some initial angst from the real estate community[85]. Newspapers, blogs, and real estate trade journals have blasted the site for giving inaccurate information on homes, with valuations as much as 20 percent above or below actual value.[86] Zillow tried hard to sooth the angst and to attract them to the website. For example, Zillow lists home-for-sale for professionals for free. On the other hand, real estate professionals realize later or sooner that the Internet as a tool is changing and will continue to change their way of doing business. Just see how the Internet has changed the travel industry from a service-oriented one to a self-service one. It's better for agents and professionals embrace this challenge and opportunity instead of refusing it. Zillow provides platforms for them and their customers by providing blog space called Real Estate Carnival, virtual community, and a set of tools. There might be other websites provide similar platforms, but Zillow's

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[85] The mark of Zillow, Knight-Ridder Tribune Business News: NA, February 26, 2006

[86] The mark of Zillow, Knight-Ridder Tribune Business News: NA, February 26, 2006

big customer base, traffic, and popularity are definitely attractive when real estate professionals think which websites they choose to work with.

Home owners in general are not aggregatees; they provide information directly to Zillow through its interactive community tools. Home owners have motivation to provide Zillow information. For example, they can use Zillow tools to arrive at the right selling prices and to track their most important asset, for free. Many home owners are supportive and active in Zillow community, although some home owners didn't like the business[87]. As all the case studies show, aggregatees are detached, if not hostile towards aggregators, so the cooperation between Zillow and home owners becomes even more precious. Actually, Zillow didn't do any official advertisement of its site; the rapid user and view growth are mainly through Word of Mouth and news coverage, which proves Zillow's popularity from another perspective.

If Zillow wants to stay neutral and prosper at the same time, it has to achieve good relationships with multi players in this industry. Its strategy makes sure that it takes care of interest of each party, either by provide real benefit, or by force them to join using leverage gained from end customers.

Zillow's value to consumers is that it takes some power previously owned by real estate professionals and gives it to buyers/sellers. Figure 5-4 illustrates the original relationship vs. the changed relationship, with the width of arrows indicating the magnitude of the relationships. Originally buyers and sellers don't have direct connection, they exchange information and negotiate price through agents. With Zillow's interactive community tools, buyers and sellers can communicate in many ways such as Q&A, owners posting home photos, and owners altering home specifications. In most cases, agents still play an important role in the final transaction (Zillow's CEO hired an agent to close his own home sale deal[88]), but the power largely tilted towards buyers and sellers.
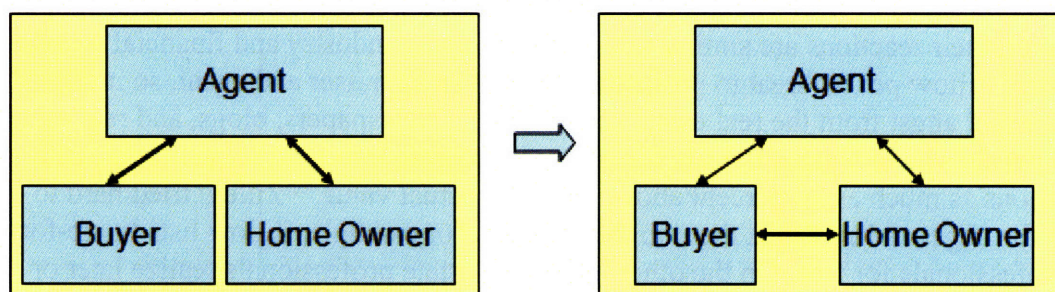
Figure 5-4: Zillow's Effect on Relationships between Agent, Buyer, and Owner

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[87] Arizona has a Zillow problem,
http://www.ocregister.com/ocregister/money/columns/article_1661439.php

Arizona bill paves way for Zillow to operate in state,
http://blog.seattlepi.nwsource.com/venture/category.asp?blogID=14&category=496

[88] My House is Pending, blog posted on 5/22/07,
http://www.zillowblog.com/zillow_blog/2007/05/my_house_is_pen.html

Originally, agents own relationship, data, and transaction, so they can influence buy/sell decision, have market insight, and earn commissions. In afterward situation, comparable data is accessible to every party, so every one has market insight and no one actually owns the comparable data, but home owner owns home specific data. As to relationship, because buyer and seller can communicate with each other and influence each other, so home owner largely owns the relationship, at least in the early phase of buy/sell decision. In later phase, however, if seller hires an agent, agent might influence the buy/sell decision also. As shown in Table 5-1 and Table 5-2, by changing the ownership of relationship and data, Zillow empowers buyer and sellers to make more informed decision.

Table 5-1: Customer Assets Ownership (Originally)

Role	Relationship	Data	Transaction
Home owners		Part of data (owner's home information)	
Appraiser		Y	
Agents	Y	Y	Y

Table 5-2: Customer Assets Ownership (Afterward)

Role	Relationship	Data	Transaction
Home owners	Partly	Part of data (owner's home information)	Y(if owner sells the home by itself)
Appraiser		Part of data (if owner hires an appraiser)	
Agents	Partly	Part of data (owner's home information) (if owner hires an agent)	Y (if owner hires an agent)

Largely, Zillow works with Google to place AdSense contextual advertisement. Different advertisements are placed on different pages based on the content of each page. The advertisements comply with Interactive Advertising Bureau (IAB) standards[89]. It also has its own advertisement placement. One of its own advertisement endeavors is EZ Ads; small businesses like agents and appraisers can use it to advertise on Zillow in a budget and controllable way. EZ Ads works similar to Google's AdWords. Both provides very simple on-line steps for advertisers to create how the advertisements look like and how advertisers want their advertisements be broadcasted and what's the budget and duration of the advertisements.

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[89] Zillow_media_kit_march_2007.pdf, www.zillow.com

EZ Ads targets its audience based on customer preferences. Only relevant advertisements, either regional wise, or activity wise, will be displayed on one user's view pages. For example, if one user searches home in Cambridge, MA, with zip code 02139, only advertisements of those agents and brokers who want their advertisements list in this region will be displayed.

In one example, if put $100 as planned cost, duration as one month, and zip code as 02139, below results will show up:

Figure 5-5: Zillow's EZ Ads

The system says '*We are unable to show your ad more than 7,099 times in 1 month within the ZIP code(s) you selected. Please choose a longer running period, or add more ZIP codes (as many as you want).*' The example indicates that Zillow has statistics data about traffic in each specific area, so it can estimate the advertisement effect.

As mentioned before, Zillow generates revenue solely from advertisements. Zillow attracted affluent users who are actively in market. According to Zillow, it's *one of the most popular real estate sites on the Web; 46% of its users have annual household incomes over $100,000; 89% own at least one home; 54% of are either actively buying or selling, or plan to in the next 24 months*[90].

For Google AdSense, in the case of CPC (cost per click), Google and Zillow share the revenue once users click the advertisement. In case of CPM (cost per thousand impressions), Google and Zillow share the revenue generated from advertisements presence. Google's pricing algorithm is very complicated, depending on many elements such as the quality of keywords and the performance of the advertisements[91]. For EZ Ads, it's possible to estate the revenue. Following facts are found on Zillow's website[92]:

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[90] Zillow_media_kit_march_2007.pdf, www.zillow.com

[91] http://www.google.com/adwords/learningcenter/text/18719.html#ctx=tltp

[92] www.zillow.com

- ❖ Four million unique users per month
- ❖ Each user visits eight pages on average
- ❖ 1 penny per view per EZ Ads

Zillow places many advertisements at obvious spots on many popular web pages (see Table 5-3 for overall situation and Figure 5-1 and Figure 5-3 for examples).

Table 5-3: Zillow's advertisements

Name	*Address*	*advertisements*
Home	www.zillow.com	0
Map& search	http://www.zillow.com/search/Search.htm?mode=browse	1 top leaderboard 1 wide skyscraper 1 rectangle 1 bottom leaderboard
Home Details	http://www.zillow.com/HomeDetails.htm?zprop=48905201	1 top leaderboard 1 wide skycrapper 2 rectangles 1 medium rectangle
comparables	http://www.zillow.com/search/Comparables.htm?zpid=48905201	1 top leaderboard 1 wide skyscraper 1 rectangle
Birds eyeview and map	http://www.zillow.com/aerial/DualMapPage.htm?zpid=48905201	1 top leaderboard 1 wide skyscraper 1 half skyscraper
Post for Sale	http://www.zillow.com/postings/Postings.htm	0
Real Estate Guide		1 top leaderboard 2 half skyscrppers 1 half wide skyscrapers 1 bottom leaderboard
MyZillow	http://www.zillow.com/myzillow/Favorites.htm	1 top leaderboard 1 skyscrapper
help	http://www.zillow.com/howto/HowTo.htm	1 bottom leaderboard
Zestimate	http://www.zillow.com/howto/Zestimate.htm	1 bottom leaderboard

		1 skyscrapper
Local real estate	http://www.zillow.com/local/Nevada/Clark/Las%20Vegas	1 top leaderboard 1 bottom leaderboard 1 sidescrapper
Good neighbor policy	http://www.zillow.com/howto/GoodNeighborPolicy.htm	1 sidescrapper 1 top leaderboard

To evaluate EZ Ads revenue, following assumptions are made.

❖ only one out of eight pages display Zillow's EZ Ads

❖ on average three EZ Ads per page

Zillow's annual revenue from EZ Ads would be $1,440,000.

Table 5-4: Zillow EZ Ads Revenue

	A	B	C	D
1				Comments
2		Number of Users Per Month	4,000,000	
3		Number of Pages Visited Per User	8	
4	Input	Rate of Pages Displaying EZ Ads (among all the pages)	0.125	
5		Number of EZ Ads Per Page	3	
6		Revenue Per View Per EZ Ads ($)	0.01	
7	Output	Annual Revenue From EZ Ads	1,440,000	=C2*C3*C4*C5*C6*12

Besides EZ Ads, Zillow also does banner exchange, with a minimum expense of three thousand dollars per month[93]. In July, 2006, Zillow has about fifty direct advertisers[94]. The annual revenue of this part is about $1,800,000.

Table 5-5: Zillow Banner Exchange Revenue

	A	B	C	D
10				Comments
11	Input	Minimum Expense of Banner Exchange Per Month ($)	3,000	year 2006
12		Number of Users	50	
13	Output	Annual Revenue From Banner Exchange	1,800,000	=12*C11*C12

Zillow also developed a set of APIs which can be used in web portals. Zillow doesn't charge anything for this, though. Zillow promotes open API[95]. The motivation behind this is to improve exposure and traffic to the web site.

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[93] http://www.zillow.com/bannerads/GetStarted.htm

[94] Zillow gets $2.5M more in venture capital, Knight-Ridder Tribune Business News: NA, July 25,2006

5.3 The Competitive Horizon

5.3.1 Other Aggregators

Before Zillow, there were already sites providing similar services. Most of the sites focused on one or several specific areas, for example, PropertyShark.com focused on New York, while Trulia.com focused on California. Moreover, registration and/or fee are required to access home information. In contrast, Zillow provides nationwide homes information, and for free.

After Zillow launched the website, however, some big established real estate companies quickly threw out their own online tools. Within a month, Realtor.com had a new feature on its front page to give consumers a starting point to assess their property values. Another one, http:://www.realestate.com, owned by InterActiveCorp, has similar online home valuations, and they have valuations for 97 million homes, 27 million more than Zillow's. The ways these two companies give valuation are different. Zillow's Zestimate gives a single number of the home value, while RealEstate gives a range and a median value. For example, for one home whose address is *4017 252nd ave se, 98029,* Zillow's estimation is $541,168, and RealEstate's estimation is from $532,100 to $571,000 with the median at $551,500, producing a 1.9% difference. Generally, difference between these two estimations largely depends on the accuracy of each one. If comparable data of the home of interest is abundant, for example, in metropolitan area, both estimations are accurate and thus have little variation. If comparable data is scarce, whether it's because the home of interest is in rural areas or because it is very expensive or very low-priced, the evaluation will be very different. As to user interface, both are intuitive. The most viewed pages of these two sites, *maps and searches* are strikingly similar (see Figure 5-6 and Figure 5-7). Trulia.com lists only on-sale houses, but it provides some nice features such as the heat maps and average sale prices.
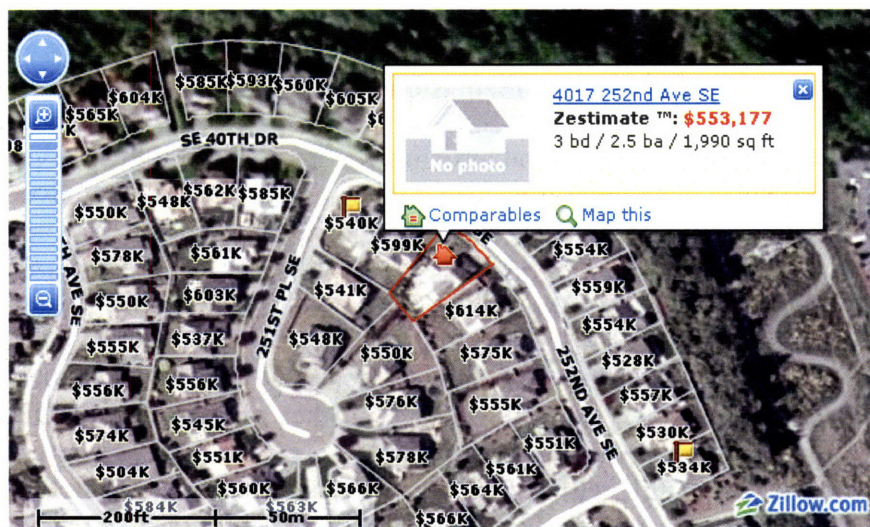

Figure 5-6: Zillow's WebPage 3(Home Details)

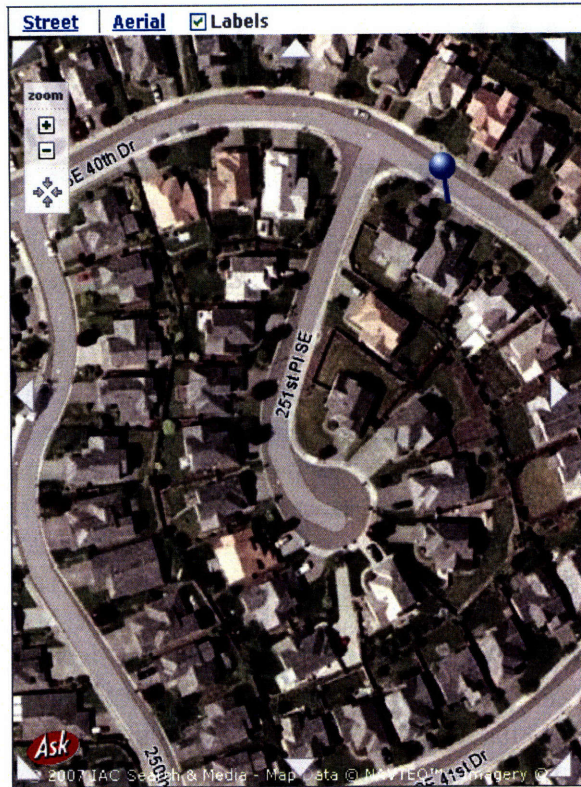[95] http://www.zillowblog.com/zillow_blog/api/index.html

Figure 5-7: RealEstate's Home Details Page

Although abovementioned companies provide similar information and tools to end users, their revenue models are very different. Zillow makes money from advertisements, and the real estate information, tools, and community serve as the platform to attract customers and views. Other real estate companies mainly use websites as an interface to attract customers to their actual revenue generating businesses, such as brokerage and mortgage, though they might also place advertisements on their websites.

5.3.2 Competitors Who Are Not Information Aggregators

Because Zillow's sole target is online advertising, and provides all other services and tools for free, only those companies who also publish real estate relevant advertisements are Zillow's direct competitors. Besides abovementioned competitors, who are mainly from the real estate industry, other online adverting publishers, especially those with contextual adverting capacity are Zillow's major competitors.

For example, Google is a strong competitor. Google's AdWords Ads are displayed along with search results on Google, while AdSense helps other website display relevant, text-based advertisements. [96] The advantage of advertising with Google is Google's huge and still growing ad network, while with Zillow, advertisers can access to a more focused group since a large percent of Zillow's viewers are active buyers and sellers. Besides competition, Zillow also cooperates with Google - Zillow is a user of Google's AdSense.

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[96] http://www.im4newbies.com/google-adwords-adsense-faq.htm

As a result, some advertisements on Zillow's website come from Google, though it's only text-based. In this situation, Google and Zillow share the revenue. It's hard to say which one of advertising with Google and advertising with Zillow is more efficient. Some real estate agents use Google's AdWords, but at the same time indicate preference of placements on Zillow's website.[97] In 2006, brokers, agents and developers spend upwards of $8 billion in advertising, and the percentage of that money spent on the Internet will grow as time goes by.[98] Despites of Google's ubiquity, Zillow might prosper given the market growth and its unique attractiveness to advertisers due to its aggregated information and its active communities.

5.4 Conclusion

Zillow made a success start and attracted big attention and advertisements. In this special case, management team played a very important role since the two founders are Internet veterans and have very good reputation in the capital market. However, it's still early to predict the company's long-term performance. Whether the company can sustain depends on several issues:

❖ Continue to be the unique value deliverer. In this aspect, realestate.com poses huge threat to it because both provide similar services, but realesate.com has a much larger home database. Zillow's chance is to make the content locally relevant. Since Zillow has an active virtual community, something similar to open source software community, it can leverage residents to achieve this goal.

❖ Improve the home valuation accuracy. In long run, become user's irreplaceable home valuation website.

Business models analysis in this case is as follow:

❖ Advertising – currently it is Zillow's only revenue source. The revenue of advertising depends on traffic, which Zillow has done a good job till now. But the future of the company depends on the uniqueness of the value delivered by the company. Zillow can also try targeted advertising more aggressively. For example, Zillow can target advertisements based on income, family size, have kids or not, school preference, traffic, and etc. Of course, this requires user to provide more information. If Zillow can make users believe in the potential value and sign in, it ca definitely pursue in this direction.

❖ Brokerage – it's not used by Zillow. Since Zillow wants to be completely on customer's side, it actually has to be independent and neutral. On the other hand, Zillow tried or actually recruited some Real Estate Brokers[99], but the main motivation is to be an insider of real estate, to access higher quality information. *Zillow.com is seeking to become a licensed broker in multiple states... We do not plan to be an*

[97] http://www.zillow.com/forum/site/ViewThread.htm?tid=568

[98] What's your house really worth? Fortune Magazine, 2/15/2007

[99] Zillow's career webpage, looking for Real Estate Broker in Hawaii

agent or act as an agent in any real estate transactions. As a licensed broker, we may ... remain current on the issues facing the local and national real estate community. We may seek to enhance our Zestimate valuations...

❖ Subscription – it's not used by Zillow. Currently, users don't have to register with Zillow to view home information. However, registered users have some functionality which general users don't have. First, registered users can save their favorite homes so that they can track those homes; second, registered users can claim to be home owners once they provide relevant proof. Based on registration, Zillow can charge fees. Currently, when users register with Zillow, the site actually only ask for some very general information such as username, photos (optional), without asking any specific information regarding income, home preference, and etc. After acquiring the information, Zillow can either do targeted advertising more aggressively or provide customized service and charge subscription.

❖ Licensing - it's not used by Zillow. Zillow does provide API to popular websites, but Zillow's target is to get more people visit its website. Zillow has made it very clear that they will only make money from advertisements.

❖ Infomediary – not used by Zillow.

❖ Referral/click–through – not used by Zillow. Although Zillow can try this, it's in direct conflict with Zillow's philosophy: be customer's edge in real estate. So it's unlikely that Zillow will collect referral/click-through fee.

❖ Professional service/consulting – not used by Zillow. Real estate is a rather mature industry, which has its own portfolio of professionals, including agent, appraiser, and lenders. These professionals are well trained and the services they provided are highly tailored. Zillow's strength is about information, but not about the trainings. Zillow's overall analysis of real estate market, however, could be valuable. Before providing this consulting service, Zillow has to improve accuracy of its estimation. Also, what kind of customer would be interested in this consulting service is still a question.

❖ Customized/personalized service – not used by Zillow. See analysis in 'subscription', Zillow can do this in the future.

❖ Application service provider – not used by Zillow. One reason might be that Zestimate is not very accurate, 7% above or below actual home value,[100] which in the eye of Zillow, is the actual transaction price.[101] However, there is potential that Zillow can gain revenue from it. Currently, Zillow provides APIs to web portals for free in order to improve exposure and generate bigger traffic. Zillow can definitely charge for this service once it has secured its leading position as a real estate content provider.

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[100] Online Home-Hunting Gets More Sophisticated; Information Week: NA, February 27,2006

[101] http://www.zillow.com/howto/DataCoverageZestimateAccuracy.htm

Zillow can also try franchise. For example, there are plenty of small and specialized real estate agents, Zillow can definitely provide services to them, and at the same time assign its customers to those small agents. However, it's risky. Zillow's primary goal is to benefit end customers, so it has to be very careful about the neutrality of the content it provides. If Zillow takes this step, it has to make arrangement in order not to affect its core business and revenue.

In an industry where information becomes more and more commoditized, there is no real stickiness in content. How Zillow performs in user experience and delivering key value – Zestimate are critical to the company's long term success.

Because of new technology and new tools, especially Web 2.0, it's very easy for one company to imitate another one given enough money and talents. RealEstate's quick move towards online house valuation is an example. However, if Zillow can build the entry barrier by building large enough home database or build a large amount of loyal user base, Zillow can still survive.

On the other hand, although home valuation seems to be a rather independent activity, there are other activities in the integrated value chain, such as home loan. Realestate has a better position in this aspect since its parent company - InterActiveCorp owns lendingtree.com, a home loan website. They can integrate and optimize the ultimate value presented to customers, just as in the previous two cases, to dramatically increase the stickiness of relationship.

6 Conclusion

Chapter three to chapter five presents three case studies of information aggregators in different industries. Although the cases are different from each other, they have similarities. This chapter first summarizes the relationships between aggregatees and aggregators and the relationships between aggregators and end users, and then goes through business models proposed in chapter 2 to see how they are actually implemented in real world, and finally predict the development direction of information aggregators.

6.1 Aggregatee vs. Aggregator

Generally, information aggregators are intruders to the aggregatee industries, at least in the eyes of aggregatees. Aggregators collect publicly available information, mainly from aggregatees. In this aspect, actually aggregatees have a better platform to do information aggregation. So why don't aggregatees take the initiatives?

❖ Aggregatees don't see the needs. According to E. Hippel, Aggregatees - usually existing companies are in requirement sticky side, while customers are in needs sticky side.[102] Aggregatees are content with their own solutions and think customers will be similarly satisfied with their services. For example, it's very natural for carriers such as UPS to improve customer online experience by providing online information and online tracking tools, but it takes intense brain work for UPS to conceive that providing rival's information will please customers.

❖ Aggregatees are not willing to disclose the information. Even when aggregatees think of competition and want to be preemptive, they might hire consultant to do the market research, but will then keep the information as secret. In other words, aggregatees choose not to publicize the information, which is understandable because information commoditization generally will reduce the overall margin of the industry.

❖ Many aggregatees don't have the competences to implement the technical solution required by information aggregation, at least in the early phase. For example, Yodlee's account aggregation employs "screen scraping", a technique to extract data from the human readable websites, usually not well structured. 'Screen scraping' requires excellent understanding of HTML (Hypertext Markup Language) and programming skills. It is also a labor intensive job, requiring constant modifications.

❖ Aggregation might cannibalize aggregatees' existing business. Besides abovementioned overall margin erosion due to information commoditization, aggregation might injure aggregatees' business in two specific ways. Firstly, comparison aggregation might expose aggregatees' inefficiencies and thus cause customer loss. Secondly, information aggregation may cause certain kinds of product/services obsolete or less attractive. For example, in Zillow's case, real estate agents become less powerful and eventually may earn less commission. Many real

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[102] Eric Von Hippel, Democratizing Innovation

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estate companies gain major revenue from commission sharing and list fee, so introducing free online information aggregation will cut their own revenue.

Usually aggregatees resist aggregators in the first place. But the influence of aggregation is strategic; an aggregatee will either utilize it or get hurt, so actually no aggregatee ignores information aggregation. Aggregators and aggregatees can develop different relationships. According to S. Madnick, the relationship could be independent, partnership, and ownership (aggregators owned by one dominate aggregatee or a consortium of aggregatees). [103] Besides these three relationships, the case study of Yodlee indicates another state - aggregator being part of an end-to-end solution provider of aggregatees. Table 6-1 summarizes the relationships and corresponding cases.

Table 6-1: Relationships between Aggregators and Aggregatees

Relationship	Example	Comments
Independent	Intershipper, Zillow	
Partnership	Yodlee	Thinking of BillPay solution, there is a partnership between Yodlee and FSPs.
Ownership (Be part of one aggregatee)	iShip	Shopping.com being with eBay can also be seen as this type.
Be part of an integrated solution provider of aggregatees	Yodlee	Yodlee's partnership with S1 can be seen as this type. mySimon.com being with CNET can be seen as this type.

Even there is cooperation and partnership between aggregators and aggregatees, it is usually superficial. No deep relationships are developed between these two parties.

For information aggregators in a closed and concentrated industry, partnering with big aggregatees is a key. On the other hand, if the information is commoditized and the aggregatee industry is diversified, being an independent aggregator is a good choice. For example, if Zillow accumulates big customer base and home information base, it can definitely succeed without partnering with any real estate company.

6.2 Aggregator vs. End User

One question faces information aggregators is whether to charge end users. In all three case studies, aggregators actually don't charge end users. The reason is that end users are supporters and later the asset of the aggregators. Customer base is aggregators' bargain

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[103] S. Madnick , Seizing The Opportunity: Exploiting Web Aggregation, MIS Quarterly Executive 2002

power with aggregatees. However, as aggregators have more power, they might as well charge end users.

Sometimes the value proposition provided by aggregators to end users and to their clients and aggregatees have conflict. On one hand, aggregators want to empower end users, give them as much information, and enhance their experience. On the other hand, aggregators have to bring value to instead of cannibalizing their clients and aggregatees. Yodlee faced this kind of dilemma when it introduced BillPay AccountAccelerator (see chapter 4). There is no easy way to balance such kind of interest conflicts. When considering actual implementation, aggegators need to think about the gain and loss of both short term and long term. They also need to think about their strategy. Whether they are partnered with aggreagtees, such as iShip has done, or they are totally independent and lean towards end users make a big difference.

6.3   Business Models

Some of the business models proposed in chapter two are widely adopted by information aggregators, such as advertisement and licensing. Some are used by none of the aggregators in case studies, such as infomediary. Table 6-2 summarizes the revenue source and the examples of each business model.

Table 6-2: Business Model Summary

Business Model	Sources of Revenue	Critical Success Factors	Examples of Aggregators
Advertising	Advertising fees and list fees	• Traffic • Uniqueness of aggregated information	• Zillow.com • shopping.com. shopzila.com • RedRoller
Brokerage	Transaction fees	• Credibility • Some industry requires permit	• VerticalOne
Subscription	Subscription fee	• Advanced technology • Customer service	• iShip
Licensing	License fee	• Standardized interface • Partnership with key players	• Yodlee
Infomediary	Sale of consolidated information	• Completeness of data • Structure of data	None
Referral/Click-through	Lead referral fees	• Partnership	• shopping.com • VerticalOne

			• Red Roller
Customized/Person alized Service	Service charge	• User experience	• iShip
Professional service/consulting	Consulting fee	• Talent • Ability to provide end-to-end solution	• iShip
Application Service Provider	Per-use or annual/monthl y fee	• Advanced product in aggregator side • Trust from aggregatee side	• Yodlee provides this capacity.

One business model anticipated to be widely adopted while in reality not adopted by any information aggregator is infomediary. Aggregators are in an ideal position to provide answers to some questions such as what products and services work, and who opens what accounts in which institution. Actually Yodlee tried to mine users' financial data but didn't continue that effort. This business model was not implemented due to two major reasons:

❖ Aggregatees usually are cautious to include aggregators into their integrated solution. The reason could be trust, interest conflict, and control over three customer assets: relation, data, and transaction. Therefore, even aggregators usually have more data in a wider breadth; they don't have relevant data in depth - the context of data, and thus lose credibility.

❖ Most of the aggregators don't accumulate an exceedingly large user base. To provide infomediary service, the amount of data has to be large in order to be objective and meaningful. Even Zillow, who did a good job in this aspect, is far behind RealEstate in the number of listed homes.

Zillow tries to move toward this direction by providing Zestimate and metropolitan home value report. Although Zillow explicitly pointed out that their only revenue module will be advertisement, as the accuracy of Zestimate and the number of listed home increase, Zillow might want to generate revenue by selling the valuation report.

6.4 Prediction of Information Aggregators

We can see following trend in business models: (true in shipping industry and banking industry)

❖ Standalone aggregation -> integrated into end-to-end solution

❖ Aggregation -> other customer valued products

Pure public information aggregation is a platform; company has to find out profit model on top of it. To find the suitable business model, a company has to consider following issues:

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❖ The diversity of the industry where the aggregatees are in, measured by the concentration ratio.[104] For example, although there are many shipping carriers, USPS and UPS account for more than 85% of the entire E-Commerce shipping market (see chapter 3), so shipping industry is a very concentrated one.

❖ Weight of information within the product/service. Does information play an important role in products/services? How does information affect three customer assets: relationship, data, and transaction? For example, for shipping industry, price is just one factor, the location of stores, the frequency of pick-up and delivery, whether it provides online tracking or not, and the quality of packaging and delivery are all very important factors. Information itself only contributes to a small amount of the entire solution. Also, the price are not transparent, especially for enterprise one.

By considering above two factors, aggregators can choose to be independent or partner with aggregatees.
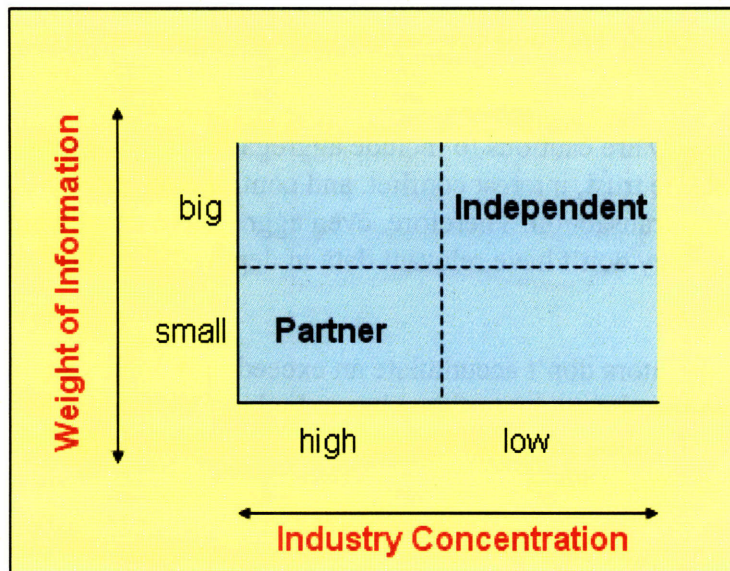
Figure 6-1: Independent vs. Partner Aggregators

If aggregatee industry is concentrated and the weight of information is small, it's better for aggregators to partner with major aggregatees, through cooperation or ownership. For example, as case study of shipping industry shows, giant carrier UPS doesn't allow aggregators to compare its price with others, so comparison information of independent aggregators such as Intershipper are not complete and become less attractive to users. UPS also sabotaged iShip's businesses with MBE (see chapter 3) by leveraging its power. But when UPS purchased iShip, it not only resumed iShips's business with MBE, but also expanded iShip's service to its own branches.

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[104] The concentration ratio is the percentage of market share owned by the largest *m* firms in an industry, where *m* is a specified number of firms, often 4. http://www.quickmba.com/econ/micro/indcon.shtml

If the aggregatee industry is diversified and information plays a critical role within the product/service, aggregators can survive and prosper being independent. For example, Zillow retrieve information from a variety of real estate websites, both national ones and regional ones, and local government websites. Although some real estate websites have much wider coverage, no one can dominate others. Similarly, many shopping comparison aggregators retrieve information from numerous online storefronts with no one dominate others, so shopping comparison aggregators can be independent from aggregatees.

In addition, aggregators need to consider the trend of the aggrgatee industry? Is it toward more on-line business? By considering this, aggregators can find out whether the entire market size is increasing or not. Shopping comparison sites generally do well because the online shopping and advertisements are increase dramatically, by seizing market share from traditional channels.

Pure information aggregation is just a start point. In order to survive, aggregators have to find revenue source. Because the entry barrier is low, after an information aggregator entered the market, the first thing they should do is to increase the entry barrier by either partner with traditional players, or by investing big money in technology, so that it can differentiate itself. Companies failed to do so face big challenges.
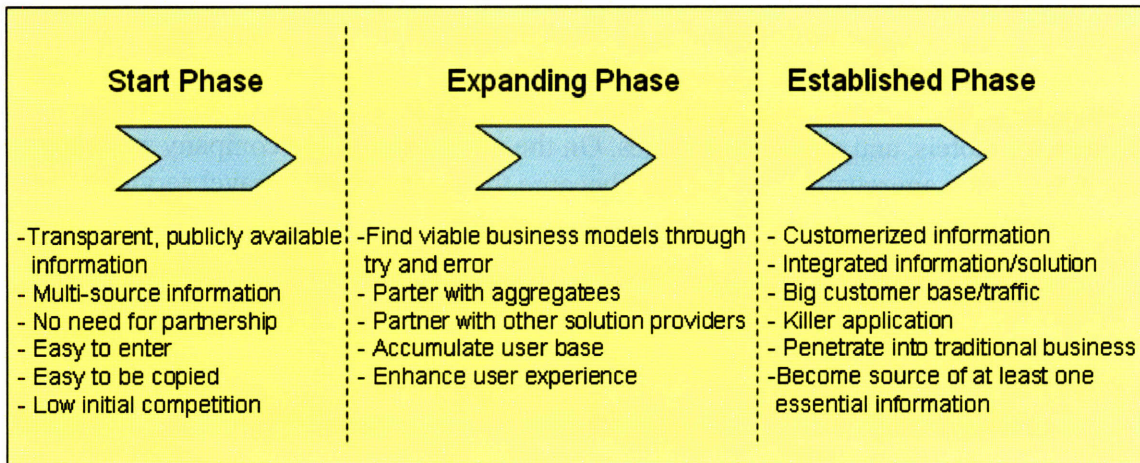
Start Phase	Expanding Phase	Established Phase
-Transparent, publicly available information	-Find viable business models through try and error	- Customerized information
- Multi-source information	- Parter with aggregatees	- Integrated information/solution
- No need for partnership	- Partner with other solution providers	- Big customer base/traffic
- Easy to enter	- Accumulate user base	- Killer application
- Easy to be copied	- Enhance user experience	- Penetrate into traditional business
- Low initial competition		-Become source of at least one essential information

Figure 6-2: Phases of Information Aggregator

In order for independent information aggregator to survive, following are some choices:

❖ For a closed industry, try to complement offered value with its customer aggregatees.

❖ Enter into an expanding market, such as many of the shopping comparison sites.

❖ Differentiate itself either by partnership, or developing core technology, or being the first mover and accumulate network effects. For example, Zillow has to differentiate itself in order to survive after facing head-on competition from big players.

❖ Be sources of at least one type of aggregated information. Zillow achieved this to some degree, although maybe unintentionally. Zillow asks viewers to contribute to

housing information (see 5.2), and these information becomes Zillow's uniqueness. Although by doing this, Zillow is not a 100 percent information aggregator anymore (see information aggregator definition in chapter 1), the initiative is very smart and worth other aggregators considering.

Another strategy employed by early information aggregators is to leverage their information aggregation capacity to pentrate into traditional businesses. CTrip and Exedia have done this successfully.

CTrip was founded in 1998 by the company's CEO Jianzhang Liang, a Chinese internet veteran. The first intention of the company is to present collected travel information, attract big traffic and them make money from advertisements. This concept helped the company attract big amount of venture capital. However, after several years of operating, the company didn't achieve good revenue. The company then changed their business model by break into traditional travel services such as hotel reservation and airline tickets reservation. During this course, the company partnered with or acquired some traditional travel call centers and agents. According to the company's CEO, CTrip is not a dotcom any more, but a traditional travel service provider, using the Internet as a tool to facilitate traditional businesses. Till now, hotel reservation and air tickets reservation are two biggest revenue source of the company. The company went public to NASDAQ in December, 2003, and now reached annual revenue of $100 million. If the company had never been an information aggregator, it's hard for it to break into travel service industry because there are many regional agents who have strong relationships with local government, hotels, and airline companies. On the other hand, if the company stuck to pure information aggregation, it wouldn't become the leading online travel service provider in China.

7 Appendix

Appendix 1: Shopping cart software programs InterShipper integrates

Intershipper can be integrated with many of the popular shopping cart software programs. Below is a list of the vendors who have integrated our services.[105]

- ❖ CFWebStore
- ❖ Click Cart Pro
- ❖ Comersus
- ❖ CoolerBiz
- ❖ eCatalogBuilder
- ❖ LiteCommerce
- ❖ PageDown Tech
- ❖ ServerLogic
- ❖ Shop-Script
- ❖ Stingray Internet Communications
- ❖ Sun Shop
- ❖ u$torekeeper Online Shopping System
- ❖ VPASP
- ❖ X-Cart
- ❖ World Design Group

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[105] http://www.intershipper.com/Shipping/Intershipper/Website/MainPage.jsp?Page=Integrate

Appendix 2: Intershipper Revenue vs. Expense 1997 - 2006

Year	Revenue	Expenses	Net Income
1997	$ 5,415.00	$ 189,877.00	$(184,462.00)
1998		$ 302,715.00	$(302,715.00)
1999		$ 553,694.00	$(553,694.00)
2000		$ 194,237.00	$(194,237.00)
2001	$ 15,910.00	$ 756,969.00	$(741,059.00)
2002	$ 7,642.00	$ 804,423.00	$(796,781.00)
2003	$ 3,637.00	$ 257,530.00	$(253,893.00)
2004	$ 25,063.00	$ 138,358.00	$(113,295.00)
2005	$ 34,547.00	$ 145,129.00	$(110,582.00)
2006	$ 56,553.00	$ 111,160.00	$ (54,607.00)

Appendix 3: Account Aggregation Service Adoption Data

Time	Users	Company Clients	Websites Grabbed	Billers	Comment
1/31/2000		17	1100		
8/1/2000				121	
8/16/2000			1500		
12/5/2000	425,000	88			merge with VerticalOne
1/1/2001			2100		
2/26/2001	800,000				
5/26/2001	1,350,000				14 of top 20 banks
5/28/2002		140			
9/17/2002	3,000,000	150	7000		60% source screen scraping, 40% source something like OFX
11/19/2002	3,300,000	150			
12/16/2002					launched advisor pro
3/28/2003					10% of U.S. banks now offer aggregation
8/11/2003				2500	bill presenting, not bill pay
Oct-03					30 of the top 50 global financial institutions. Checkfree only has 280 billers
9/28/2005				2940	
Jan-07	6,000,000		8000		

Appendix 4: My own experience with MyPortfolio of Bank of America

I signed in MyPortfolio in Bank of America in February, 2007. I have following experience and feelings:

❖ Sometimes, BoA's own data is not updated for at least one week.

❖ Account information from other sources is updated every time I logged in. [note]

Some web sites such as OMEGA Financial, MIT FCU can't be integrated even currently Yodlee can aggregate from more than 8,000 sites.

Note: according to Yodlee, Yodlee's Data Engine has sophisticated scheduling rules that enable it to efficiently and automatically update data even when the user is offline so that the customers access current account data every time they log in. [106]

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[106] http://corporate.yodlee.com/technology/key_capabilities.html