

1 Introduction

"We have a solution unlike anything that is on the market today or that has been on the market before [...] Our features provide real savings for business travelers, companies, and leisure travelers that puts us well ahead of the rest of the travel market." (TRIPBAM, 2013)

It was April 2013 when Steve Reynolds found himself taking a new and unexpected journey. After 25 years in the travel industry, he had successfully funded two travel companies in the corporate space and had held positions as executive and consultant. Now he was incorporating an innovative consumer service: TRIPBAM. TRIPBAM's value proposition consisted in discovering cheaper hotel rates for travelers who had already booked a trip.

This turn in Reynolds' career came about rather serendipitously. First at a board meeting ¹when a colleague explained how he managed to always get the best rates having his secretary shop every day until the day of travel. Then ²when he noticed a corporate travel agency offering a similar manual rate-checking service, called the platinum desk, to their best clients. The catalyst was an observation at a four-way intersection on the way to the Dallas airport. Four comparable hotels stood on each corner. Reynolds recalled thinking:

"What if we ³automate rate monitoring and provide it as a service? Could we significantly lower clients' hotel cost while preserving flexibility and quality?"


From this intuition, Reynolds grew TRIPBAM into both a consumer-oriented and business-to-business solution. In 2014, the firm won the Business Travel Supplier Innovation Award at Business Travel News' Innovate Conference and, in 2015, the Phocuswright Battleground Contest. It also won recognition from corporate travel publications in the United Kingdom and the United States (TRIPBAM, 2013).


With the product in place and seed funding secured from Thayer Ventures, the leading hospitality venture capital firm, it was critical for Reynolds to grow TRIPBAM from a clever idea into a viable business. The success or failure of the company depended on growing the user base, beating an increasing number of competitors, avoiding industry retaliation, and building a sustainable business model.


Summary of Comments on CAIS IS Education 16-049.R1 annotated.pdf

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2 Industry Background




More than fifty years had passed since the first reservation system was introduced in the airline industry. In 1963 SABRE, a joint effort of American Airlines and IBM, demonstrated the capability of IT to efficiently manage the inventory of airline seats. It was just a matter of time for hospitality firms to implement a similar solution to manage the daunting problem of pricing hotel rooms. Two years later Holiday Inn's HOLIDEX was a reality and the hospitality industry changed forever. In the late 1970s and early 1980s, the introduction of Central Reservation Systems (CRS) showcased the power of distribution networks, which created the efficiencies and distribution services needed for the franchising model to work. Franchising ushered in an era of consolidation during which large multinational chains replaced family-run hotels. By the 1990s, the US lodging industry was dominated by franchisors and management companies with strong brands in each market segment.

The widespread adoption of the Internet in the mid-1990s subverted the established order. Hospitality operators lagged behind and new entrants with technology backgrounds and the strong entrepreneurial spirit of the dot-com era entered and grew quickly. These new ventures quickly captured a substantial amount of the value created in the industry by intermediating reservations online.

The dominant players included Expedia, originally a business unit of technology giant Microsoft, and Priceline, the brainchild of technology entrepreneur Jay Walker.

In early 2015, the market continued to consolidate. Expedia purchased Travelocity for \$280 million on January 23rd, Orbitz on February 12th for \$1.34 billion, and HomeAway on November 4th for \$3.9 billion. After its acquisition spree, Expedia became the world's largest Online Travel Agency (OTA) by total bookings and, with Priceline, established a de-facto duopoly in the industry (see Exhibit 1). Large OTAs drove revenue through commissions and placement costs.¹ However, unlike the use of fixed commission as in the "pre-Internet days," current arrangements created costs of acquisition through intermediaries ranging anywhere between 15% and 35%. Furthermore, the OTAs' share of guest-paid room revenue increased along all hotel segments. For economy and midscale hotels it increased from 7.8% in 2011 to 15.8% in 2014. For upper-midscale and upscale hotels from 7.7% to 11.7% during the same period

¹ Commissions are paid to OTAs as a percentage of the total booking value. Placement costs consists of additional fees OTAs may request to hotels for gaining a better positioning in hotel and price comparison searches.

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(Mayock, 2015), and for upper-upscale and luxury hotels, the OTAs' share increased from 6.6% to 8.8%. In 2014, while lodging operators were still receiving the largest share of their bookings from their websites and through their call centers, the OTAs' share of the online hotel market increased to 48% (up from 46% in 2012) (Walsh, 2014). This trend was generally thought to reflect the propensity of millennials, who represented 33% of U.S. leisure hotel guests (Harteveldt, 2013), to interact and book directly online, through apps or social media. As Douglas Quinby, a principal analyst with the travel research firm Phocuswright put it, since about 2005 there had been "pretty amazing growth of both the funding that's gone into online travel and travel technology startups as well as the number of companies that have ... made their way into the arena." (Robinson-Jacobs, 2013)

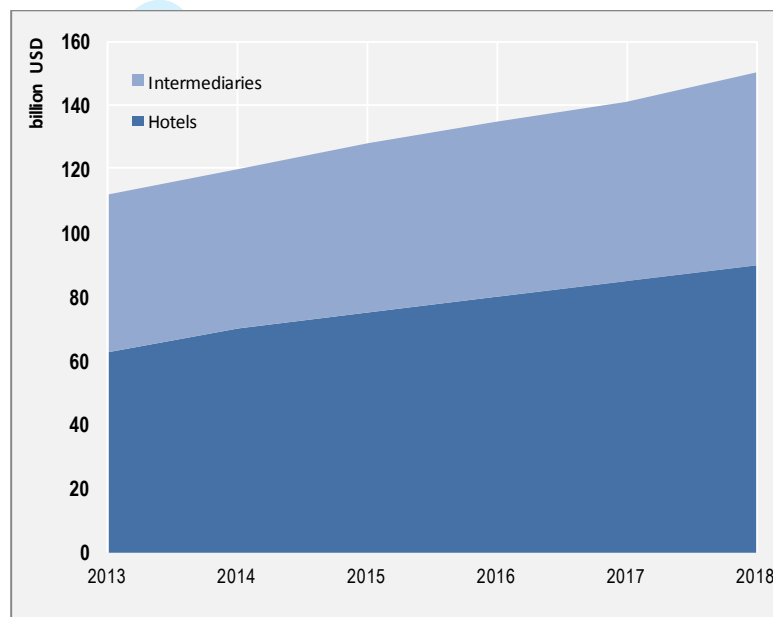




Figure 1. Hotel Global Online Sales by Channel, projections for 2014 and onwards (Rossini, 2014, p. 11)

OTAs weren't the only players in the distribution space however. Metasearch sites, like Kayak (a Priceline property), Skyscanner and Hipmunk were often the place where savvy travelers would shop first (Figure 2).

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OTAs were not, however, the only players in the distribution space.

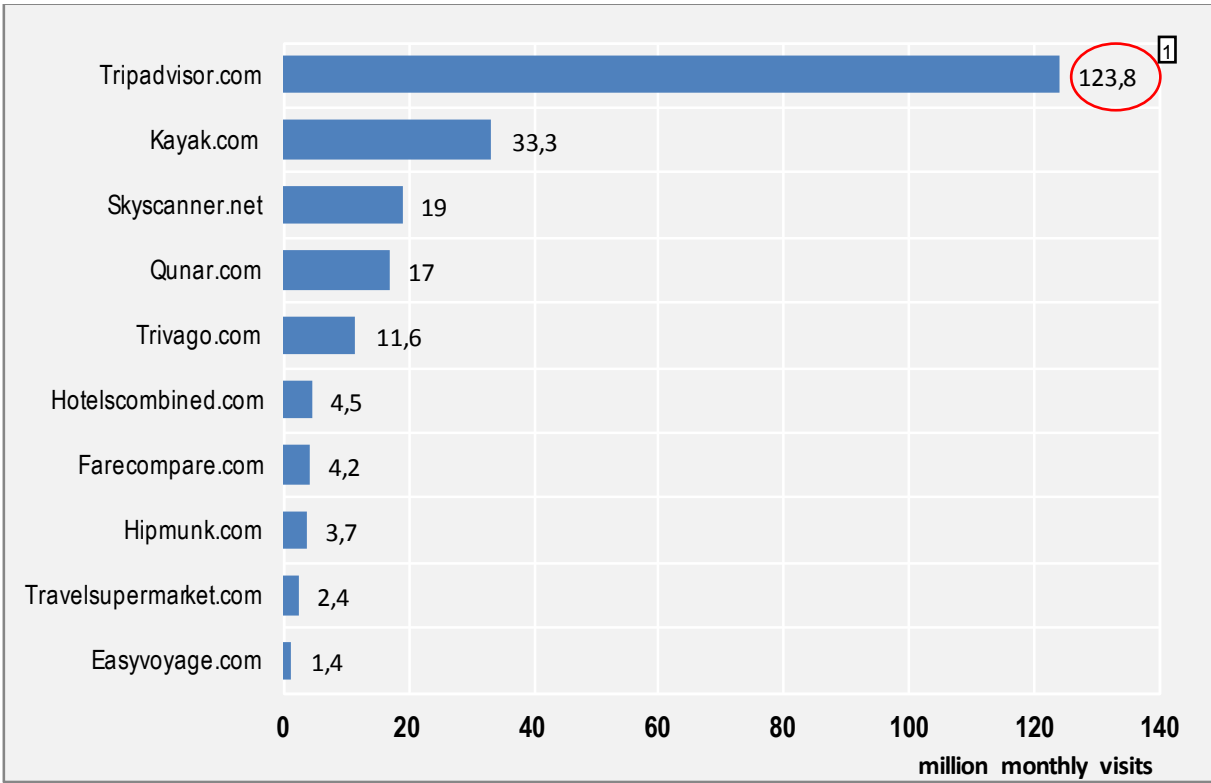




Figure 2. Key Global Metasearch Engines in Travel (source data from SimilarWeb, February 1st 2016)

Central Reservation Systems (CRSs), ~~Travel Agencies, Travel Management Companies (TMCs), were~~ other important players in the lodging distribution chain. While travel agents serviced a niche market of travelers with complex itinerary requests in the unmanaged consumer market, business travelers relied on internal travel managers or TMCs like Concur or American Express for their travel needs. Travel agents' revenues were primarily composed of service fees (e.g., ticketing, booking, expense management) and transaction fees (e.g., credit card discount rate, processing costs, GDS fees). In some contracts they could also garner commissions, but these financial flows represented a fraction of their total revenue.

Business travel management was a complex process encompassing corporate travel policies (e.g., maximum allowed rates, allowed categories, and daily expense limits), itinerary planning and booking, expense management, and reporting. It also included yearly rate negotiations with suppliers. Up 4% and totaling \$112 billion in 2015, U.S. corporate travel represented one third of the total travel market. Despite hoteliers' efforts to attract direct bookings, more than three quarters (\$87 billion, 78%) of corporate travel was still managed by an intermediary (Fadnis, 2016).

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Travel Agencies, and Travel Management Companies (TMCs) were

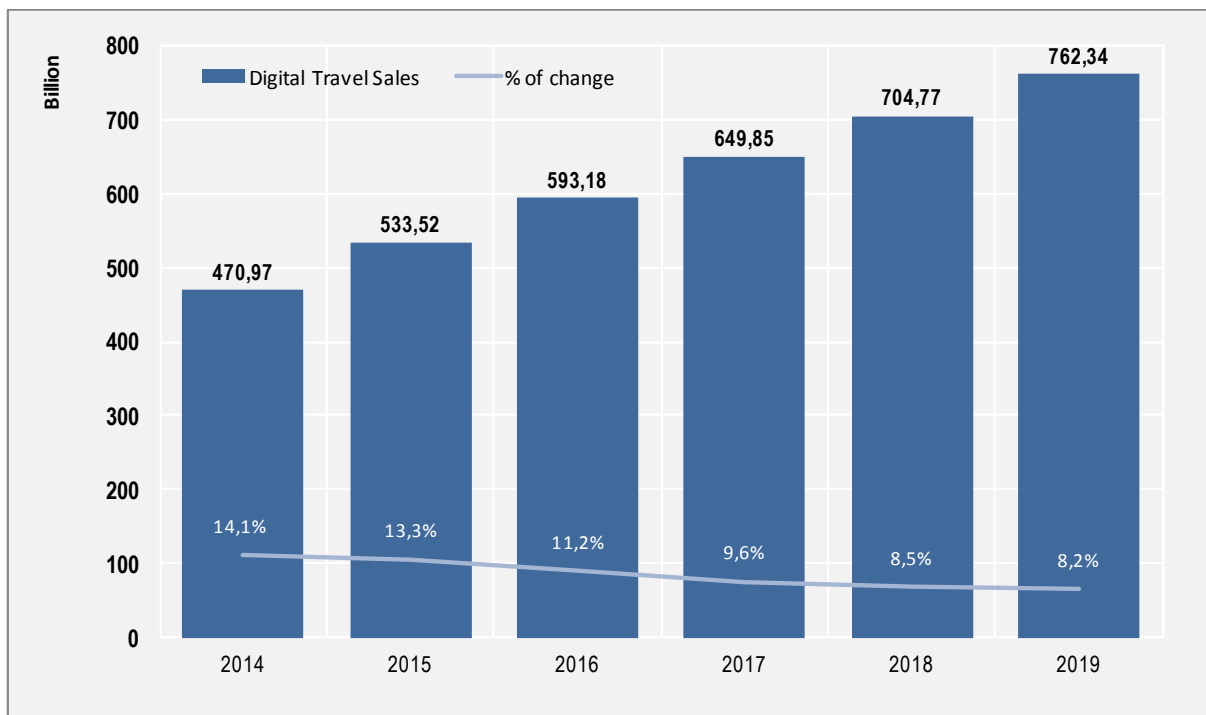


Figure 3. Worldwide Digital Travel (eMarketer, 2015)




The rising power of OTAs on the consumer side imposed high customer acquisition costs on hotels and an increasing dependency upon intermediaries in the distribution channels, particularly for independent operators. In addition, given the strength of their cash flow, OTAs were able to invest in marketing and communication to attract consumers. They also continually innovated on their online offerings by introducing faster and better search and comparison tools. In 2015, ease of use was still the main reason travelers' favored OTAs and other booking sites, even ahead of price (Gasdia, Liu, & Blutstein, 2015). Additionally, OTAs introduced their own loyalty programs in an effort to offset the value proposition of the major chains' proprietary frequent traveler incentives. 16% of consumer travelers' booked rooms four times or more annually and many of them (67%) belonged to hotels' loyalty programs (Gasdia et al., 2015).

While observers did not consider lodging a pioneering industry when it came to IT, the travel value chain was controlled by software in the form of Global Distribution Systems (GDS), Central Reservation Systems (CRS) and Property Management Systems (PMS). By 2012, four major GDS dominated the hotel reservation landscape: Amadeus, Sabre, and Travelport's Worldspan and Galileo. GDS represented the backbone of the travel industry and hotels published there their information such as room availabilities and rates. Other than hotels, the access to GDSs was only granted to travel agents or authorized travel

resellers. Smaller brands accessed GDSs indirectly through intermediate distribution systems called switch. Pegasus, Genares, Dhisco and InnLink were representative players.

Internally, hotels used revenue management systems to optimize ~~their occupancy, and profits~~¹ acting directly on room availabilities and rates. During periods of expected high occupancy, the hotel raised rates to extract greater margins, while accepting to sell at lower price in times of low projected occupancy. The Internet increased rates visibility for guests and competitors alike, enabling revenue management systems to take market conditions into account when creating forecasts. The ultimate outcome of these trends was a drastic increase in volatility of room rates and the complexity of rate structures that customers had to understand and work with.

Interestingly, the rise of OTAs forced reservation and distribution systems to evolve. The OTA model, enabling consumers to shop directly for travel, drastically increased the number of hits to the GDS. These hits were called availability requests or “looks.” But the number of actual confirmed reservations sold, the so called “books,” did not increase accordingly. The net result was a dramatic growth in the look-to-book ratio (or L2B) (Figure 4). Such growth required that technology intermediaries like the switch (e.g., ~~Pegasus~~)² the GDSs and CRSs continuously maintain and update their technology infrastructure. They were paid, however, for confirmed reservations. Therefore, they had to insulate themselves against the risk of intermediaries who would shop (create cost) without booking (create revenue). Intermediaries then charged escalating fees for³ ~~for~~ the access to their connectivity services, fees tied to look-to-book ratios.

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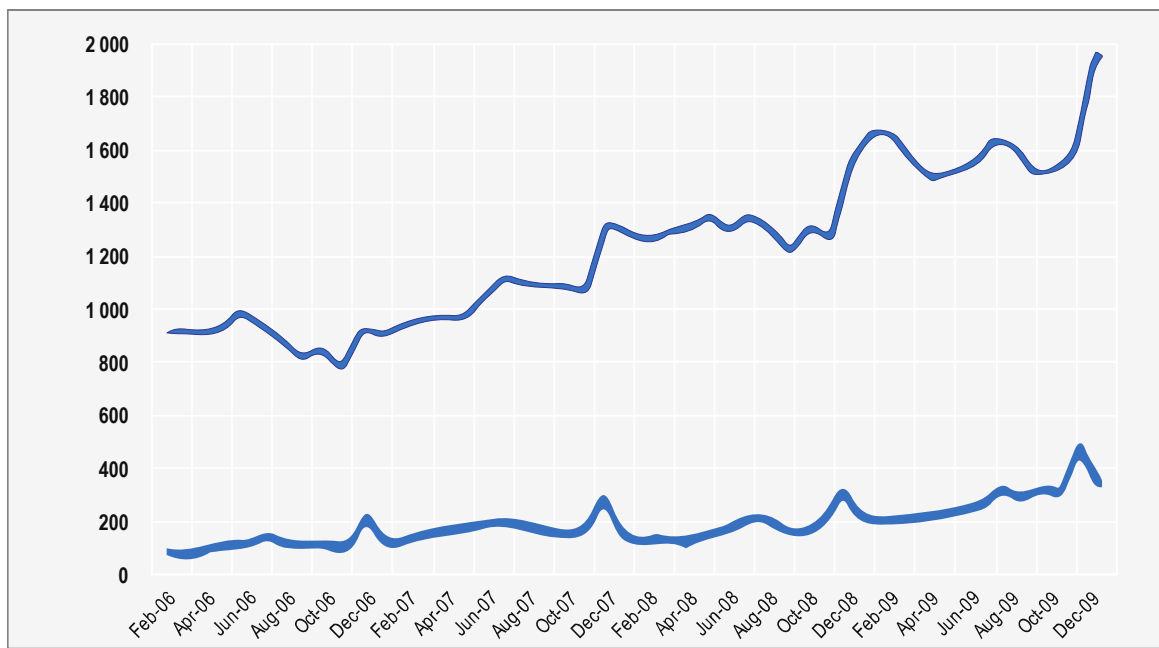


Figure 4. The historical evolution of look-to-book ratios for GDS and alternate distribution systems
(Mark Peacock, 2010)

It is in this landscape that TRIPBAM was born, with the objective of helping travelers navigate industry complexity and take advantage of rates competition. Industry figures looked promising: \$40 billion hotel bookings were placed through intermediaries (Figure 1). 92% of travelers averaged two bookings per year (Gasdia et al., 2015), and the average daily room had been steadily rising. Reynolds had reason to believe that TRIPBAM was set for a profitable journey.

3 Building TRIPBAM

Steve Reynolds was a founding member of two technology companies in the travel vertical. The first, Houston-based CTI, provided travel systems and services to Fortune 1000 companies in the late '80s and early '90s and was purchased by American Express. The second, Travel Technologies Group (TTG), funded in June 1992 and based in Dallas, TX, grew to \$25M in annual revenues before merging with two other companies in 2000 to become TRX. TRX employed 1,600 people in 14 countries and processed over 80% of the corporate travel transactions in the U.S. After leaving his executive position at TRX in 2003, Reynolds held multiple managing and consulting positions and in 2015 was named one of the top 25 most influential executives within corporate travel. Inspiration struck in 2012 when he wanted to prove the viability of TRIPBAM's automated hotel rate shopping. Reynolds explained these early tests:



"We went out and bought historical hotel rates for 2012 to 2013 and we built a little analytic engine to go back and look at how often, within a cluster of hotels, we observed rate fluctuations. We wanted to know if we could deliver savings. The key was to beat OTA's non-refundable rates by tracking rates across a set of hotels on a daily basis. Results came out better than we expected. We found savings 50-70% of the times and the savings averaged around \$60 per night. That's when I knew we were on to something."

TRIPBAM found that, in the majority of cases, rates granting free cancelation (i.e., refundable) were found twice per booking and were beating OTAs' rates when approaching the day of the stay. The last piece of the puzzle was to ascertain whether the commissions earned on bookings offset the costs for the daily shopping of room rates. Access to GDS and other distribution systems varied but generally required the payment of a one-time setup fee and a monthly fee. Such fees could range substantially depending on the size of the intermediary and the volume of reservations being generated, but they usually hovered around \$5,000 and \$2,500 respectively. OTAs like Expedia provide free API² access to their affiliates soon as they could comply with a L2B ratio of 500 to 1 for room rates and availability requests. As Reynolds commented:




"Shopping costs have come down compared to the mainframe era because hardware and infrastructure costs have decreased dramatically. Today, it's micro pennies per hit."

In November 2011, once he became convinced of the opportunity available to TRIPBAM, Reynolds reached out to a former colleague at TRX: Caleb Blanton. After leaving TRX in 2007, Blanton had created his own IT consulting company, Creativa Consulting. Blanton recalled:

"Steve told me the story of how he came up with the idea. We had our share of experience with booking tools and we knew that the travel space was really congested, but I immediately realized this wasn't a booking tool. It was a shopping service and in an industry this congested it's pretty unique to find an emerging niche."

But between an idea and an operating startup there was significant work to be done. Blanton explained:

² An Application Programming Interface (API) is a standardized method to allow a set of data and functions of a computer program to be shared with other applications. For example, both TripAdvisor and Yelp use Google Maps API to show the location and provide the directions to users' desired venues. More specifically, Expedia's API provided affiliates the access to several core functions for managing the booking process (e.g., listing hotels, room availability, room images, payment types, geolocation). See <http://developer.ean.com/docs/getting-started> for more details.

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"I took Steve's coarse-grained business requirements and developed finer grained software solutions. It was challenging, but I am particularly good at bridging the gap between the business and the technology."

Reynolds financed the initial development of TRIPBAM's prototype. It was a proof-of-concept limited to core functionalities and based only on static data. Reynolds recounted:

"I needed a minimum viable product to pitch investors, to demonstrate our initial success. Investors were critical partners to fuel our growth."

TRIPBAM was incorporated in Dallas in April 2013 and was the first service providing clustered rate shopping to consumers. This unique feature of TRIPBAM enabled users to shop rates from a set of similar hotels and within a geographical area.

Initially, TRIPBAM development was outsourced to Blanton's software company, but in 2015 his whole team joined TRIPBAM full time, raising employees count to 10. In August 2013, Thayer Ventures injected \$1m in seed funding. A second wave of funding followed in January 2015 for an additional \$525K of equity to fund TRIPBAM's development and market penetration in the business segment. To secure TRIPBAM's Intellectual Property in September 2013 the firm applied for a utility patent covering the clustered rate shopping concept, receiving it in March 2014 (Reynolds, 2014).

4 The Product

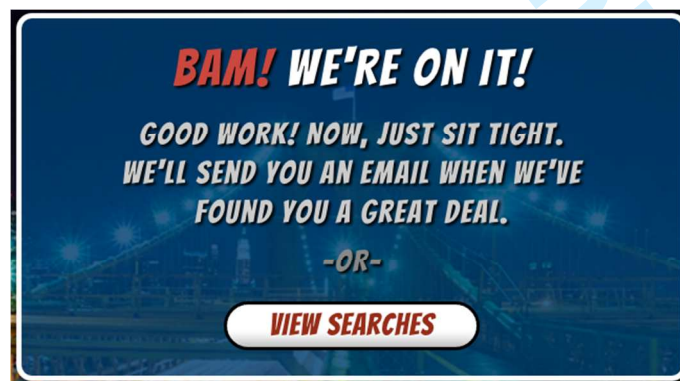




Figure 5. Search confirmation message


At its core, TRIPBAM was an automated cloud-based service enabling customers to monitor and re-book hotel reservations prior to travelling. On average, stays were booked between 1 week and 2 months in

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September 2013, the firm

available rate within the cluster. For those who had already booked, TRIPBAM sought to beat their current rate (Figure 7). Setting up a clustered search also enabled customers to take advantage of all the different ways in which TRIPBAM algorithms could uncover advantageous rates. TRIPBAM stated on its website:

“Fine tuning the amenity mix is a great way to reveal hidden rates. For example, you can save a lot of money by switching from a king-size bed to a queen. Look at all types of combinations to further lower your costs.”

While current search design allowed limited selections, mostly focusing on bed types, the firm had plans to expand the list. The strategy for what rates to book also created opportunities. The firm website explained:

“In the early stages of a search, it could be risky to book a non-refundable rate. However, a day before check-in it might be worth considering. We include penalty rates when it makes sense to get you rates at rock bottom prices.”

The screenshot shows the TRIPBAM website interface. At the top, there's a navigation bar with links: HOME, ABOUT, MY TRIPS, HELP, ACCOUNT, and social media icons. The main content area is divided into two columns. The left column contains a search form with the following elements:

- Radio buttons for "FIND ME THE BEST RATE ACROSS THIS HOTEL CLUSTER." and "BEAT MY RATE! NIGHTLY RATE: 150.00 (USD) MINIMUM TOTAL SAVINGS: 1.00 (USD)".
- Input fields for "Arriving: 12/11/2015" and "Departing: 12/15/2015".
- Input fields for "# of Adults: 1" and "# of Children: 0".
- A "Search cut-off: 24 hours from" dropdown.
- A "Room Options:" section with checkboxes for "Request AAA Rates", "Request Senior Rates", "Request Government/Military Rates", and "Request Corporate/Group Rates".
- A "Room Options:" section with radio buttons for "Minimum # beds" (1 or 2), "Preferred Bed Types" (Any bed types, Double beds or better, Queen beds or better, King beds only).
- A checkbox for "NAME THIS SEARCH".
- Two large buttons: "BACK" and "NEXT STEP!".

 The right column displays a "HOTEL CLUSTER" section with the title "8 HOTELS". It lists four hotels:

- Hilton Fort Worth: 815 Main St, Fort Worth, TX (US), 4 stars, .11 miles from center point.
- The Ashton Hotel: 610 Main St, Fort Worth, TX (US), 4 stars, .11 miles from center point.
- Embassy Suites Fort Worth Downtown: 600 Commerce Street, Fort Worth, TX (US), 4 stars, .11 miles from center point.
- Courtyard Fort Worth Downtown/Blair: 601 Main Street, Fort Worth, TX (US), 4 stars, .13 miles from center point.

 At the bottom of the right column, it says "Etta's Place - A Sundance Inn". The footer contains links: HOME, ABOUT US, FAQ, WATCH VIDEO, TERMS OF USE, PRIVACY STATEMENT, MY PREFERENCES, MY RESULTS, MY SEARCHES, LOGOUT, HELP, CONTACT US. It also includes copyright information: "© Copyright 2014 by tripBAM, Inc. Current User: fapgn@gmail.com Current Version: 1.11.0 Server: WEB-02".

Figure 7. Clustered search design page

Once TRIPBAM found a lower rate at the same hotel the customer had reserved, or one in the acceptable cluster, it sent an automatic email asking the customer to accept or decline (Figure 4). If the traveler accepted, then TRIPBAM would rebook the stay at the hotel and send a new confirmation email. Otherwise no action was taken and TRIPBAM used the information to improve its knowledge of the



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Blanton took particular care in designing the data providers’ access. He wanted the application to easily integrate new data sources without affecting the way the logic layer dealt with that information. By doing so developers could concentrate on data use and manipulation instead of investing precious time and development dollars on interfaces and components integration.

The business logic layer, including the rules engine for rate comparison and clustering, was based on the Microsoft .NET framework. The data base management system was Microsoft SQL Server.

The user interface was built on DotNetNuke, an open source content management system and application framework for delivering the web user experience. The user interface tier implemented additional components based on non-Microsoft technologies like AngularJS (an open source web application framework). Blanton intentionally decided on a best-of-breed strategy for TRIPBAM as he wanted to use “the right technology for the job” at each step.

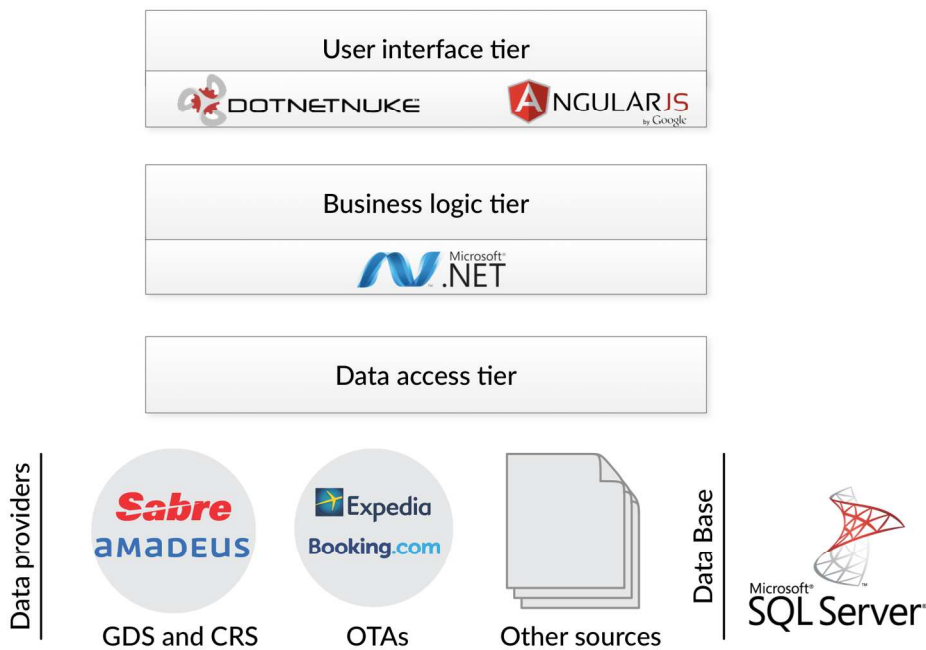


Figure 10. Overall logical architecture (source: case writers based on company data)

Interestingly, TRIPBAM’s architecture was mainly transactional. Static hotel data and a subset of booking information for analysis and operations were stored in the database. Data providers were polled for rates, availabilities, and bookings. Customers’ personal data were not stored or processed outside of booking fulfillment. The whole system architecture was conceived to support internally an application platform.



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TRIPBAM planned to seamlessly expose internally and externally its system capabilities through an API. Or as Blanton put it, *“it’s always good to drink your own champagne”*.

TRIPBAM collected rates and availability information for the hotels in the monitored lists at a predetermined time. Timely notification to users was an important part of the value proposition as special rates were available for limited time or quantities.

Blanton’s team built the rules engine on a proprietary framework and determined when a monitored rate fit the customer preferences, the cluster characteristics, and the saving threshold she identified, thus triggering the alert notification (Figure 11).

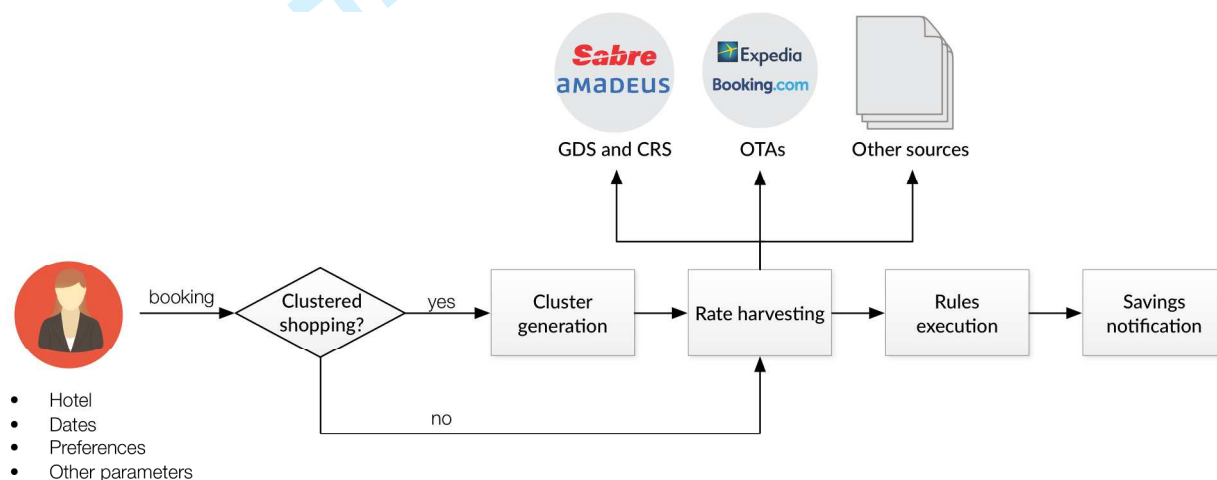


Figure 11. TRIPBAM workflow (source: case writers based on company data)

4.2 The Corporate Opportunity

Just two months after TRIPBAM’s launch, something unexpected happened. Reynolds recalled:

“Large corporations called up and said they wanted to use TRIPBAM for all of their corporate bookings. We were surprised, but we started to work with them. On the base of those relationship we started to develop more corporate oriented functionalities like a customizable rules engine, reporting and analytics.”

Large corporations easily exceeded 15,000 bookings per year (Hermes Management Consulting, 2013).

The team had to work hard to refine the service for corporate customers. In particular, compliance was a critical element because in corporate travel companies had specific requirements on preferred property



program, negotiated rates, preferred brands, and agreements with hotel brands. While most corporation¹ had automated policy compliance tools, 8 of 10 companies manually monitored and controlled travel expenses (Amadeus, 2015). The use of TRIPBAM was substantially different compared to the consumer market. In the corporate space, bookings were initiated and managed by the customer on reservation systems like Concur, travel agents, or directly on brand.com sites. Thus, TRIPBAM had to pivot its value proposition in order to market itself as a service for generating savings and enforcing travel policies' compliance. The service agreement between TRIPBAM and a business customer defined the engine shopping parameters (e.g., same hotel, same room, preferred cluster, non-preferred cluster, etc.). In general, customers provided the bookings they wanted to monitor through TRIPBAM's API and² rates were shopped accordingly. The customer was then notified in the case of a lower rate.

While different from what TRIPBAM planned for the consumer market, the B2B opportunity appeared to be real. Reynolds recalled:

"Thayer Venture's Jeff Jackson, a real expert in the B2B space, pushed us to pursue B2B since he saw it as the best opportunity."



4.3 Revenue Model

In the consumer space, TRIPBAM sought commissions for brokering the reservation like travel agents did (Figure 12). Commissions were directly collected when TRIPBAM was the travel agent confirming the booking that the customer actually used – the last booking. Reynolds explained the inherent challenge:

"Today many consumers use TRIPBAM for shopping. We have to figure out how to increase conversions and make these shoppers book with us. We planned to limit the ability to shop for free, providing one or two rebooking before asking a fee."

On the corporate side, the revenue model was different as bookings were initiated and managed independently from TRIPBAM. Reynolds commented:

"TRIPBAM can be used to improve compliance as much as cost savings. One of our client has improved preferred property usage by more than 20 percent."

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On the corporate side TRIPBAM was marketed as a subscription fee service with a very minimal monthly fee. While the minimum subscription discouraged smaller customers, it helped TRIPBAM to contain interface development costs.

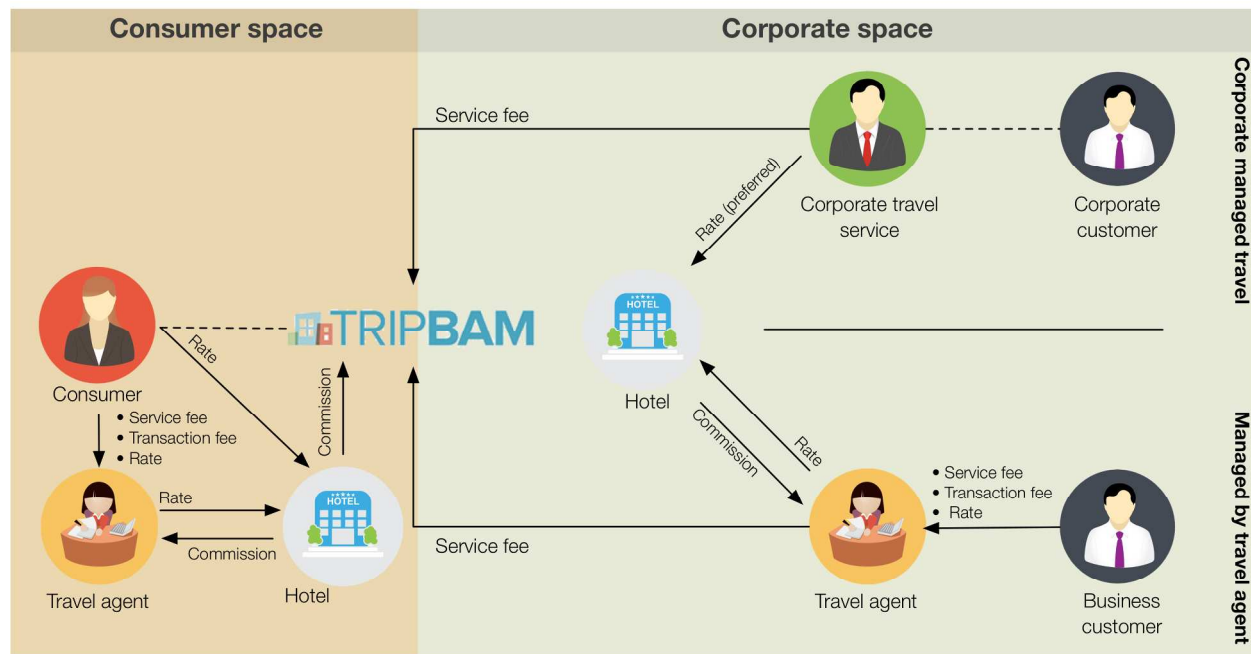





Figure 12. TRIPBAM consumer and corporate revenue models (source: case writers base on company data)

4.4 Competition

While TRIPBAM had been a pioneer, there was increasing competition. OTAs were only offering price guarantees on the day of purchase and not aggressively moving into TRIPBAM's territory. Reynolds explained:

"While we are about cost savings, OTAs interest lays in revenues improvement. They are so dependent upon hotel commission revenues that copying us would actually mean diminishing their revenues."

Reynolds worried more about the number of other startups or existing companies that would look to copy them in the event that their service became widely accepted. In 2012, Tingo, owned by TripAdvisor, introduced the concept of automatic rebooking and refund. The application leveraged the Expedia Affiliate Network to book and monitor hotel rates. In case of price drops or free upgrades, the service would automatically rebook and refund the price difference directly on customers' credit cards. In 2013, the

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European startup TripRebel launched on Tingo basic principles. The system featured the same automatic room rebooking when upgrades, better rates, or additional amenities were made available at same hotel. Additionally, it enabled the user to rebook at better rates within a pre-defined “favorite” list of properties.

In 2014, WorldMate, a traveler’s mobile application, received the 2014 Phocuswright Most Innovative Established Company Award for its Hotel Price Alerts and Counter Offers features that notified users of lower rates available at the same or in a comparable property. WorldMate disclosed that these features were generating an average savings per trip of \$88 for their 11 million users and that the re-booking process took less than one minute and required 8 clicks (WorldMate, 2014). As WorldMate CEO Amir Kirshenboim put it:

“Price Alerts and Counter Offers are the culmination of over 100 man-years of engineering and are only possible because of the amazing efforts of our talented and dedicated team.” (CWT, 2014)

Owned by Carlson Wagonlit Travel (the fourth largest travel agency in the world with \$23.4 billion revenues from 58 million transactions in 2015) and strengthened by the partnership with Expedia, WorldMate showed that the rate shopping was not only successfully replicable by competitors, but also exploitable by established travel agents. WorldMate vice president, Ian Berman, further stated that he could envision a managed version incorporating policies and preferred suppliers for corporate customers.

While Yapta traditionally targeted the managed corporate travel for airfares refunds, it started to challenge TRIPBAM on hotels using GDSs data and same hotel rate shopping. It was backed by Amadeus and Concur and had secured more than \$20 million in funding.

5 Early Results




TRIPBAM consumer base growth was slow. However, TRIPBAM had caught the attention of the mainstream press, with stories in the New York Times and The Wall Street Journal that generated several thousand users, even before any marketing effort. On the corporate side, initial testing of TRIPBAM returned savings averaging \$44 per room-night on same hotel bookings where TRIPBAM found a better rate. Tests with ~~perspective~~¹ clients entailed taking a set of active reservations and ~~the application~~² TRIPBAM's proprietary shopping algorithms to compute potential savings. Cindy Heston, director of travel and events at Anthem WellPoint, commented on these results:

"This initial test, even on such a small scale, shows there are new, incremental savings to be found in traditional travel categories." (TRIPBAM, 2014)

While adopted by only 20% of corporate customers, the clustering approach proved to generate significant savings (see Exhibit 2). For those customers who used clusters, TRIPBAM shopped an average of 6.5 properties and found savings on 39% of monitored reservations with average savings of about \$174 per stay (Campbell, 2015). Beside savings, the transparency gained on hotel rates had additional value for corporate customers. Michelle De Costa, director of global travel and client experience of IT service company Liberty Mutual observed:

"This could be a game-changer, because I'll know how my negotiated rates are stacking up out there." (Baker, 2014)

Agencies and corporate customers gained access to data supporting contracts negotiation. By 2016, TRIPBAM was processing about 170,000 bookings monthly, identifying over \$3 million in potential savings per month (see Exhibit 3). Potential savings represented the difference between the initial bookings and the final rate ~~TRIPBAM's~~³ identified before the stay. Interestingly, firms were still conservative concerning rate shopping and rebooked for lower rates only about 1 in 2 bookings. TRIPBAM's business was gaining traction in the corporate space having closed deals with 15 of the 20 top travel management companies

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TRIPBAM: Leveraging Digital Data Streams to Unleash Savings

TEACHING NOTE

Gabriele Piccoli and Federico Pigni

Overview

The TRIPBAM case can be used in a wide range of classes in Information Systems, entrepreneurship, or strategy. It provides the opportunity for students to practice Information Systems design and the analysis of added value, including value creation and appropriation, for IT-dependent strategic initiatives.¹ During the **discussion**, the instructor has the ability to explore many related topics, from the value creation potential offered by Digital Data Streams (DDS), to the emergence of robotic process automation in the form of TRIPBAM's automated shopping agent, to the challenges IT startups face when focusing their value proposition.

Synopsis

TRIPBAM pioneered automated clustered rate monitoring in the hotel industry. After capturing a traveler's reservation, TRIPBAM software scrutinized the Digital Data Stream² of changing room rates and notified users of any potential savings. While in the beginning TRIPBAM focused on the consumer market, by the time of the case the company had refocused on the corporate market. The pivot³ was spurred by the interest the firm had received from the industry as well as the many direct personal relationship TRIPBAM executives had in the B2B space. Was this decision correct? Should the firm focus on both the consumer and corporate verticals? Does the TRIPBAM offer indeed create added value? Could TRIPBAM defend its IT based competitive advantage against imitators?

Readings

1. Lacity, M., & Willcocks, L. P. (2016). Robotic process automation at Telefónica O2. *MIS Quarterly Executive*, 15(1), 21–35.
2. Piccoli, G., & Pigni, Federico. (2016). *Information systems for managers: texts and cases*. Prospect Press.
3. Pigni Federico, Gabriele Piccoli, & Richard T. Watson. (2016). Digital Data Streams: Creating Value from the Real-Time Flow of Big Data. *California Management Review*, 58(3).
4. Thompson, B. (2015). Beyond Disruption. <https://stratechery.com/2015/beyond-disruption/>

¹ see for example Chapters 2, 7 and 9 of Piccoli, G., & Pigni, Federico. (2016). *Information systems for managers: texts and cases*. Prospect Press.

² Digital Data Streams are generated by the continuous flows of real-time data representing events captured in digital form at their inception. In this case room rates DDSs are generated by hotels when providing their daily rates and availabilities down the different distribution channels.

³ The term "pivot" is used in entrepreneurship to refer to the unexpected and sudden strategic re-orientation of a firm. Typically this entails shifting the business model focus.

See

Study Questions

1. Would you invest in TRIPBAM if you were a venture capitalist?
2. What is TRIPBAM's value proposition?
3. How does the firm deliver its value proposition?
4. What is the added value of the TRIPBAM solution?
5. What would you do to ensure the success of TRIPBAM if you were Steve Reynolds?

Analysis

What is TRIPBAM?

TRIPBAM is a startup built on the realization that the intense shopping activity most travelers engage in prior to booking their accommodation, needs not stop after the reservation is made. Rethinking the polling of hotel room rates as a Digital Data Stream (DDS) brings into focus the idea that value could be created by automating the monitoring of rate changes for those reservations that customers already hold. TRIPBAM launched as a consumer service, before pivoting in 2014 to focus on the corporate and travel management market.

TRIPBAM offers one service to consumers, the monitoring of reservations after the traveler has already identified a suitable option. Table 1 contains a partial list of benefits and drawbacks of the service from the standpoint of a consumer (the actual traveler).

Table 1: Perceived benefits and drawbacks of the TRIPBAM's core service for individual travelers

Advantages	Disadvantages
Potential savings	No reward points from the travel intermediary
Automated process	Savings improve with the shopping of more properties and different room types, this flexibility leads to uncertainty about where you will stay and what service you will get
Larger base of opportunities	Automated rebooking creates convenience, but it leads to loss of control
Customizable searches and clusters	
Different rate shopping modes (radius / category)	
Peace of mind that you got the best deal	
Get to keep reward points from the hotel	

An analysis of the above table suggests that different types of trips provide a different degree of fit with the TRIPBAM service. For example, a pure business trip in city center



service focuses on back-office automation using available technology. The deep domain knowledge of Reynolds and his team, and the combined decades of experience they have in back office travel automation are certainly part of the answer. Only a group of individuals with deep knowledge of the back-office systems could engineer a viable solution. This is an important point that reiterates the central role that deep domain expertise plays in new technology startups. But the case also hints at other possible answers.

- a) The wide availability of room rates in digital form, a byproduct of the success of OTAs and electronic distribution.
- b) The changing competitive environment and the decreasing costs of GDS connectivity – reducing financial and transactional break-even thresholds. Decreasing access cost to reservation platforms and the servitization of scalable IT infrastructures made the processing, benchmarking, and comparison of room rates within a range of the revenues this service may generate per booking.
- c) The maturation of cloud solutions that have steadily reduced the technological infrastructure cost (i.e., hardware and software) of a solution like TRIPBAM.
- d) The opening left by the dominant online players. The business models of established OTAs discourages rate shopping after the reservation, as they would hurt their commission dollars. OTAs are constantly seeking to offer incentives for booking with them, and strive to increase the loyalty of their customer base. But, from a financial standpoint, it is very difficult for them to justify a service that automates the process of reducing their own cash stream: commissions!

This analysis shows that, as it often happens with IT startups, the emergence of TRIPBAM was not due to a sudden technological breakthrough, but rather to the relentless evolution of technology and the clever realization by founders with deep domain expertise that existing processes could be improved and customer needs fulfilled. This dynamic is similar to that seen in cases like TripIt⁷ and Duetto.⁸

IS design



Perhaps the most advanced aspect of TRIPBAMs technology infrastructure was its focus on Digital Data Streams (DDS). TRIPBAM understood that by clustering hotels and monitoring rate fluctuations they would maximize the potential for value creation. However, while the role of IT is central to the value proposition of TRIPBAM, to understand how TRIPBAM delivers its service we need to understand its Information Systems design.

The analysis of the case through the socio-technical information systems model⁹ shows how IT needs to be complemented by people, process, and structure in order for TRIPBAM to deliver its value proposition.

⁷ Lynda M. Applegate, Gabriele Piccoli, & Kathryn Brohman. (2008, October 22). *TripIt: The Traveler's Agent*. Harvard Business School Publishing.

⁸ Lynda M. Applegate, Gabriele Piccoli, & Federico Pigni. (2015, August 12). *Duetto: Industry Transformation with Big Data*. Harvard Business School Publishing.

⁹ see for example Chapter 2 of *Information Systems for Managers: Text & Cases* and Lyytinen, K., & Newman, M. (2008). Explaining information systems change: a punctuated socio-technical change model. *European Journal of Information Systems*, 17(6), 589–613. <http://doi.org/10.1057/ejis.2008.50>

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- 3) We assume the loaded cost of a senior software engineer to be around \$150,000 in line with case data and public sources. (e.g., \$103,000 median salary²⁰ plus 40% of loaded costs²¹).
- 4) We set IT cloud infrastructure costs at about \$4,000 per month for the infrastructure (compute, storage, backup, bandwidth, network) and \$2,000 for software and licensing. These numbers are not in the case, but they need not be overly precise. In an information systems class, we would expect students to have some familiarity with hosted services. In our computation, we consider the overall costs of the development, staging, and production environments. The case mentions that TRIPBAM runs on a private cloud, meaning that the virtualized environment pools physical computing resource only accessible by the firm. The benefits are generally the greater control on the different aspects of both the computing and software architectures, as well as privacy. However, this implies that computers are dedicated to TRIPBAM 100% even when not in use. For example, using AWS calculator, we suggest an estimate based on their three tier architecture²²:

Tier	Instances	Type	Monthly costs
Presentation	2	Windows m3.medium	\$190.32
Business logic	2	Windows m3.xlarge	\$758.36
Data access	3	Windows + SQL Server m3.xlarge	\$2,780.16
			\$4,101.73

This would result on average cloud infrastructure costs of about \$4,000 per month and software costs to be 50% of the infrastructure costs. The rationale of this configuration follows:

- We consider that, for presentation and business logic, 1 instance is dedicated to production environment and the other to development and staging environments. Only the data access tier, a focal part of the system, has dedicated resources at all three stages of software development. Eventually, the additional resources can be defended considering the need of load balancing for critical components.
- Presentation: entry level instance with dedicated storage because of the limited number of web users per month and composed of simple pages mainly polling the backend, and eventually sending notifications;
- Business logic: dedicated storage, mid-memory, mid-cpu instance for handling the business rules engine and processing the results of the query both coming from the jobs set for matching rates and the web for clusters formation.

²⁰ Senior Software Engineer Salary. (Payscale). Retrieved April 4, 2016, from http://www.payscale.com/research/US/Job=Senior_Software_Engineer/Salary

²¹ What Does It Cost to Hire a FULL-TIME Software Engineer? (2015, October 26). Retrieved April 4, 2016, from <https://www.linkedin.com/pulse/what-does-cost-hire-full-time-software-engineer-mark-andrews>

²² You can run your own simulation here: <http://calculator.s3.amazonaws.com/index.html#r=IAD&s=EC2>



- Data access: dedicated storage, high-memory, mid-cpu instance for storing and querying rates and hotel static data.

Driver	Description	FC
Data access costs	The case does not provide TRIPBAM's data access costs, but we can assume that they are in line with standard fees in the industry: \$5,000 one-time setup and \$2,500 monthly access. We assume three data providers and one-year amortization of the setup costs. With 10,000 B2C bookings per months, we compute a per transaction data access cost of \$0.88 $[(\$5,000 * 3 \text{ providers} / 12 \text{ months}) + (3 \text{ providers} * \$2,500) / 10,000 \text{ bookings per month}]$.	\$0.88 per booking
Development and Maintenance costs	We extrapolate development and maintenance costs from the estimates of payroll information. Based on the assumptions introduced earlier, the annual fixed cost of running and improving TRIPBAM's software is \$600,000 $(\$150,000 * 4)$. This yields an estimated \$5 per transaction $(\$600,000 \text{ annual development costs} / 120,000 \text{ bookings per year})$.	\$5 per booking
Infrastructure costs	Technology infrastructure costs can be estimated at around \$4,000 per month for the infrastructure and \$2,000 for software licensing (see the simulation above). This adds an estimated \$0.60 per transaction $(\$6000 / 10,000)$.	\$0.60 per booking

The analysis of B2C costs set TRIPBAM costs at \$6.48 per booking. A key insight of this analysis is that, like any other information good, the TRIPBAM's offering is subject to strong economies of scale due to the preponderance of fixed costs. Thus, the unit economics are heavily influenced by the transaction volume – which we know being low in the consumer space since TRIPBAM has not focused on it.

Estimate Added Value

With a CWP of \$26.25 and FC of \$6.48 dollars per booking, the value proposition of TRIPBAM looks strong with an added value of $\$26.25 - \$6.48 = \$19.78$. This is the total per-booking value created by TRIPBAM in the consumer space despite the current low volume of transactions. Thus, in theory, TRIPBAM could charge up to \$19.78 for their service to consumers (see Figure 2). Note for precision-sake that this analysis does not include non-IT fixed costs, like general overhead, rent, management salaries or business development costs. Strictly speaking then, it should be considered a contribution margin per transaction computation.




Estimate Customer Willingness to Pay


We estimate CWP based on a comparison to a fully manual process and a loaded cost of staff equal to the loaded salary of a secretary, \$42,000 per year²⁵ assuming 40% over salary for benefits and other costs the employer is responsible for.

An important point to recognize is how different the customer is compared to the consumer market. The executives in charge of the travel & expenses (T&E) and corporate travel management (CTM) must decide whether to engage in a service contract with TRIPBAM. They need to balance the potential savings and compliance enforcement advantages enabled by TRIPBAM's monitoring of the reservations DDS, with implementation challenges and change management efforts needed to ensure those benefits. As it is often the case with corporate technology implementation, success is a two-step process. Value must be perceived by the decision makers, but front line employees must adopt the new processes in order for the benefits to materialize. While there were no negative CWP drivers in the consumer analysis, their impact needs to be carefully evaluated in this analysis.

Driver	Description	CWP
Automatically identify alternative stays from multiple sources	In the B2B scenario, a travel agent (as for the platinum desk described in the case) or a secretary engages in manual shopping during working hours. At \$42,000 loaded annual salary, an hour of work is worth \$21.	\$21 per booking
Automatically rebook or offers to rebook once better rates are available	Assuming the same time expenditure as in the consumer scenario, rebooking efforts are worth \$10.5	\$10.5 per booking
Automatically cancel bookings	Assuming the same time expenditure as in the consumer scenario, rebooking efforts are worth would result in \$5.25 per booking.	\$5.25 per booking
Compliance reconciliation	Without compliance, enforcement software travel managers have to reconcile trips with compliance procedures during the expense reporting process. There is no data in the case to help us estimate how much time it takes, per transaction, to reconcile whether a booking is within or outside policy. For the purpose of this computation, we assume a 10-minute effort, resulting in \$3.5.	\$3.5 per booking
Cost of non-compliance	One of the main concern organization have with respect to travel management is compliance with travel policies. The reason is that non-compliance has a number of costs, including an inability to negotiate effectively with travel providers by consolidating spending thus increasing bargaining power. Because of the difficulty in estimating actual values, these should be considered soft benefits.	\$0 per booking

²⁵ Secretary Salary. (n.d.). Retrieved April 5, 2016, from http://www.payscale.com/research/US/Job=Secretary/Hourly_Rate

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Driver	Description	SOC/FC
Development costs	Incorporating corporate policies required a specific development for each customer or the creation of a flexible rule engines, raising development and maintenance costs. Given the same figures adopted in the consumer analysis, we assume 2 additional senior engineers working 2,000 hours per year each, for \$75 loaded per hour. The cost per booking of 6 employees (4+2) would be then \$0.44	\$0.44 per booking
Data access costs	The case does not provide TRIPBAM's data access costs, but we can assume that they are in line with standard fees: \$5,000 one-time setup and \$2,500 monthly access. We assume three data providers and one-year amortization of the setup costs. With 170,000 B2B bookings per months we compute a per transaction data access cost of \$0.05 $[(\$5,000 * 3 \text{ providers} / 12 \text{ months}) + (3 \text{ providers} * \$2,500) / 170,000 \text{ bookings per month}]$.	\$0.05 per booking
Infrastructure costs	Technology infrastructure costs are assumed as above, \$4,000 per month for the infrastructure and \$2,000 for software licensing. This adds an estimated \$0.04 per transaction $(\$6,000 / 170,000)$.	\$0.04 per booking



Estimate Added Value

There is a very important consideration at this point, which was implicit in the analysis of Added Value in the consumer space. TRIPBAM's Customers Willingness to Pay (CWP) is the lowest between the cost of performing the TRIPBAM service internally manually by the staff and the expected average savings. In other words, if the expected average savings are greater than the cost of manual search, then the upper bound of CWP is the cost of manual search because the customer would prefer to do the work manually if TRIPBAM charged more. Conversely, when the expected savings are lower than the cost of manual shopping for the corporate client, then it is this lower expected saving that determines the upper bound of CWP.

The above analysis suggests in the corporate and travel management space TRIPBAM enjoys a significant potential added value: $\$39,72 = \$40.25 - \$0.53$. However, this computation is based on the expectation that savings will exceed the cost of manual shipping. This is the case only when clients do embrace the clustered shopping approach. In this scenario, TRIPBAM could theoretically charge up to \$40.25 for their services, thus appropriating the total value created $(\$40.25 - \$0.53)$.

Conversely, a competitor like Yapta ~~who~~ does not have the ability to do clustered shopping, would be able to uncover expected savings of only \$12 $(\$80 * 15\%)$ per average stay (see Exhibit A2 in the case).²⁷ A careful analysis of Exhibit A3 would reveal

²⁷ Publicly available data on Yapta corroborates the analysis in Exhibit A2: $\$109 * 12\% = \13.08 . The firm claims: "early customers of RoomIQ [...] saved an average of \$109 per booking (2.4 room nights on average) since [...] September of 2014. [They] are seeing an opportunity to save on approximately 12% of all hotel bookings tracked. Source: Yapta, Inc. (2015, February 3). Yapta's RoomIQ Reveals Hidden Hotel

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Teaching Plan

The TRIPBAM case is very versatile and it captures the interest of students who are immediately excited about the possibility of saving money on their next personal trip. You can count on many of your students to visit the TRIPBAM consumer page and to even have tried using the service. This makes for an engaging class, but it may limit your ability to sequence the discussion. If you are able to do so, we suggest that you discuss TRIPBAM's first as a consumer service and later repeat the analysis for TRIPBAM as an engine for travel management and corporate clients, following the progression of the analysis we present above. The teaching plan discussed in this section follows this approach, but it can be adjusted as you see fit.

Would you invest in TRIPBAM?


We first ask students whether they would invest in TRIPBAM's next round of financing. While the answer depends on the specifics of the term sheet and the proposed pre-money valuation, the absence of this data should not be an excuse for students not to take a stand. We force a position and we write the numbers on the board – nobody is allowed to abstain. The purpose of this vote is to create a positive tension between students who view TRIPBAM's opportunity positively and those who don't. Moreover, the tally of votes will give you an idea of how the class breaks down and alert you to individuals who feel particularly strongly about TRIPBAM. Note that we just take this poll but we don't allow people to discuss or justify their vote.


Would you use TRIPBAM?

After taking the investment poll we make sure that students have a thorough understanding of the service offered by TRIPBAM. A good way to open the discussion here is simply asking students whether they would use TRIPBAM in their next trip. This is a subtle way to ensure that the students have clearly understood what the pros and cons of the service are and also ensures that students get familiar with the context. It is also a way to focus early discussion on the consumer side and enforce a sequencing of the discussion.

This question may raise a rich debate with some students who have no problem with the process, with some that may indeed have done this manually before, and some others who claim they would never do so. Pitching these two "camps" one against the other provides a high energy means to surface many of the perceived advantages and disadvantages of clustered rate shopping.

As your students provide positive and negative aspects of the service, you can further stimulate the discussion by asking students to qualify their contributions (e.g., "Would you use TRIPBAM for your honeymoon?"). The list may remain incomplete at this stage as less intuitive advantages and disadvantages only emerge during the discussion. However, you should reserve a space on the board for it so you can build on it as the discussion goes along.

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