

Case Study

iTrolley Solutions - Is the Timing Right? A Case Study

Executive Summary

Sanjeev and his friends, excited about the opportunities that existed in Big Data, decided to quit their jobs in MNCs to pursue a tech start-up in retail analytics. The initial surveys among stores managers and shoppers showed very positive response to their idea. They registered iTrolley solutions, to be developed on a "Big In-Memory Database" platform of a "Large Enterprise" as their partner to offer retail solutions. It was a unique solution catering to both shoppers and retailers with great benefits. Retailers could avail better inventory management and integration of multiple channels and shoppers could select the best offers in a store through the iTrolley app. The application syncs with data warehouse managers through POS/CRM, and provides inbound analytics to ensure better maintenance of inventory levels. The partner, a "Large Enterprise" firm and their Solution Architects approved iTrolley's idea and provided a credit of \$1,100 to build the solution on their platform. However, it was still expensive to build the solution because it required complex data analytics and WebApp Genie capabilities. The team was also not sure about the pricing. They built a minimum viable product using the POS data and past purchase history of the consumers. The team used algorithms for connecting the in-store customer data along with the in-store products and customer purchase activity data. The approval of overall data architecture and the solution was validated and certified by the "Large Enterprise Partner". The team also received two certifications from the "Large Enterprise Partner" worth € 20,000.

Once validated, the team presented their solution to the head of a large retail chain and his team. They were excited and promised to arrange a meeting with the top management. It was

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The case was written for class discussion and purely for academic purposes rather than to illustrate either effective or ineffective handling of management situations. The authors intend no harm to any of the persons or companies mentioned in the case. Due to the NDA signed, a few of the critical trade names are masked.

important to run a pilot using their POS data to develop a proof of the concept. Sanjeev and team explored alternative market opportunities using their networks to connect to various retailers, both large and small. However, the responses were mixed. There were delays in getting to run pilot projects in the retail stores and funds were becoming scarce, time was running out, expenses started increasing, initial investments were dwindling and pressure from the families increased. The initial enthusiasm was slowly ebbing out. The team got an opportunity to pitch to the panel at NSRCEL, IIM Bangalore's incubation center. They received enthusiastic feedback and the panel offered a few subsidized workstations at the center which the team accepted. In the meantime, the team continued to meet retailers to gain access to their POS data and to run pilot projects. They also used the service of a lead generator company to connect them to top brasses of retail stores. While the store managers or even owners could see the benefit of their product, the vendors resisted to provide access to the data. The team pitched to accelerators and venture capitalists for funding and mentoring. All of them asked for either a proven revenue model or a proof of concept. The team members grew more and more impatient. After meeting multiple stakeholders, it was suggested that the way forward may be to build the product using open platforms like Hadoop and Mapreduce. The challenge was that the team didn't have such expertise, and had to hire Hadoop professionals who charged quite a huge salary and equity from startups. They were at cross roads.

Sanjeev, Param and Chandan were jubilant. They had just finished presenting their retail analytics solution, "iTrolley" to the store managers of one of the largest retail chain. Chandra, Head of Operations exclaimed, "This is the future of Retail". iTrolley was a unique solution catering to both shoppers and retailers with great benefits. The shoppers could select the best offers in a store through iTrolley app. They could also avail group discounts and loyalty points along with priority check out facility. For the store, the web based platform helped in inventory management and integration of multiple channels far more efficient than any other current ERP system. The team at the big retail chain suggested that they develop sample customer scenarios and promised to set up a meeting with the top management to get their permission to run a pilot project at their chain stores very soon.

The Seed of an Idea

Sanjeev, a tech enthusiast, used to be a frequent visitor to many of the startup events at Bangalore, looking for ideas and to network with the entrepreneurial community. In one of the Startup Weekend¹ event held in November 2013, Pavan, a participant pitched an idea to develop a shopping app which could show relevant offers, once a

¹ <http://bangalore.startupweekend.org/> (Accessed on June 2016)

shopper scans a product. Sanjeev, who was keenly watching the pitch knew that though the idea sounded very simple, it required deep knowledge in retail sector and an ability to extrapolate data from the store's POS or CRM sales systems. Sanjeev had been working with large MNCs in data management space, especially, in data structuring, modeling, reporting, visualization and was quite keen to startup a tech venture in Big Data management space.

Sanjeev, discussed this idea with two of his close friends, Param and Chandan who also shared the same optimism. Param had a corporate finance background, managing projects. He had good people skills and was keen to join Sanjeev as a partner. Chandan had a technical background and had the expertise to build web applications. In his earlier role, he built web based architecture for a health care company. He had some knowledge on Big Data analytics.

Though all of them were optimistic about the scope of a retail analytics solution, they wanted to understand the existence of a market for such a product. As a first step, they visited a few big retail chain stores with a questionnaire to gauge their current store practices and their willingness to invest in the new idea. The store managers enthusiastically provided their feedback and were unanimously conveyed that, such a product would be very useful. The team collected letters of appreciation and intent to use this product from the prospective clients. The team conducted a customer survey with 200 shoppers from malls and big retail shops. The shoppers too provided positive feedback about the potential product.

Retail Analytics Industry at a Glance

Retail analytics market was estimated to reach \$4.4 billion by 2019 according to a markets and markets research² at an estimated compounded annual growth rate (CAGR) of 18.9%. The current software that the retail outlets use to attract their customers are Enterprise Resource Planning Systems (ERP), Customer Resource Management (CRM), Point of Sales (POS) Systems, Loyalty Programs, Data Storage and Data Centers, Payment Gateways and a few Back Office Analytics software, with reporting and relevant analytics built into it. All these software tools and packages have their own value and prices. The general value is on the coding platform which is built to create a real-time analytics with associated trend and necessary reporting. Other notable software in this area are Order Management Systems (OMS), Inventory

² <http://www.marketsandmarkets.com/PressReleases/retail-analytics.asp> (Accessed on Dec 2014)

Management Systems (IMS), Warehouse Management Systems (WMS) coupled with business intelligence and data analytics software, help the retailers to keep track of their inventory, stores, product as well as sales information.

However, as the purchasing power of the Indian consumer grew, sales at the retail brand outlets also increased³. While the demand for online retailers like flipkart.com, snapdeal.com, jabong.com picked up due to very competitive prices against the retail store outlets, the retail shops had to explore better ways to attract the customers mainly using technology. Though they had huge customer data with them, they really didn't know what to do with it. The question was whether they could leverage these data to generate better revenue.

Choosing the Team

Backed with the positive response from a couple of big retail stores, the team brainstormed to build a suitable solution. Sanjeev knew that the original three member team lacked the technical skills to get the job done. The challenge was to acquire talent with a combination of web application and android mobile app development. He attended many entrepreneurship events to scout for the right people. He contacted Pavan, a web developer, and Mohan, a mobile app developer, from the Startup weekend who presented the original idea. Both of them agreed to join the team. However, the joy of finding a good team didn't last long. Pavan, who was a crucial member of the team, decided to quit and move to Germany to pursue an MS degree in Artificial Intelligence.

Sanjeev kept trying and in one of the NASSCOM's 10,000 Startups meet, found Bhupen, a Java web application developer, whom he was able to convince to join the team. Bhupen had previously developed an agricultural product which he demonstrated to Sanjeev. He was confident that he could develop a Retail Analytics solution on a Big Data analytics platform. Although the team had no experience in building any Big Data analytics solution, post many brainstorming sessions and with good user story scenarios, they set on to research ideal platforms that would suit best.

Funding and Equity

Since all the team members were working professionals, the funding was an issue from the start. At least a few of them had to quit their jobs to spend full time in setting

³ <https://www.kpmg.com/IN/en/IssuesAndInsights/ArticlesPublications/Documents/BBG-Retail.pdf> (Accessed on Dec 2014)

up the venture. After the discussions within themselves, and with their families, Sanjeev, Param and Chandan decided to quit their jobs to spend maximum time in the venture. Chandan was not married; Sanjeev and Param were supported by their wives who were working professionals. Bhupen and Mohan decided to support the team during their spare time while working full time. The equity was shared in the following ratio. Sanjeev: 33 percent, Param: 26 percent, Chandan: 16 percent and Bhupen and Mohan, 9 percent each and the rest of the equity was reserved for future expansion.

Business Opportunity

Most of the apps in retail analytics market were freely downloadable. They worked on a model where the shoppers could select offers and the app will display them on their screen. When the users access the coupons and offers, app provider would get commissions per order. However, this model had problems because, the apps didn't help the consumers to purchase any products within stores. There were no apps which could even show the offers to the consumers based on the past purchase information. Realizing this perceived gap, the team were very positive about building an in store retail analytic solution.

Chandan was quite enthusiastic about the scope of this solution, "Generally, a typical customer needs to visit various sections and floors to know the offers for different products. Would it not be great, if one could go to a store, search for a formal shirt, while scanning the bar code through iTrolley app, get to see all the offers listed in the store in the category of shirts and can choose the best offer? While everyone understands the power of Big Data, truly using to build more customer convenience and in turn more business to stores is a great business proposition."

A Turning Point

While the team was brainstorming on the existing tools on which the solution can be built, Sanjeev received an invitation from TiE⁴ group to participate in a "Large Enterprise" Startup Support group to learn about building products and solutions on their Big In-Memory Database⁵ platform. It had all the relevant components they were looking for; Big Data Processing, Data warehousing, Predictive Analytics, Textual Analysis and Business Reporting. After attending the event, all the co-founders decided

⁴ *The Indus Entrepreneurs*

⁵ *Big In-Memory Database is an in memory data platform that is deployable as an on-premise appliance, or in the cloud. It is a platform that's best suited for performing real time analytics and developing as well as deploying real time applications.*

to use this platform. The only task the team had to do was to integrate all these features and build a solution on the top of the "Big In-Memory Database" platform. Since the team did not have the expertise to build a product using open source platforms, "Big In-Memory Database" sounded like a perfect fit.

The "Large Enterprise" suggested a 60:40 revenue sharing model (60 for the start-up and 40 for the "Large Enterprise"), for building a solution on their "Big In-Memory Database" which the team thought was attractive. They had to sign a MNDA⁶ with the "Large Enterprise Partner". The main clause of the NDA was that, both the parties can become competitors and are free to build similar solution in case of a potential fall-out in future. After multiple discussions, the team decided to pitch to the "Large Enterprise" with the below plan.

The Purpose: Deliver a "minimum viable product" called iTrolley Solutions, to be developed on their "Big In-Memory Database" platform.

iTrolley would address the following pain points of retailers:

- ◆ Inventory management during holidays and peak hours: When sale is at peak, it is a pain for most of the retailers to manage inventory especially non-moving stocks. Most of the times, inventory movement is done manually.
- ◆ Intuitive forecasts: Sales in most stores are seasonal and forecasts are not accurate; seasonal sales made inventory management hard and predicting minimum inventory was done based on intuition.
- ◆ Retailers often spent on many small banners and hoardings to announce various offers and most of these went unnoticed due to clutter.
- ◆ It was increasingly becoming difficult to attract the customers even with great offers.
- ◆ Most of the current apps in the market were built by third parties (Niffler, Smapin.com, Rvlove, Locappy, Adibrium) and most of the times showed redundant or inactive offers.
- ◆ The stores had difficulty in managing existing data. The POS data usually gets updated twice a day to the centralized database and not in real-time.

⁶ *Mutual Non-Disclosure Agreement*

- ◆ Most of the current solutions couldn't provide competitive comparison of data between stores, cities, states and countries.
- ◆ Channel integration is done poorly, leading to losing customers. Processing large volumes of data from different sources was a challenge.
- ◆ Internal IT team is treated as cost center rather than strategic enabler.

For shoppers, iTrolley proposed to address the below issues.

- ◆ Customers had to keep looking for banners and other displays to know the offers.
- ◆ Group discounts were not offered.
- ◆ Though everyone had smart phones, there were no store apps to help them purchase better with relevant offers and loyalty points.
- ◆ Often, customers were faced with stock-outs of their favorite brands which lead to disappointments, brand / store shifts.
- ◆ Check-outs usually had long queues and often customers might leave the items at the checkout points due to inordinate delay and walk out of the store without buying.

The opportunity was very clear. The team named the product as "iTrolley", a purchasing solution for the shoppers, who can receive relevant and current offers in their mobile phones store app, while scanning the barcode of the product they are interested in. They would have access to digital loyalty memberships, explore joint buys/offers resulting in cost savings. The consumers can purchase through a secured payment gateway through their mobiles and have choice for priority checkouts.

For stores, it provided better inventory management and integration of multiple channels. The product will help the store to identify and supply out of stock items quicker which will solve inaccurate lead time delivery. Thus with this tool, the store can liquidate slow moving items better. The solution provided speedy inventory management without keeping any manual records, increased customer retention and more efficient store operations, cost savings, opportunities to cross-sell and up-sell among many others. They could track the consumer's time spent in store and nudge them to buy more products through displaying relevant and joint offers.

Product Development

The solution is built on the “Big In-Memory Database” of the “Large Enterprise Partner”, which most of the large retailers use for inventory management. The application syncs with data warehouse managers through ERP and provide inbound analytics to ensure better maintenance of inventory levels. Initial plan was to build a basic solution only using the POS data and past purchase history of the consumers, instead of entire CRM data and develop a prototype or a minimum viable product. The team used the following development tools from their “Large Enterprise Partner” to build this solution.

Backend and Middle tier development technologies:

- ◆ “Big In-Memory Database” Studio and Client
- ◆ “Big In-Memory Database” server with XS services
- ◆ Predictive Analytics Library in XS Server
- ◆ Custom, Sentiment, and Linguistic Textual Analysis Libraries in XS Server.

Front-end Development Technologies:

- ◆ The “Large Enterprise Partner’s” UI

The usage of the tool was thus defined:

For analytics, the team would use Predictive Analytics Libraries and Information views with the purpose of:

- a. Setting up the suggested offers to consumer through the app, the team used information views created based on the data attributes from consumers’ carts, purchase history data, browsing history data, etc.
- b. Showing the real time offers, the team could use pre-build data attributes from retailers’ product data.

After innumerable brainstorming sessions, the team devised ways to convey this idea into a workable prototype. Param, one of the co-founder recollected, “Though we had a fair amount of rapport with the store managers, we couldn’t get hold of sample data easily from the stores. However, after constant follow-ups with many store managers, the team could acquire relevant metafields, that are required to process the information within the present data architecture. Once those metafields were ready, the team themselves started to build the data with 40,000 rows in 126 metafield columns”.

The project “iTrolley” had the following scope:

1. iTrolley Retailers Application (Desktop based): Retailers can install the plugins and the “Big In-Memory Database” platform which will serve as the mediator for in-memory calculation and predictive analytics with precise results in seconds.
2. iTrolley Consumers Mobile Application (HTML5 mobile app): Consumers, after downloading this app in their phones, can scan the barcode of a particular product and receive all the relevant offers around the product. They can search for group discounts and can avail faster online payments and priority checkouts. (Refer Annexure 1 for overall architecture of “iTrolley”).

The “Large Enterprise Partner” Solution Architect team approved iTrolley’s idea and provided a credit of \$1,100 to the team to build the solution. However, it was still expensive to build because it required complex data analytics and WebApp Genie capabilities. The team also were not sure about pricing this product right.

Retail Insights

Team needed to learn the “Big In-Memory Database” as quickly as possible to get the data uploaded to review in-memory calculations, set up a mapping process across the retailer plugin application, so that data uploaded onto the platform performs predictive analytics and throws the desired results set as per the retailers or consumer purchase behavioural patterns. The mobile app and the web application were the integral part of the envisioned solution, and one of the key components was to visualize the design of the app, for which, the non-technical team took the responsibility of building the wireframes. The key components of inventory management data with a set of desirable results were brainstormed and were built on WebApp as below:

- ◆ Slow moving, Low inventory: Nothing much to sell
- ◆ Slow moving, high inventory: Offer the products
- ◆ Fast moving, low inventory: Sell only to privileged customers
- ◆ Fast moving, high inventory: Offer + Conditional

For the software interface, the team used a set of tools from the “Big In-Memory Database”.

- ◆ Mobile app development:

They used both XJS and OData with http based data access. In order to develop mobile apps that had good performance of uploading, retrieving data, real-time and online, the team used OData services to consume data online.

◆ WebApp development:

The team would use the "Large Enterprise Partner's" technology i.e., SLT ("Large Enterprise Partner Landscape Translation") which helps in replicating the retailer's inventory database into the "Big In-Memory Database". The team built user stories, data models, data architecture and technical architecture. They showed the product to the "Big In-Memory Database" solution architects at various stages, who would provide their constant feedback. After many iterations, the team built the solution, using Javascript for WebApp and then on android platform for building the mobile app. With the tested algorithm of K-Means clustering, the team had put in the structure of how the clusters of data would appear and the way it would reflect as a result on the Offer Management Console of the WebApp. The What-if table is derived out of data connection via the metafields from data structuring.

From the above sequence and orderly activity, the team used algorithms for connecting the in-store customer data along with the in-store products and customer purchase activity data. The approval of overall data architecture and the solution was validated and certified by the "Large Enterprise Partner" on November 26th 2014. Further, the team received two certifications from the "Large Enterprise Partner" worth €20,000. The team was highlighted at various "Large Enterprise Partner" channels and websites. In order to receive the certification, the team had to put up huge amounts of documentations. Questionnaires were filled, sometimes with 185 and more fields. They had to document sample pitches of product varying from 10 seconds to 25 seconds to 1 minute to 5 minutes and so on. The team was excited to cross the important milestone of certifications after days of documentation process.

The First Pitch

Once they received certifications, the team was excited to showcase their prototype to the team at a "big retail chain". After the demo, Chandra, and others were exuberant, "This is the future of retail! Brilliantly done product! Just by using dummy data, you could create this, with real POS data, you could do wonders".

They suggested the team to build multiple user scenarios, which can be showcased to top management team. Sanjeev recalled, "We realized that there's tonnes of data banks

in the retail space, which were not utilized fully yet. Next major hurdle was to get access to real POS data and replicate the solution in a real retail scenario. "However, this turned out to be next biggest challenge. Sanjeev and team explored all their networks to connect to various retailers, both large and small. Big retail chain store managers backed the proposal and mentioned that this is a brilliant idea, even the market leaders like Oracle or IBM hadn't come up with such a solution yet. They were hesitant on pricing, as most of them had existing contractual agreements with IBM and Oracle which was worth millions. However, all of them promised that, if the product can offer greater value, they could come up with a suitable pricing.

A few of them raised concerns about the security of the platform. Getting access to the real decision makers was another challenge. Store managers were easily convinced about the product, but, didn't have the authority to help the team to access the POS data. Getting to the next level was found to be a herculean task. While all of them promised to get appointments with senior management team, there was inordinate delay. Senior executives of most of the large retail stores were often travelling and the team had to constantly follow up for months to get appointments. While the team waited for the right opportunities, the initial enthusiasm was slowly ebbing out. The funds were tight and they started swiping credit and debit cards quite recklessly to keep things going. Sanjeev had to buy laptops for all the members and had to figure out a way to manage overheads. None of them were paid salary. Yet, the team went on, since the feedback from store managers was very promising.

Plan A to Plan B

Since there was delay in getting to run the pilot project in the retail stores and funds were becoming scarce, Sanjeev and team had to devise ways to make the venture remain afloat. They decided to utilize tech conferences to showcase their product in anticipation of attracting attention from investors. The "Large Enterprise Partner" proposed incentives to showcase their products at the "Echelon Singapore Summit"⁷ 2015. Param and Chandan decided to represent iTrolley Solutions. Since setting up a stall would cost about INR 1,50,000 they opted for a slot for a "two minutes pitch" which costed them INR 15,000. At the same time, Sanjeev participated in the ReTech Con⁸ organized by Retail Association India (RAI) held in Mumbai. Though the product was noticed and appreciated by the delegates, retailers and funders, they failed to

⁷ *Asia's largest tech conference, drawing thousands of delegates from the tech and business world, comprising startups, investment firms, and government agencies.*

⁸ <http://www.retechcon.com/> (Accessed on June 2016)

attract any serious offers from investors or retailers. Investors asked for “Proof of Concept” and retailers were hesitant to part with their POS data. It was the “Chicken and Egg Dilemma”.

The team received an opportunity to pitch to NSRCEL, IIM Bangalore’s incubation center⁹ in October 2015. It received enthusiastic feedback from the panel and was offered workstations at a nominal amount of INR 2,000 per month. Sanjeev and team decided to shift their office to NSRCEL, as they thought proximity to funders and mentors would be a great advantage. In the meantime, the team continued to meet retailers to gain access to their POS data and to run pilot projects. It used the service of a lead generator company to connect them to top brasses of retail chains. Mother Earth, Vishal Retail, Nilgiri’s and a couple of other retailers were initially very enthusiastic.

Sanjeev recalled, “The major issue was that most of the retailers had outsourced their POS / CRM / ERP to other vendors. While the store managers or even owners could see the benefit of our product, the vendors resisted to provide access to the data. In a few cases, where data was not handled by vendors, there was a delay in decision making by the store management. A few of them wanted simpler plug and play solution. Yet another set of store managers didn’t understand our product at all. In all the cases, we suffered, mentally and financially”.

The team pitched at Kyron accelerator¹⁰, NASSCOM, Seedfund¹¹, Microsoft Ventures and individual venture capitalists for funding and mentoring. All of them asked for either a proven revenue model or a proof of concept and the team didn’t have any. The team members grew more and more impatient.

Open Source versus Proprietary Platform

The morale of the members was getting to very low levels. It was more than three years now that they started off. Families started to pressurize them to go back to regular jobs. Bhupen and Mohan decided to quit. Chandan had pressure from his family to marry, and was looking for a more secured job. Once he received a lucrative offer from one of the tech companies he quit too. Sanjeev decided to leave NSRCEL’s space. (Refer Appendix 2 for major Milestones).

⁹ <http://www.nsr cel.org/mentoring-incubation/incubation-facilities> (Accessed on July 2016)

¹⁰ <http://kyronglobal.com> (Accessed on July 2016)

¹¹ <http://seedfund.in> (Accessed on July 2016)

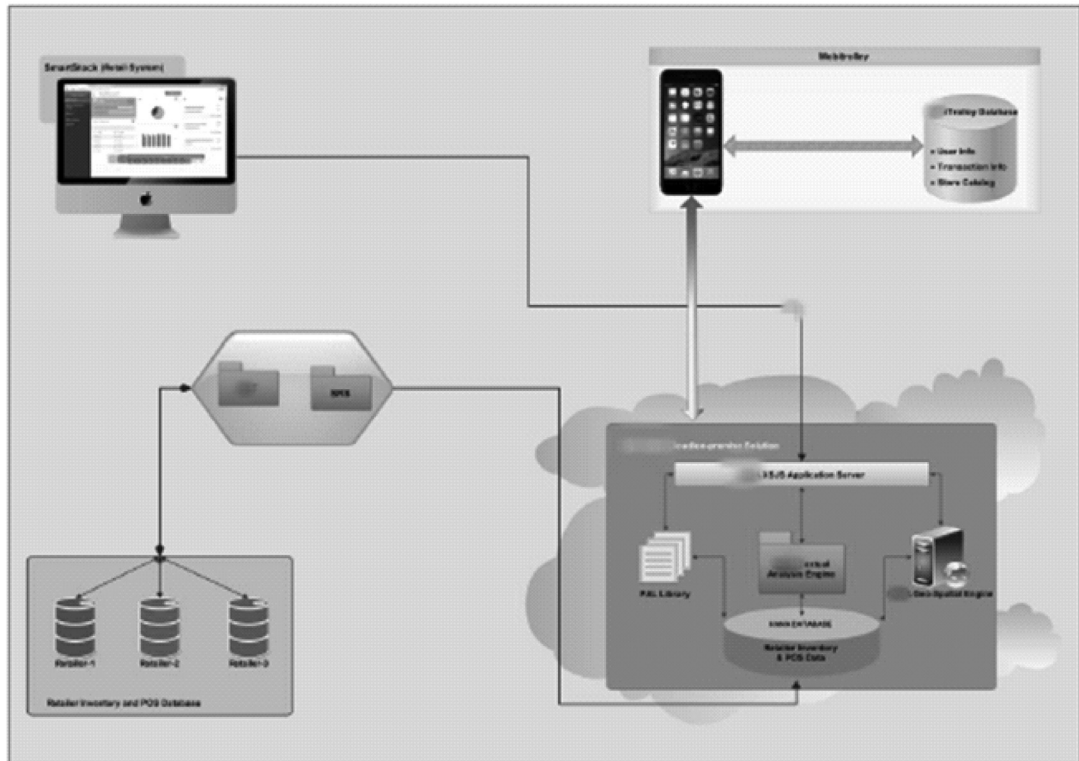
Multiple stakeholders suggested that the way forward may be to build the product using open platforms like Hadoop and Mapreduce. The challenge was that the team didn't have the expertise and they had to hire again. Typical Hadoop professionals charge quite a huge salary and equity from startups. Sanjeev and Param were at cross roads.

They had the following questions in mind.

- ◆ What is the right Go-to Market strategy for an expensive product like this, built on the "Big In-Memory Database" in the retail market?
- ◆ Is the market ready for such a product, whether built on a proprietary platform or on open source?

Appendix 1: iTrolley Overall Architecture

iTrolley Solution Overall Architecture



Appendix 2: Important Milestones and Time Lines.

Month and Year	Major Milestones
January 2013	Started working on the idea
March 2013	Sanjeev, Param and Chandan quit jobs to start up.
April 2013	iTrolley was registered as a Private Limited Company.
June 2013	Attended the "Large Enterprise" Focus group
November 2014	Validation Certification from the "Large Enterprise Partner"
April 2015	Integration Certification from the "Large Enterprise Partner"
June 2015	Echelon Summit / Retech Conference
October 2015	Entry in NSRCEL
January 2016	Exited from NSRCEL

Book Review

Surging India: Thoughts That Inspire

(Editors: Jagdish Shettigar and Sangeeta Shukla.
New Delhi: Bloomsbury, 2016.ISBN 978-93-85936-29-6).
Pages: 220, Price not mentioned.

*Santosh Dhar**

There is a change from one level of meaning to another when we move from concrete to abstract conceptualizations. Adaptation requires gaining a perspective into a new way of looking the world. Intellectual could be inspired by reading of books. Theorizing of others can make one to assess their ways of thinking and provoke new ideas. Therefore, it is useful to allow the observations, and narratives of others to take over and open new doors for our own thoughts.

The Book *Surging India: Thoughts that Inspire* is an inspirational book, a compilation of the views and wisdom of some eminent Indian Leaders from varied walks of life. The book has been divided into 31 chapters categorized in 8 sections. The first section is on Success and Happiness and has three chapters. Chapter on the Happiness Mantra is written by HH the Dalai Lama. According to him, Happiness is related to having a calm mind which provides the basis for distinguishing right from wrong. Chapter on Decoding success is written by Sri Sri Ravi Shankar. According to him, happiness is the confidence that one can maintain in tough situations. One needs shakti, yukti, bhakti and mukti i.e., energy, skill, devotion or dedication and a sense of freedom from within. Chapter on The Sunny Side of Human Nature is by Rajashree Birla. The author briefly shares three fold path; having genuine compassion, minding the mind and being aware of the law of impermanence.

The second section is on Managing and Leading and has got 6 chapters. Chapter on Knowledge Society by Bharat Ratna APJ Abdul Kalam stresses upon team spirit,

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