

**Nishikant Dhanuka**[Follow](#)

Senior Data Scientist at Booking.com

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# Diary of a Data Scientist at Booking.com

By Nishikant Dhanuka, Senior Data Scientist at Booking.com



## Hiring

I joined **Booking.com** as a data scientist about two and a half years back, straight after a 3 years consulting gig in Dubai. Moving from consulting to a pure data science role was a big shift in my career and in hindsight I'm very happy I made that choice. In fact, I was already impressed with the company during my interviews. What I liked the most was that I was interviewed by peers who were already in the same role, which allowed for many 'quality' interactions during the process and reaffirmed the recruiter's claim that the company had a 'flat hierarchy'. Also the background of the interviewers was very diverse and interesting—one had a PhD in astronomy, and the other was CTO of his own startup.

*Though I must be honest, the awesome lunch at the office (and Amsterdam in general), also influenced my decision quite a bit :)*

## On-boarding

I still remember that on my first day my on-boarding buddy asked me -‘*how do you like your screens?*’. I was not sure what to say as I had only worked on a single laptop previously. And then I got a Mac laptop, 2 big screens (primarily to project my code to impress the non-technical audience) and a plethora of other cool gadgets. I was all set to conquer the world with my new data scientist title 🧐.

Soon after I got my first on-boarding project, which involved analyzing lots of text and generating some business insights. Previously, I only had experience with structured data, so I was excited with this new challenge. I jumped right into it and managed to up-skill myself to do meaningful analysis with text data, but it was not long before I hit a wall: ‘*scale of Booking.com data*’.

**B** ooking.com sells over 1.5 M room nights every 24 hours and millions of people browse the website at any given time, which means the scale of all the data that we touch as data scientists is really big. Fortunately there was an internal training on ‘*distributed computing using Spark*’. I immediately took it and lo and behold my analysis was now running on multiple machines.

## Projects



Booking.com Data Scientists presenting their projects at Analytics Fair

My second project was about building a '*recommendation engine*' for our partner website to recommend relevant opportunities. Again it was very exciting as previously I had only worked on standard regression and classification models, so I was eager to work on something new. And that's when I first got introduced to the fascinating world of collaborative filtering and factorization machines. Again, because of scale, I had to implement the solution using sparse distributed matrices in PySpark. I then productionized the code and we kick-started an A/B test to see if it had a positive impact on our business. It was also my first A/B test experience but fortunately, because of **our awesome experiment tool and infrastructure around it**, it was not very difficult to set up. In a couple more iterations, we were able to handle the cold start problem as well, and I was happy that I had successfully completed another project.

What followed next was an interesting mix of projects, each with their own challenges, needing me to be on my toes as a data scientist and be always learning. For example, one of the projects required me to represent the business problem as a weighted network graph and perform interesting analytics on that; whereas for another project I had to wear a consultant hat and validate an important strategic decision by generating meaningful insights from simple data analysis.

Fast forward two and a half years and I am currently a senior data scientist at **Booking.com**. The degree of challenges has only gotten better, as now I'm working on an Artificial Intelligence (AI) product '*Machine Translation*', and deploying neural networks and deep learning solutions to **build a full-scale system in production**. Although Machine Translation is an active research topic with some recent breakthroughs, we keep a '*Business-First AI*' approach to focus on how it can help our customers. I would love to talk more about this particular topic but that's for another blog post hopefully.

## Team Structure

To talk a little bit about how data scientists are organized within teams at **Booking.com**; we have what we call an '*embedded*' structure wherein Data Scientists are integrated close to the business. For example, I'm in a team with developers, data scientists, a product owner and other specialist roles. We are formed in such a way that all capabilities are represented in the team to execute an idea from conceptualization to

implementation. For our day-to-day operations, we follow the recipe of ‘*booking agile essentials*’: daily stand-ups, retrospectives, backlog, team purpose, KPIs and OKRs (objectives and key results). This, along with bi-weekly sprint meetings, enable teams to make progress in small steps and demonstrate value or fail and learn as quickly as possible.

*It's because of such close interactions with the business that as a data scientist at **Booking.com**, one is expected to be excellent in communication and commercial awareness, alongside technical craftsmanship. These are essential skills we test for in our job interviews.*

## Best thing about the job - People



Booking.com Data Scientist Community during weekly Analytics Talk

**B**ooking.com has 120+ data scientists and the community is growing bigger every day. Every one of us has a very different profile, background and working preference. For some, it's their first job after PhD, whereas others come with a lot of work experience; some are Bayesian, some are Frequentist; some like R, others prefer Python; some strongly vouch for out-of-core learning (Vowpal Wabbit), while others prefer distributed computing using Spark and H2O. This diversity allows for continuous growth and learning from each other. We have weekly meetings like analytics talks, journal clubs, etc. to get peer feedback on analyses and discuss how ideas from the latest research papers could be applied to solve real **Booking.com** problems. Also, people volunteer to give technical trainings on a regular basis, on topics like A/B testing, Git, Hive, Python, R, Spark, H2O, TensorFlow etc.

*For me, this ‘people and community’ aspect is the best part of the job as it enables me to learn new things everyday and have fun while doing it.*

## Some Challenges

Like every growing data science practice, we do have some challenges as well.

- To start with, because of how fast our data science community is growing, it sometimes gets difficult to **share knowledge in a scalable way**. To deal with it, we continuously experiment with different formats like talks on specialized topics (like NLP), emails, hackathons etc. to understand the best way to share knowledge at each stage of our growth.
- **Embedding** data scientists close to the business has its disadvantages as well. Sometimes we miss critical and friendly peer feedback in our daily work. In order to cope with it, we encourage everyone to present their work often and discuss their latest projects with peers. We also have a mentorship program for new joiners.
- Though we have already contributed to the community several times (you can find some of our publications and talks [here](#) and [here](#)), we could definitely do better in terms of **sharing some of our learnings and best-practices to the outside world more often**. We are currently working on some guidelines around this.

I think the good part is that we acknowledge these and many other challenges and have special ‘task forces’ looking into potential improvement areas.

*To end with, I can say that there is never a dull moment as a data scientist at Booking.com!!*



Booking.com Data Scientists enjoying Amsterdam summer on a boat after office

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Does this sound exciting to you? Would you also like to be a Data Scientist at Booking.com? **Come Work with us!**

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