



CIP @ Solvay

*Interview with Alessandro
Falcone & Andrea D'Ettore
who completed their
Credited Internship in Data
Analysis*



About Alessandro Falcone

Alessandro is a student of the Double Master degree in business engineering from Politecnico di Milano and Solvay Brussels School. His bachelor at Politecnico di Milano was useful to build an engineering mind-set through quantitative courses, such as statistics, math and physics. During his master he focused on business courses, such as strategy and leadership.

Alessandro has a business engineering background with an enriched knowledge in European financial regulation and in data science, thanks to his studies and willingness to explore a new domain.

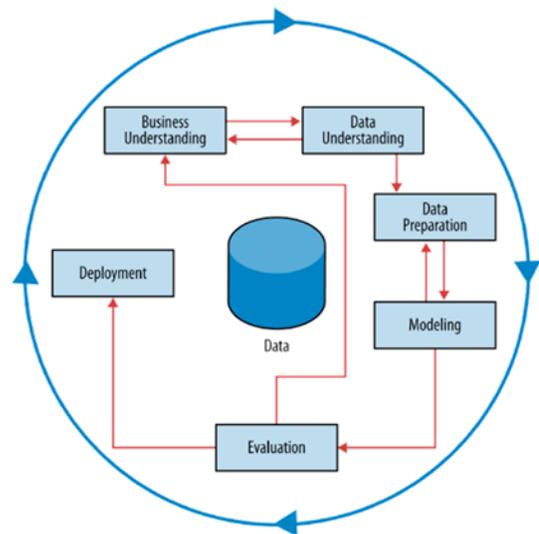
*I worked for SAS Institute. **SAS** is a data-driven organization leader in business analytics software and services. Since 1976 this American multinational company creates statistical tools and advanced technologies with the aim to support customers in their decision-making process. – Alessandro Falcone*

Inside Alessandro's internship

At SAS, I had the opportunity to work on a **big data and analytics project** for the Indian Government (Central Board of Excise and Customs - CBEC). It was a *data mining* project with the aim to develop an anti-dumping solution to safeguard the local markets.

In this scenario, my specific responsibility was to **conduct sophisticated quantitative analyses on a large dataset, to build and test machine-learned models**, and finally to **deliver a solution** that aims at detecting possible evasion and fraud cases through advanced analytics software and technologies.

To accomplish this mission, I followed the **Cross Industry Standard Process for Data Mining** (Chapman *et al.*, 2000). The CRISP-DM methodology is a sort of golden rule, largely used to realize successful data mining projects. Below, a brief description.



First, it was key to **study the business context** by going into details of all dynamics behind the problem of dumping/anti-dumping to understand and foresee the possible scenarios.

Secondly, I needed to understand **what I had in my hands**: the meaning of the variables, the formulae behind the various taxes and duties, and so forth.

Afterwards, it was time to **prepare the huge data set**. The accuracy and completeness of the metadata, the definition and consistency of the information, and the overall quality of the data set were all important considerations.

Interview with Alessandro

WHAT DIFFERENCES DID YOU DISCOVER BETWEEN THEORY AND REALITY?

During the first working weeks, I saw only differences between what I studied and what I needed to accomplish the goal. However, once I became more confident with the work and the topic, I noticed that **the methodology, the techniques used and the supporting dynamics were something I had already tasted during my studies**, daily lectures, and projects at school.

DID YOU RECEIVE A GOOD THEORETICAL BACKGROUND AT THE SOLVAY BRUSSELS SCHOOL?

Yes, I did. The *European Financial Integration and Regulation* courses have been useful to understand the dynamics behind the massive amount on which I worked, and, above all, the *Digital Firm* course (now I think it's called *Data science & Business Intelligence*) held by Professor Thierry Van de Merckt and Professor Martine George, was critical and fundamental to overcome the challenges and issues that I faced during the project. For instance, understanding the differences among the various machine learning models, or the CRISP-DM methodology and how deal with it, were truly useful and key. Of course, I had other training courses during the internship; I needed to go deeper into the data scientist world and techniques. However, I believe **my background was a good start, a good building block for new knowledge**.

WHY DID YOU CHOOSE TO STUDY AT THE SOLVAY BRUSSELS SCHOOL?

I am a double degree student from **Politecnico di Milano**, and I decided to come to Solvay for different reasons. Here, I would have had the chance to study new topics, such as the **European regulation courses and the data science ones**, the opportunity to **work with professors that have amazing work experience** (so less academic and more professional), and of course, also for the challenging program itself. I believe that stepping out of the comfort zone is important to growing up and enriching our background with a unique experiences.

Then, once I clearly understood what I had and the dynamics behind the data, I **started modelling and apply different machine learning techniques**.

Evaluation was a time of reflection. Here, I considered the model itself by assessing the results through statistical analysis. I also considered the relation between the results of the models and the business context by evaluating if the outcomes were reasonable and useful for insights.

Finally, I **transcribed and deployed the solution** developed.

WHAT WAS THE BIGGEST CHALLENGE YOU ENCOUNTERED?

If I must point out the most critical challenge of the whole project, I would say **the ability to translate the business knowledge in lines of code and then read the results of the models**.

Even though I didn't have much knowledge in programming, learning a new language was not that difficult. The hardest part of this job was to be **mindful on the business question and use software to develop the most appropriate model**. Modelling intricate dynamic behaviors is something amazing and truly complex. You need to pay attention to the impact and influence that each variable may have on the overall model and foresee various scenarios to create the most suited algorithm.

WHAT IS YOUR CAREER REFLECTION?

My experience at SAS helps me to realize that **a good salary is not enough. We need a context in which we can be proud of ourselves and fulfilled**.

Work-life-balance is something that students and young workers often forget. I was in one of the best places to work, and, indeed, the working environment was amazing. I had the chance to **have an impact**, to learn a lot, and to take care of myself. I would like to keep walking this path. **Working is one of the most relevant parts of our life and we need to feel good about it**.

DO YOU HAVE A LAST ADVICE FOR STUDENTS WHO WANT TO PURSUE A CIP?

Keep studying while performing the CIP, dive fully into the business project and accept ambitious challenges!



About Andrea D'Ettore

Andrea attended the Double degree programme in Business Engineering between Solvay Brussels School and Politecnico di Milano. He chose the stream called "*European Financial Integration and Regulation*", which aims at developing quantitative profiles that could work in European public institutions. His interest in the Big Data domain led him to choose to have a CIP program in an analytics project to strengthen his technical skills in coding and statistics. Thanks to this background, he hopes to have the chance to work for companies and projects that will have a positive impact on society.

I did my internship at ING Belgium in the Advanced Analytics team which is a part of the Marketing Department of the bank. – Andrea D'Ettore

Inside Andrea's internship

I completed my internship as a data scientist in an Analytics team of ING Belgium, one of the big players in the Belgian banking market. The scope of the project was **the development of a statistical model for improving marketing effectiveness**.

During my experience I understood that a key success factor for these initiatives lies in having **an effective collaboration among three kinds of stakeholders: strategic, technical and operational ones**.

In order to align these different professionals, a proper organizational structure that allows fast but adequate interactions is paramount.

Data analysis using advanced analytic techniques aims at **providing new knowledge**. This requires knowledge of several statistical softwares (like R, SAS, Python, etc) and a proper mathematical and coding background. On top of that, a new technological infrastructure is required for coping with large and unstructured datasets. However, the information obtained should also be aligned with the questions that the business owners aim to answer, hence the importance of the involvement of strategic stakeholders. Finally, the results of the model, once interpreted, should be used in the day-to-day business operations. The feedback coming from the line managers and the business owners are then used by the analytics team for improving the models.

The CIP program allowed me to work in **a company transforming into a data-driven organization**, i.e. a company that uses data for taking well-informed business decisions. The transformation is evident across many teams.

The marketing department had a dedicated analytics team for developing specific solutions tailored to its needs.

The analytics team was a multidisciplinary one, with IT experts and data scientists working together. They had the opportunity to interact daily about technical issues and opportunities for developments.

The "link" between the marketing analytics team and the rest of the organization (other analytics teams, line managers, business owners, IT providers, etc.) was the team's project manager. This role aims at managing the analytics initiatives in terms of time, budget and scope as well as providing visibility and learning opportunities to the team. Finally, the project manager aligns the team with the activities of the function.

With such a structure it is possible to connect many people, assuring accountability and alignment. The CIP allowed me to see how organizations are dealing with the introduction of Big Data, a potential new revolution. Without this experience, knowing about these aspects is very difficult, given the novelty of the topic.

Interview with Andrea

WHAT DIFFERENCES DID YOU DISCOVER BETWEEN THEORY AND REALITY?

When a topic is studied theoretically, several aspects are **overlooked**; this makes real work much more challenging but also very interesting. In data analysis, for instance, data cleaning and preparation is often

overlooked in courses and mathematical techniques are applied directly to tidy datasets. In real projects, data preparation is 80% of the work.

DID YOU RECEIVE A GOOD THEORETICAL BACKGROUND AT THE SOLVAY BRUSSELS SCHOOL?

The Solvay Brussels School gave me the basis of econometrics and a course in data science. I had to study several topics on my own, but **surely the courses I had allowed me to speed up the process of acquiring new knowledge.**

HOW DID YOU DECIDE TO APPLY FOR A DATA SCIENTIST INTERNSHIP?

I was really interested in the chance of coupling **business knowledge** that we acquire as business engineers with some **strong analytical basis**. I think it is a big plus for fresh graduates.

WHY DID YOU CHOOSE TO STUDY AT THE SOLVAY BRUSSELS SCHOOL?

Because the double degree programme offered me the chance to study European financial integration and regulation while working for public institutions, a path that always interested me. On top of that, Solvay allowed me to have a **valuable international experience** from both a studying and a working point of view.

WHAT DID YOU CONSIDER AS YOUR STRENGTHS AND WEAKNESSES?

For my strengths, I have a high level of **motivation** and a willingness to **challenge** myself.

Regarding my weaknesses, I had difficulties in **communicating** effectively the results of my technical analyses.

WHAT DO YOU THINK OF THE QUOTE "KNOWLEDGE FOR IMPACT"?

Specialized knowledge will be more and more what differentiates workers and what ultimately leads to real impacts for organizations and people. Therefore, we should look for learning opportunities that will give us knowledge and have an impact on society and ourselves.

WHAT IS YOUR LAST ADVICE FOR STUDENTS WHO WANT TO PURSUE A CIP?

Take it **seriously!** It is a wonderful opportunity to experience the working environment. **Think big** and try to do activities that could have a long term **impact** on you. **This is not about a good grade!**

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