

Changing SAS Discipline into the Life Science Sector

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ABSTRACT

Working as a SAS programmer is a very interesting and rewarding career. There are many different paths a SAS programmer can take - most commonly in retail, finance and pharmaceutical. Typically in the competitive graduate market choice is not always possible when applying for your first job. What happens if, after gaining experience in one area of SAS, that you feel you would be better suited and more interested in another sector? In this paper I will discuss my experience of changing SAS disciplines into the life science sector, the obstacles I dealt with and the path I took to realising my ambition. I will also discuss employers' concerns when hiring somebody from another market sector. Having now spent some time as a statistical programmer I will also use this experience to retrospectively discuss the important requirements of working in the life science sector.

INTRODUCTION

If you haven't studied a mathematical or statistical (or similar) course at university it is unlikely you will have heard of SAS until you have a job in which SAS is required as a tool for that particular role. Whether you have already worked with SAS at university or you were introduced to it in your job, you will probably not be immediately aware of the vast scope of SAS across many industries and the type of very interesting and varied work that is performed across these industries. What you will soon realise however, once you start working with SAS, is that it's very easy to become passionate about and absorbs your interest. From a very top level perspective you might easily assume that once you know how to program in SAS, that it is just a matter of course programming in any of the key industries: life sciences / pharmaceutical, finance and retail. In reality there are many different requirements for each sector – it's not only about being able to program in SAS.

If you are searching for a SAS career after graduation, such is the competition for graduate positions, it is not always possible to be selective for the industry you wish to work in. Maybe you really want to work in the life science sector but there are only roles available in finance at the time you are applying. Rather than risk passing by the opportunity you decide to take that position in the financial sector. Alternatively maybe you become introduced to SAS as part of your existing job. As you grow into the position, expanding your knowledge and awareness, you begin to examine what other opportunities exist and you become very interested in what SAS can offer you as a career. Once you have that all important experience as a SAS programmer you decide to target a specific industry or company that particularly appeals to your interests and matches your career goals.

The question is can you transfer your existing SAS skills very easily to a job in another industry sector, or are there other attributes required that are not immediately obvious? This was the position I found myself in. During the course of this paper I will discuss my own experience of changing SAS discipline from retail into the life sciences as well as what I believe employers are looking for in candidates.

CHANGING SAS DISCIPLINE INTO THE LIFE SCIENCES

I was lucky enough to use SAS as a tool in my first job after graduation. Although it wasn't the only part of my job I became very interested and passionate about SAS, so much so that I decided I simply had to move into a career using SAS full time. My first challenge was that I wasn't using SAS regularly enough to open many doors. I knew that first and foremost I wanted to work as a SAS programmer and, having researched available opportunities, the positions in pharmaceutical companies seemed most interesting. I always enjoyed maths and statistics at school – I was very interested in programming and I loved working with SAS. I also had a keen interest in the sciences, so it seemed that working as a statistical / clinical trials programmer in the life science sector would be an excellent match to my interests and ambitions. Once my mind had been made up I set about my task of applying for SAS jobs.

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After many months with numerous interviews and not much luck my resolve was sorely tested! Would I get my lucky break into the world of SAS?

My opportunity finally arrived and I was offered a position as a SAS programmer with an international retailer. This was great! I was very happy to achieve my goal of becoming a full time SAS programmer. Over the next couple of years I greatly improved my SAS knowledge and focused on developing my skills and expertise. However as time went by, although I really enjoyed the work, I couldn't help but feel unfulfilled. There wasn't the sense of passion that I would like to feel about my job and to be totally dedicated to the type of work I was doing. I started looking into further opportunities and dreaming how interesting it would be working as a SAS programmer in the life science sector. I felt that if I was ever going to have total satisfaction with my career in SAS then it would be working in the life sciences. Therefore, having some solid SAS experience behind me, I set about applying to pharmaceutical companies and CROs.

This is when I discovered that having SAS programming knowledge is one thing and getting a job as a statistical programmer is another! Why is this? What is the reluctance of pharmaceutical companies and CROs to hire SAS programmers from other industry sectors? On the top level you would imagine that knowing SAS would be enough to find some opportunities. However as you will know if you already work in the life sciences there are a multitude of other skills and experiences required to work effectively and productively as a statistical / clinical trials programmer.

One of the big differences working in the life science sector is that it is a highly regulated environment. There are many standards and ways of working to get used to. Working as a statistical programmer in clinical trials you also need to understand the background and purpose of clinical trials themselves. Understanding the complexities of working on a trial can only come from experience. It is very apparent that a SAS programmer who has little or no knowledge or experience of these matters will find it difficult to start working with an immediate impact. Therefore there will be a very considerable learning curve, which of course employers are reluctant to sponsor.

Another point to consider is that a candidate with SAS experience from another sector will already have some specific salary requirements, and will likely already be working above a junior level. There is a clear work grading in pharmaceutical companies. Therefore for these reasons it is very difficult for a life science organisation to fairly place a SAS programmer without the required experience. Likewise the candidate him/herself must carefully consider if it is worth taking a step back to a more junior position. The longer you work in one industry sector the harder and more impractical it will be to break into another.

After nearly 2 years of applications and not even securing an interview, I was very fortunate to be offered a position with OCS Consulting in the Netherlands. OCS works primarily in the life science sector providing experienced and dedicated SAS programming professionals to pharmaceutical and other life science organisations. OCS also works in house for life science companies on projects such as bespoke statistical and reporting applications, generation of CDISC standard data sets and migration of clinical programs.

OCS was willing to give me the opportunity of obtaining the experience I needed to become a statistical / clinical trials programmer. I have been with OCS for 3 years now, and have worked on some very interesting projects during that time for various pharmaceutical / life science companies. I am also very happy to say that for the past 10 months I have been working as a statistical programmer on assignment with Danone Research in Wageningen, where I work on a variety of clinical trials.

WORKING AS A STATISTICAL / CLINICAL TRIALS PROGRAMMER

Without the experience of working as a statistical / clinical trials programmer, it is obviously difficult to see from an employer's point of view why they are reluctant to hire SAS programmers without the industry knowledge required to work effectively from day one. Now that I have been working as a statistical programmer I can retrospectively look back to examine what would have helped me in my search for a position and what employers would specifically look for on a CV.

Working in a highly regulated environment is a new experience and there are a lot of things to get used to such as working with CDISC standards, quality control, validation, double programming, careful code comments, keeping

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informative documentation and effective and diligent organisation of your work to maintain good clinical practices (GCP). This takes time to become fluent with and work in a productive manner.

It is also very useful to gain as much background knowledge as possible about clinical trials – why they are needed and what they aim to achieve. In particular paying attention to the differences between pre-clinical, Phase I, Phase II and Phase III trials and understanding some of the different types of trials, for example, equivalence trials, crossover trials or superiority trials.

It is also important to get a grasp of the day to day work of a clinical trials programmer. Notably that you will work predominantly with three key documents – the study protocol, the statistical analysis plan (SAP) and the case report form (CRF).

Another key aspect in the field of clinical trials programming is the rapid rise of CDISC data standards for controlling all stages of data during a clinical trial from study design to final delivery to the FDA. In particular it is very important to understand the role of data management and the use of the Study Data Tabulation Model (SDTM) for production of all data domains used in a clinical trial. Indeed unless a programmer has used data domains such as lab data, adverse events, demographics, visits, etc. then coming into the industry without the knowledge and understanding of how to handle this type of data is obviously a big hindrance to effectiveness.

It should also be noted the importance of statistics in the work of a clinical programmer. Generally a programmer will work closely with a statistician, however it is key for the programmer to have a fundamental understanding of statistics, as well as the type of SAS procedures used in clinical trials. There are a wide range of statistical and graphical procedures, some of the most common include: survival analysis, confidence plots, t-tests and chi-squared / Fisher's exact tests. It is also very worthwhile to have a basic understanding of the methods used by the statistician, e.g. hypothesis testing, randomization, sample size and power calculation.

There are some excellent books that cover all of these topics in great detail. A selection of these is listed in recommended reading.

SAS CERTIFICATIONS

Of very worthwhile notice is a new SAS certification – the SAS Certified Clinical Trials Programmer. This certification tests your understanding of many of the details discussed above and is surely an excellent way to demonstrate both your general understanding of clinical trials programming as well your desire to work in the industry.

There is also another new SAS certification due for release soon. This is the SAS Certified Statistical Business Analyst. This certification tests your knowledge of SAS statistical procedures and your wider statistical knowledge such as hypothesis testing, analysis of variance, linear and logistic regression - all very worthwhile information for a statistical programmer!

SUMMARY

As a final summary, what can you do to improve your chances of working in the life sciences and what would employers take notice of on your CV? The following list encompasses some of the key points:

1. Obtain your SAS certifications: Base programmer, advanced programmer and the new clinical trials programmer certification. This will show your commitment to your career in SAS as well as a good level of SAS knowledge. The clinical trials certification in particular is important because you will at least demonstrate a general background knowledge of the type of work performed by a statistical / clinical trials programmer.
2. Learn about CDISC. This is now an integral part of most pharmaceutical companies and CROs and is undoubtedly a key component of the knowledge required by a clinical trials programmer.
3. Read plenty of background material about clinical trials and the industry – see references for examples.
4. Tune your statistical skills. If you haven't got a convincing background in stats, start reading up and improving your knowledge. It will really help if you can demonstrate a fundamental understanding.
5. Be realistic about how much you want to work in life sciences and what compromises you might have to make to get the opportunity you want, e.g. drop in salary / seniority.

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It took me a long time to finally achieve my ambition of working as a statistical programmer and I am not at all disappointed. I have no hesitation in saying that it is just as interesting, motivating and challenging as I had imagined and expected. There is so much scope with SAS and the work that is performed in clinical trials to learn new things every day and to look forward to a continually evolving and exciting career path.

Please note the story here is from my own experience only, and not necessarily a general outlook of gaining work as a SAS programmer in the life sciences. Although I do believe that the suggestions I have given for preparing yourself for a career in this industry will certainly stand you in good stead!

REFERENCES

-SAS Certified Clinical Trials Programmer:

<http://support.sas.com/certify/creds/ct.html>

-SAS Certified Statistical Business Analyst:

<http://support.sas.com/certify/creds/sba.html>

RECOMMENDED READING

-SAS Programming in the Pharmaceutical Industry; Jack Shostak

-Clinical Trials: A Practical Guide to Design, Analysis, and Reporting; Duolao Wang, Ameet Bakhai

-Introducing the CDISC Standards: New Efficiencies for Medical Research; Amanda J. de Montjoie

-Validating Clinical Trial Data Reporting with SAS; Carol Matthews & Brian Shilling

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