

How to grow as a programmer in the pharmaceutical industry ?

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AGENDA

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1. Introduction (a)

In the continuous evolution of the pharmaceutical world, our principle responsibility as statistical programmer is to stay focused on the evolution of our job.



How to grow as a programmer : this is the question!!

Growing in a function means :

- evolving,
- improving the tools,
- thinking a different way,
- learning from others.



⇒ **Benefits in job/career.**



1. Introduction (b)

Several paths to expand your skillset and experience:

- Becoming familiar with **new languages** (R, Rshiny, Python)
- Keeping up with **developments** in the language(s) you know
- Get **qualifications**
- **Self-learning** and learning from others
- How R/Python can **interact** with SAS e.g. R and SAS/IML, Python functions in PROC FCMP



1. Introduction (c)

=> Try to provide strategies and concrete solutions from my own experience.



2. SAS/R/Python : 3 top languages to know (a)

Nowadays, this is important to **know different programming languages or at least to be able to learn new programming languages in a short time.**

=> Our job : live with changes all the time



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There was a time when entry to analytics meant **SAS**.

But, we discovered R and Python offer more : **flexibility and scalability attributes.**

❖ **R and Python are more popular**

2. SAS/R/Python : 3 top languages to know (b)

SAS is still considered as the **starting point** for future analytics professionals.

=> SAS is validated, whereas R and Python need to be validated or at least the packages.
=> Authorities do want validated systems



SAS CODE EXAMPLE :

```
Data finaldt;  
merge dataset1 dataset2;  
by id;  
Run;
```

2. SAS/R/Python : 3 top languages to know (c)

For more advanced analytics, R and Python are more easily accessible regarding **cost factors**, and **provide advanced analysis**.

=> R and Python = **open-source programming languages** with a large community.

=> Continuous addition to their respective catalogs.

- R is mainly used for statistical analysis
- Python provides a more general approach to data science.

Python Code example :

```
left = pd.dataset1  
right = pd.dataset2  
pd.merge(left, right, on=['id', 'subject_id'])
```



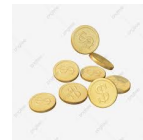
R code example :

```
finaldt <- merge(dataset1, dataset2, by="id")
```



2. SAS/R/Python : 3 top languages to know (d)

- For SAS, companies have to pay license costs.
- At the universities, students learn R or Python more often because of the higher costs of SAS (another reason to be popular).



In the near future, we can say that all sources will coexist together.



3. Development and experience (a)

Qualifications/certifications => *credibility* as a statistical programmer.

- This is one way to grow in the job.



- Most of the pharmaceutical companies provide their own trainings to improve their knowledge and skills.

While qualification offers a **solid foundation** in programmer role, gaining hands-on experience is crucial.

=> THEORY vs PRACTICE



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3. Development and experience (b)

Programming comfort zone : it is an area where he/she is used to working.



3. Development and experience (c)

=> Painful exercise to leave from our comfort zone by challenging ourselves with learning new skills/tools, but it is necessary to become more experienced.

The ability to be flexible regarding languages of programming, is sought after by employers.



3. Development and experience (d)

How can we gain hands-on experience ?

=> move beyond our comfort zone.

=> develop skills by improving our knowledge.

=> importance of mentoring.

=> be open to other ways of programming, pick up and apply techniques from other experienced programmers.



3. Development and experience (e)

=> always be up-to-date with programming standards and SOPs

=> participate as much as possible in meetings, trainings, be proactive.

=> Keep up with news on statistical programming, as new tools available for programming.

=> try to be visible within the community.

=> always learn from our mistakes



3. Development and experience (f)

Here are some further trainings available for us to become more confident:

- **SAS certifications** : the most relevant: *(May be expensive)*

1. SAS certified Associate Programming Fundamentals using SAS 9.4
2. SAS certified Specialist : Base Programming using SAS 9.4
3. SAS certified clinical Trials Programmer using SAS 9.4
4. SAS certified professional : Advanced Programming using SAS 9.4



- **Another useful link** : <https://sasensei.com/>

- question-based learning system
- allow players to test their knowledge (competition)



3. Development and experience (g)

-**Certifications / qualifications in R and Python** (R basic certificate, R programming for Statistics and Data Science, PCAP (**Certified** Associate in **Python** Programming)...)

-Online trainings

❑ <https://www.datacamp.com/> : top training for Python
access to everything, not just Python

❑ <https://www.python.org/> : Plenty of learning materials.

❑ <https://www.coursera.org/> : Build real-world career skills with hands-on learning from the world's leading experts. Several domains available.

❑ <https://shiny.rstudio.com/tutorial/> : tutorial for R shiny, videos for simple to more advanced topics.



4. My experience as a statistical programmer (a)

20 years of programming within pharmaceutical company/CROs



I have a qualification in SAS programming « *Statistiques et traitement informatique des données* », and a certification from SAS institute.

I started my career as statistical programmer associate.



4. My experience as a statistical programmer (b)

At the start of my career, I understood that for being more **credible** in my job, I needed to learn from other experienced programmers due to the constant evolution of programming world in the pharmaceutical industry.

=> The majority of the aspects of this job cannot be taught in courses or on paper.



4. My experience as a statistical programmer (c)

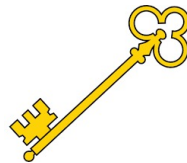
We gain in maturity and self-confidence, are able to be proactive in our daily tasks by planning the work, take challenges with smile...



This is important as well to be visible from *everyone working with us*. This is really recommended if you want to climb the ladder in statistical programming job.

Like this, with being self confident and sure of what you say, then the others will be *confident in your knowledge and your skills*. It will give you more confidence in relationships with clients or other functions.

I think this is the key for evolution within this job.



As a conclusion , home messages

Enjoy evolution and see the positive side

Trust in your capabilities

Dare

Be pro-active



=> and finally always keep your smile



References

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