

Back to the future

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ABSTRACT

Keeping up with the rapidly changing world of Pharma Development, this paper investigates how the role of a programmer has changed over the years and proposes where it is going. Comparing programmers in the past and present we can try and answer the challenging question “what is the future for programmers”? This paper is based on research of programmers in the industry today, looking at their views on the past, present and the future.

...now, where did “Doc” leave his time machine?

INTRODUCTION

Do we know where we are going if we do not know where we have come from? It is always interesting to learn from people who have been involved, who know and whose experience we can trust and rely on. Comparing the role of a programmer in the past and in the present gives us an insight into the extent of how it has changed. Is the role of a programmer really that much different now compared to a decade or two ago? This paper is based on the thoughts of programmers with experience in the industry of 10 or more years collected via a questionnaire. It examines the participant's perception of the role both in the past and present and contemplates their opinions of its development into the future.

PRESENT

I have been working as a programmer in pharmaceutical industry for 3 years. When I started my career and learned to use various functions, procedures and techniques that SAS® version 9 is capable of, I found that there were so many interesting methods and endless ways of getting to one solution; only my imagination was stopping me from not using the best options in my code and taking it a step further. People entering the industry today seem to be surprised that our role is not all about independent programming. There are established standards, code that can be re-used, macro systems, reporting tools – all supposed to make our everyday life easier, save time and resource. Once this information is absorbed and programmers start to feel more comfortable in their position there is a danger to become spoiled and lazy. Hardware and internet access is not an issue these days, programming options in SAS is not an issue either, nor is lack of online material – they are all handy and taken for granted these days. I wonder what it was like two decades ago when everything was in the early stage: poorer standards, not that many guidelines, lack of information. Obviously even SAS was not as powerful as it is today – and what about the state of computers and hardware? It is difficult to imagine that people like me 20 years ago faced completely different challenges – restrictions due to hardware not being capable enough must have been frustrating. Surely in the past it must have been so much different!?

PAST

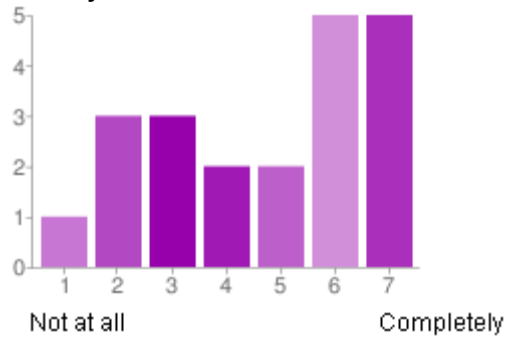
A survey of people in the industry today sharing their experience and thoughts about the role of a programmer takes us back to a time where internet was a luxury and the idea of being able to work from home in the future was unimaginable. In total 21 people took part in the survey: 4 with experience of 10 to 15 years; 10 having 15 to 20 years of experience and 7 with more than 20 years of experience in the industry. Of those surveyed, 52 percent remembered having first started programming in SAS version 6 environment whilst 29 percent had first started using SAS version 5. At present SAS version 9 is most commonly used across the industry. The survey participants were also asked to compare the current version of SAS being used to the version they first started working with and estimate how much everyday work had improved. On a categorical scale of 7, where 1 was equivalent to “No change at all” and 7 was equivalent to “Changed Completely”, 76 percent of answers fell in the categories of 5 to 7. The participants highlighted that the greatest achievements in SAS over time have been the addition of reporting procedures, e.g. proc report and the ODS functionality.

Of those questioned, 95 percent think that the role of a programmer has changed compared to the time they first started in the industry. Participants were asked to estimate the change on a scale of 7, where 1 was equivalent to “No change at all” and 7 was equivalent to “Changed Completely”. 48 percent estimated the change to either 6 or 7 on the scale. 24 percent thought that the role of a programmer has changed completely. The median of all answers was 5. See Figure 1.

PhUSE 2010

Figure 1.

Do you think that the role of a programmer has changed compared to the time you first started in the industry?



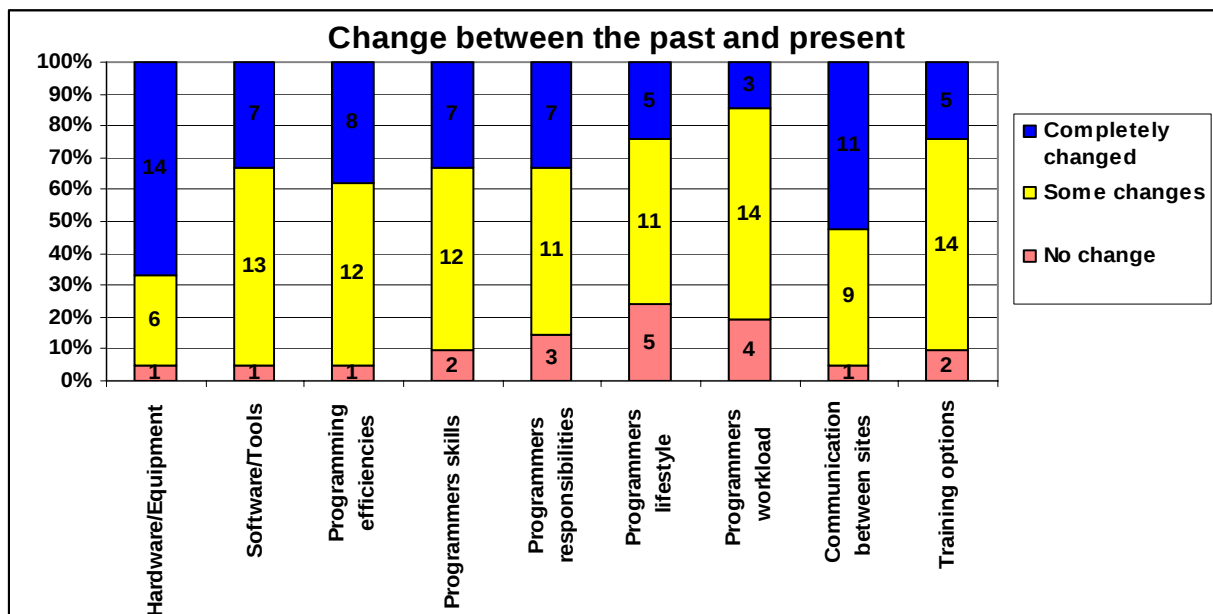
1 -	Not at all	1	(5%)
2		3	(14%)
3		3	(14%)
4		2	(10%)
5		2	(10%)
6		5	(24%)
7 -	Completely	5	(24%)

In addition to achievements in SAS, the participants were asked to provide their opinion on the biggest achievement in the industry that has happened during their career. The highest number of comments were made about CDISC and standards across companies; remote working; and the advent of PhUSE, which brings together programmers in the industry. 10 percent of those questioned said that there have not been any great achievements since they have started in the industry. Are we not progressing fast enough? What is stopping us? Are we too worried about stepping out of our "comfort zone" and facing the real challenges?

If we could actually travel back in time then is there anything we would change? Some interesting points emerged from the feedback gathered: a few programmers thought that some crucial processes could have started slightly earlier. The ideas have been around much longer than they have actually started to be implemented. One of those taking part of the survey commented: "I would have pushed for data and reporting standardization a lot earlier. We are still awaiting CDISC to gain the right level of traction." Another participant mentioned: "Introducing Industry wide CRFs. These are the starting point to data collection. It is getting harder to standardize at the end if the starting point does not contain the information."

One part of the survey involved comparing categories like hardware, available tools, training, programmer's responsibilities, etc. between the present and the past. The participants had the choice of three answers: "No change", "Some changes", "Completely changed". The area where the biggest change has taken place would be "Hardware/Equipment". Of those questioned, 67 percent thought that this category has changed completely. The result is not that surprising as the improvements of hardware have been extensive over the past decade. The speed and memory space of our computers today is incomparable to the machines from 15 to 20 years ago. The other main area where clear differences are notable is "Communication between sites" – 52 percent of the survey participants thought that this category has changed completely. The majority of communication across sites is via emails, instant messenger, cell phones and teleconferences – this was not possible in the past. See figure 2.

Figure 2.



PhUSE 2010

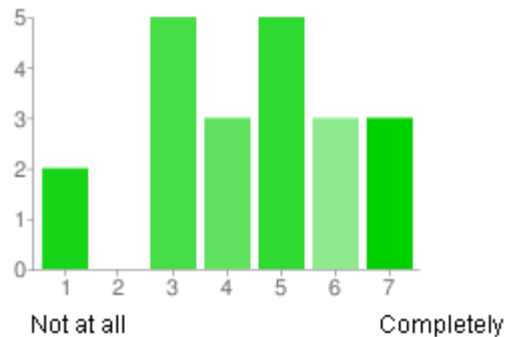
According to the feedback, the most common response in other categories, for example programming efficiencies; programmer's skills and responsibilities, was that there have been some changes compared to the past. "Efficient programming" seems to be a rather recent trend in programming judging by the amount of training courses and interest surrounding it. It is easy to forget that this topic has always been important however as there used to be restrictions due to slower systems and less storage space in the past. People did not have to be reminded to program efficiently, it was self-explanatory. Is this not another marker of laziness?!

One section of the survey focused on the impact of reporting tools on the role of a programmer. It is fair to say that the time spent on hands-on programming has reduced within the past years, whilst increasingly we rely on the standard systems for reporting. How does that affect our programming skills? 95 percent of those questioned have been involved in the development of standard reporting tools. On a scale of 7, where 1 was equivalent to "No change at all" and 7 was equivalent to "Changed Completely," there was no clear trend in the answers. 10 percent of the participants thought that reporting tools have not had any impact on the role of a programmer. 52 percent of the responses fell in the categories of 5 to 7. The median of answers was 5. See figure 3.

This may be another alert of programmers getting lazier or perhaps it means that our role is shifting more towards project management. One of those surveyed commented: "Working with multiple sites and across different (multiple) time zones simultaneously; outsourcing work to India and China; wider role (and influential role) as a programmer; programmers taking more lead roles". Our everyday tasks require more involvement in meetings, communication via email, teleconferences, more interaction with different functions, partners and vendors. Even our job descriptions more often than not refer to the word "analyst". In some sense programmers have remained the same, but we also have to acknowledge that our role is changing somewhat.

Figure 3.

How much in your opinion have standard Reporting Tools changed the role of a programmer?



1 -	Not at all	2	10%
2		0	0%
3		5	24%
4		3	14%
5		5	24%
6		3	14%
7 -	Completely	3	14%

FUTURE

"My interest is in the future because I am going to spend the rest of my life there" (Charles F. Kettering).

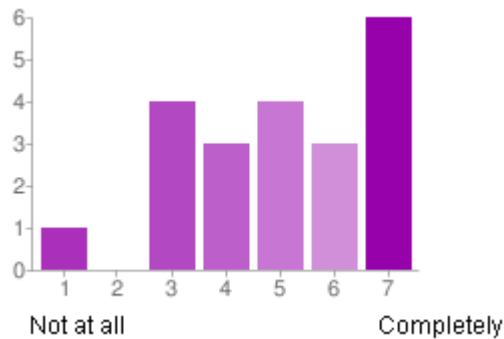
Obviously it is impossible to tell what will happen in the future, but we can learn from the experienced and set goals. People taking part in the survey were asked to compare the role of a programmer in present and in the next 15 years. 95 percent of those questioned think that the role will change somewhat in the next 15 years, 29 percent think that it will change completely. See figure 4. The most common answers to the question "What do you think will impact the future of programmers the most?" was Regulatory requirements/standards (52 percent), and Outsourcing work to Asia (43 percent).

People tend to make overestimated predictions about the future. The trilogy: "Back to the Future" portrayed the year 2015 as really hi-tech with flying cars, floating skateboards and holographic images. Sounds a bit ridiculous? Learning from programmers with 20 or more years of experience in the industry has not at all developed so quickly. "I actually do not think the industry has achieved a great deal in the last 12 years. There have been many great efforts at industry standardization but we are still at the beginning of implementing these and understanding the wider impacts," said one of the survey participants. Another mentioned: "Today seems rather mundane and ordinary compared to what I imagined 2010 would be. Slow evolution rather than revolution". What is stopping us from moving on faster? Maybe we should push towards "flying cars" and "floating skateboards" – no kidding, the worst that can happen is another 15 to 20 years to go by and people still saying we have not achieved much! It is time to start thinking about innovations in the industry – if not now, then when?

PhUSE 2010

Figure 4.

How much different do you think the role of a programmer will be in 15 years from now?



1 -	Not at all	1	5%
2		0	0%
3		4	19%
4		3	14%
5		4	19%
6		3	14%
7 -	Completely	6	29%

CONCLUSION

It is quite clear that people starting their programming career today are in a much different position than the ones 20 and more years ago. It is difficult to say whether we are in a better situation at present or not - we are in front of different challenges. A good base has been set up for the programmers – we have got the technology and tools. What else could we improve on?

In my opinion our main challenge is to keep finding better and more efficient ways to improve the lives of the patients. Maybe learning more from other industries is an idea or programmers getting more involved in the “big picture” – we do not want to conclude that the changes in the industry have been insignificant in the next 15 years.

The role of a programmer is changing, it is time to step out of the “comfort zone” and start thinking innovatively. It is up to us to define the direction and speed of events!

REFERENCES

<https://spreadsheets.google.com/viewform?formkey=dGxYaXhmRiZTYUI4NzRpWkl5eEZ1amc6MQ>

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