



PhUSE 2015

Analysing the role of a lead programmer

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Overview

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- Skills and Qualities
 - › Communication
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 - › Programming and Study Specific Knowledge
- Transformation into Data Scientists
- Conclusions

Introduction

- How was this role analysed?
 - › Survey consisting of two parts:
 - Part I – multiple choice questions
 - Part II – open ended questions

Introduction

The Participants

- Programmers
 - › Lead programmers
 - › Programmers working with lead programmers
- Statisticians

Accountability of participants

	Programmers	Statisticians	Other
Number willing to participate	24	21	4
Number actually participated	16	17	2

DATE: 05FEB2015

Introduction

Credibility of Participants

Programmers		Statistician work experience (years)					
		NONE	<1	1 - <2	2 - <5	5 - <10	>= 10
Programming experience (years)	NONE	0	0	0	0	0	0
	<1	0	0	0	0	0	0
	1 - <2	0	0	0	0	0	0
	2 - <5	0	0	0	0	0	0
	5 - <10	1	0	0	0	1	0
	>= 10	11	1	1	1	0	0

Statisticians		Number of years statistician experience					
		NONE	<1	1 - <2	2 - <5	5 - <10	>= 10
Programming experience (years)	NONE	0	0	2	2	4	7
	<1	0	0	0	0	0	0
	1 - <2	0	0	0	0	0	1
	2 - <5	0	0	0	0	0	0
	5 - <10	0	0	0	0	0	0
	>= 10	0	0	0	0	1	0

Introduction

Credibility of Participants

Programmers		Work experience in Pharma/Biotech (years)					
		NONE	<1	1 - <2	2 - <5	5 - <10	>= 10
Work experience in CRO (years)	NONE	0	0	0	0	0	4
	<1	0	0	0	0	0	1
	1 - <2	0	0	0	0	0	2
	2 - <5	0	0	0	1	2	3
	5 - <10	0	0	0	1	0	1
	>= 10	0	0	1	0	0	0

Statisticians		Work experience in Pharma/Biotech (years)					
		NONE	<1	1 - <2	2 - <5	5 - <10	>= 10
Work experience in CRO (years)	NONE	0	0	2	2	3	0
	<1	0	0	0	0	0	0
	1 - <2	0	0	0	0	0	2
	2 - <5	0	0	0	0	1	2
	5 - <10	0	0	0	1	1	1
	>= 10	0	0	0	0	2	0

Expectations

Survey Results – Part I

Level of importance of tasks associated with the role of a lead programmer

	Programmers	Statisticians	Average Score	p-value
Willingness and attitude to perform a task	58 (46.8)	66 (53.2)	3.758	0.811
Communication skills	60 (48.8)	63 (51.2)	3.727	
Creating ADaM specifications	60 (49.2)	62 (50.8)	3.697	
Review of CRF	60 (49.2)	62 (50.8)	3.697	
Manage study progress / Resource management	58 (48.7)	61 (51.3)	3.606	
Programming of ADaM datasets	55 (46.2)	64 (53.8)	3.606	
Review of SAP	61 (52.1)	56 (47.9)	3.545	

NOTE 1: Numbers in parentheses are percentages.

2: Tasks are presented by decreasing average score.

3: P-value represents the difference between column mean scores.

4: Score: 1=not important, 2=somewhat important, 3=very important, 4=essential.

Expectations

Survey Results – Part I

	Programmers	Statisticians	Average Score
Keep up to date with latest developed tools	57 (49.6)	58 (50.4)	3.485
Creating SDTM specifications	48 (42.1)	66 (57.9)	3.455
Interpret and understand data	58 (51.3)	55 (48.7)	3.424
Programming of TLG outputs	48 (42.5)	65 (57.5)	3.424
Quick decision making	53 (48.2)	57 (51.8)	3.333
Annotating TLG mocks	46 (43.0)	61 (57.0)	3.242
Programming of SDTM datasets	41 (38.7)	65 (61.3)	3.212
Additional study specific edit checks	45 (43.3)	59 (56.7)	3.152
Create PDF file of TLG outputs	43 (41.3)	61 (58.7)	3.152
Review of edit checks (from Data Management)	43 (43.9)	55 (56.1)	2.970
Review of protocol	42 (51.9)	39 (48.1)	2.455

Expectations

Survey Results – Part I

Task groups ranked from most to least important

	Programmers	Statisticians	Overall Score	p-value
Manage study team, progress and resource management	34 (52.3)	31 (47.7)	65	0.800
Willingness and attitude	46 (50.0)	46 (50.0)	92	
Understand and interpret data	46 (46.0)	54 (54.0)	100	
Review abilities	63 (46.3)	73 (53.7)	136	
Quick decision making	64 (44.8)	79 (55.2)	143	
Keep up to date with new tools	76 (46.9)	86 (53.1)	162	
Additional tasks	91 (52.6)	82 (47.4)	173	

NOTE 1: Numbers in parentheses are percentages.

2: Tasks are presented by the weighted overall score.

3: P-value represents the difference between column mean scores.

SOURCE: SURVEY/CSR/PROG/T-SURVEY-Q5.SAS

DATE: 01SEP2015

Skills and Qualities

Survey Results – Part II

- Open ended questions investigating
 - › Beneficial skills and qualities
 - › Frustrations
 - › Partnerships
- Results categorised into 3 main groups:
 - Communication
 - Leadership Qualities
 - Programing and Study Specific Knowledge

Skills and Qualities

Communication

Benefits

- Clear, concise and consistent
- Simplify a problem and communicating in non-programming terms
- Take a pro-active approach

Frustration

- Lack of communication

Skills and Qualities

Leadership Qualities

- Be assertive
- Time management
- Pragmatism / realistic expectations
- Agility and flexible
- Quick decision making
- Good teacher
- Motivate team
- Be innovative

Skills and Qualities

Programming and Study Specific Knowledge

- Understanding and interpreting data
- Good technical programming skills
- Implement standards and processes
- Attention to detail & know-how
- A little statistical knowledge
- Willingness to speak up
- Knowledge of therapeutic area, study design and how trial was run
- Shift – project management skills needed

Transformation into Data Scientists

- Clinical Data Sciences
 - › Data Planning
 - › Data Operations
 - › Data and Analysis Infrastructure
 - › Quality and Process Management
- What does this mean for lead programmers?
- What does ideal Data Scientist look like?

Transformation into Data Scientists

Managing Partnerships

- Clear, Concise and Consistent Communication
- Set expectations upfront
- Build flexibility into processes and timelines
- Harmonise procedures, practices and SOPs
- Use metrics to measure and evaluate performance
- Effective planning
- Make time zone differences work in your favour
- Mutual respect and common decency

Conclusions

- Remarkable talent!
- Manage Expectations
- Identify Levels of Importance and Prioritise Accordingly
- Communication, Leadership Qualities and Programming and Study Specific Knowledge
- Identified a Need for Change into Data Scientists
 - Maintain strong programming capabilities
 - Also need broader, more generalised skillset
 - Oversight and Project Management
 - Partnerships



The world as we have created it is a process of our thinking.
It cannot be changed without changing our thinking.

Albert Einstein