

# Becoming a Lead Programmer: Skills, Responsibilities, and Career Pathways

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PHUSE US Connect 2026



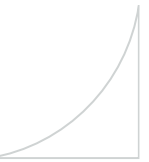
Inspired by patients.  
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# Agenda

1. Introduction
2. Role and responsibilities
3. Role-specific skills
4. Leadership skills
5. Obtaining a Lead Programmer position



# What is a Lead Programmer?

*A Lead Programmer for a defined set of work is the one who is ultimately responsible for statistical programming deliverables to be completed on-time and with high quality.*

Involves leading a team of programmers

Often part of the responsibilities of a programming position.

Can be Director-level, Manager-level, or any qualified programmer (depending on the company)

Not the same as a line manager (but can overlap)

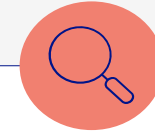
Much of this is applicable to Statistician and Data Manager roles too.

# Project Programmer vs. Lead Programmer Responsibilities



## Project Programmer

- Programming SDTM datasets
- Programming ADaM datasets
- Programming Tables, Figures, and Listings (TFLs)
- define.xml and eSub packages



## Lead Programmer

- Overseeing all programming work
- Monitoring project status
- Timelines and budgets
- Working with project programmers to resolve issues
- Reviewing documents (protocol, SAP, etc.)
- Interacting with other functional areas

# Lead Programmer vs. Line Manager Responsibilities

	Line Manager	Lead Programmer
<b>PRIMARY FOCUS</b>	Human resources and administrative oversight	Technical and operational leadership at the project level
<b>KEY RESPONSIBILITIES</b>	<ul style="list-style-type: none"><li>- Compliance with HR and organizational policies</li><li>- Career development</li><li>- Resource Allocation</li><li>- Performance Evaluations</li><li>- Corrective/disciplinary action when required</li></ul>	<ul style="list-style-type: none"><li>- Coordination of programming activities</li><li>- Quality assurance of deliverables</li><li>- Task prioritization</li><li>- Ensuring regulatory standards are met</li></ul>
<b>SCOPE OF INFLUENCE</b>	Departmental or organizational level	Project-specific execution and programming team guidance
<b>INTERACTION WITH TEAM</b>	Provides mentorship and manages professional growth	Directly supervises project work and resolves technical challenges
<b>DECISION MAKING</b>	<ul style="list-style-type: none"><li>- Personnel decisions</li><li>- workload distribution</li></ul>	<ul style="list-style-type: none"><li>- Technical decisions</li><li>- Workflow optimization</li></ul>

# Lead Programmer Responsibilities Contd.

*Everything* programming-related for a project falls on their shoulders.





Things can and eventually will go wrong.

Accountable for *all programming issues* with deliverables.

Can be stressful and overwhelming at times.



# Required Role-Specific Skills

-  Understanding their programmers
-  Budgeting and resource estimation
-  Interacting with other functional areas
-  Building a Team, Recruiting, and Interviewing

# Understanding Your Programmers



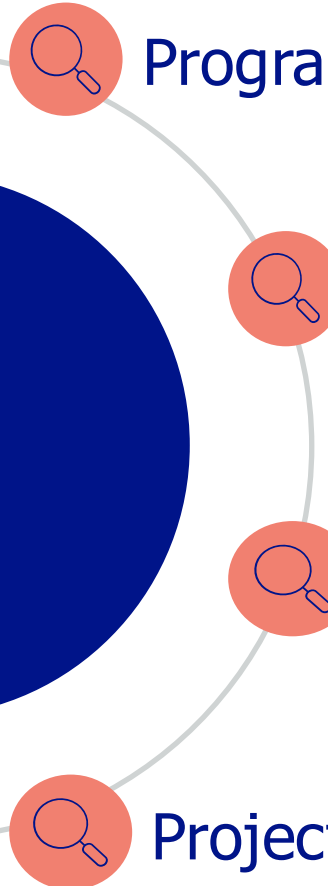
Skill Levels

“If I give a specific task to a specific programmer, how long will it take them to complete?”

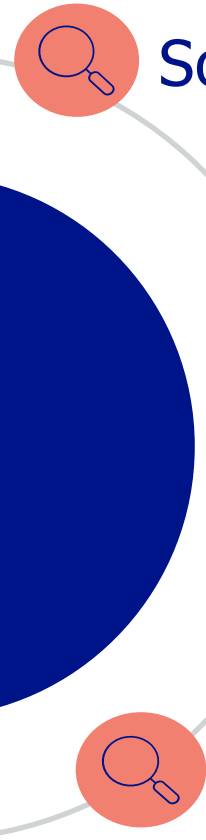
Personality type

Introvert / Extrovert / Heads-down / Challenging / etc.

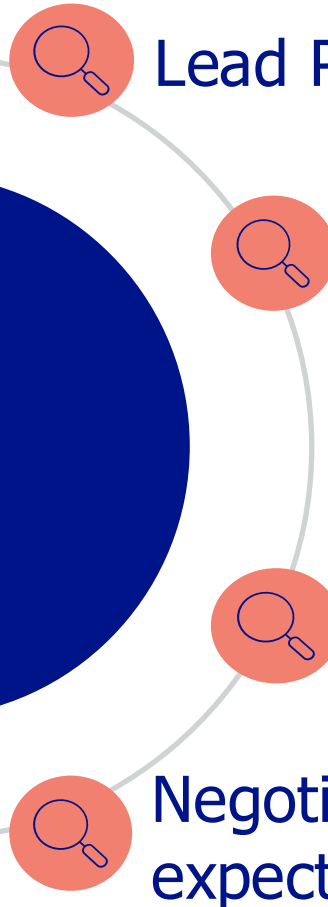
# Budgeting And Resource Estimation

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- Programming resources are finite
  - Estimating how long a programming effort will take, and how many resources are needed
  - Forms the fundamental building blocks of budgeting and timelines
  - Project timelines + resource allocation = Budget

# Building a Team, Recruiting, and Interviewing

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- Sometimes a Lead Programmer is tasked with assembling their own team
  - Requires long-term vision
  - Aligning individual skills/experience and project objectives
  - Interviewing someone requires assessing their skills based on very limited information

# Interacting With Other Functional Areas and Negotiating


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- Lead Programmer is the primary point of contact for the programming team
  - Requires interaction with many other functional areas
  - Discussing programming with people who have little knowledge of the actual work
  - Negotiating timelines is a critical skill to ensure reality can meet expectations


# Learn To Say It “In Corporate”

 Example: A project manager asks you to program 30 new outputs two days before a major deadline.


 Response 1: “On what planet do you think this is a reasonable request?!”



 Response 2: “Unfortunately we are unable to accommodate this request so close to the deadline. If there are a couple outputs you would like us to prioritize we should be able to program those before the deadline.”

 Response 3: “Accommodating this request will require pushing out the timeline X days and/or require a change in scope costing Y dollars. Please advise us how to proceed.”

# Interacting With Other Functional Areas Example

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- Concomitant medication classification for a study
  - Medical Directors gave the programmers instructions
  - Deliverable from CRO had many misclassifications
  - CRO followed instructions perfectly. The instructions were flawed.
  - I had to make it clear to the Medical Directors the mistake was in the classification, not the implementation.



# Leadership Skills and Traits



Confidence



Respecting Your Team



Avoid Micromanaging



Providing Feedback and Corrective Action

# Confidence



Lead Programmers must be confident in themselves



Not to be confused with arrogance



Some nervousness and doubt is good – it acts as a check



You must be able to make decisions!



A lack of confidence will filter down to the programming team

# Respect Your Team



Lead Programmers set the tone for their team



Mutual respect is the foundation of effective leadership



A Lead Programmer's success is linked to their team's performance



Empower your programmer's autonomy

# Avoid Micromanaging

- Excessive oversight can be tempting given the responsibility of a Lead Programmer
- Can lead to resentment and backlash
- Often rooted in a lack of trust of one's team
- Requires self-awareness from a Lead Programmer
- Examples include: requiring excessive status updates, scrutinizing inconsequential details, and taking over work without good cause.

# Micromanaging Example

- Programmers on my team helping with other projects
- The Lead Programmer on the other project micromanaged them.
- Programmers were absolutely miserable
- I worked to get them off the project ASAP
- My priority is the well-being of my team

# Providing Constructive Feedback / Taking Corrective Action

- Performance issues must be addressed with honesty and professionalism.
- Direct and constructive conversations are key. Though they can feel uncomfortable.
- Performance Improvement Plans necessitate close oversight
- Ultimately a Lead Programmer must prioritize project success over personal feelings.

# Corrective Action Example

- Relatively new FSP programmer on my team (~6 months)
- Asked me to help finish a validation program they were working on.
- The bottom of their program had a PROC COMPARE which compared the production dataset to itself (i.e. would always get a clean compare)

```
data prod;  
  set qc.<output name>;  
run;  
  
proc compare base=qc.<output name> compare=prod;  
run;
```

# Corrective Action Example Contd.

- I informed my manager (who is also the line manager for this FSP programmer).
- I did not make a decision immediately
- Thorough investigation and I had a conversation with the programmer
- Result... I recommended this programmer be put on a PIP but still be allowed to work with my company.



# Obtaining a Lead Programmer Position

# Obtaining a Lead Programmer Position

- Determining readiness for a Lead Programmer role
- Highly Individual Process
  - Some key career experiences and milestones one should achieve first.
  - Gain experience across study phases (1-4) and across therapeutic areas (oncology, neurology, etc.)
  - Experience on large submission projects (ISS/ISE) is ideal but not necessarily possible for everyone.
  - Experience with eSub packages and regulatory submissions.

# Obtaining a Lead Programmer Position Contd.

- Understand the required qualifications
  - Will vary by company
- Discuss this with your Line Manager
  - Programmer has the required skills and experience -> manager should arrange a Lead Programmer position
  - Programmer does not have the required skills and/or experience -> manager should design a plan for the programmer to get them the skills/experience

# Obtaining a Lead Programmer Position Contd.

- Demonstrating readiness and advocating for oneself
- Must convince leadership you are prepared to assume significant responsibility
  - Leadership does not take this decision lightly
  - Advocacy goes beyond expressing interest
  - Requires demonstrating you are already operating at that level
  - Showing leadership behaviors and delivering results

# Conclusion

- Becoming a Lead Programmer is a significant career milestone
- Critical to understand 3 key aspects:
  - The nature of the position, including responsibilities
  - The skills and competencies required for success
  - Strategies to obtain a Lead Programmer position
- Lead Programmers are the critical link between project programmers and management.



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## **Thank You**

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