

Developing the Workforce of the Future

Empowering Statistical Programmers for the Future: Technical Skills, Adaptability, and Leadership in the AI Era

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Agenda Highlights

- Strategic Guidance for Statistical Programmers
- Technical Proficiency and Foundational Skills
- Adoption of Emerging Technologies
- Interdisciplinary Communication and Stakeholder Management
- Leadership and Influence in Analytics Teams
- Evolving Roles and Future Career Paths
- Navigating Uncertainties and Industry Challenges
- Adapting to Technological Disruption and Ensuring Relevance

Strategic Guidance for Statistical Programmers

Why SPs still matter (and why this is changing)

- SPs are central to analysis pipelines and deliverables
- AI/ML + cloud are changing *how* pipelines are built and run
- The goal: increase impact, not just “keep up”

Pipeline diagram:



Why SPs still matter (and why this is changing)

- Automation of routines
- Shift to collaborative platforms
- Speed + Transparency + Reuse
- Visualization: Broad range
- Reproducibility is the SP superpower

Role of Statistical Programmers in the Evolving Analytics Ecosystem



Upskilling with Foundational Languages

Mastering R, Python, and SAS is essential for statistical programmers to stay relevant and effective in analytics.

Adopting Emerging Technologies

Utilizing machine learning frameworks, cloud-based tools, and AI applications enhances analytical capabilities.

Building Interdisciplinary Communication

Effective communication across disciplines fosters collaboration and drives innovation in analytics projects.

Leading Modern Research Practices

Promoting reproducible research and automation positions programmers as leaders in evolving analytics ecosystems.

Technical Proficiency and Foundational Skills

Where do
your **deliverables** live
today?

Where is your
org **deploying** tomorrow
?

What helps
you **collaborate** cross-
functionally?





Mastering R, Python, and SAS for Analytics

Importance of Foundational Languages

R, Python, and SAS are essential for statistical programming and analytics due to their robustness and versatility.

Career and Company Considerations

Choice of primary language depends on career stage and company technology deployments.

Continuous Learning and Adaptability

Investing time to learn and apply skills is key, especially with growing AI collaboration in analytics.

Continuous Learning and Professional Development



Lifelong Learning

Engaging in lifelong learning through courses and workshops keeps professionals agile and updated with new ideas.



Leveraging Learning Resources

Utilizing webinars, podcasts, and academic literature helps maintain competitive edge and adapt to industry changes.



Certifications and Career Growth

Certifications validate expertise, increase marketability, and provide structured learning aligned with career goals.

“Thriving in the AI era is about the ability to learn quickly and adapt... also unlearn.”

Adoption of Emerging Technologies



Exploring ML Frameworks, Cloud-Based Tools, and AI Applications

ML Frameworks Integration

Integrating ML frameworks with cloud platforms enables scalable data processing and efficient analytics workflows.

Automation and Reproducibility

Cloud tools help automate workflows and improve reproducibility in model development and deployment.

AI Advancements Awareness

Staying updated on AI trends allows programmers to use advanced tools addressing evolving business challenges.

Understand data structures, splits, metrics, leakage risks

Be able to reproduce a model run end-to-end

Inputs/outputs + assumptions + versioning

Compute/storage decoupled
run jobs scalably

Translate to requirements for AI/ML engineers

translate to effective AI prompts

Position SP as reproducibility + governance champion.



Interdisciplinary Communication and Stakeholder Management

Building Communication Skills and Data Storytelling



Effective Stakeholder Communication

Strengthen communication to connect technical and non-technical stakeholders for better collaboration.

Mastering Data Storytelling

Turn complex analyses into practical insights to guide decision-making and foster innovation.

Cross-functional Engagement

Engage regularly in meetings and feedback sessions to improve clarity and mutual understanding.

Bridging Interdisciplinary Gaps

Understand other functions' needs and educate them to integrate insights effectively.



Data Storytelling

Pre. Clarify requirements and acceptance criteria

1. Start with **question**
2. Translate analysis into decisions
3. Show **result + uncertainty**
4. End with **impact**
5. Document decisions for future reuse

Leadership and Influence in Analytics Teams

Championing Best Practices and Driving Innovation

Leadership through Best Practices

Statistical programmers lead by promoting best practices and ensuring traceability in data processes.

Fostering Innovation and Ethics

Adopting new methodologies and advocating ethical data use drives innovation and trust in analytics.

Encouraging Collaboration and Diversity

Promoting open dialogue, diversity, and knowledge sharing accelerates problem-solving and decision-making.

Addressing Challenges Beyond AI

Statistical programmers identify bottlenecks AI cannot solve and provide strategic leadership solutions.



Evolving Roles and Future Career Paths

Transition to Data Business Analyst and Data Scientist Roles



Evolving Role of SPs

The traditional SP role is expanding to include business analysis and data science responsibilities.

Bridging Business and Data

Data Business Analysts translate business needs into detailed data requirements and analytical questions.

Collaboration with AI Engineers

Analysts communicate requirements to AI and ML engineers who build or select models for insights generation.

Harnessing AI for Analytics

Using AI models or prompt engineering, analysts enable intelligent automation to meet organizational goals.

Digitization and the Changing Scope of Statistical Programming



Digitization of Documents

Study protocols and SAPs are converted into digital formats to streamline data processing and analysis.



AI-Ready Data Labeling

Data is labeled and prepared for AI models to automate the generation of study analyses and reports.



Impact on Statistical Programmers

Emerging digitization reduces traditional roles for statistical programmers in report generation and submissions.

Navigating Uncertainties and Industry Challenges

Impact of Geopolitical, Healthcare, and Financial Factors



Geopolitical Influences

Global stability and regulatory changes shape operational strategies across industries worldwide.

Healthcare Access Challenges

Public health concerns and logistical barriers affect in-hospital care and patient engagement.

Financial Strains in Healthcare

Reduced reimbursements from programs like Medicaid strain providers and require innovative solutions.



Leveraging Real-World Data and Adapting to Change

Real-World Data Insights

Leveraging Real-World Data provides deeper understanding of treatment outcomes and healthcare trends beyond clinical trials.

Challenges of RWD Integration

Integrating Real-World Data requires managing data quality, privacy concerns, and accurate interpretation for effective use.

Adaptability to Change

Proactively adapting to geopolitical, technological, and policy shifts enables organizations to navigate uncertainty successfully.

Adapting to Technological Disruption and Ensuring Relevance

Risks of Inaction and Strategies for Lifelong Learning

Risks of Ignoring Change

Failing to adapt to AI and automation risks professional obsolescence and industry disruption.

Embracing Continuous Learning

Investing in lifelong learning and skill development ensures resilience in evolving data careers.

Personalized Development Paths

Each individual must tailor their learning approach based on personal goals and circumstances.

Growth Mindset Importance

Adopting a growth mindset helps professionals navigate change and seize new opportunities.



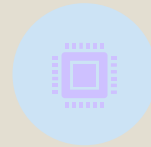
Create an **Action plan**



next 90 days



Pick 1 workflow to make upgrades



Learn 1 adjacent tool (e.g., in Python/R, if SAS-native)



Create 1 reusable template + **share with team**



Keep up



Weekly: 1–2 hrs learning



1 improvement



Adapt, modernize, lead

Conclusion

Technical Excellence

Statistical programmers need strong technical skills to excel in advanced analytics and AI applications.

Adaptability to Change

Adapting to evolving technologies and methodologies is essential for ongoing relevance in analytics.

Communication and Leadership

Effective communication and leadership empower statistical programmers to guide projects and teams successfully.

Leveraging Emerging Technologies

Utilizing new technologies helps statistical programmers secure vital roles in the future analytics landscape.

Acknowledgements:

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Questions and Responses on 'Developing the Workforce of the Future'