

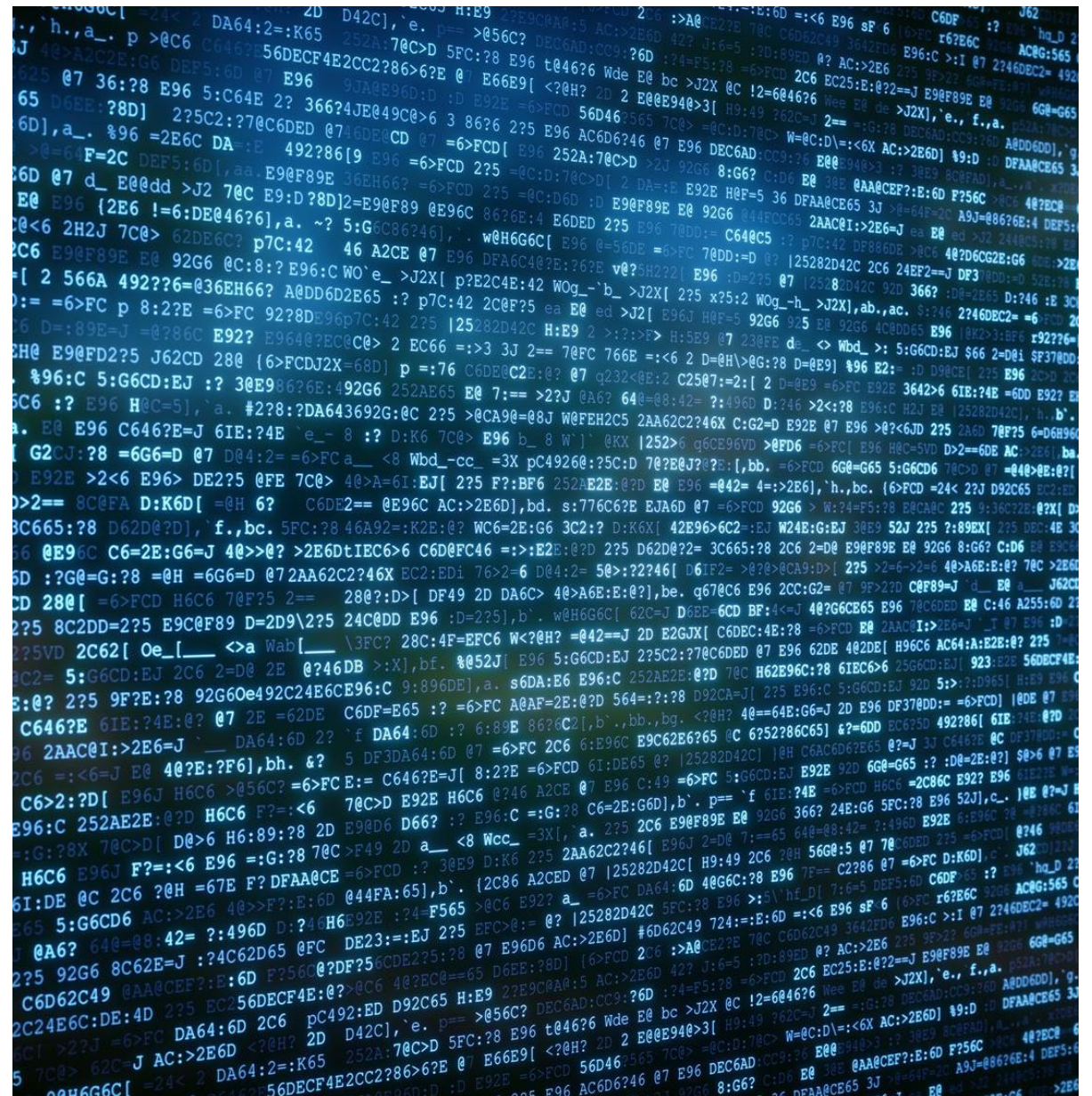
How and Why ,Statistical Programming Leaders needs to plan for Next Generation Statistical Programming

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Agenda Overview

The Evolving Landscape

Challenges in Adopting Data Science in
Pharmaceutical Clinical Development

Regulatory Constraints and Organizational
Resistance

Evolving Teams to Meet Demand for Evidence



The Evolving Landscape



What's New that is Happening

Evolution of Programming Tools & Data

- SAS Viya
- Posit Positron
- Co Pilot
- RWD
- Digital

Evolving Approaches

- Prompt Engineering
- Self Serve tools
- Vibing – Using AI assistants
- GEN AI.... ChatGPT, CLAUDE

What remains constant

Need for Statistical programmers

- Professionals who understand code development and are able to ensure that approaches and programs are robust
- Analysts who understand and can work with Dynamic Clinical data

Need for Evidence

- Regulatory requirements evolving
 - Evidence provision
 - Use of AI
 - Use of Open Source
 - Data Privacy
 - Acumulus
- Evolution of other Stakeholder needs
- Move to Data Evidence provision as well as outputs

The Evolving Role of Statistical Programmers



Key Responsibilities and Tasks in this New Era

Data Management & Wrangling

Statistical programmers are now responsible for managing large datasets, ensuring data integrity, and maintaining accurate records. Data wrangling involves cleaning and transforming raw data into a usable format, ensuring data quality for analysis.

Importance of Data Analytics

A strong understanding of data analytics methodologies is essential for effective evidence generation and decision-making.

Interdisciplinary Collaboration

Collaboration among data scientists, statisticians, and domain experts enhances the quality of evidence generated from data.

Robust Analytical Framework

Integrating data science into evidence generation enhances the analytical framework, allowing for deeper insights.

Machine Learning Insights

Machine learning is utilized to extract actionable insights that drive informed decision-making processes.



Extracting Actionable Insights From Complex Data

Deriving Actionable Insights

Focus on extracting meaningful insights from complex datasets to inform strategic decision-making.

Data Visualization Techniques

Employing data visualization techniques helps in simplifying complex data and making it easier to understand.

Importance of Big Data

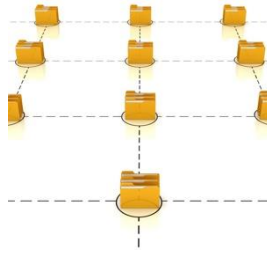
The rise of big data has revolutionized the way statistical programmers work, enabling deeper insights into complex datasets.

Contextual Understanding

A deep understanding of the data's context is crucial for accurate interpretation and application of insights in clinical development.

Challenges in Adopting Data Science in Pharmaceutical Clinical Development

Data Accessibility and Inconsistent Standards



Challenge of Data Accessibility

Ensuring data accessibility across various departments is crucial for effective communication and collaboration.



Importance of Consistent Standards

Maintaining consistent data standards is essential for reliable data analysis and decision-making.



Impact on Collaboration

Inconsistent data practices can hinder effective collaboration and lead to misunderstandings among teams.



Importance of Data Governance

Organizations must implement strong data governance practices to manage and protect data, ensuring it is accessible to all stakeholders.



Misapplication of Tools

Impact of Misuse

Misusing analytical tools can lead to inaccurate conclusions and poor decision-making in data science projects.

Importance of Training

Proper training is essential for statistical programmers to fully leverage analytical tools and improve their effectiveness.

Navigating Compliance Challenges

Understanding regulatory constraints is essential to navigate the challenges faced in data science effectively.

Importance of Technology Knowledge

A robust understanding of technology is crucial for overcoming inefficiencies and ensuring compliance in data science.

Organizational Resistance

Overcoming Organizational Resistance to Change

Understanding Resistance

Recognizing the reasons behind resistance to change is crucial for effectively addressing it within the organization.

Cultivating Adaptability

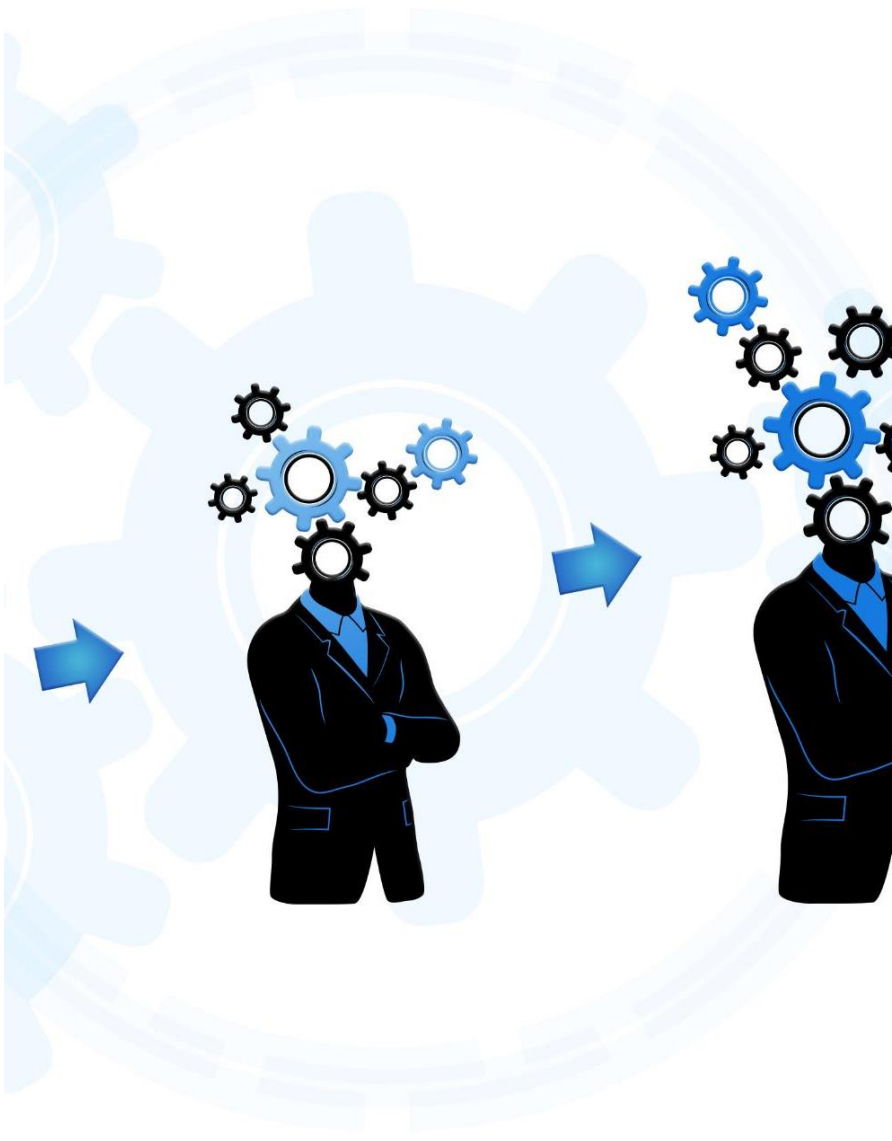
Fostering a culture of adaptability allows organizations to respond more effectively to changes and emerging trends.

Promoting Continuous Learning & Improvement

Encouraging continuous learning helps employees develop the skills necessary to embrace change and drive innovation and a focus on continuous improvement to adapt to change and thrive in a competitive environment is required

Culture of Innovation

Creating a culture that embraces innovation is vital for overcoming resistance and encouraging progress.



Strategies for Successful Implementation

Stakeholder Engagement

Engaging stakeholders is crucial for understanding their needs and ensuring support for data science initiatives.

Ongoing Training

Providing ongoing training helps teams stay updated with the latest tools and techniques in data science.

Aligning Objectives

Aligning data science objectives with organizational goals ensures that initiatives deliver value to the business.



Evolving Teams to Meet Demand for Evidence



Evaluating New Tools and Technologies

Importance of Evaluation

Evaluating new tools is essential for improving programming capabilities and optimizing workflow efficiency.

Staying Informed

Keeping up with emerging technologies ensures that teams remain competitive and can adapt to changes in the industry.

Identifying and Developing Essential Skillsets



Programming Skills

Fostering programming skills among team members is essential as it enables them to create and innovate effectively. Includes prompting and use of AI agents

Data Science Competence

Developing data science skills helps teams analyze information and make data-driven decisions critical for success.

Adopting New Tools

Regular assessment and adoption of new tools are crucial for teams to keep up with advancements in data science.

Continuous Skill Development

Ongoing skill development is vital for data science professionals to remain competitive and effective in their roles.



Meeting Growing Expectations From Stakeholders

Timely Insights

Stakeholders are increasingly demanding timely insights that can inform decision-making processes effectively. The demand for high-quality insights must be balanced with the need for speed to satisfy stakeholders' evolving needs.

Collaborative Efforts

Collaboration between statisticians and programmers is essential to deliver quality outputs that meet stakeholder expectations.

Agility in Teams

Teams must be agile to adapt quickly to changing stakeholder expectations and project requirements.

Effective Project Management

Implementing rapid changes relies on effective project management to ensure timelines and deliverables are maintained.

Continuous Communication

Continuous communication within teams and with stakeholders is crucial for successfully managing expectations and changes.



New Required Programming Skills

- **Agile Code development**
- **Vibe Programming**
- **Gen AI Prompting**
- **Developing AI Agents**
- **Multi Language Programming skills**

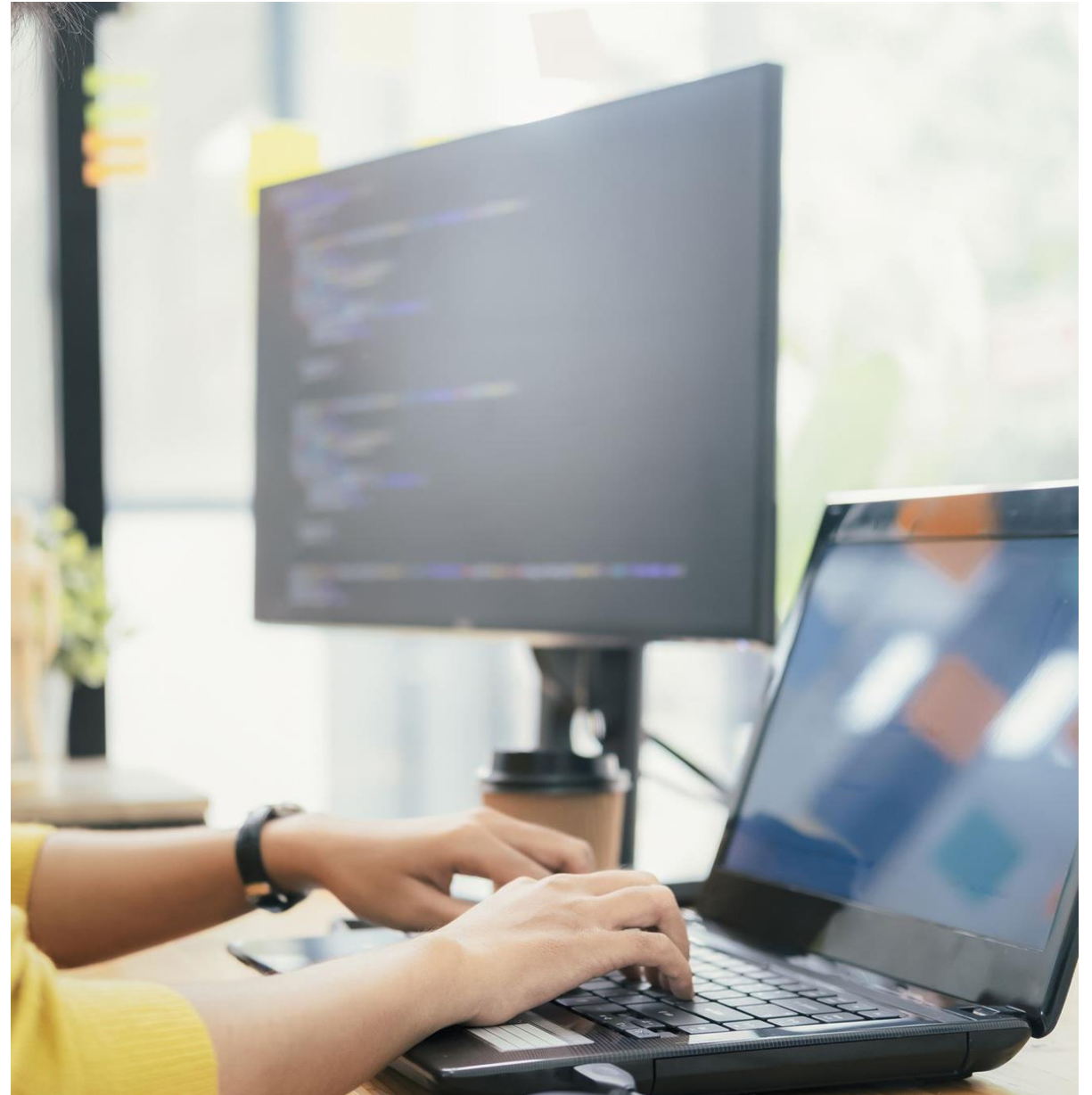
Co-Pilot Assistants for Enhanced Productivity

Automating Repetitive Tasks

Co-pilot assistants automate repetitive coding tasks, allowing programmers to save time and increase efficiency.

Focus on Complex Problems

By handling routine tasks, co-pilot assistants enable programmers to concentrate on more intricate problem-solving challenges.





AI Agents for Automating Routine Tasks

Streamlining Workflows

AI agents help streamline workflows by automating repetitive tasks, allowing teams to focus on more strategic activities.

Reducing Manual Effort

With AI agents handling routine tasks, the manual effort in data processing is significantly reduced, enhancing productivity.

Increasing Efficiency

The implementation of AI agents leads to increased efficiency by minimizing errors and speeding up task completion.

Future Directions and Opportunities



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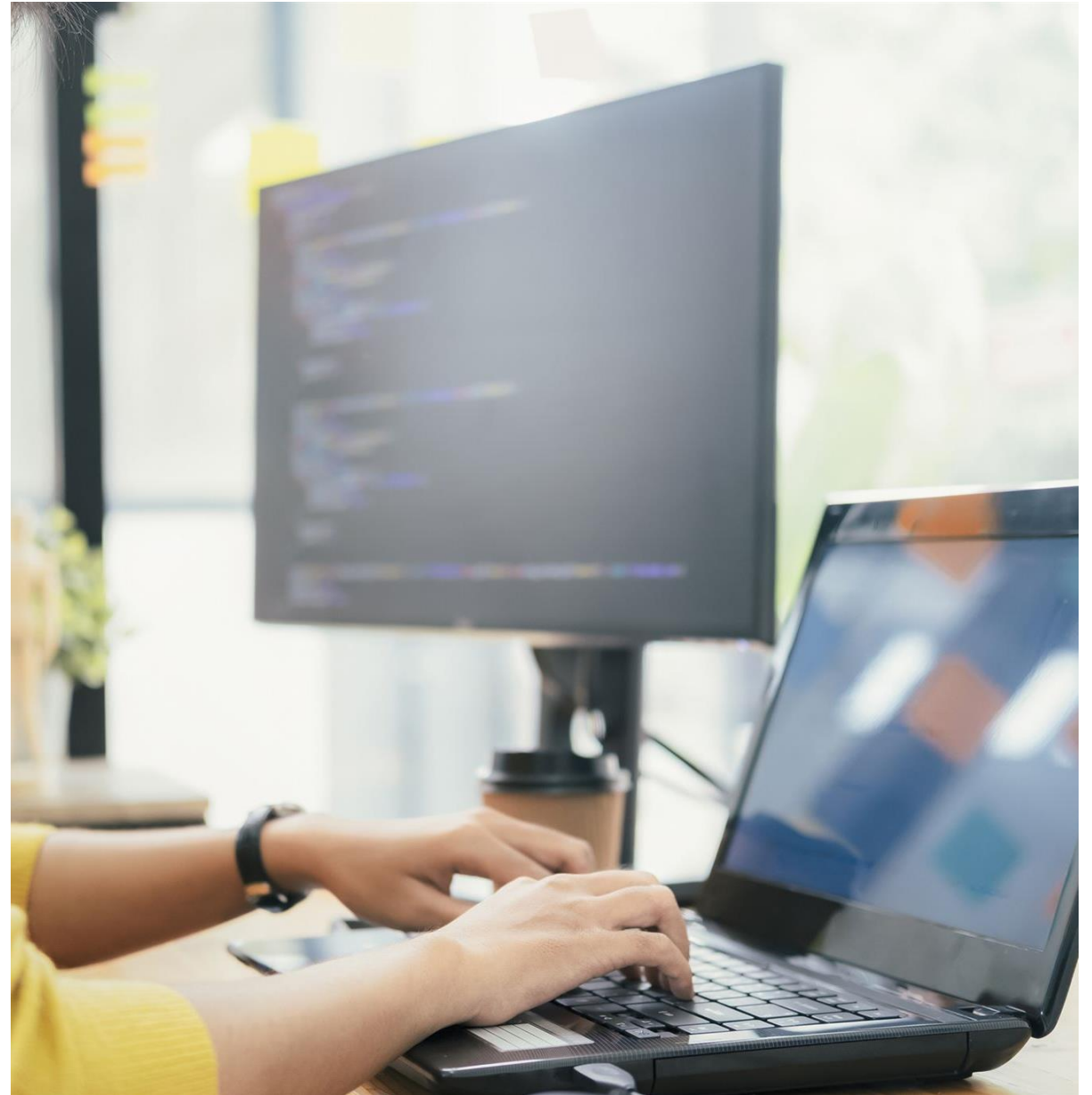
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Building a Resilient and Adaptable Team

Importance of Resilience

Resilience in teams allows for quick recovery from setbacks and challenges, fostering a proactive and positive work environment.

Culture of Continuous Learning

Promoting continuous learning within teams encourages innovation and adaptability, preparing them for future challenges.

Flexibility in Work Practices

Flexibility in work practices allows teams to adjust quickly to changing circumstances and fosters a dynamic work environment.

Strategic Planning

Future Challenges

- Empower Leaders with Tools

Innovative Solutions

- Implement cutting Edge Methods

Cross Disciplinary Skills

- Master diverse domains

Data Driven Decisions

- Drive Business success

Skillset enhancements

Embrace Technology

--Stay ahead by adopting new tools and techniques

Continuous learning

- Never stop improving your statistical programming skill

Adaptability is key

- Flexibility to evolve with the changing landscape

Conclusion

Adapting to Changing Roles

Embracing new responsibilities and adapting to evolving job roles is essential for future success in statistical programming.

Change Management

Ensure that Teams are supported and excited about the changes and possibilities.

Evolving Teams

Building flexible and adaptive teams is vital for collaboration and innovation in statistical programming projects. To thrive in this new era, statistical programmers must evolve their skill sets to include new technologies and methodologies

Embracing Innovative Tools

Utilizing innovative tools and technologies will enhance efficiency and effectiveness in statistical programming tasks.