



The Future is Now

Roles and Skills for Statistical Programmers

Ellen Asam and Amy Gillespie

Paper # PD02

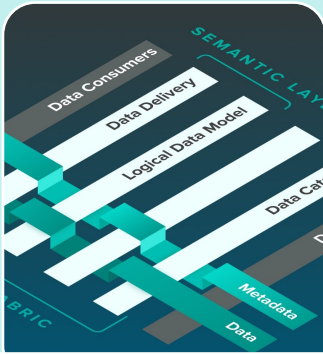
May 2022

Outline

- Trends and Technology Developments Impacting Statistical Programming
- General Workplace Trends & Observations
- Mix of Skills Important for Statistical Programmers
- Future Investments Required Today

Trends in Technology

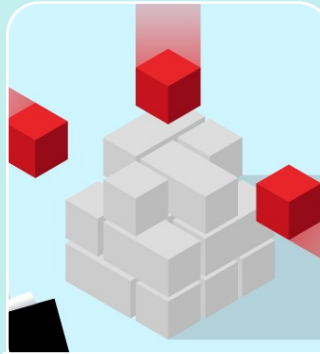
Trends support system flexibility, resiliency, reusability and agility – making development easier and faster



Data Fabric



Cloud-Native Platform



Composable Applications; components, modules



Decision Intelligence & Advanced Analytics



Hyper-automation



Generative AI

Reference:

[Top Strategic Technology Trends for 2022 | Gartner](#)

Trends in Healthcare

Trends influenced by
technology advances
and the pandemic



Remote
healthcare
and
telemedicine



Extended
reality for
clinical
training and
treatment



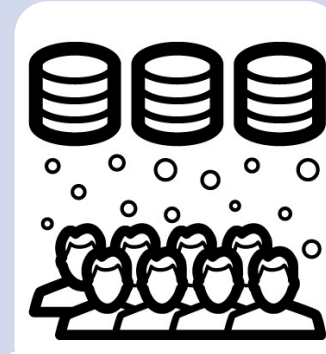
Making sense
of medical
data with AI
and machine
learning



Digital Twins
and
Simulations



Personalized
medicine and
genomics



Synthetic
Control Arms

References:

[The Five Biggest Healthcare Tech Trends In 2022 \(forbes.com\)](https://www.forbes.com)

[Synthetic control arms are a good option for some clinical trials - STAT \(statnews.com\)](https://www.statnews.com)

Can the statistical programming profession
evolve to address these trends and
advances?

YES!

Statistical Programming Evolution

Influenced by
technology and
health care trends



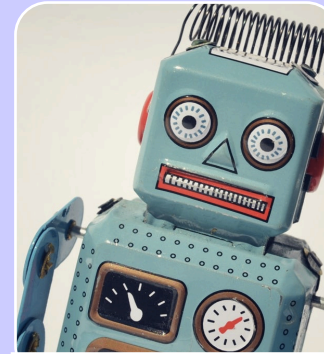
Multi-lingual



Data visualization;
interactive figures



Submission
readiness

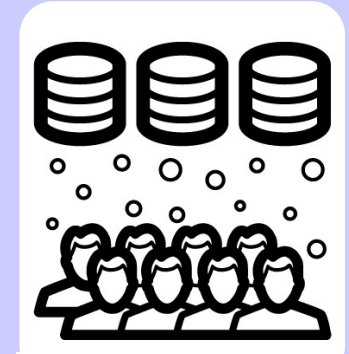


Advanced
automation &
standardization

NLP, linked data,
document driven
programming



Working with data
beyond collected
clinical trial data,
e.g. real world
data, digital
health technology
data, etc.



Increased cross-
industry
collaboration

References:

<https://www.lexjansen.com/pharmasug/2020/SI/PharmaSUG-2020-SI-173.pdf>

<https://www.lexjansen.com/phuse/2019/li/LI05.pdf>

General Workplace Trends & Observations

General Workplace Observations from Recent McKinsey Surveys & Papers

“Demand for higher cognitive skills, such as **creativity, critical thinking, decision making, and complex information processing**, will grow through 2030, by 19 percent in the United States and by 14 percent in Europe, from sizable bases today.”

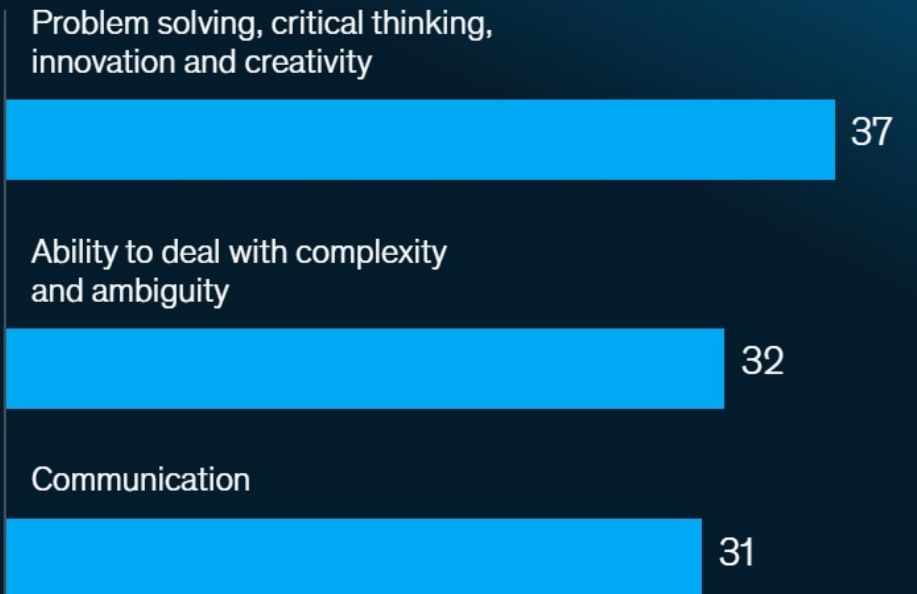
“Adoption of automation and AI technologies will transform the workplace and increase the need for some skills, such as **technological** as well as **social and emotional skills**.

The need for **finely tuned social and emotional skills** will rapidly grow”

Missing skills

But HR professionals report difficulty recruiting candidates who have the necessary soft skills for an automating world.

Top three areas of missing soft skills, % of respondents



References:

<https://www.mckinsey.com/featured-insights/future-of-work/five-fifty-soft-skills-for-a-hard-world>

<https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce>

More Trends & Observations:

Defining the skills citizens will need in the future world of work

- “To future-proof citizens’ ability to work, they will require new skills—but which ones? A survey of 18,000 people in 15 countries suggests those that governments may wish to prioritize.”
- Outlined 4 broad skill categories with 13 separate skill groups



Cognitive	Interpersonal	Self-leadership	Digital
• Critical Thinking • Communication • Planning & Ways of Working • Mental Flexibility	• Mobilizing Systems • Developing Relationships • Teamwork Effectiveness	• Self awareness & self management • Entrepreneurship • Goals achievement	✓ Digital fluency & citizenship ✓ Software use & development ✓ Understanding digital systems

What's in a Name

Statistical Programming Analyst

Quantitative Analyst

Data Scientist

Data Strategist

Data Wrangler

Data Analyst

Data Curator

Data Architect

Data Engineer

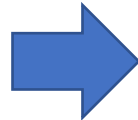


Mix of Skills Important for Statistical Programmers

Traditional Programming Skillset Remains the Foundation

Most important is technical competence:

- SAS Programming
- SDLC and Validation

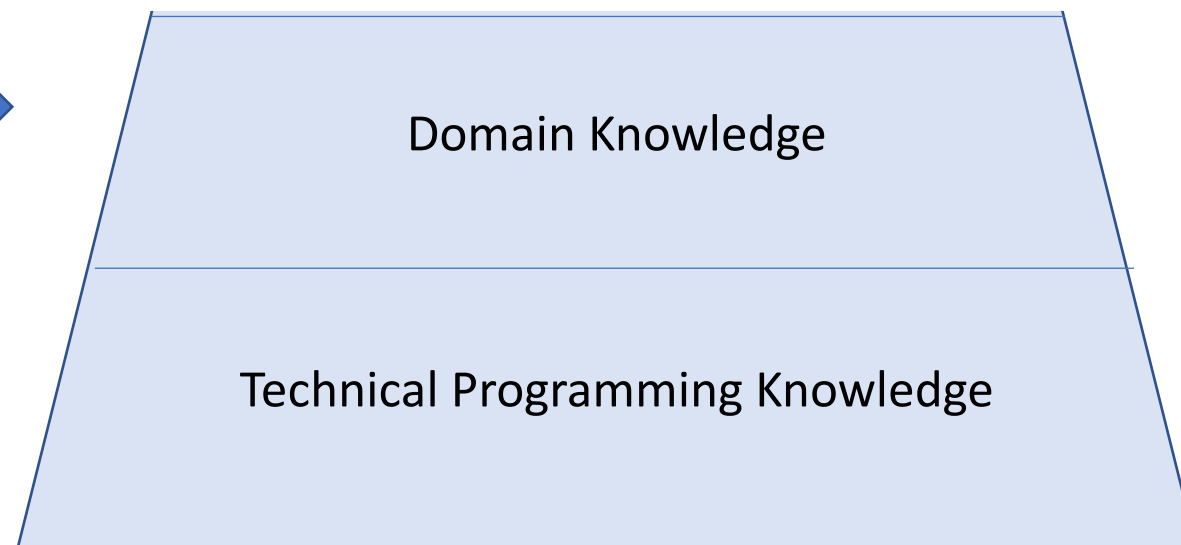


Technical Programming Knowledge

Traditional Programming Skillset Remains the Foundation

Next is domain knowledge:

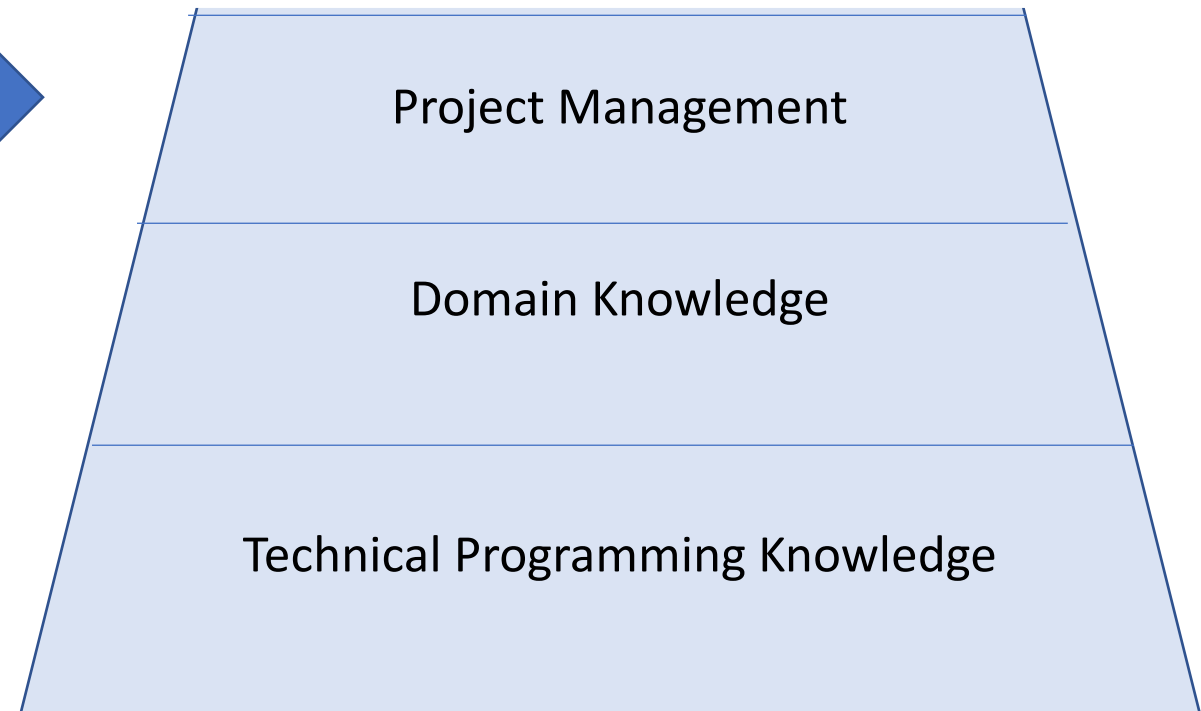
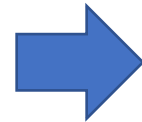
- Clinical trial process
- Clinical data and complexities
- Scientific & Statistical concepts
- Relevant info from the protocol and analysis plan
- Industry and regulatory standards



Traditional Programming Skillset Remains the Foundation

Next is project management experience:

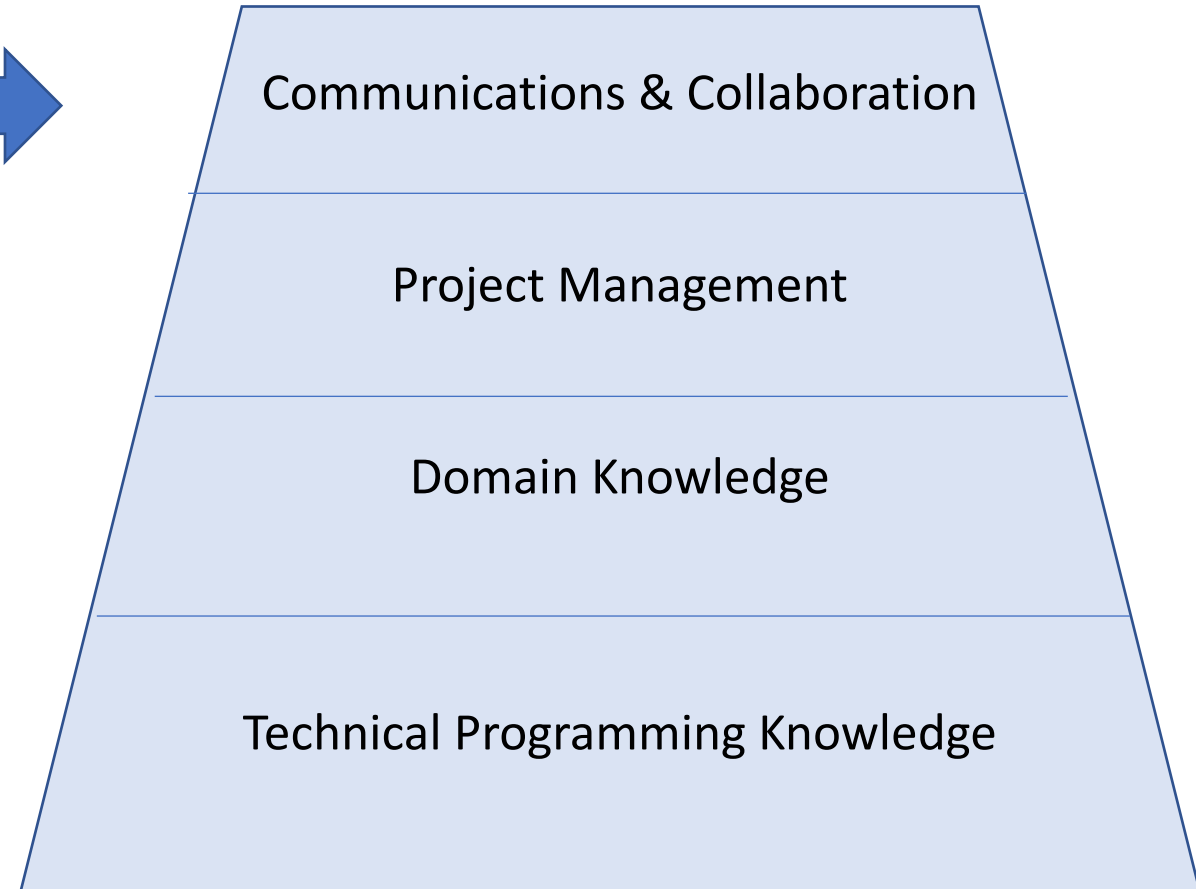
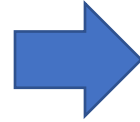
- Developing, executing and managing a project plan
- Teamwork



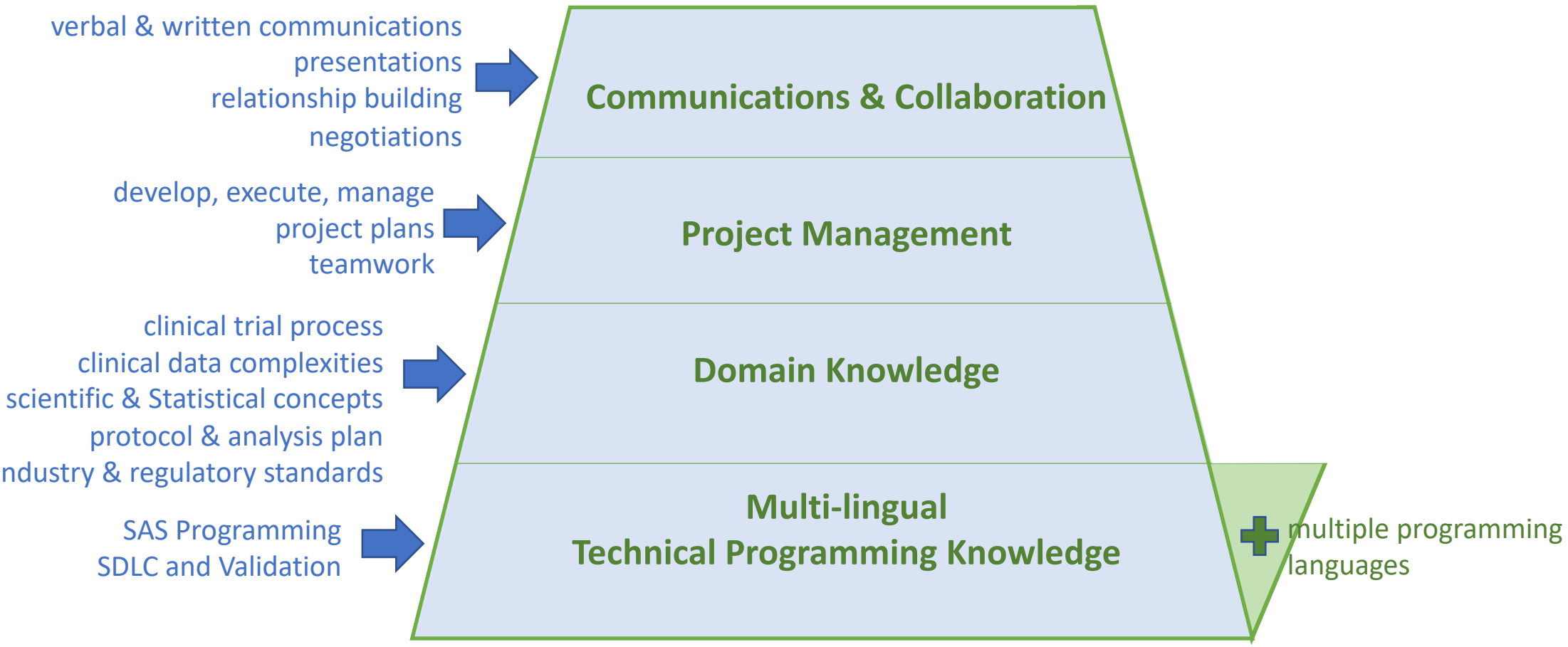
Traditional Programming Skillset Remains the Foundation

Finally, Communication & Collaboration skills come in:

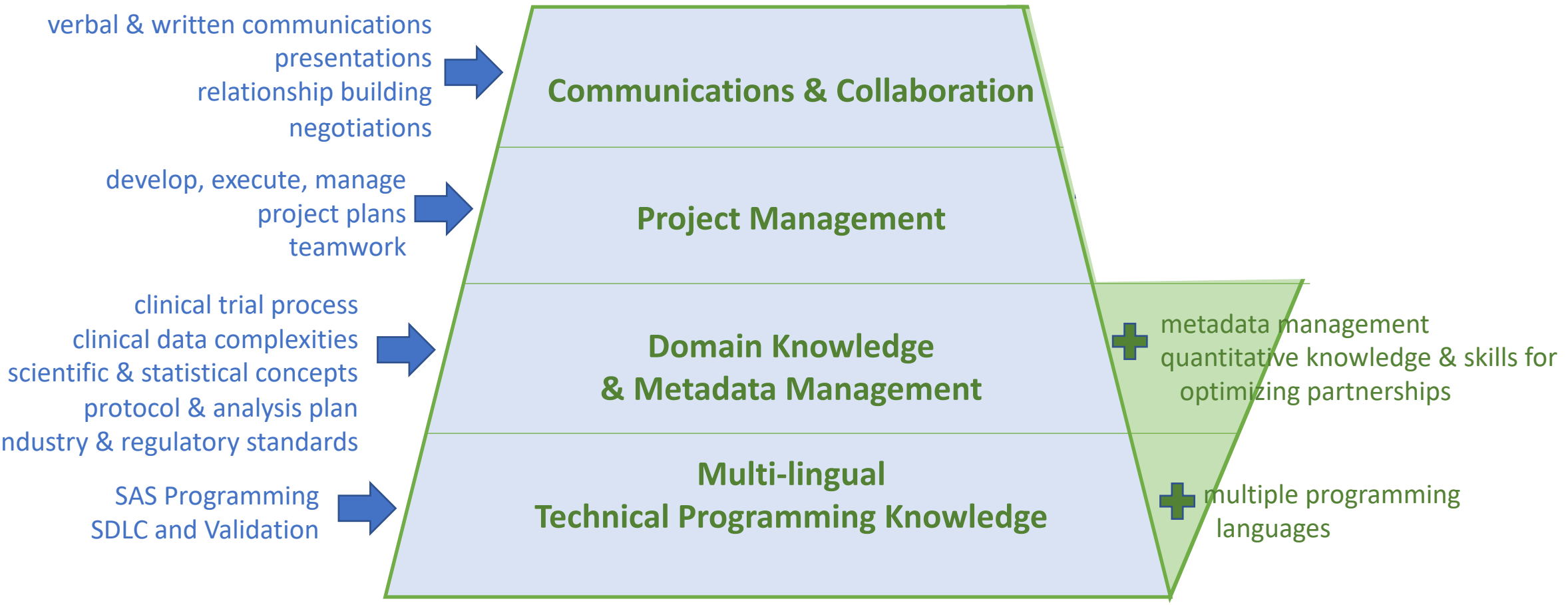
- Clear verbal and written communications
- Presentations
- Relationship building
- Negotiations



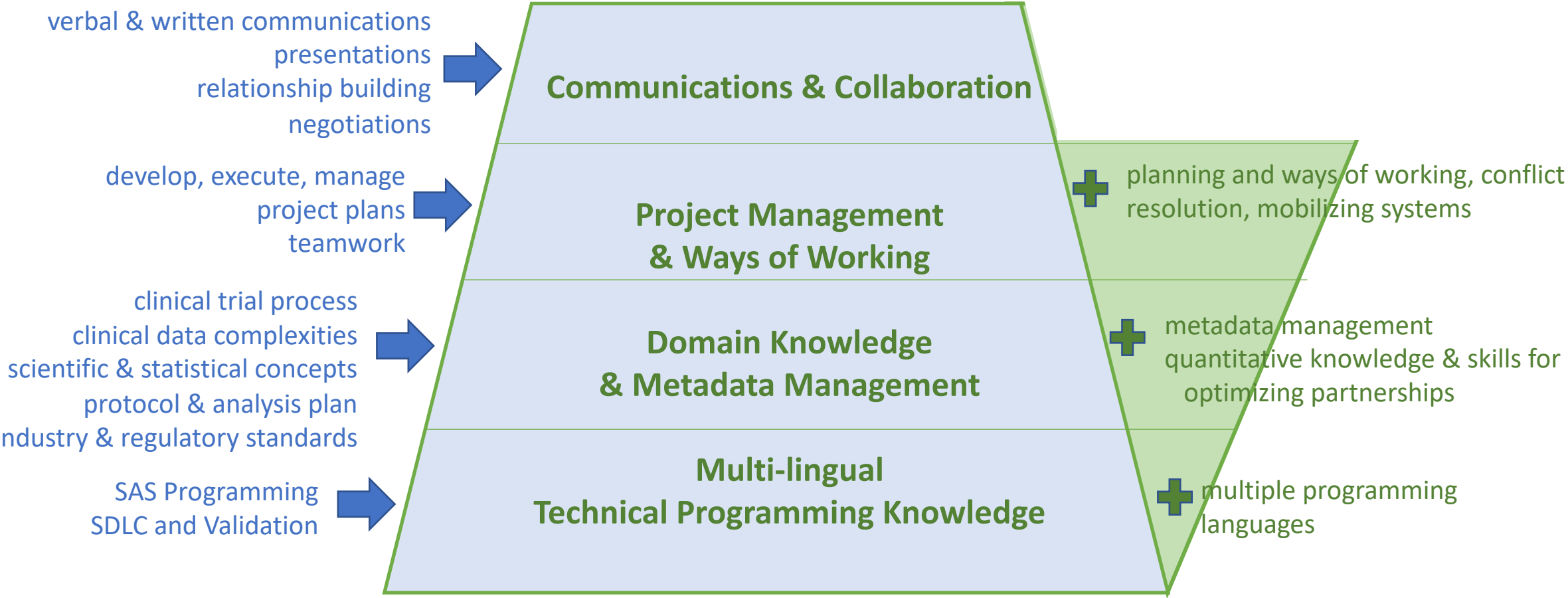
Future Statistical Programming Skillset



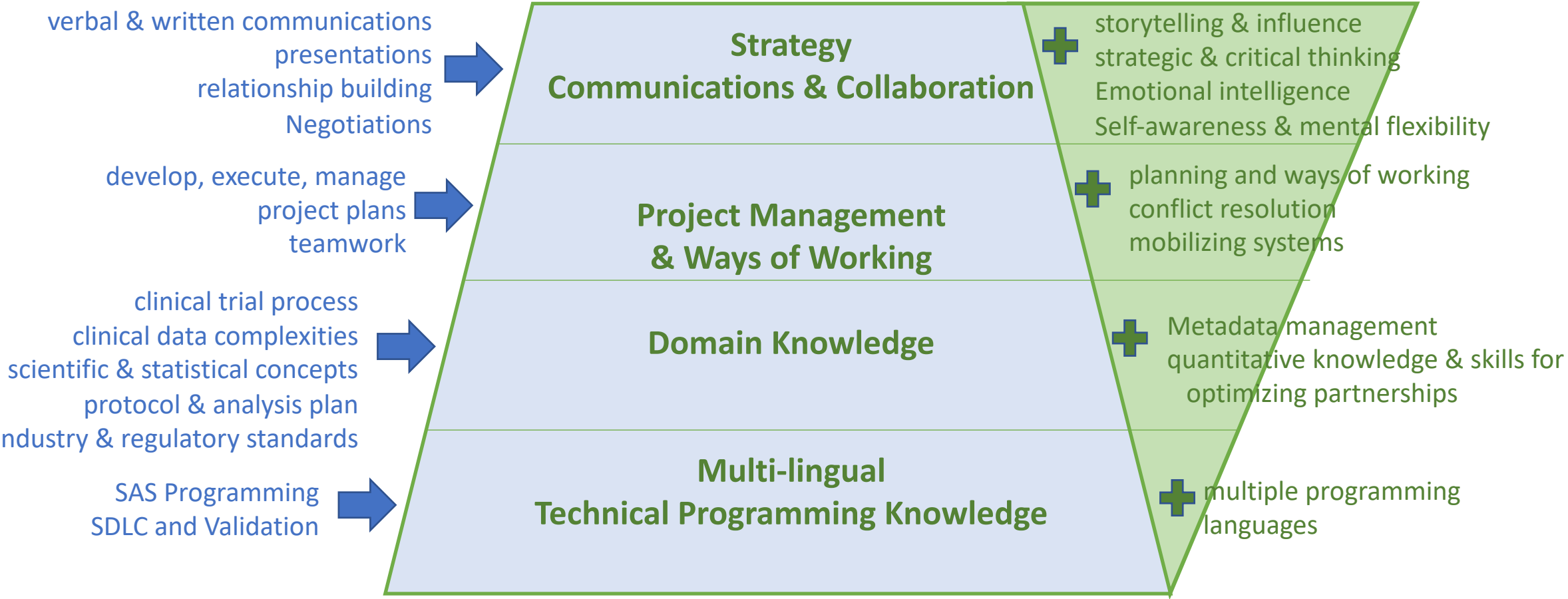
Future Statistical Programming Skillset



Future Statistical Programming Skillset



Future Statistical Programming Skillset

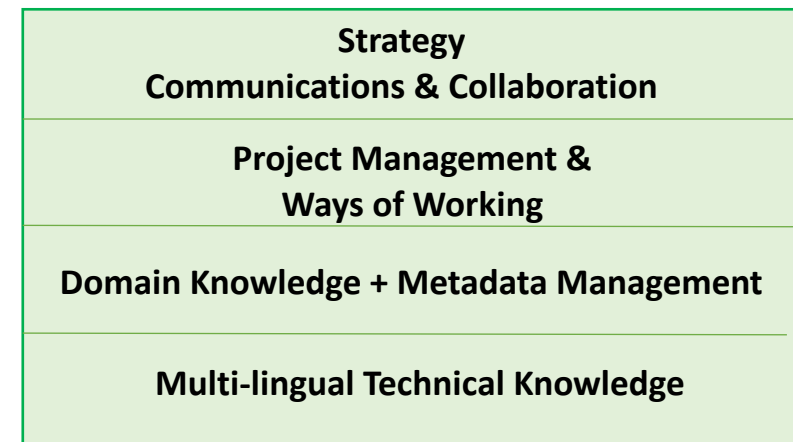
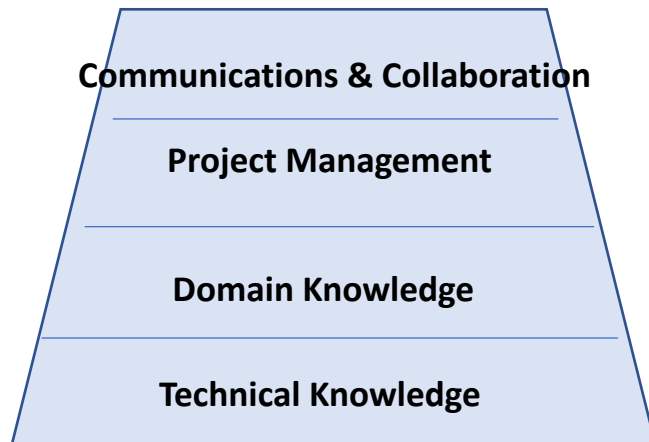


Future Investments Required Today

The Future Is Now



Grow your
skills today



- Investment in these skills are important for tomorrow's workplace but are equally valuable today
- These skills are also important for success when working in hybrid and remote working environments



The future depends on what
you do today.

Mahatma Gandhi

Contact Information

Ellen Asam

 267-305-6803

 ellen.asam@merck.com

Amy Gillespie

 267-305-6817

 amy.gillespie@merck.com