

ORGANIZATIONAL CONSIDERATIONS WHEN REPLACING OR ADDING A NEW SOFTWARE LANGUAGE

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Brian started using SAS® in 1990 and R in 2019. His favorite projects involve using SAS and R to solve problems. Recently, he has been on the development team for the Accel2R Training product, which helps SAS clinical programmers learn R. In his spare time, he enjoys time with family, camping, reading, Rugby, and soccer.

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Agenda

- Outline factors to consider focusing our discussion about SAS® and R.
 - IT Architecture, Administration, Validation
 - Workforce & Development Considerations
 - Costs
- Conclusions

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IT & Architectural Considerations – Architecture & Topology

- Cloud or on-prem
- # of servers
- Server sizing
- Data location
- User access

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IT & Architectural Considerations - Administration

- Need to hire talent to administer
- Maintenance and downtime
- Complexity
- Hotfixes, patches, upgrades

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IT & Architectural Considerations - Validation

- Processes
 - Installation Qualification, Operational Qualification, Performance Qualification
- Vendor supplied validation (purchase platform with validated packages on it)
- Regulatory requirements
- SAS has more out of the box processes
- R has CRAN and supplemental packages to assist with validation.

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Workforce & Development Considerations – Adoption Resistance

- Current workforce may not want to learn a new language / technology
- Could be turnover and chaos
- Could be recruiting, hiring, and onboarding of new staff
- How will users find the time to train? There must be support from management.

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Workforce & Development Considerations – Learning Curve

- Significant change in coding approach
- Change in language generation (SAS is 4th generation and R is 3rd generation language)
- Loss of flexible SAS Macro language, now using functions
- R not as polished and production ready for creating tables, listings, and figures.

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Workforce & Development Considerations – Training

- Different users excel with different learning styles.
 - Online self-guided
 - In-person instructor led
 - Online instructor led
 - Train the trainer (training led by internal resources)

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Workforce & Development Considerations – Support

- SAS has very mature, organized, and centralized support structure
 - Follow the sun
 - Online, central phone number
- R is decentralized for the most part. It depends on which package you are using.
 - Posit?
 - Package author
 - Stack Overflow

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Workforce & Development Considerations – Version Control

- SAS has traditionally used SourceSafe, Subversion, or none.
- R tends to lean towards Git, Github, and Bitbucket, especially for package development.
 - Significant learning curve

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Workforce & Development Considerations – Current Programs

- Matching results from previous studies could be challenging.
 - Could be rounding or computational differences that are hard to explain.
- Need to plan out how to handle including legacy results along with new studies (ISS, ISE)

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Workforce & Development Considerations – Agility

- SAS has a very controlled and cumbersome processing for adding modules.
- R has a very easy method for downloading & installing additional packages on a user's desktop.
 - On a server there may be permission and validation issues regarding adding additional packages.

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Cost – Licensing

- SAS has traditionally been viewed as an expensive software to license.
- R has traditionally been viewed as a free software, but enterprise usage will come with some licensing costs.
- We really need to consider the total cost of ownership

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Cost – Total Cost of Ownership

- Software Licensing
- Administration
- Validation
- Documentation
- Support

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Conclusion

Replacing or adding a new software package in your environment is not a decision to take lightly. There are many costs that are not obvious and can impact your users and organizations significantly. Details such as administration, validation, support, training, time away from day-to-day work, all factor into the total cost of ownership.