

**Appendix D to “Systems Engineering Competencies and Proficiency Levels by Role for an MBSE-Enabled Project,”  
submitted for publication to the *IEEE Open Journal of Systems Engineering*, October 2025**

Sarah G. Shaw  
PhD Candidate  
Department of Systems Engineering

*Appendix D*

Figures D.1-D.11 are radar plots showing the resulting required proficiency level in each competency in the Digital Engineering Competency Framework (DECF) v1.1 [1] for each role for the System Requirements Definition and Traceability project should-be team of 10 and should-be team of 50. The top row of charts across each figure shows the proficiency levels for All tasks, the middle row shows the proficiency levels for PM/Admin tasks, and the bottom row shows proficiency levels for Project tasks. The numbers labeled on the concentric circles correspond to proficiency levels as follows: 1 = Awareness, 2 = Basic, 3 = Intermediate, 4 = Advanced, and 5 = Expert.

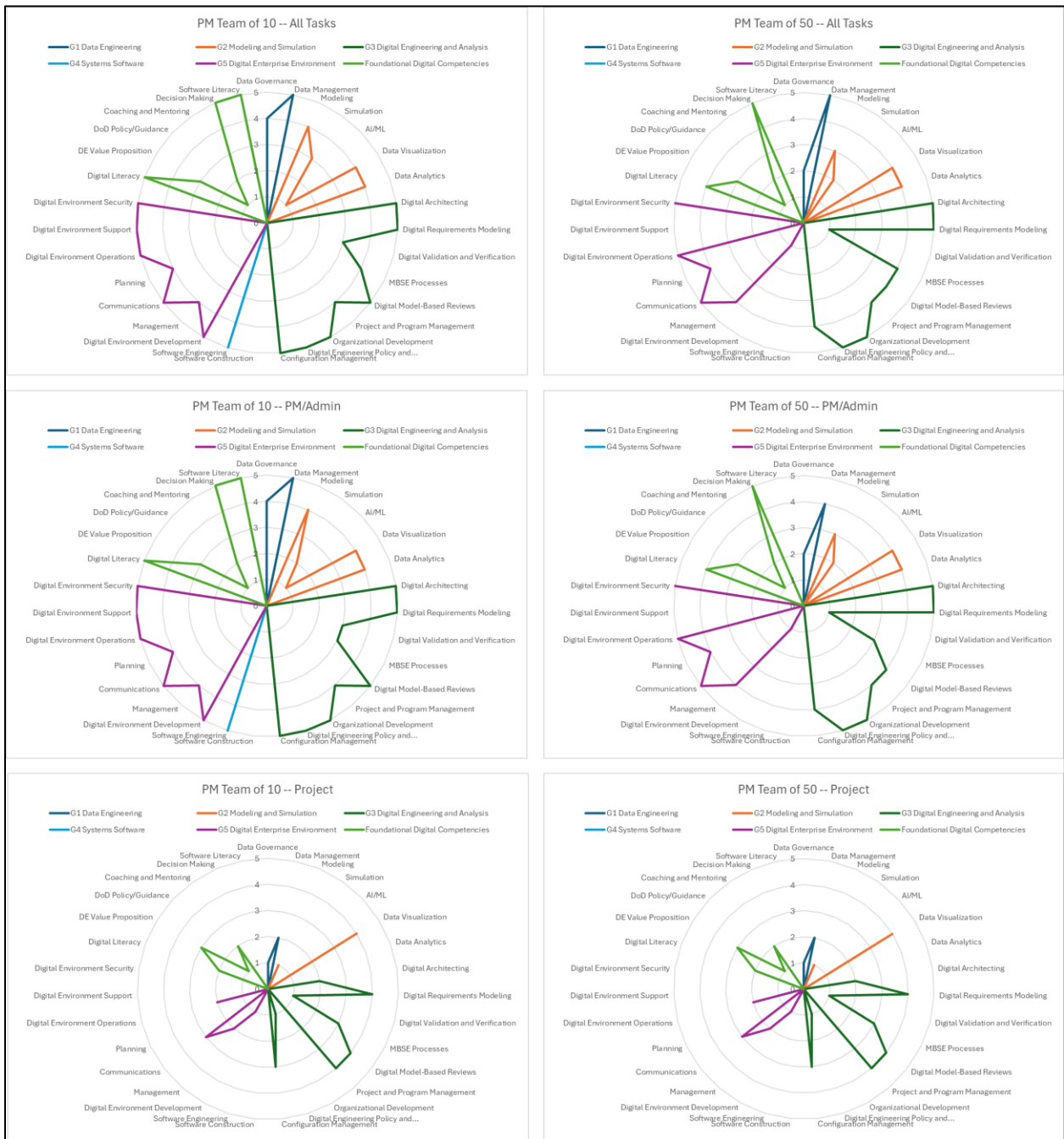


Figure D.1. Proficiency Levels for the PM Role in System Requirements Definition and Traceability MBSE Project

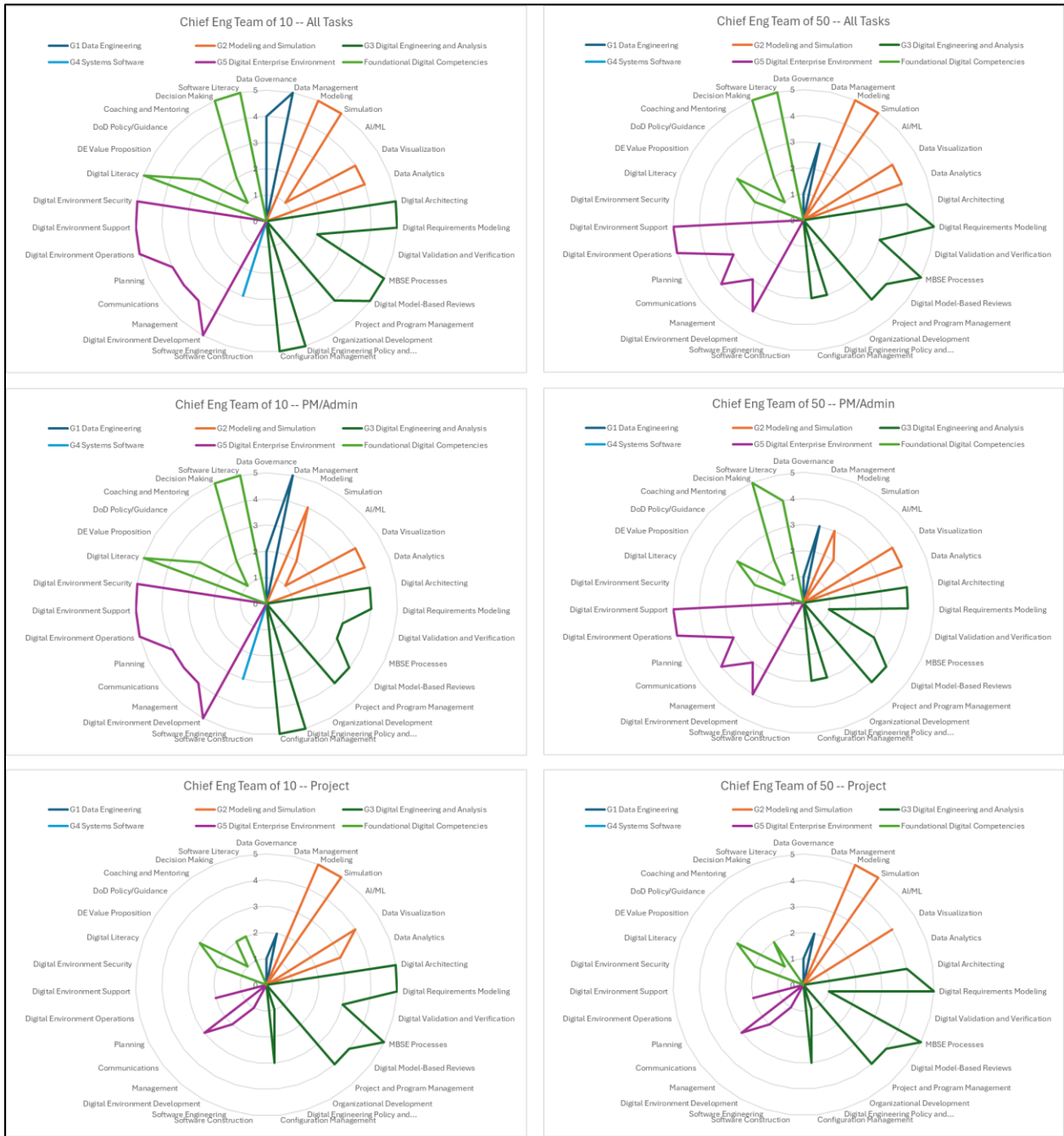


Figure D.2. Proficiency Levels for the Chief Eng Role in System Requirements Definition and Traceability MBSE Project

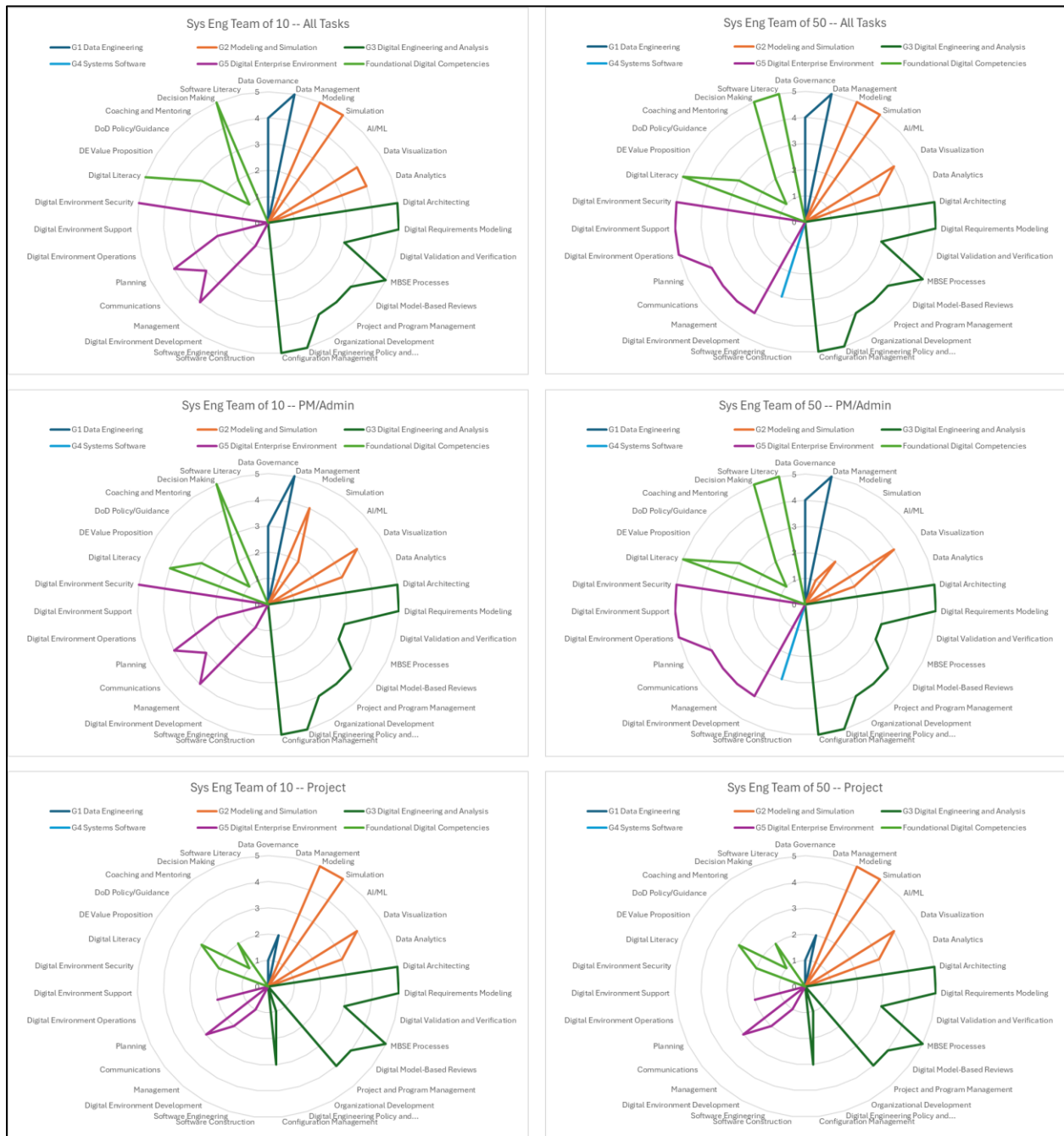


Figure D.3. Proficiency Levels for the Sys Eng Role in System Requirements Definition and Traceability MBSE Project

There are no PM/Admin tasks assigned to the Tech SME in either team size for System Requirements Definition and Traceability, so those radar plots are not shown in the following figure. Since Project tasks are the only tasks assigned to the Tech SME, the radar plots for the Project tasks are the same as the Tech SME radar plots for All tasks.

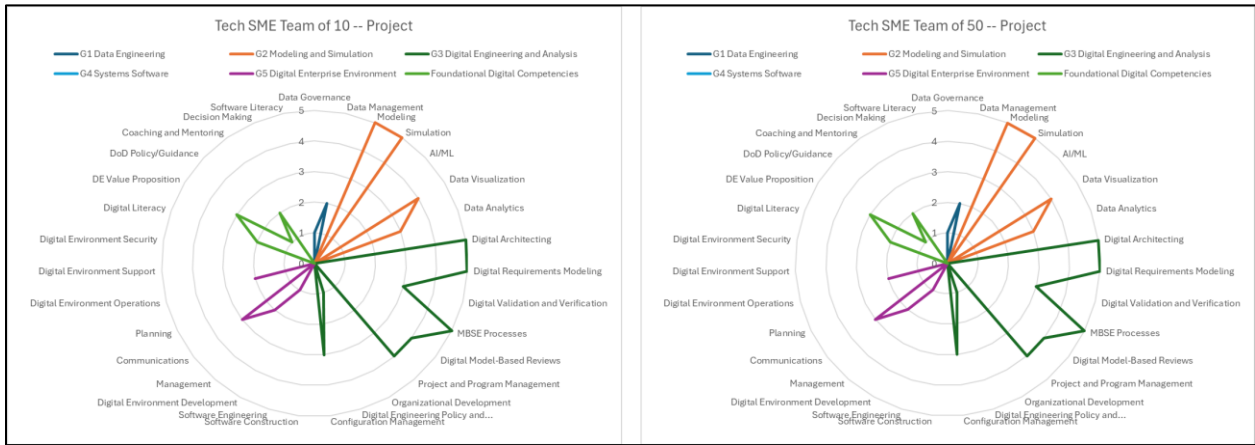


Figure D.4. Proficiency Levels for the Tech SME Role in System Requirements Definition and Traceability MBSE Project

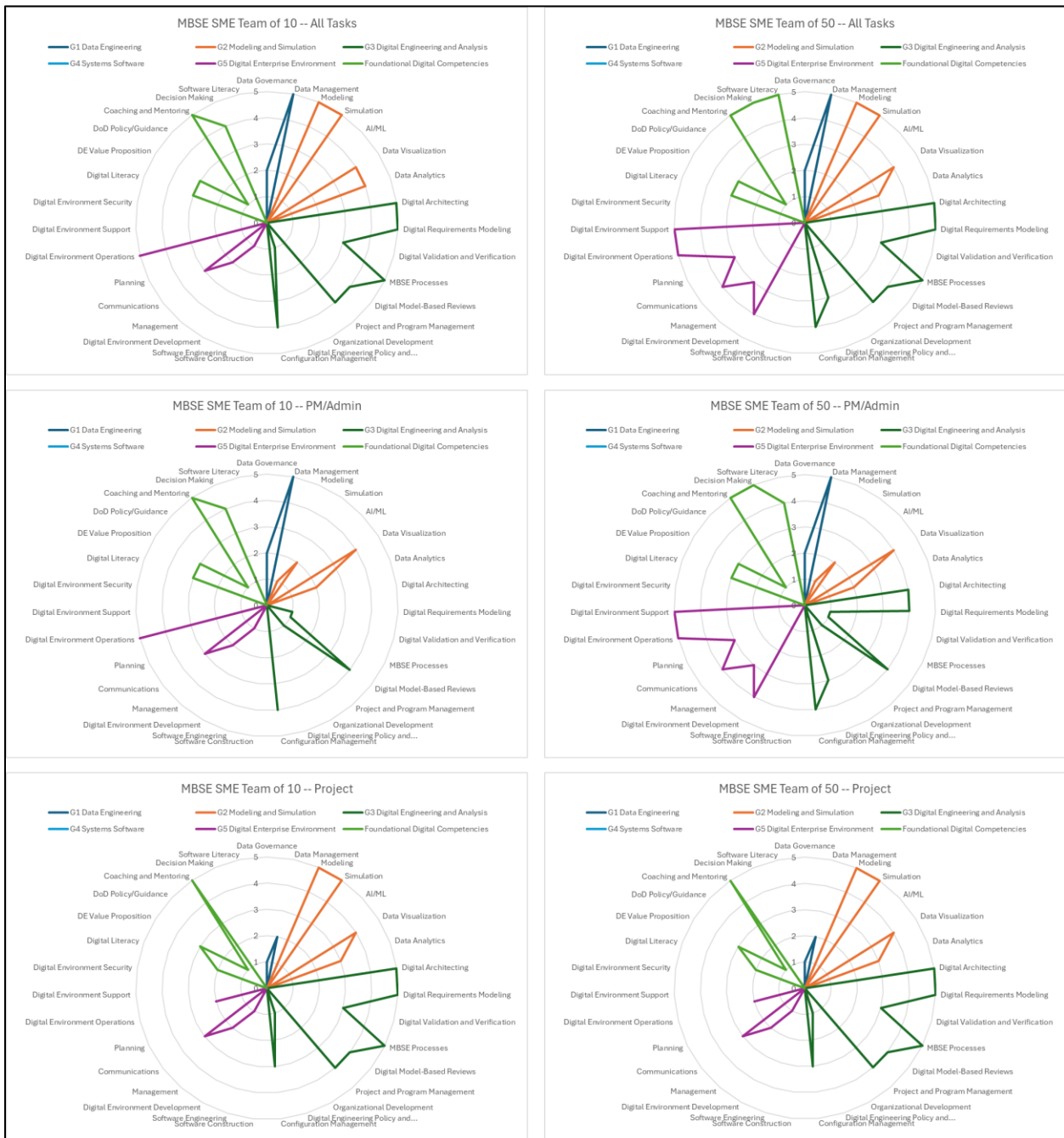


Figure D.5. Proficiency Levels for the MBSE SME Role in System Requirements Definition and Traceability MBSE Project

There are no Project tasks assigned to the Prog Sec or IT roles in either team size for System Requirements Definition and Traceability, so those radar plots are not shown in the following figures. Since PM/Admin tasks are the only tasks assigned to the Prog Sec and IT roles, those radar plots are the same as their respective radar plots for All tasks.

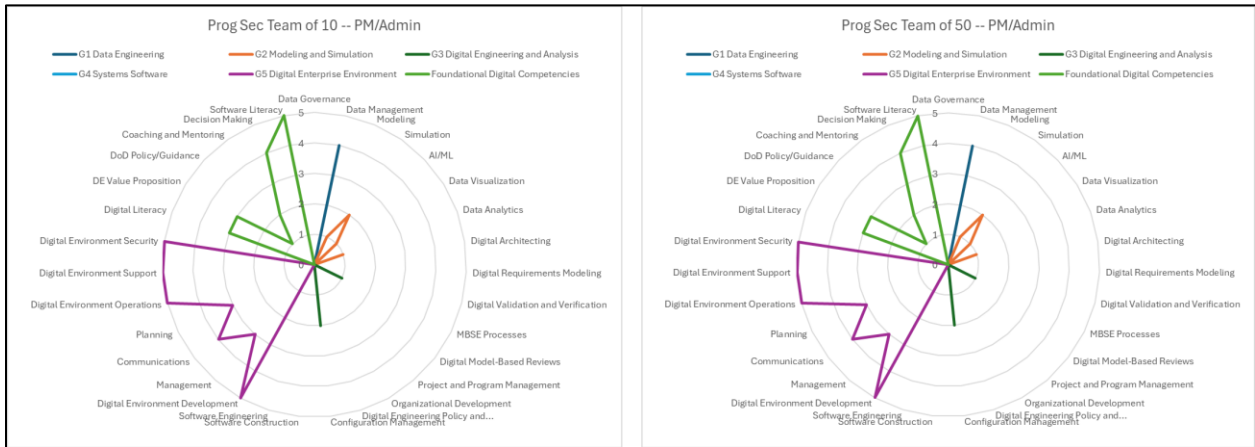


Figure D.6. Proficiency Levels for the Prog Sec Role in System Requirements Definition and Traceability MBSE Project

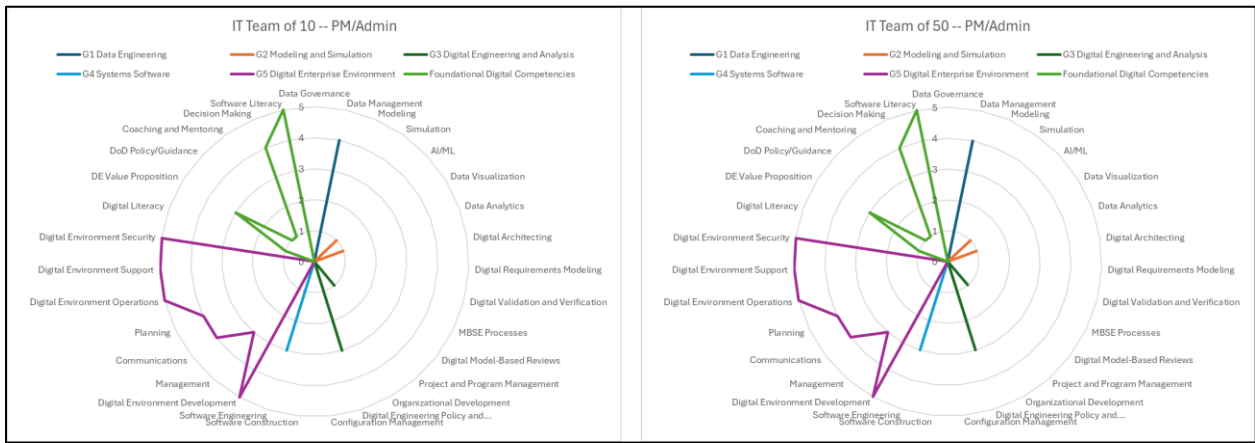


Figure D.7. Proficiency Levels for the IT Role in System Requirements Definition and Traceability MBSE Project

There are no tasks assigned to the Phys Sec role in the should-be team of 10 and only PM/Admin tasks are assigned to the Phys Sec role for the should-be team of 50 for System Requirements Definition and Traceability, so those radar plots are not shown in the following figures. Since PM/Admin tasks are the only tasks assigned to the Phys Sec role, those radar plots are the same as the Phys Sec radar plots for All tasks.

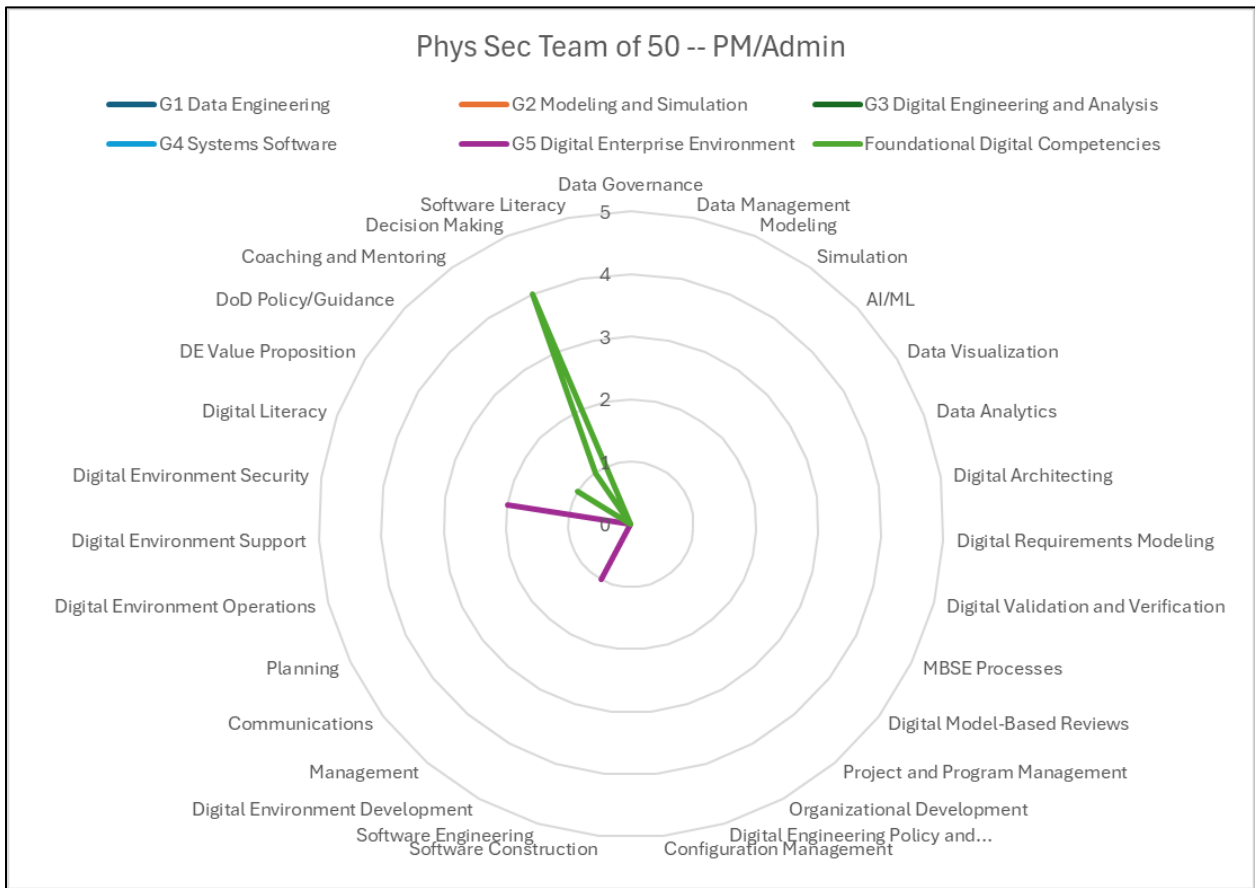


Figure D.8. Proficiency Levels for the Phys Sec Role in System Requirements Definition and Traceability MBSE Project

There are no Project tasks assigned to the Config Cntrl role in either team size for System Requirements Definition and Traceability, so those radar plots are not shown in the following figure. Since PM/Admin tasks are the only tasks assigned to the Config Cntrl role, those radar plots are the same as the Config Cntrl radar plots for All tasks.

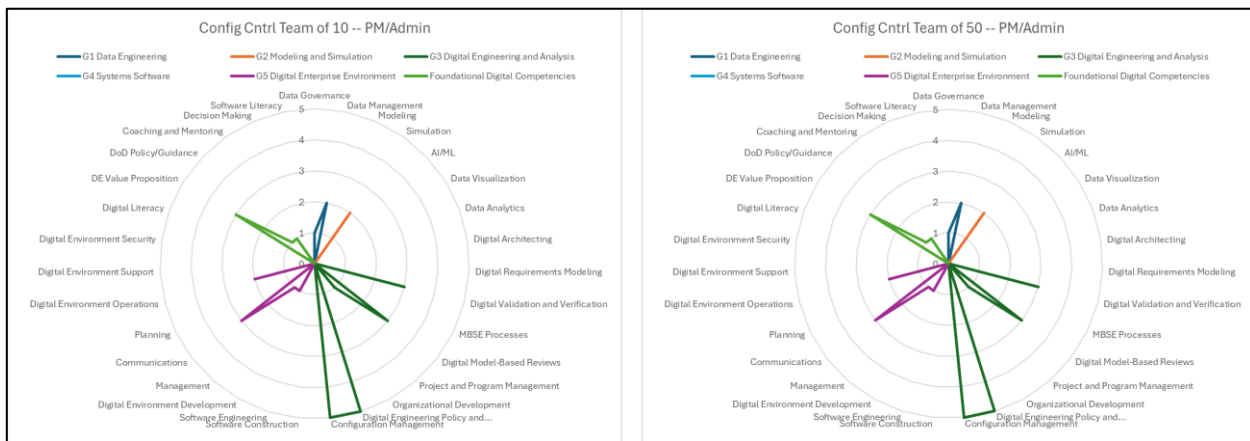


Figure D.9. Proficiency Levels for the Config Cntrl Role in System Requirements Definition and Traceability MBSE Project

There are no PM/Admin tasks assigned to the T&E SME in either team size for System Requirements Definition and Traceability, so those radar plots are not shown in the following figure. Since Project tasks are the only tasks assigned to the T&E SME, those radar plots are the same as the T&E SME radar plots for All tasks.

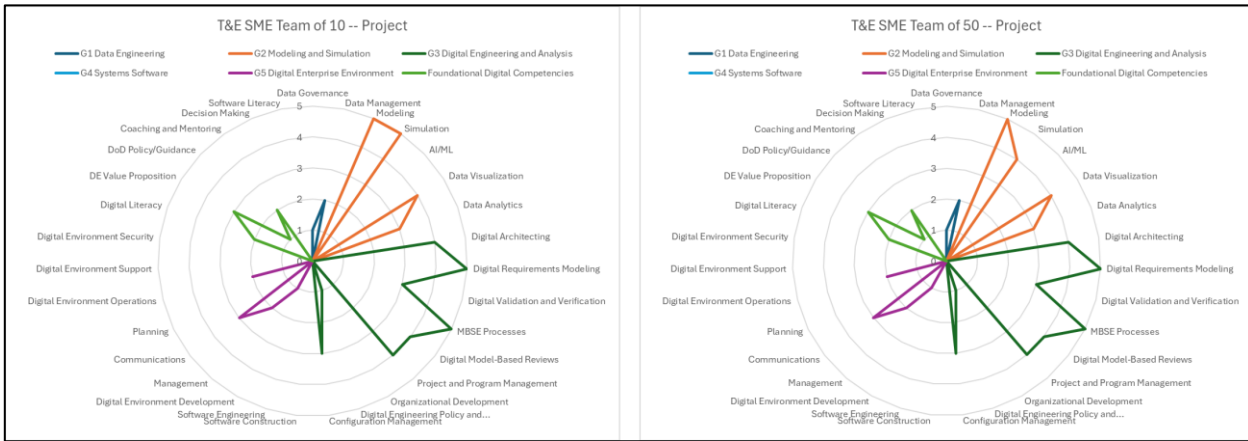


Figure D.10. Proficiency Levels for the T&E SME Role in System Requirements Definition and Traceability MBSE Project

There are no tasks assigned to the Finance role in either team size for System Requirements Definition and Traceability, so those radar plots are not shown.

There are no Project tasks assigned to the Scheduler role in either team size for System Requirements Definition and Traceability, so those radar plots are not shown in the following figure. Since PM/Admin tasks are the only tasks assigned to the Scheduler, those radar plots are the same as the Scheduler radar plots for All tasks.

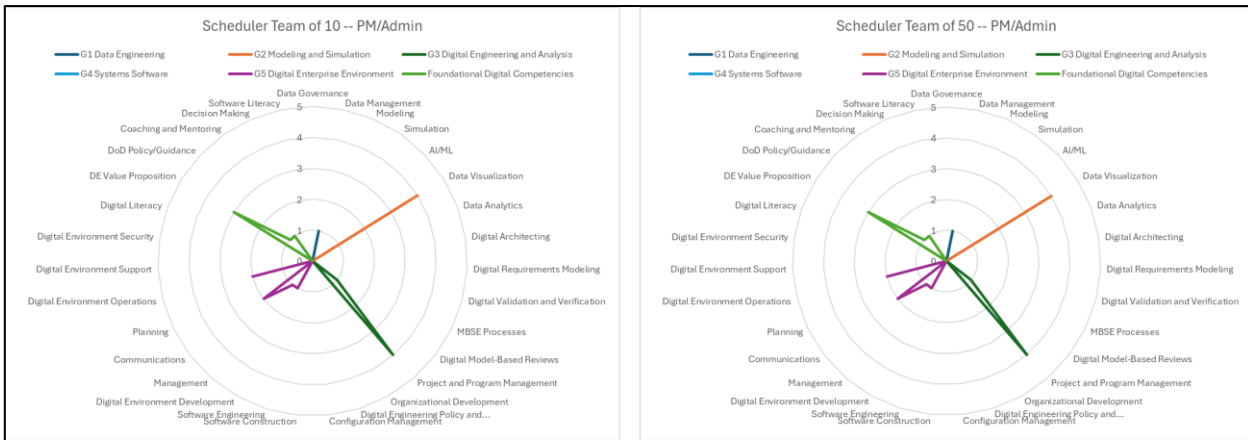


Figure D.11. Proficiency Levels for the Scheduler Role in System Requirements Definition and Traceability MBSE Project

There are no tasks assigned to the Contracts role in either team size for System Requirements Definition and Traceability, so those radar plots are not shown.

## REFERENCES

- [1] N. Hutchison *et al.*, “WRT-1006: Developing the Digital Engineering Competency Framework (DECF) -- Phase 2,” Systems Engineering Research Center (SERC), Stevens Institute of Technology, Technical Report SERC-2021-TR-005, 2021. [Online]. Available: [https://sercproddata.s3.us-east-2.amazonaws.com/technical\\_reports/reports/1616668486.A013\\_SERC%20WRT%201006\\_Technical%20Report%20SERC-2021-TR-005\\_FINAL.pdf](https://sercproddata.s3.us-east-2.amazonaws.com/technical_reports/reports/1616668486.A013_SERC%20WRT%201006_Technical%20Report%20SERC-2021-TR-005_FINAL.pdf)