Pacific Northwest
NATIONAL LABORATORY

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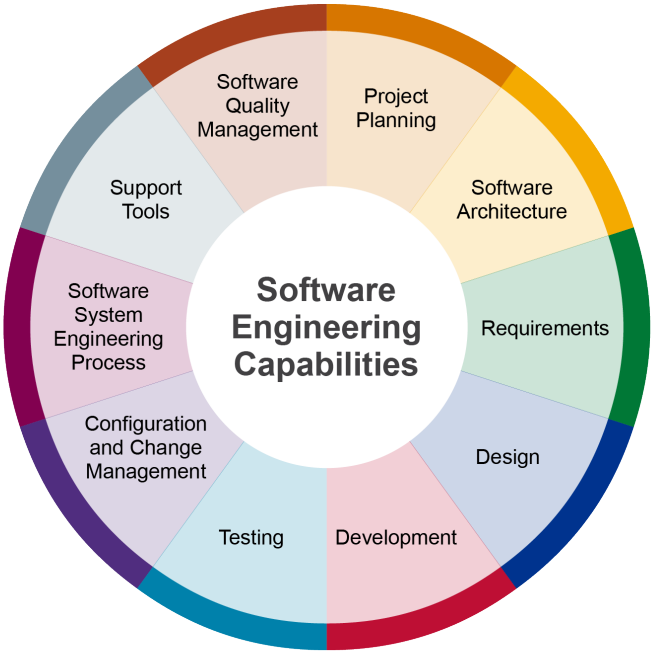
Software Engineering

Creating a community of software engineering practices and providing the necessary tools, resources, and skills to deliver better software faster by utilizing proven software engineering methods that support the entire lifecycle.

The Pacific Northwest National Laboratory (PNNL) has rigorous laboratory-level standards for software development. These standards vary depending upon the type of project and its associated risk, but include software planning, configuration management, requirements, design, development, testing, and reviews. PNNL's software engineering capability provides guidance on laboratory standards and builds upon those standards to produce high-quality software. Our software engineering capability fosters a community of best practices and provides the necessary tools, resources, and skills to deliver better software faster by utilizing sound engineering principles that support the entire lifecycle.

Project Planning & Estimation—tailoring software lifecycles to match project needs including traditional waterfall and agile methodologies; performing risk analysis and mitigation; grading software; and ensuring compliance with PNNL software standards using established methodologies to quantify the software development effort and schedule for planning purposes. This allows the project to accurately structure development cycles to meet client milestones and create a competitive advantage.



Software System Engineering Process

Software System Engineering Process is an end-to-end defined process (agile or traditional) that includes applying best practices, performing training on the process that is being used, assessing how well the process is being followed and determining process problem areas to help facilitate solutions. Proper software process builds quality into the product throughout the lifecycle of the system.

Architecture—selecting the correct software architecture is one of the most important decisions a project can make when beginning a new software effort. PNNL experts can assist projects in developing an architecture that meets requirements, increases developer productivity, and allows the system to adapt to future needs.

Requirements—helping to elicit, analyze, document, and validate traditional requirements or agile user stories. Correct requirements are essential for building software delivers the highest value to our sponsors.

Design—planning, building, and documenting the application design and linking design to both requirements and test cases. Whether performing design in a traditional sense or using agile techniques, information on software design is readily available.

Development—applying coding standards for application development improves the maintainability of the application. PNNL engineers provide expertise in many different technologies, as well as support for unit testing.

Testing—creating and executing test plans and procedures; analyzing test coverage; establishing test traceability; and automating testing in different environments.

Configuration and Change Management—defining configuration items and establishing effective configuration management processes and practices, including continuous integration support.

Tools to Support Software Engineering—bringing appropriate tools and tool expertise to enable high project performance, as well as training project staff on various tool executions.

Software Quality Management—helping establish software metrics, facilitating software defect resolution, assisting with reviews, and performing assessments.

To learn more, please visit: ***ssep.pnl.gov.***

Contact

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