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Considerations for Introducing Artificial Intelligence into Nuclear Power Plants

December 2024

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Changing the World's Energy Future

Idaho National Laboratory

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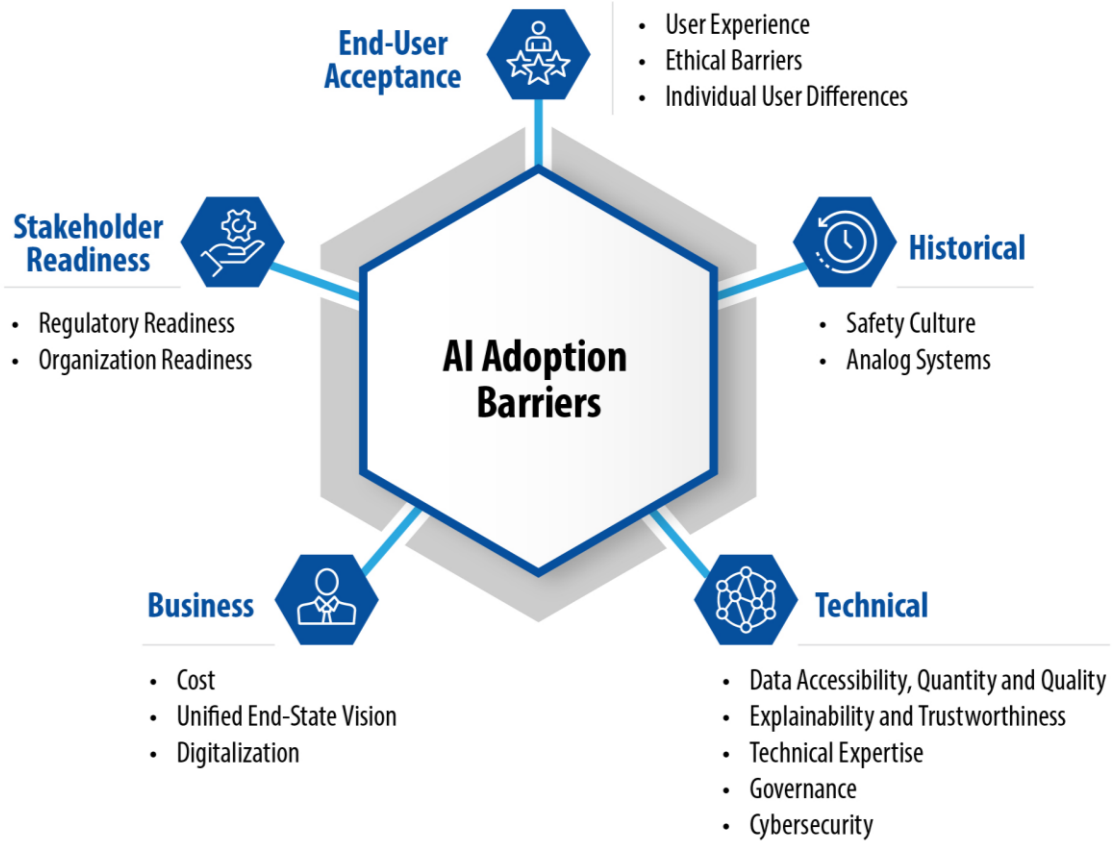
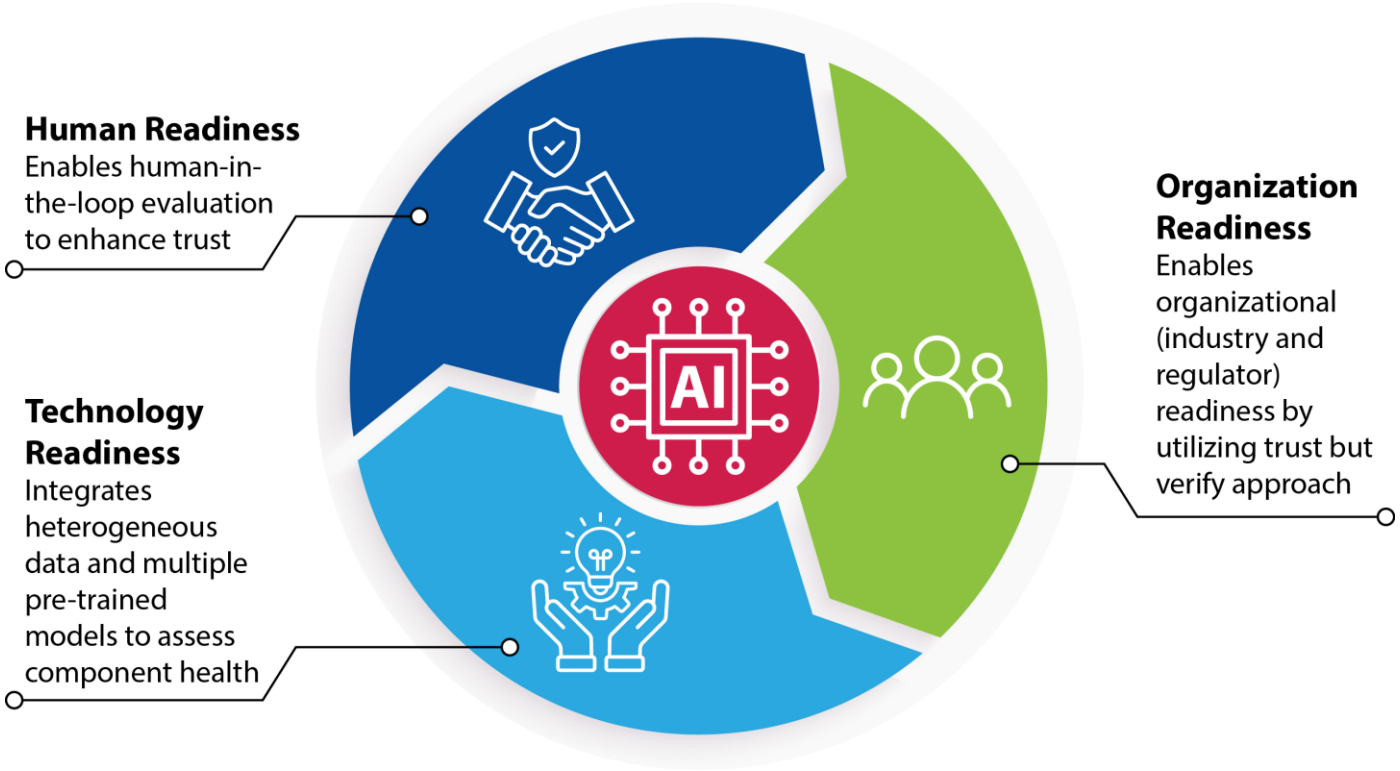
Some Potential Applications of AI in Nuclear Power Industry

Nuclear Readiness for Artificial Intelligence





Hall, A., and **V. Agarwal**. 2024. "Barriers to Adopting Artificial Intelligence and Machine-Learning Technologies in Nuclear Power." *Progress in Nuclear Energy*, 175, 105295. https://doi.org/10.1016/j.pnucene.2024.105295

Walker, C., Lin, L., Agarwal, V. et al.. "Demonstration and Evaluation of Explainable and Trustworthy Predictive Technology for Condition-based Maintenance." INL/RPT-24-80727, September, 2024.