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Contributor: Sümeyra KUZU/Kiron-Thrive

Company: Thrive – Kiron Organization

Company origin: Germany

Tested in:



Al use case attributes

Industry

Energy • Real Estate Management and Development • Others

Organizational function

Operations • Quality • Research & Development • Sustainability

Value gain

Cost Saving • Enhanced Quality • Increased Efficiency

Al capabilities

Analysis • Optimization

Data source

Structured

Technology type

Supervised learning

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Type: 📋 Industry

Stage: PoC

Brief description



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Risk classification

Limited risk

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Required resources













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Brief description

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Required resources

Jupyter Notebook P

Limited risk

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This project, facilitated by Thrive/Kiron, explores energy efficiency of buildings. Using publicly available datasets (UCI Energy Efficiency Dataset and Kaggle), machine learning models predict heating and cooling loads based on building features. Insights help guide energy-efficient building design.

Jupyter Notebook Python-Libraries(scikit-learn, pandas,seaborn, etc.)

Problem statement

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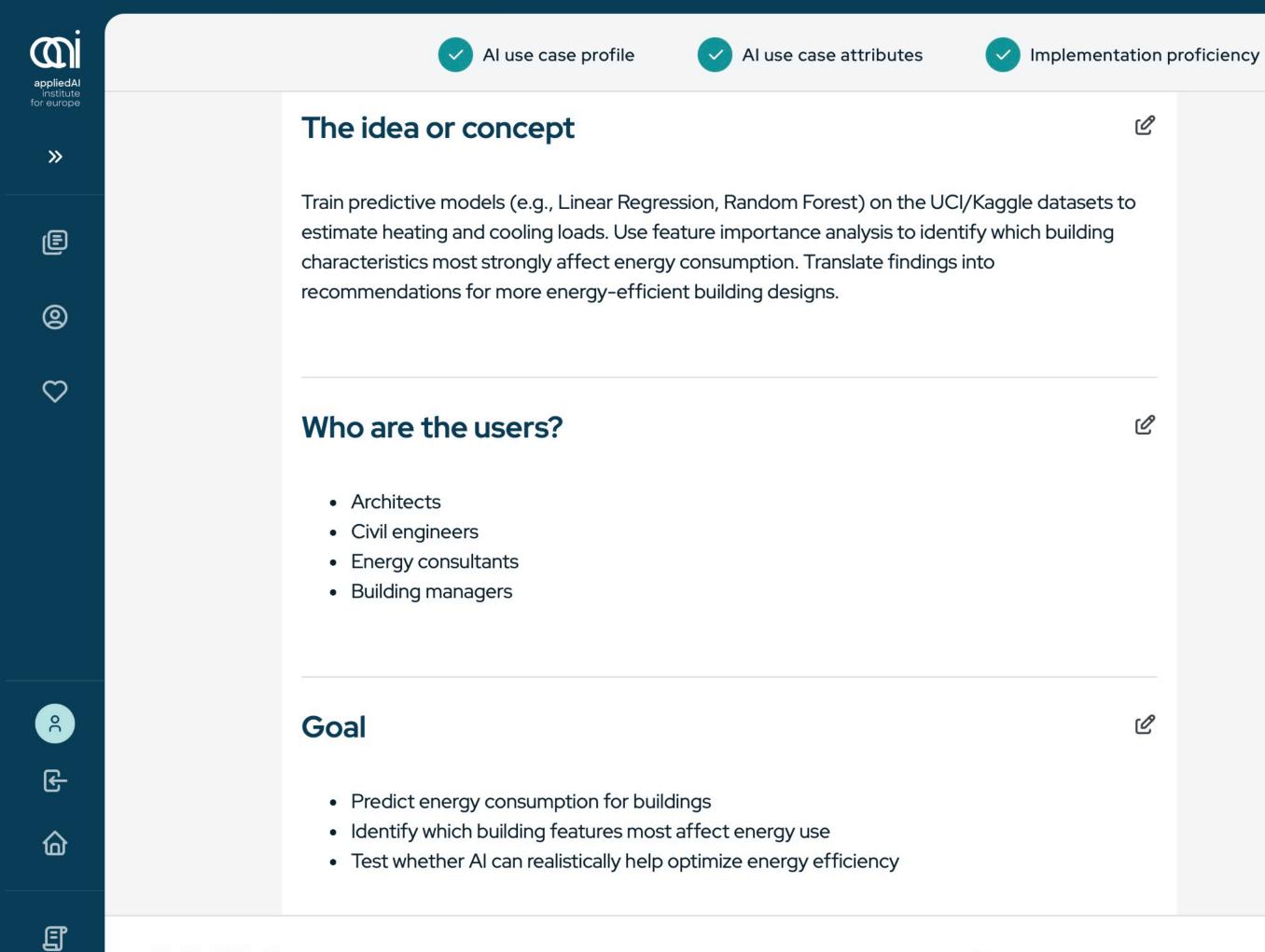
Many buildings consume excessive energy due to suboptimal design choices, resulting in higher operational costs and carbon emissions. Predicting energy consumption based on design features can help reduce costs and environmental impact. Critical assumptions:

- Public datasets sufficiently represent real-world energy patterns.
- Machine learning models can capture key relationships between building features and energy loads.

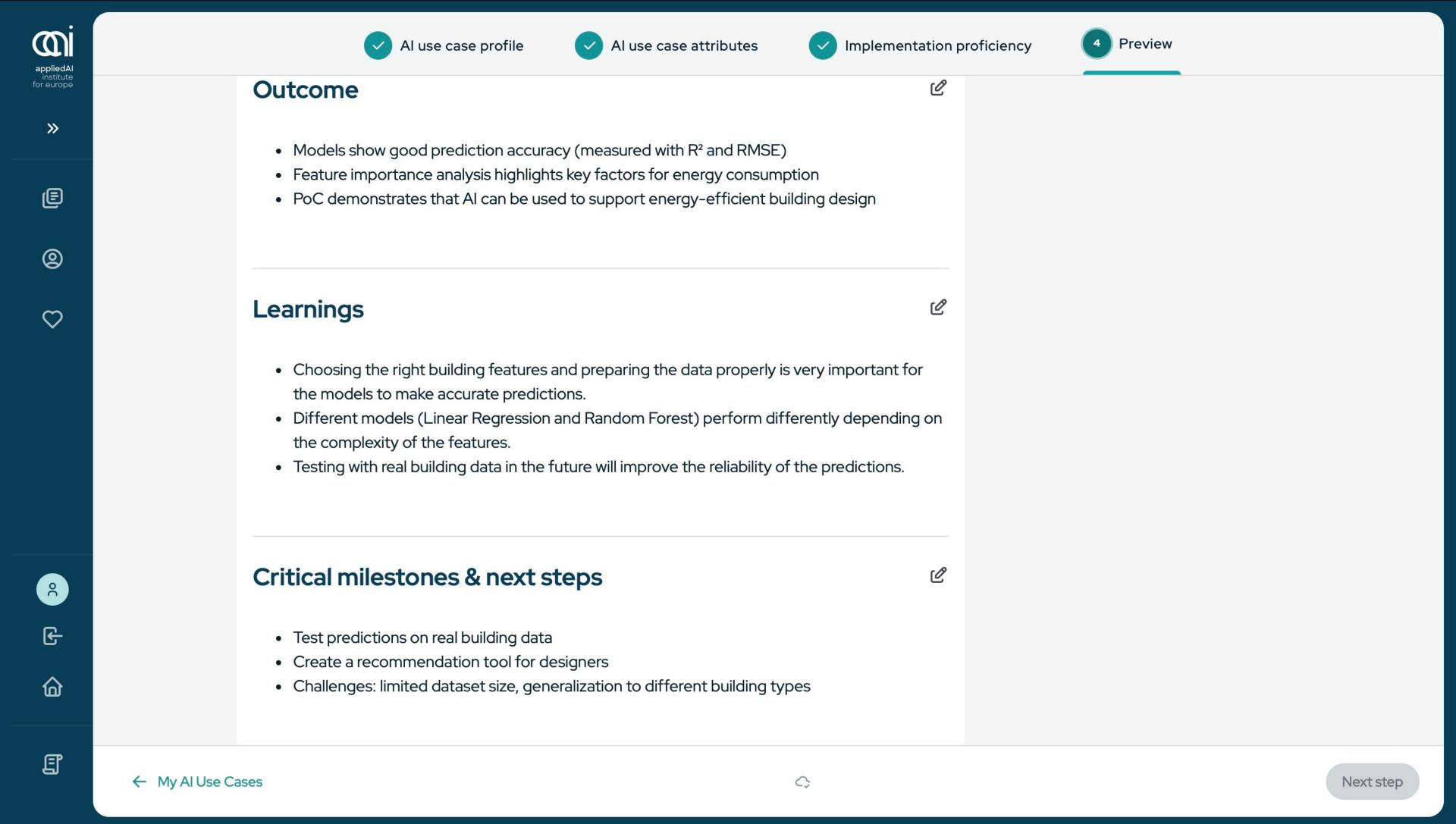
The idea or concept

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Train predictive models (e.g., Linear Regression, Random Forest) on the UCI/Kaggle datasets to estimate heating and cooling loads. Use feature importance analysis to identify which building







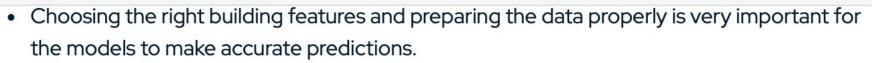












- Different models (Linear Regression and Random Forest) perform differently depending on the complexity of the features.
- Testing with real building data in the future will improve the reliability of the predictions.

Critical milestones & next steps



- Test predictions on real building data
- Create a recommendation tool for designers
- Challenges: limited dataset size, generalization to different building types

Note



- This PoC demonstrates feasibility and provides insights into building energy consumption.
- Next steps include testing with real building data and integrating results into design recommendations.