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Artificial Intelligence Supports for Nuclear System Experts

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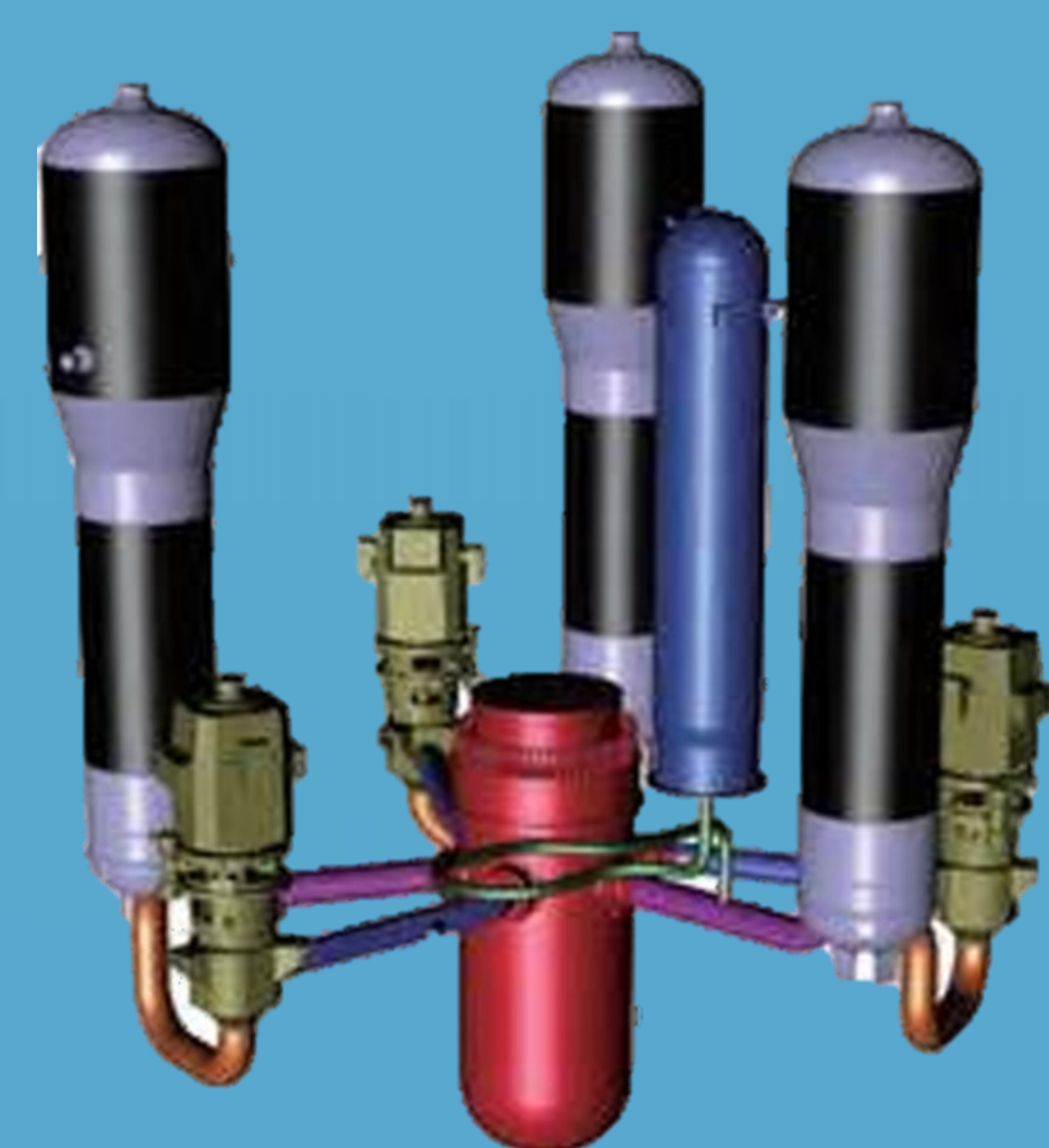
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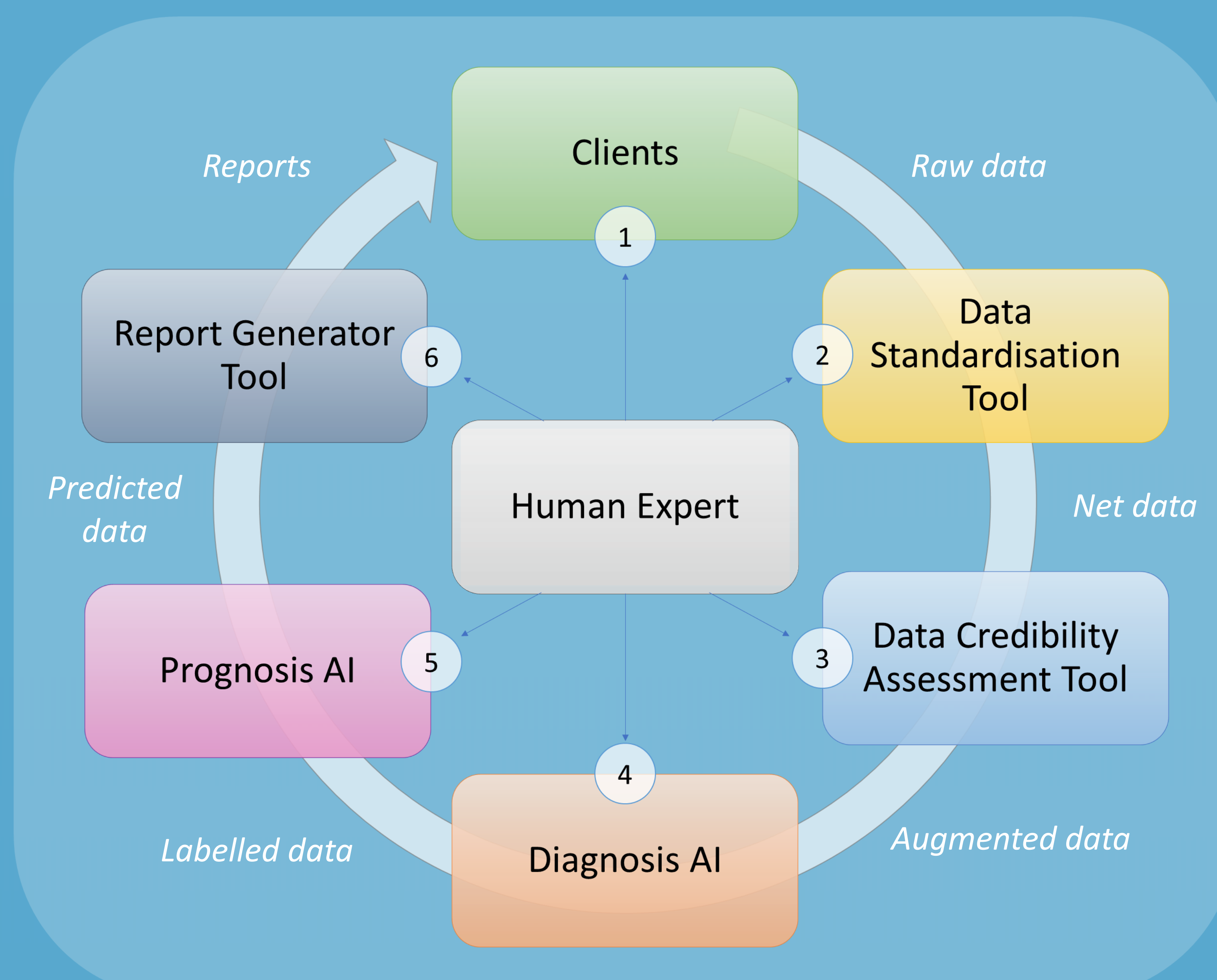


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Artificial Intelligence Supports for Nuclear System Experts



Nuclear Primary Loop



RCP Analysis Process of Expert supported by Intelligent Tools



Reactor Coolant pump

- 1 Several clients with different kinds of pumps, then various sensors and heterogeneous data.
- 2 23.1% of expert working time is taken up by this standardisation process.
- 3 Technique of achievable limits check and a time verification technique by imitating the Markov process.
- 4 Machine Learning methods of Clustering and Classification (k-Nearest Neighbor, SVM...).
- 5 Prediction of future states by Markov Chain or Reconstruction of signals by Regression techniques and analysis of these data.
- 6 The report redaction process represents 61.5% of the expert activity.

If Tools 2, 3 and 6 are both designed and efficient, mathematically it can divide by 6 the expert working time. In reality, these automations will require a new activity of control of the results by AI.

Analyze more, identify better, to increase the availability of facilities!

Issues of the thesis:

- realistic designs of system and knowledge
- efficient diagnosis by artificial intelligence
- capitalization and processing of expertise and operating data

