

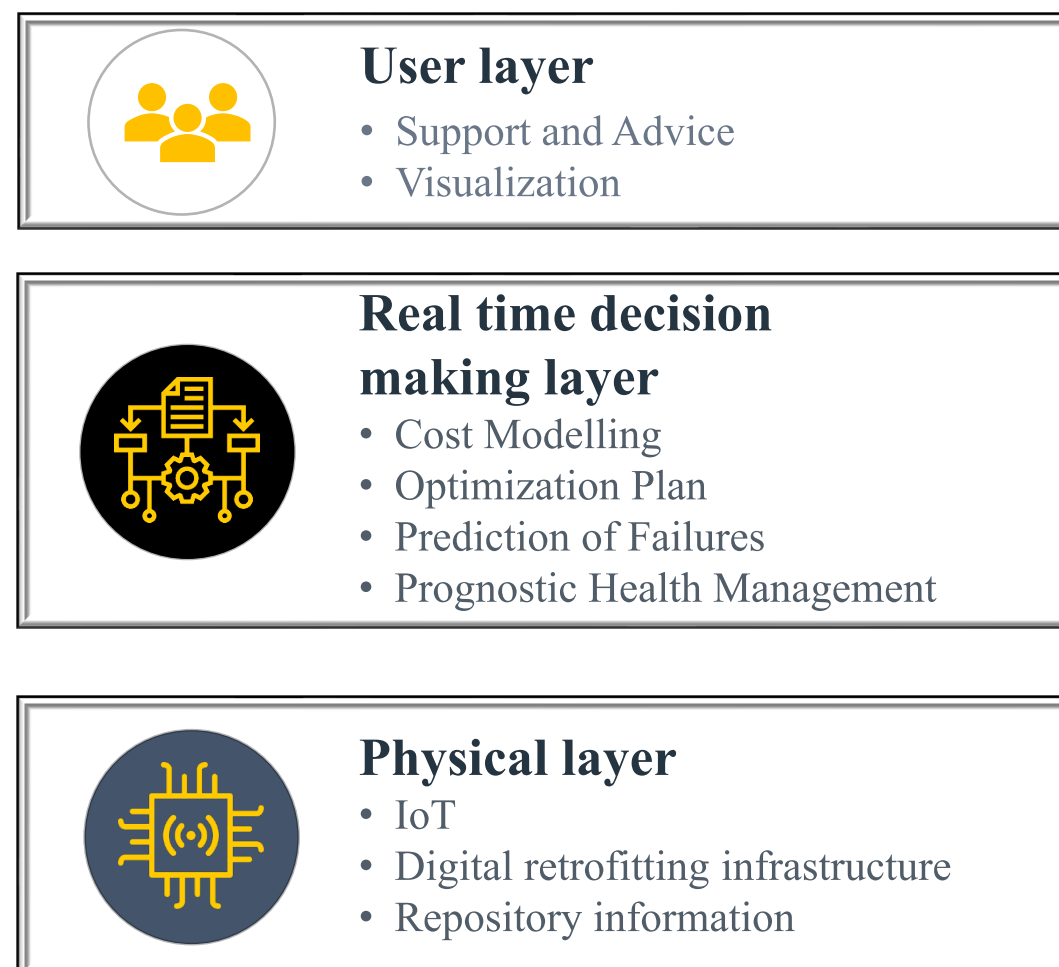
Remanufacturing and Refurbishment of Large Industrial Equipment

Current status



? Who to contact ?
Time for maintenance
Risk of failure
Cost of reparation
Machine near to its
End-of-Life

Smart Solutions



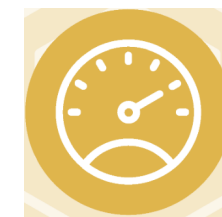
Expected status



Time for
Remanufacturing and
Refurbishment
Profit
Machine lifetime
Extension

Objectives

- Harnessing Big Digital analytics, Industry 4.0, Internet of Things (IoT) and Circular Economy strategies;
- Making industry more sustainable, productive, cost-efficient and competitive



**Production
Efficiency**



**Environmental
Recovery Efficiency**



**Reuse of
Equipment**



**Lifetime
Extension**

Method

To demonstrate **RECLAIM** solutions for effective management of large industrial equipment that approach the end of their design life, Aston carries out the following research to develop required technologies:



Condition Monitoring

This work develops techniques for online condition monitoring based on smart sensors, Internet of Things, machine learning and artificial intelligence. It aims to monitor the condition of machinery to detect and warn their potential failure in advance and predict the remaining useful life to support production and maintenance planning.



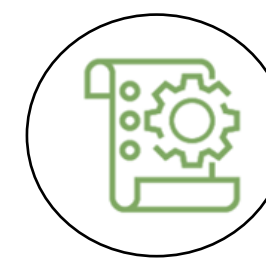
Smart Inspection and Remanufacturing

This task develops automated robotic inspection technology to identify failure mode, and automated repair technology to carry out optimised repair process, where life cycle impact is considered for optimisation.



Life Cycle Cost modelling

This task develops a cost model for estimating the cost of life extension strategies, such as remanufacturing, repair and refurbishment. The cost model does not only consider the direct cost of life extension, but also the indirect cost incurred by conducting life extension activities. The output of the cost model will support decision making and optimisation of life extension strategies, production and maintenance planning.



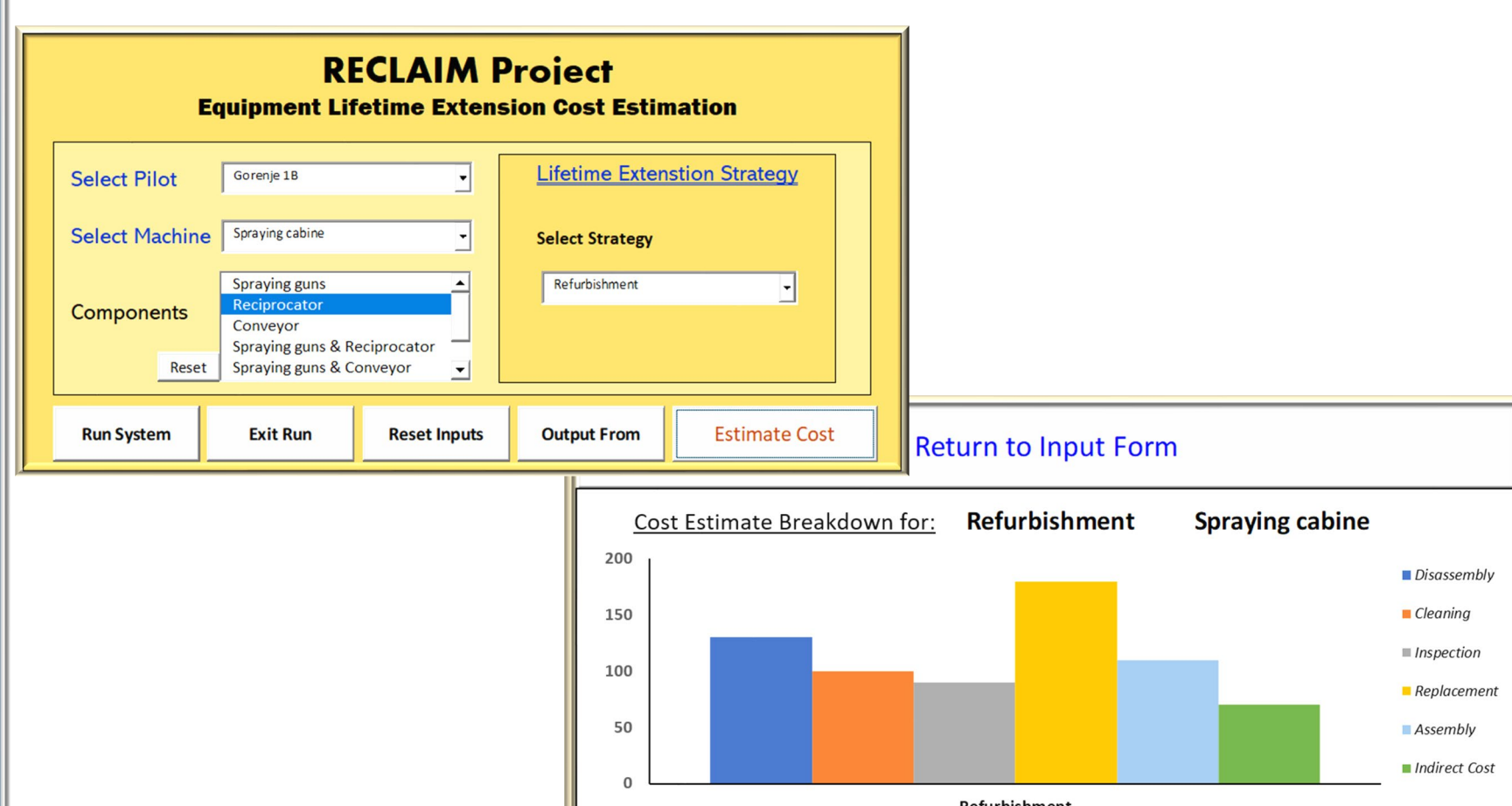
Decision Support System

This task develops methodologies with procedures for the execution of optimised life extension strategies and activities. Multiple criteria are considered for decision making, including quality, cost and time association with life extension strategies and activities.

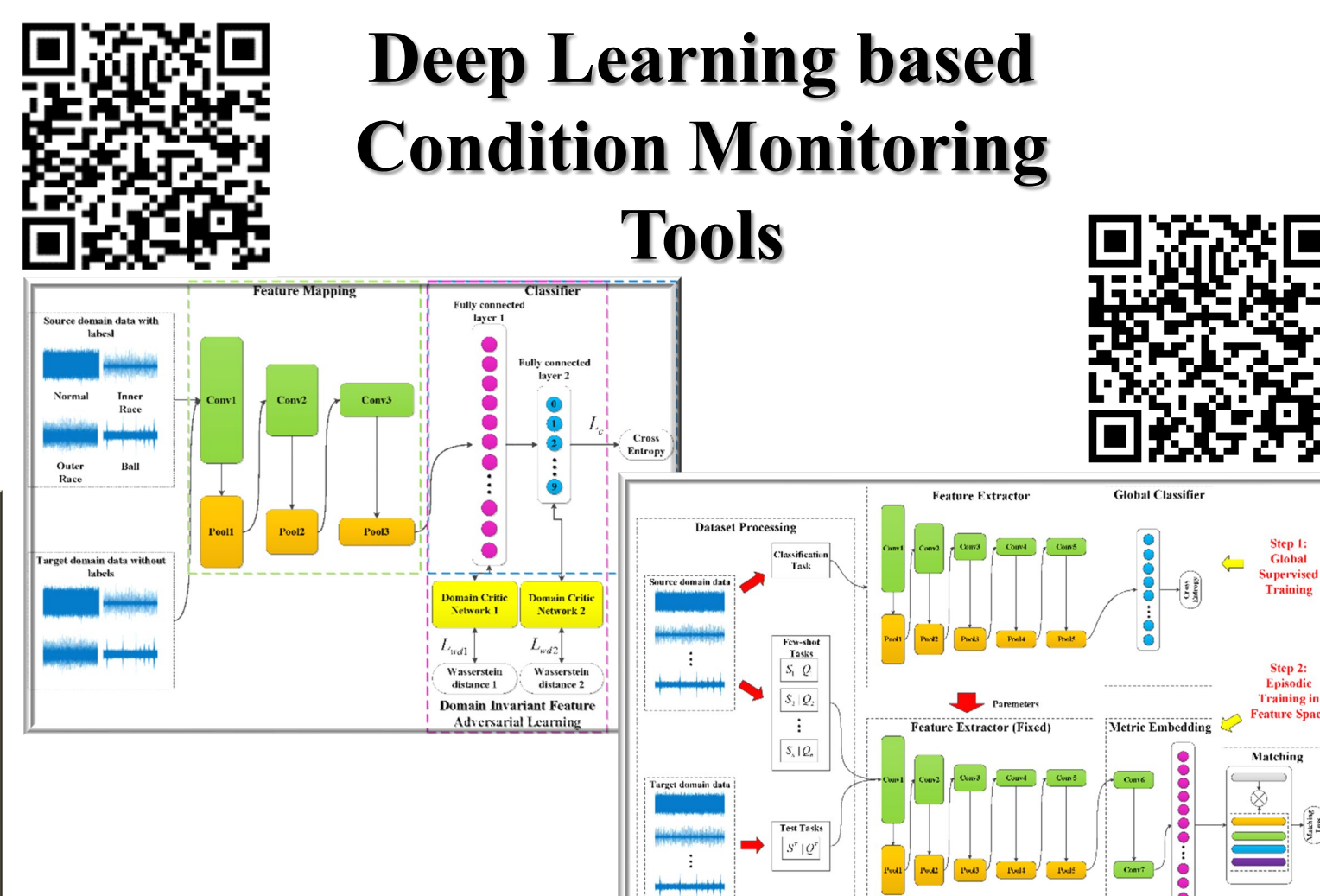
Deliverables

The project will deliver a set of digital and smart toolkits including **cost model, decision support system, condition monitoring system, smart inspection & remanufacturing system.**

Cost Estimation Tools



Deep Learning based Condition Monitoring Tools



Decision Support System

