**Problem**

Hospitals spend $93B per year on medical equipment in the US. However, they are neither able to elaborate long-term budget plans for the replacement of medical equipment nor they have an idea of how will their fleet evolve in the following years.

**How can we help hospitals develop a replacement plan for their medical equipment over the next 5 years?**

To solve this problem, we need to tackle the following questions:
1. How can we estimate the cost of replacing an asset?
2. Which is the best replacement strategy for each client?
3. How can we optimally suggest which specific assets should be replaced?

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**Methodology**

The goal is to estimate how much it will cost to replace an asset in the future.

However, since we only have information about the past purchases, we start from the past purchase price, and we update it applying the price trends observed in the data within each product category.

Running regressions for each category, controlling on manufacturer and organization, then validating each regression separately.

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**Replacement Cost Forecast**

The Interactive 5-year Budget Planning provides the final quantification of the consistency between the Optimal Budget and the actual equipment in the US. Which is the best replacement strategy for each client? How can we estimate the cost of replacing an asset? How can we optimally suggest which specific assets should be replaced?

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**Interactive 5-year Budget Planning**

Interactive dashboard for clients to define a replacement strategy (how to prioritize the replacement of assets) that suits their needs and preferences by customizing the parameters of the model. The dashboard integrates a sequential approximation of the prescriptive model to improve the customer’s experience by reducing the computational time.

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**Replacement Cost Forecasting**

Running regressions for each category, controlling on manufacturer and organization, then validating each regression separately.

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**Optimal Budget Planning**

Binary optimization problem to provide the final prescriptions: which assets and when should the client replace according to its needs and preferences. The model maximizes the health score of replaced assets subject to budget constraints, prioritizing urgent assets, and allowing multiple same-asset replacements within the optimization horizon.

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**Company adoption**

HANDLE is currently implementing in their platform both Replacement Cost Forecast & Interactive 5-year Budget Planning.

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**Next steps**

1. Finalize integration into HANDLE platform
2. Collect feedback from running AB testing on real clients
3. Implement Optimal Budget Planning into production
4. Analyze consistency between prescriptions and actual decisions of the client

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**25k times speedup**

**97% of the optimal objective function**

**3,2% budget saving**