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Unleashing the Power of A.I for Estate Management in the NHS

The Political Background

In October 2022 the Government announced in the Estates Returns Information Collection (ERIC) data:

1. The cost of backlog maintenance had increased by 11% in the year and the total now stands at £10.2bn.
2. Investment to cut the backlog has risen by £1.4bn.
3. Approximately 52% of the total backlog is high and significant risk, i.e. £5.3bn. This risk falls to the NHS Trusts.

Digital NHS (2022) Estates Returns Information Collection, Summary page and dataset for ERIC 2021/22

This shows that the NHS caught in a process of continuing insidious decline, with only 14% of the backlog being tackled in the short term. Based on these figures, the situation will undoubtedly worsen.

Inevitably, it will reach a point where the NHS estate does not perform; patient safety will be compromised and the costs of the backlog will increase.

The Financial Background

The term backlog maintenance goes against good practice. A backlog is '*a large number of things that you should have done before and must do now.'* (Cambridge Dictionary)

The very idea that you can put off backlog maintenance and tackle only 14% of it per annum is therefore inconsistent with good financial management and is doomed to fail.

Backlog maintenance should not be accepted as "the norm" and we would recommend clearing the backlog every year.

This may seem unrealistic, but think about the alternative, which is to see the figures grow exponentially. We believe it has already reached the point of no return, unless an alternative solution is found.

Creating a Balanced Approach to Estate Management

The solution to this problem is to combine **the costs of estate management with those of backlog maintenance to create a balanced programme**. This includes:

1. To upgrade buildings to enlarge them or provide a change of use.
2. To provide the additional equipment needed to keep the facilities up to date.
3. To provide all backlog maintenance.
4. To uprate the buildings with regard to the new fire safety and building safety regulations (2021 and 2022).
5. To provide energy saving and climate change amendments to comply with new regulations.
6. To update the buildings with regard to Information Technology.

It could well be that the backlog maintenance costs are subsumed in the other changes to the building, which would negate the need to apply for additional funds. This is why we would suggest that the project management should be approached in this way, to gain maximum value for money and to make it easier to fund.

There are several steps in the process that leads to the solution.

1. Gathering the Data

There is a great deal of data involved in managing an estate:

- **Primary data** – This is information produced from the estate itself, such as surveys, condition and age of buildings; occupancy rates; energy usage; maintenance and repair history. Collecting primary data on an estate is a vital for effective project management and decision-making.
- **Secondary data** – This is data obtained from reliable sources other than the estates and buildings, such as the Office For National Statistics, property records, and industry information on the lifecycle of an asset. This can be used to challenge or improve the primary data and is a vital source of information.

We agree the taxonomy and seek the data that we require from you. This is a “well trodden path” and an essential first step.

We search for useful and appropriate secondary data which will enhance the model - and agree it with you, before we use it.

2. We Build the Computer Model and Test It

We will run these models to see whether there are gaps in the data.

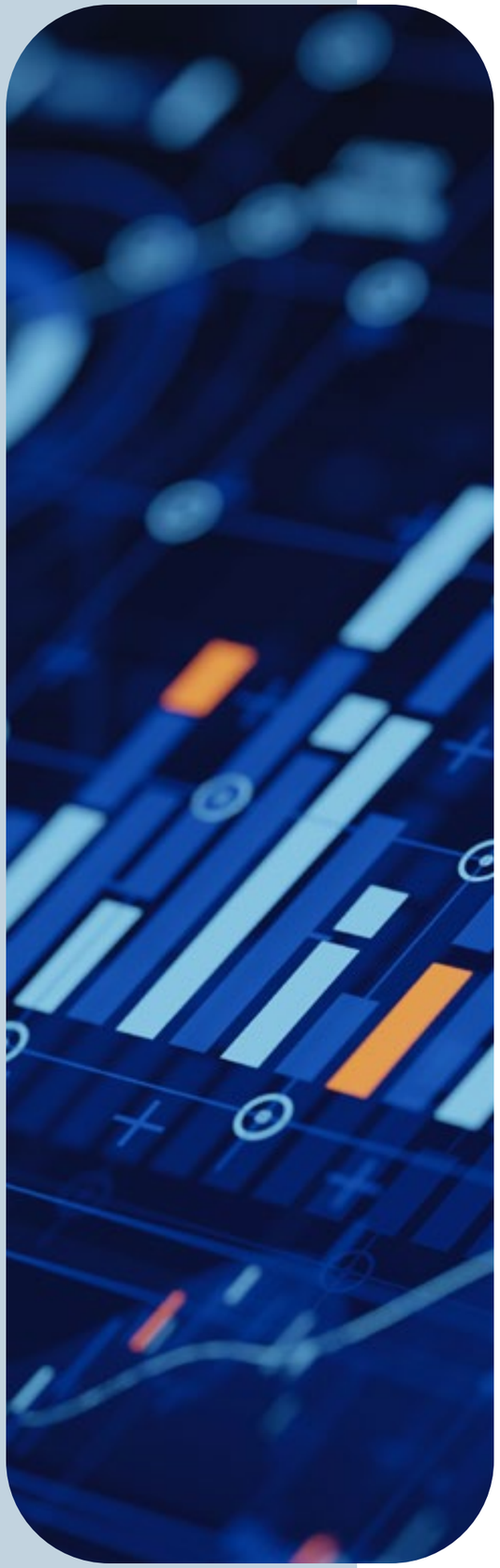
When the model has run successfully using limited information, we will then complete both the data and final testing of the model.

3. Applying Artificial Intelligence to the Data

Artificial intelligence and machine learning makes it possible to assess a wide range of options very quickly, or to reveal matters which could not be assessed by a conventional analysis of the data.

At this stage we expect to find a number of facts about the estate that were hitherto unknown and use the model to discuss them with you.

(The software that we use allows us to communicate with other software so that we have a “no-code” or “low-code” tool to get all the information that you need.)



4. Visualising the Data

A “picture is worth a thousand words”, so we seek ways to visualise the computer models and make the tables and spreadsheets more user-friendly.

For example, a 3D model of an estate can do so much to enhance the understanding by all users of the system.

A 4D model (incorporating time) can analyse the data and review work packages, volume and cost of works, so that you can see the development of the site at each stage of development.

5. Combine and Group the Data

This is where the real work is done!

With the maintenance programme data captured and represented in a visual model, intelligent decisions can be made concerning capital programmes and maintenance work packages.

A number of options will be run for a programme, depending on the buildings to be included, the decanting implications, the capital programme and capital costs. The 4D model is finalised and the discussions can begin to finalise the detail.

6. Incorporate Other Data into the Model

Once the model has been prepared, it can be adapted to include anything that you may need in the future.

It is not difficult to add new data.

Conclusion

The benefits of using artificial intelligence (AI) for a estate management in the NHS is very strong.

AI relies on algorithms, statistical models and large amounts of data – thus making it ideal for dealing with the complex matter of estates.

Our 6-step process for providing a model that defines programme options can be used for:

- the upgrading of buildings
- providing additional equipment required to keep the facilities up to date
- providing energy saving and climate change measures
- improving building and fire safety measure
- dealing with backlog maintenance
- uprating the Information Technology in the building

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