# How Clarsynt Put a Healthcare System on the Right Path to AI

In Sweden, universal healthcare allows for greater access to medical services.

Accounting for 17% of the country's population, 1.6 million people rely on this client, a Swedish healthcare administration, for healthcare and medical services through 17 hospitals, 121 healthcare centers and 170 public dental care facilities. In addition, some care is delivered through private centers under contract with the system.

They wanted to know how they could use the data they'd captured over the years to meet patient needs while maintaining cost-effective staffing.

### Could AI help automate staffing and administrative planning to support the healthcare system's goals?

Clarsynt came on to conduct a feasibility study to determine not just whether a large-scale AI project was technically and organizationally feasible, but to determine whether an AI solution would address their challenges and effectively optimize their systems.

## The Challenge

If they were understaffed, they wouldn't be able to provide quality care to all patients; if they were overstaffed, they would see cost increases that could sap resources from time periods with high demand.

With an entire hospital system to manage, the scheduling of staff and other resources is a complex problem for operations managers. Health system administrators have long had an interest in solving this complex staff scheduling problem, but have not gotten the results they want using ordinary methods of operations research. The scheduling problem is not just about resource allocation, it is also about people and their preferences. The administrators believe they need intelligence to solve this problem. Can modern methods of Artificial Intelligence solve this problem?

A feasibility study can save you time and money before you kick off a large-scale implementation by uncovering obstacles in your existing processes and data.

**Discover what's feasible for your unique organization.**

AI has extraordinary potential to help organizations sustain high-quality operations at maximum efficiency, but for large organizations with complex processes, a feasibility study can help avoid costs, save time, and identify unknowns prior to kicking off a large-scale project.

## Key questions

The client wanted to determine how AI could support the healthcare system's goals by answering these questions:

- Did their system have enough relevant data for making accurate predictions about patient demand and staffing?
- Could they use the data they had to draw reliable conclusions about the varying needs throughout the system?
- If their data was insufficient, what additional information--and resources for obtaining the information--were necessary?
- Was information available internally sufficient or did they need data from external sources?
- How could they use AI while maintaining data privacy?

**Case Company Profile**

INDUSTRY:
Healthcare

EMPLOYEES:
approx. 50,000

PROJECT TIMELINE:
6 months

INTERESTING TO KNOW:
Based in Sweden, their public includes 1.6 million people who rely on them for healthcare and medical services through 17 hospitals, 121 healthcare centers and 170 public dental care facilities.

## The feasibility study

To save the client from the expense of an unsustainable or inflexible implementation project that could exceed several million dollars in cost, Clarsynt's feasibility study helped uncover:

1. The value of processes they already had in place
2. What they could realistically learn from the historical data they had captured.

A sound feasibility study for AI planning would require attention to organizational goals, system-wide variables (populations, disease and injury trends, human resources, among many others), available data for each variable, reviews of current literature, and knowledge of existing AI tools.

> *"Clarsynt's work has contributed to more investigations and use of AI in logistics planning, with developing algorithms combined with RPA technology in our hospitals. Their findings directly contributed to elevating this region in Sweden to national AI competence."*
>
> **–Dr. Lars Lindsköld, Senior Advisor to AI Sweden**

## Predictive modeling

In many ways, prediction is the core of intelligence. When an expert observes and anticipates what will happen next in order to take action and avoid trouble, what we often think of as instinct is really a prediction based on data. The feasibility of an AI enhanced scheduling tool for the hospital system rests on the ability to make accurate predictions of items that drive demand for services from currently available data.

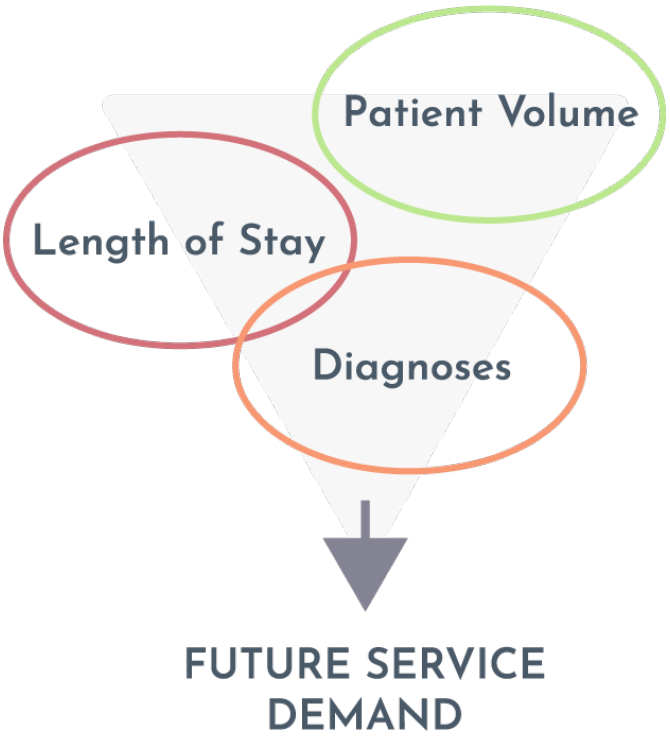
Clarsynt developed predictive models for future service demand based on historical data including patient volume, length of stay, and diagnoses. During the predictive modeling process, Clarsynt also evaluated and reported on data quality and relevance—enabling them to better understand which measurements would matter moving forward. Typically a resource-intensive and expensive process, data evaluation ultimately reduces costs for the healthcare system.

Predictive modeling indicates which data is needed for the prediction and which data is not. Accurate and timely measurements can be expensive, so knowing which ones contribute to relevant insights and which don't is a good way to reduce the cost of working systems.

Identifying missing data at this stage also avoids the unnecessary expense and frustration of trying to implement AI before a strong data foundation is in place.

In this work, Clarsynt used powerful models called neural networks to recognize subtle relationships in the data. These are just one of many machine learning algorithms available to us and are capable of seeing patterns in complex data.

The modeling process explored the available data and its ability to predict the relevant demand for services through many model variants. These variants ranged from simple, with few predictive variables, to complex with many predictive variables. All to show what is necessary, what is sufficient, and what is missing before beginning an expensive implementation project.




## Report findings

Clarsynt's feasibility report process revealed that the data that was available could predict the length of patient stay. Length of stay being an important driver of service demand in the hospital, these predictions could be leveraged as an input into organizational adjustments and staff schedules. The project identified clear next steps for implementing an improved data strategy to advance the scheduling program.

Furthermore, the study showed which missing data presented the greatest challenges for predicting patient volume system-wide—including seasonal and event-driven variations in the data.

## What is the value of a feasibility study?

While the value of a well-designed AI program is indisputable, implementation costs are considerable. Programs require input and buy-in from throughout the enterprise, so a feasibility study that captures concrete goals, evaluates the level of data that is available, and assesses current resources is an essential first step in the process.

According to Dr. Lars Lindsköld, Senior Advisor to AI Sweden, the feasibility study from Clarsynt, "contributed to more investigations and use of AI in logistics planning, with developing algorithms combined with RPA technology in our hospitals."

**Clarsynt got the AI process off on the right foot by helping the client:**

- Understand the possibilities AI technology can bring to healthcare administration and hospital operations.
- See the value of involving doctors and nurses to shape an AI solution.
- Implement AI solutions in real-world situations.

## How can a feasibility study support your goals?

When companies have data sitting in data warehouses, data marts, and data lakes but are not putting that valuable resource to work, they may be letting competitive advantages and operational efficiencies go to waste. A feasibility study is a low-cost way to assess the opportunities, costs, and potential ROI of AI.

**AI is a business automation tool that can produce knowledge and efficiencies across the organization:**

- Customer segmentation
- Customer-service analytics
- Energy management
- Fraud and debt analytics
- Human resources
- Inventory and parts optimization
- Logistics-network optimization
- Manufacturing
- Marketing and sales
- Operations
- Performance management
- Predictive maintenance
- Predictive service and interventions
- Product-feature optimization
- Risk modeling and analytics
- Service optimization
- Strategy and corporate finance
- Supply-chain management
- Talent management

Clarsynt leads businesses through strategic process improvements to enable faster growth and higher margins. Through rigorous business analysis, inspired solution design, and skilled project management, we serve our clients' interests to deliver operational efficiency, managerial effectiveness and AI transformation.

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Clarsynt

From insight to implemented—we get strategy done.