

# Business Intelligence Helped Increase Patient Satisfaction and Lower Operating Costs

Universal Data Warehouse

Data systemization

Data visualization

## Customer

A large healthcare network with over 100 facilities across the United States.

## Industry

Healthcare

## Challenge

A technology solution that would improve daily operations by providing more insight into existing processes



# Business Problem

- ▶ A declining customer satisfaction due to the lack of access to business and healthcare data, caused by the absence of a universal data warehouse (DWH) system.
- ▶ Revenue decrease throughout the entire health network



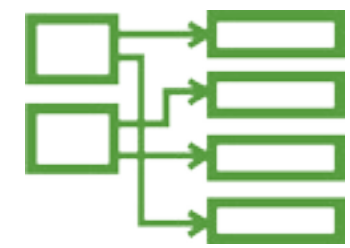
# Challenge

A technology solution that would improve daily operations by providing more insight into existing processes, allowing bottlenecks in service delivery to be quickly identified and staff to quickly react to patient issues



# Solution

**A two-layer business intelligence (BI) solution for a quick access to patients' data.**



## **Data systemization**

a DWH-module to collect, systematize, and store data.



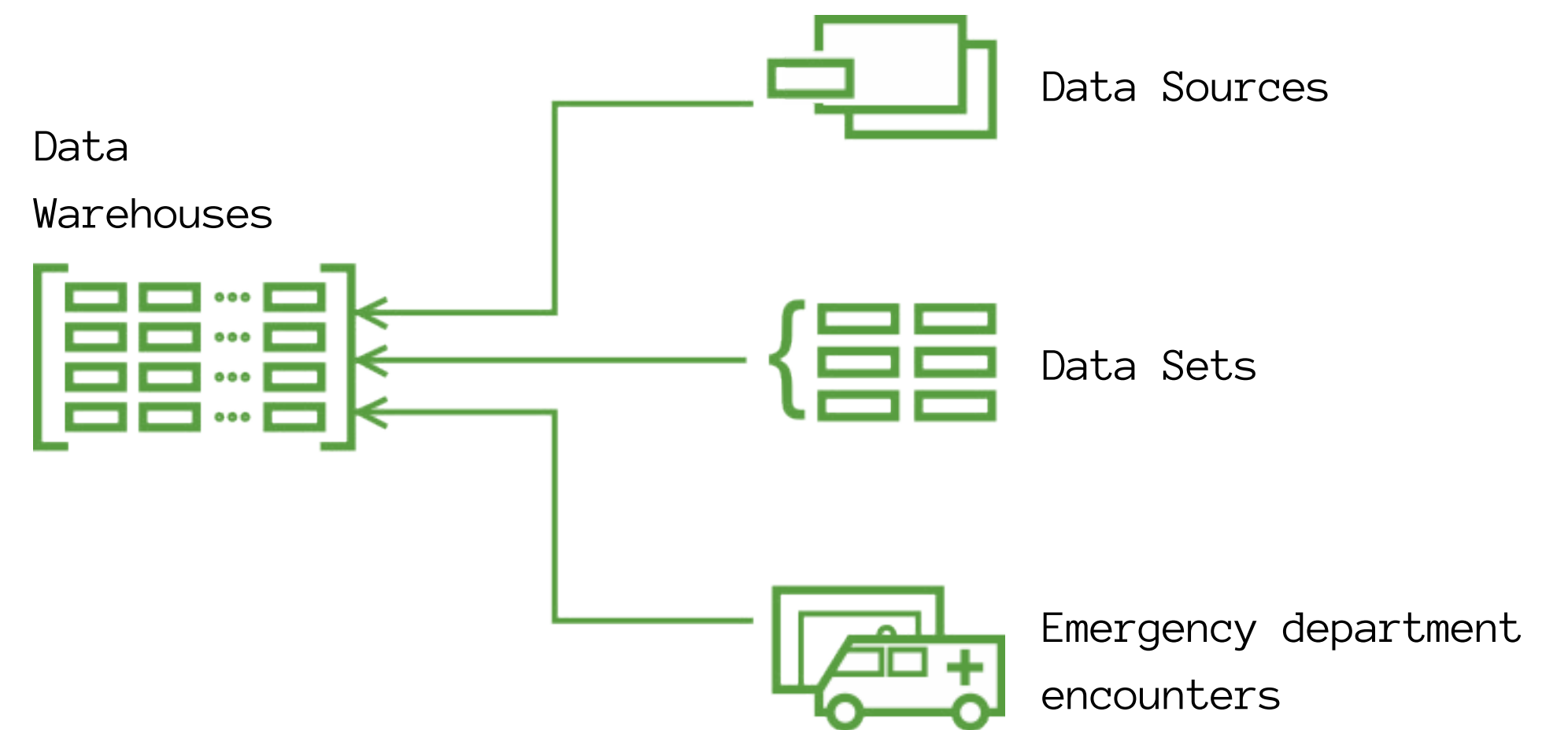
## **Data visualization**

a BI-module providing access to clinical records through the use of tags and visualization of key parameters such as average length of treatment for specific diagnosis, number of deaths, and successfully cured patients with the same diagnosis within the larger healthcare network.

# Data Systemization

Implemented data warehouse to store historical clinical records. Data was gathered from different sources, emergency department encounters from all sources available throughout the network, and clinical datasets: free text provider notes, inpatient, outpatient, laboratory.

HBase + Hadoop chosen to manage the continuously growing volume of data.

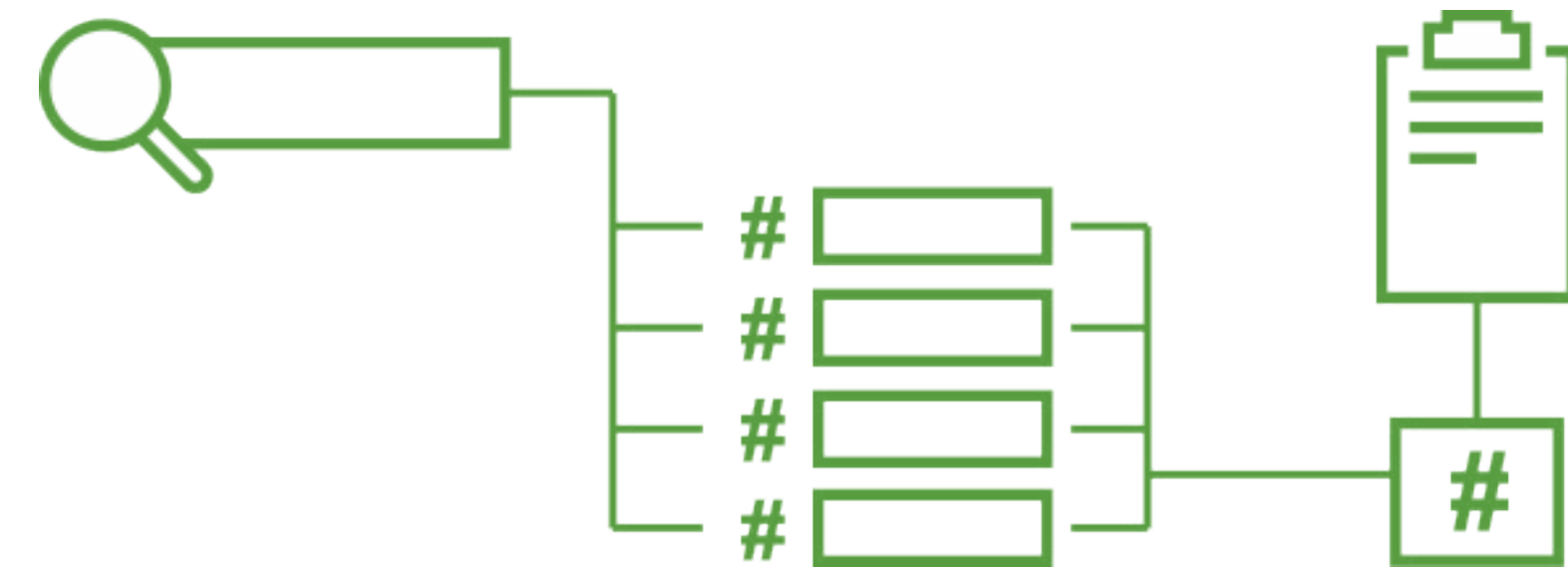


# Data Systemization

Implemented a number of Data Mining methods, including Text Mining, for extraction of particular keywords, setting them as tags to view the clinical history of a patient.

So now patient specific data can be accessed by manually searching keywords or clicking on tags extracted automatically from clinical history.

Sentiment Analysis used to improve search algorithm, producing highly relevant search results.



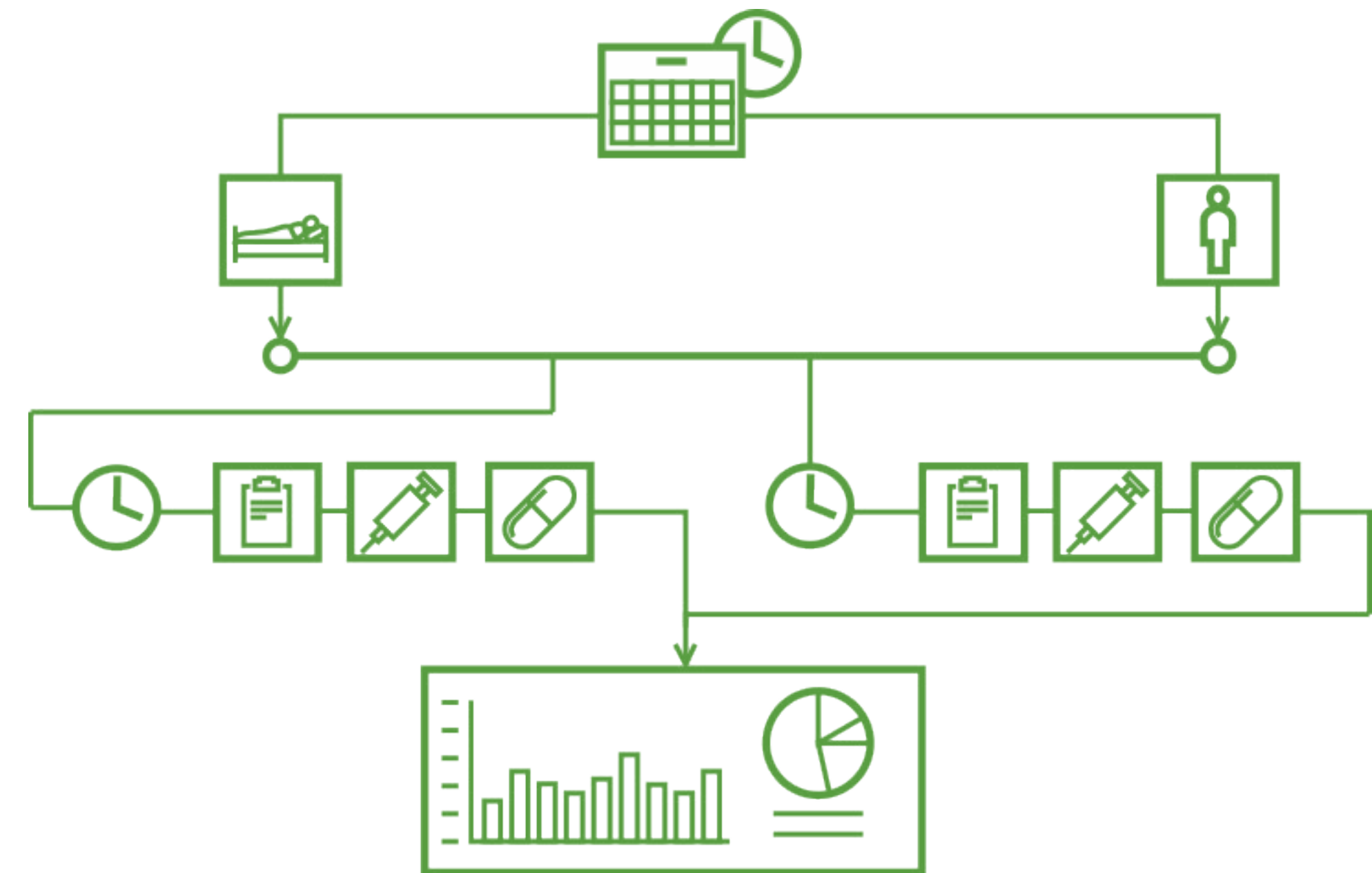
For example, a common keyword such as sugar, combined with other keywords such as high likely produces desired results related to the diabetes tag group.

# Data Visualization

Extracted key parameters such as start and end dates of treatment, drug types, etc.  
Then created descriptive statistic models to present information such as

The number of patients with diagnosis A that were treated with drug B.

Tableau Software for data visualization

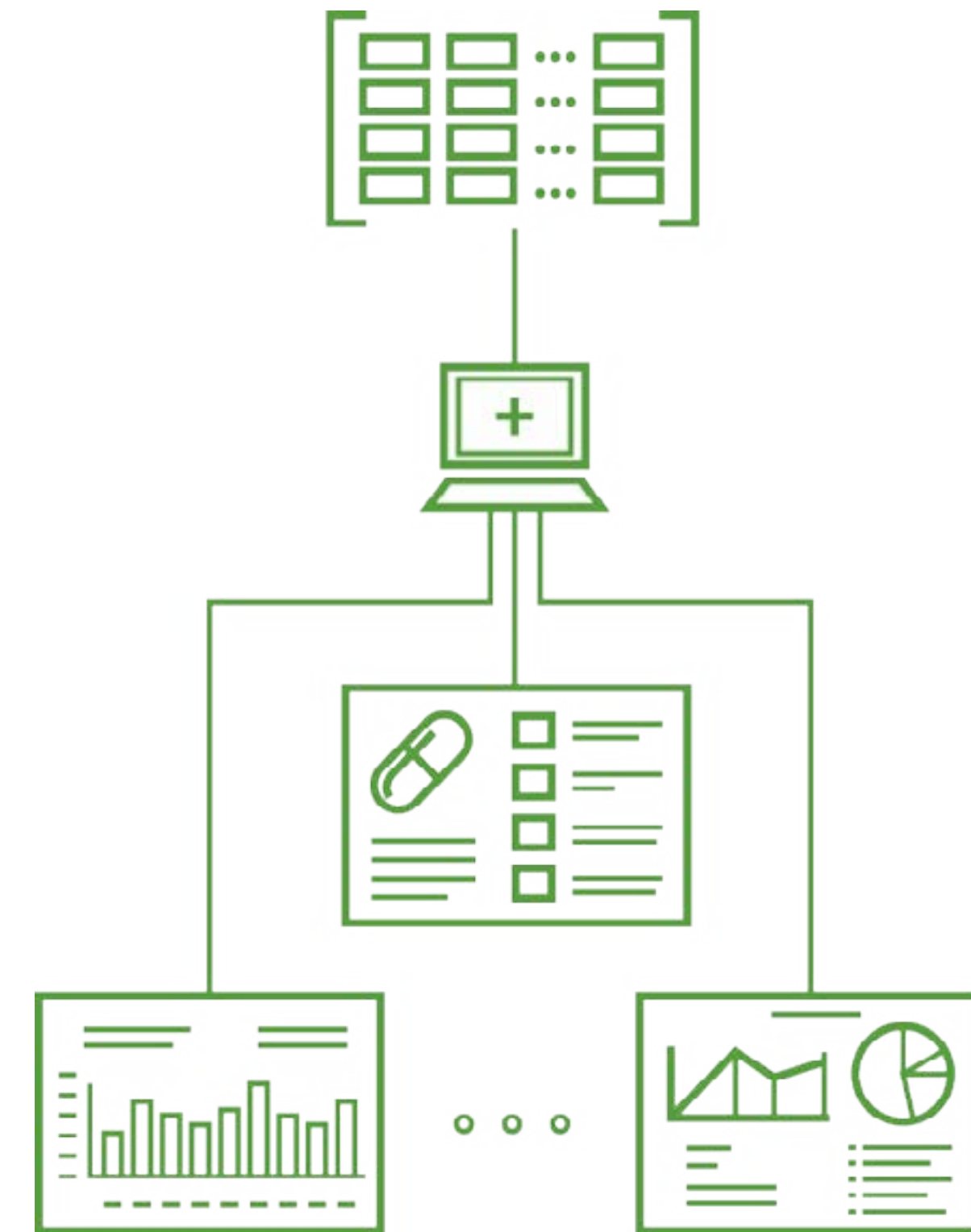


# Data Visualization

## The result:

a broad set of extendable dashboards displaying information from network data, i.e. information on diagnosed conditions or on most commonly used drugs prescribed for different groups of diagnoses.

Doctors and clinical staff received visual information about medical diagnosis and treatments.





# Benefits

up to  
**6%**

Decreased staff support costs

up to  
**20%**

increase in the speed of service delivery,  
according to the patients' feedback

**5%**

Patient volume increased by

**2%**

Decreased staff support costs



The clinical staff and administrators  
can quickly make informed decisions.



Executives can see trends in patient care,  
demand for various specialists,  
and the financial impact of decisions.



Improved customer satisfaction  
throughout the entire healthcare network.

# About

Named a Top 100 Global Outsourcing Company, ELEKS is a global organization providing software engineering, technology consulting and quality assurance services.

Since 1991, ELEKS innovative and award-winning solutions have significantly contributed to the customers' unparalleled business growth to include Data Science, Mobility, Digital and Financial solutions.

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